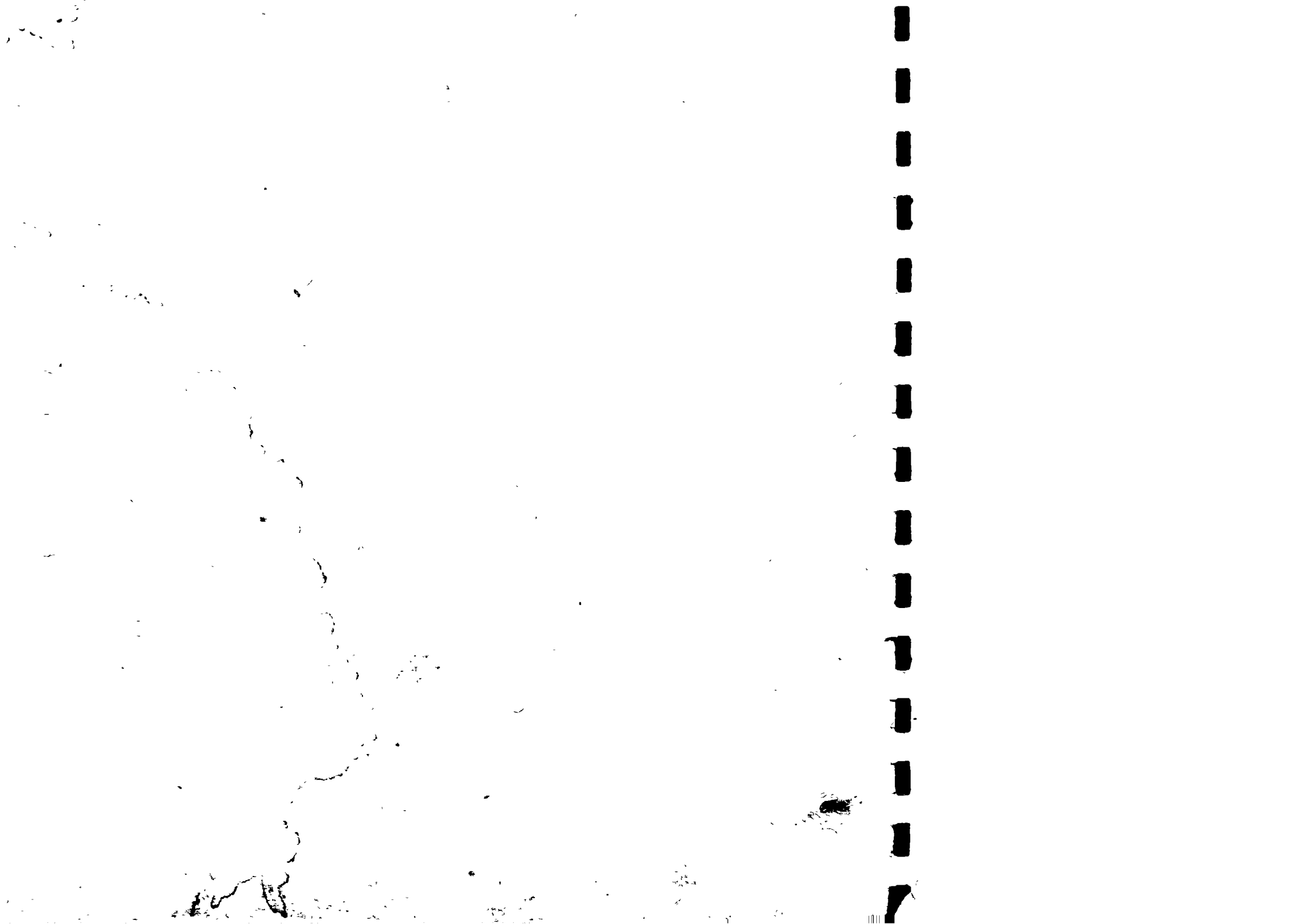




PART I: SECTOR OVERVIEW

822-90-7859



# 1990 STATUS REPORT

## PART I: SECTOR OVERVIEW

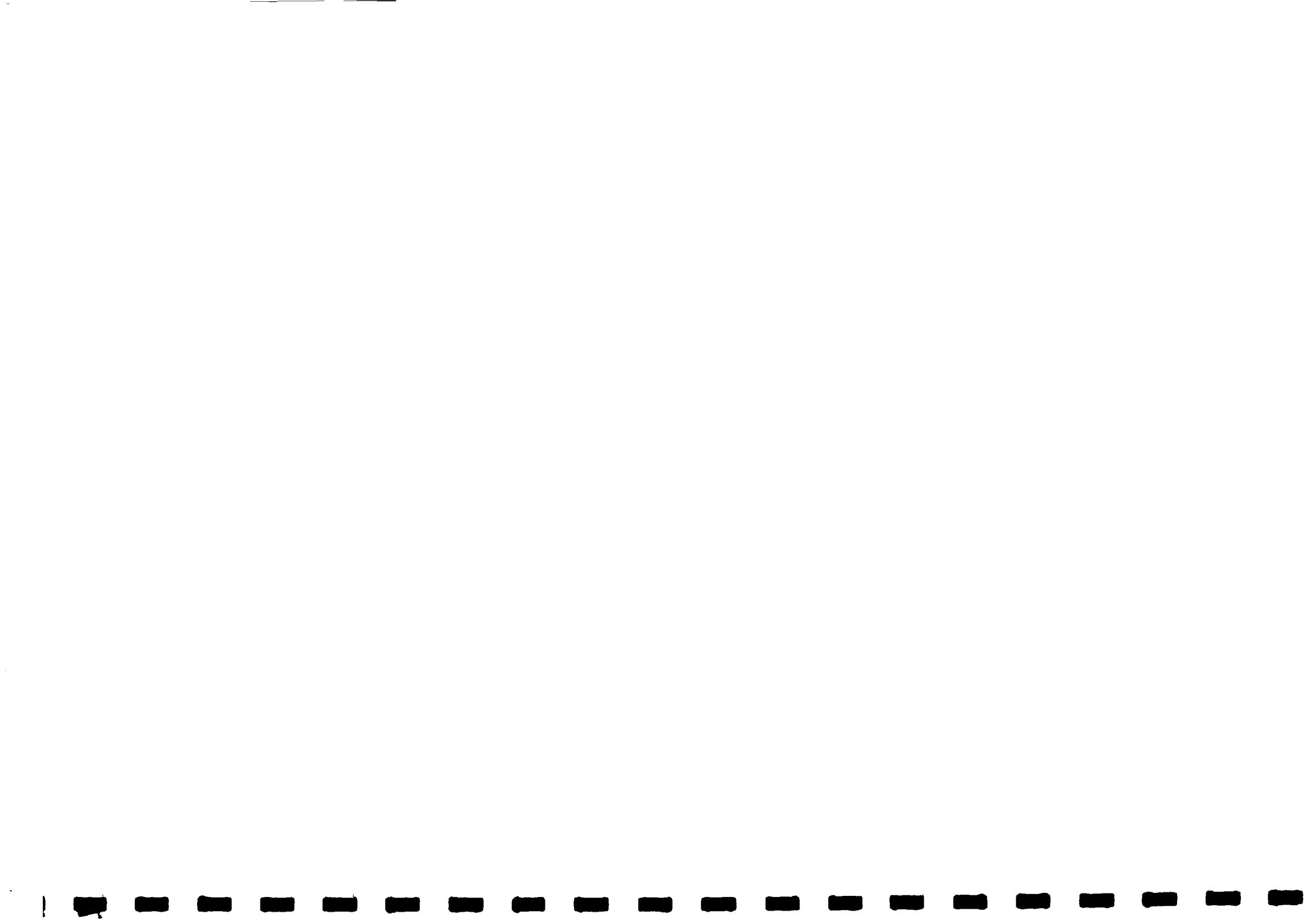
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UNICEF KATHMANDU  
OCTOBER 1990



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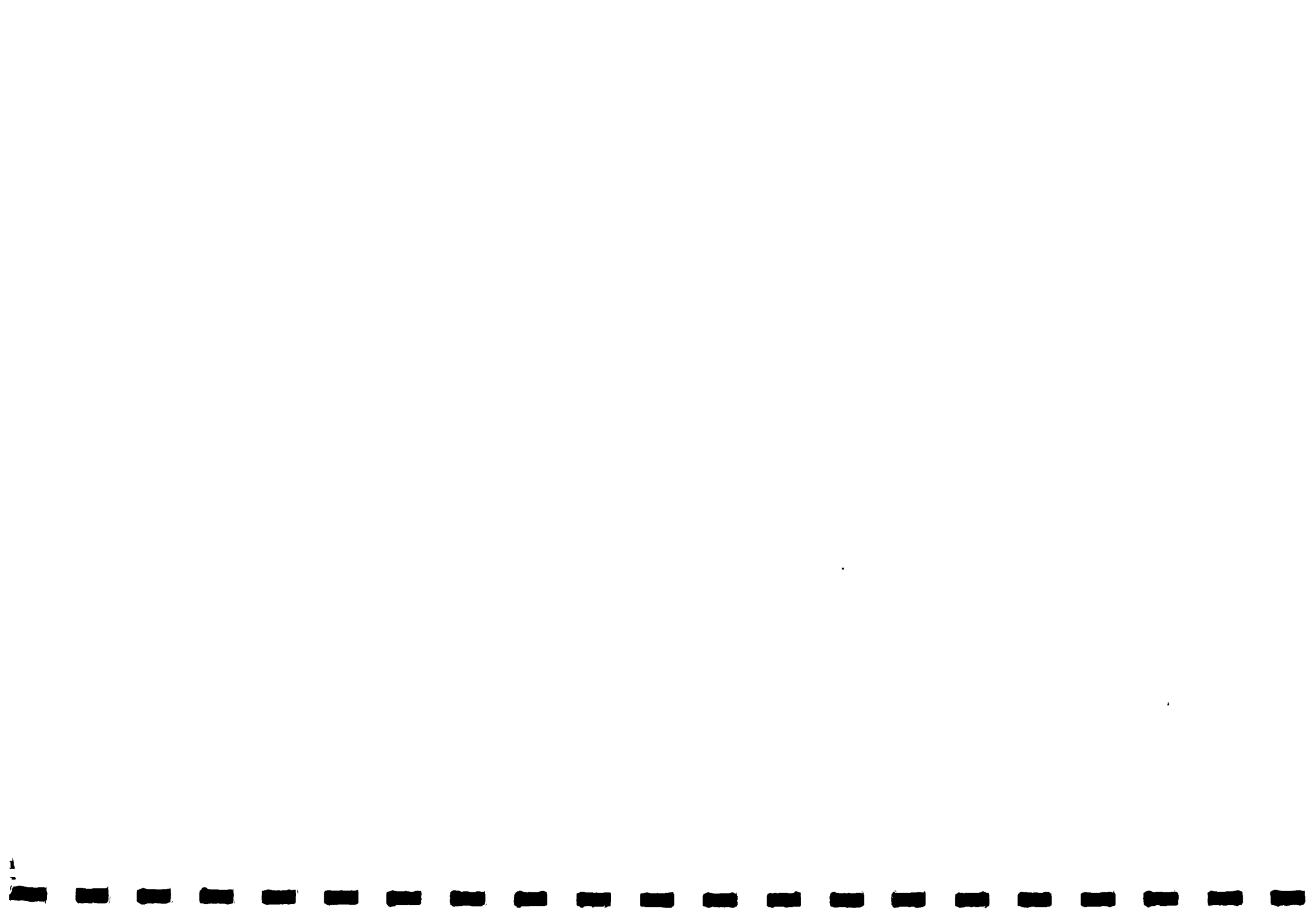
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PART II: UNICEF'S ASSISTANCE TO THE SECTOR:  
A PROPOSAL FOR THE 1990s.





On the occasion, the Water and Environmental Sanitation Section of UNICEF decided to record the status of UNICEF's assistance to the water supply and sanitation sector in Nepal.

For practical reasons, this study is published in two parts. This first part documents the major events in the sector, traces the developments in the UNICEF assisted sector programmes and describes the relevance of these programmes to the sector as a whole. An assessment of the present situation in the sector is also included.

The second part of the study will look at the years ahead and attempt to outline trends in the sector, stressing the elements which are of particular concern to HMG/UNICEF cooperation. This part details a revision of UNICEF's sector support for the final two years of the current country programme and analyses the developmental framework for the next HMG-UNICEF Plan of Operations, which will cover the period 1993 to 1997. The second part is planned to be ready in draft form for discussion with His Majesty's Government by early December 1990.

The main purpose of this report, once completed, must be seen as a tool to facilitate a thorough analysis of the present situation and also to serve to improve coordination between the national sector institutions and the external support agencies. As such, it will be the basis for discussion and negotiation between UNICEF and HMG in reviewing the current programme of cooperation and in preparing the next country programme as well as a framework for exchange of information and precision between all the concerned parties.

We hope that the subject matter has been presented in an attractive fashion, which will offer the patient reader many hours of enjoyable reading. Comments, questions, corrections and elaborations, as well as requests for additional copies are welcome at: WES Section, UNICEF, P.O. Box 1187, Kathmandu.

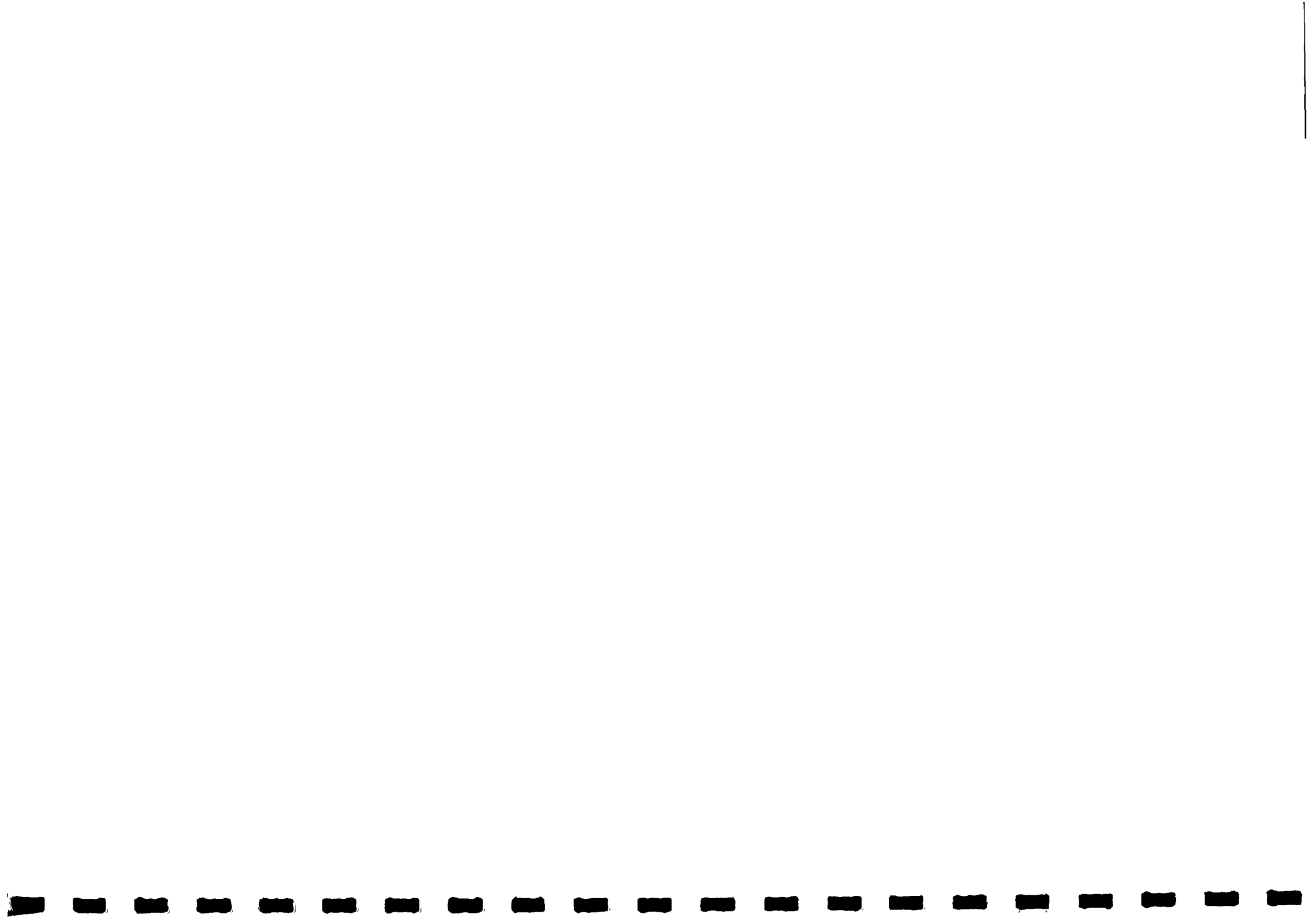
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CIDA	Canadian International Development Agency
CSTU	Central Sanitation and Training Unit
CSW	Community Sanitation Worker
CTSDC	Curriculum Textbook Supervision Development Training
CUC	Canadian UNICEF Committee
CWSS	Community Water Supply and Sanitation
DA	Development Associate
DCP	Development Communication Production
DDWSBO	District Drinking Water Supply Branch Office (of DWSS)
DE	District Engineer (of DWSS)
DG	Director General (of DWSS)
DISVI	Disarmo e Sviluppo (Italian International Cooperation)
DO	District Office (of DWSS)
DPHO	District Public Health Office
DTO	District Technical Office
DWSS	Department of Water Supply and Sewerage
EASTAP	EastConsult's Sanitation Action Programme
EEC	European Economic Community
ESA	External Support Agency
ESS	Environmental Sanitation Section (MoH)
FCHV	Female Community Health Volunteer (MoH)
FINNIDA	Finland International Development Agency
FRG	Federal Republic of Germany
GNP	Gross National Product
GR	General Resources
GTZ	Deutsche Gesellschaft fuer Technische Zusammenarbeit
GVS	German Volunteer Service
GWS	Gorkha Welfare Scheme (British Gurkha)
HC	Handpump Caretaker
HC	Health Committee
HELVETAS	Swiss Association for Development and Cooperation
HES	Health Education Section (MoH)
HMG/N	His Majesty's Government of Nepal
HW	Health Worker
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association (World Bank)
IDWSSD	International Drinking Water Supply and Sanitation Decade
ILO	International Labour Organisation
IRDP	Integrated Rural Development Project
JAWU	Japanese Automobile Workers Union
JICA	Japanese International Cooperation Agency



MHPP	Ministry of Housing and Physical Planning
MITS	Management Information for Technical Support
MLD	Ministry of Local Development
MoEC	Ministry of Education and Culture
MoF	Ministry of Finance
MoH	Ministry of Health
MPLD	Ministry of Panchayat and Local Development
MST	Maintenance and Sanitation Technician
MWR	Ministry of Water Resources
NGO	Non-Governmental Organisation
NNCU	Netherlands National Committee for UNICEF
NPC	National Planning Commission
NRCS	Nepal Red Cross Society
NWSC	Nepal Water Supply Corporation
NWSSC	National Water Supply and Sanitation Committee
ODA	Overseas Development Agency (U.K.)
OS	Overseer
O&M	Operation and Maintenance
PCRW	Production Credit for Rural Women
PDTC	Panchayat Development Training Centre
PHC-DW	Primary Health Care - Drinking Water (of NRCS)
RB	Redd Barna
RD	Regional Director(ate)
RT	Repair Technician
RWSP	Rural Water Supply Project
SAARC	South Asia Association for Regional Cooperation
SAP	South Asia Partnership
SC	Sanitation Coordinator
SCF (UK)	Save the Children Fund (U.K.)
SDC	Swiss Development Cooperation
SFDP	Small Farmers Development Programme
SNV	Stichting Nederlandse Vrijwilligers (Dutch Volunteers)
SS	Sanitation Supervisor
SSNCC	Social Service National Coordination Council
ST	Sanitation Technician
SUSP	Semi Urban Sanitation Programme (Pilot scheme)
SWW	Sanitation Women Worker
S&WI	Sanitation & Women's Involvement
TAG	Technology Advisory Group
TRWSSP	Terai Rural Water Supply and Sanitation Programme
TT	Tubewell Technician
TTP	Terai Tubewell Project



VHW	Village Health Worker (MoH)
VM(S)C	Village Maintenance (and Sanitation) Committee
VM(S)W	Village Maintenance (and Sanitation) Worker
VSO	Voluntary Services Overseas
WA	WaterAid
WATSAN	Water Supply and Sanitation
WDD	Women Development Division (of MLD)
WDO	Women Development Officer (of MLD)
WES	Water and Environmental Sanitation
WHO	World Health Organisation
WIP	Women's Involvement Programme
WSSB	Water Supply and Sewerage Board
WSSC	Water Supply and Sewerage Corporation
WSST	Water Supply and Sanitation Technician
WV	Women Volunteer
WW	Women Worker



2



to efforts at building village capacity for maintaining and operating completed facilities in more recent years. Health education, including the promotion of personal, domestic and environmental hygiene, has also gained a place of importance in the programmes as it became evident that the health benefits of improved water supply do not necessarily flow from the construction of improved water supplies alone.

In twenty years of endeavour from 1970 to 1989, UNICEF cooperation with the government and other agencies in the sector has provided:

Improved water supplies : 1,130,000 beneficiaries

Latrines (private and institutional) : 170,000 beneficiaries

Training, workshops, seminars: 65,000 participants

These results have been achieved with a total budget of almost US\$ 30 million.

This expenditure can be broken down as follows:

Estimated Community Participation:	US\$ 3 million
HMG expenditure :	US\$ 7 million
UNICEF expenditure :	US\$ 20 million

The year 1990 marks the end of the International Drinking Water Supply and Sanitation Decade (IDWSSD). Although Nepal has not met the ambitious targets for the provision of drinking water supply facilities set at the beginning of the decade, there were nevertheless great improvements in coverage from 1981 to 1990.

C H I N A

Figure 1 1

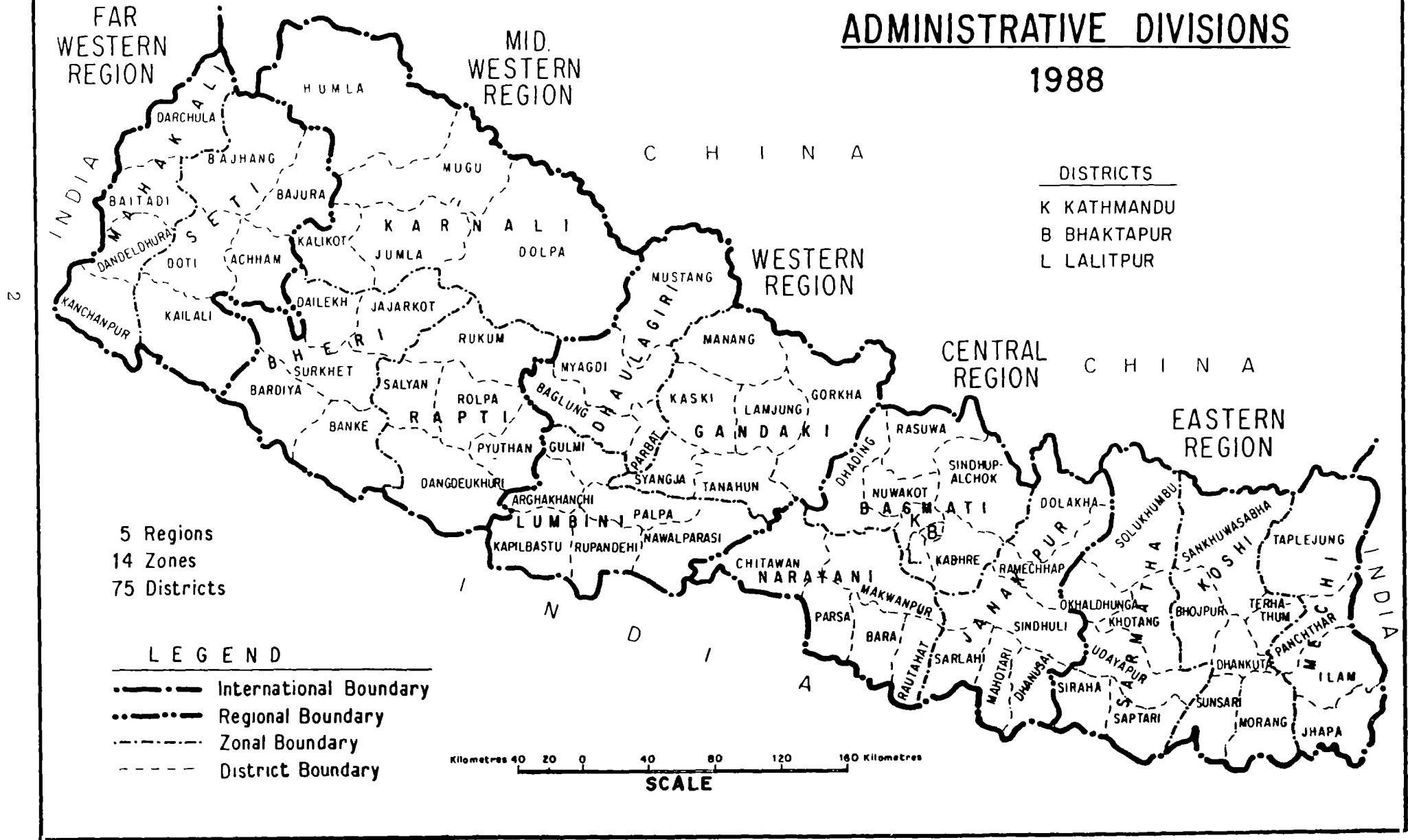
# NEPAL

## ADMINISTRATIVE DIVISIONS

1988

DISTRICTS

- K KATHMANDU
- B BHAKTAPUR
- L LALITPUR





of sanitation facilities and in improving personal and environmental hygiene has not been significant. In 1990, government estimates put the use of sanitary latrines by the rural population at 5% and in urban areas at 47%.

In order to meet the targets for the year 2000, increased financial resources, clear sector policies and procedures and innovative technical approaches must be sought to improve coverage levels. At the same time, the fledgling sanitation, health education and women's involvement components of the programme must also be supported with sufficient funding and manpower resources. More realistic targets must be set for the year 2000 in light of the resources which are likely to be available for the sector.

As HMG and UNICEF begin to plan and formulate the future programme of cooperation, these factors will be kept in mind in order to develop a programme which responds to Nepal's particular needs.

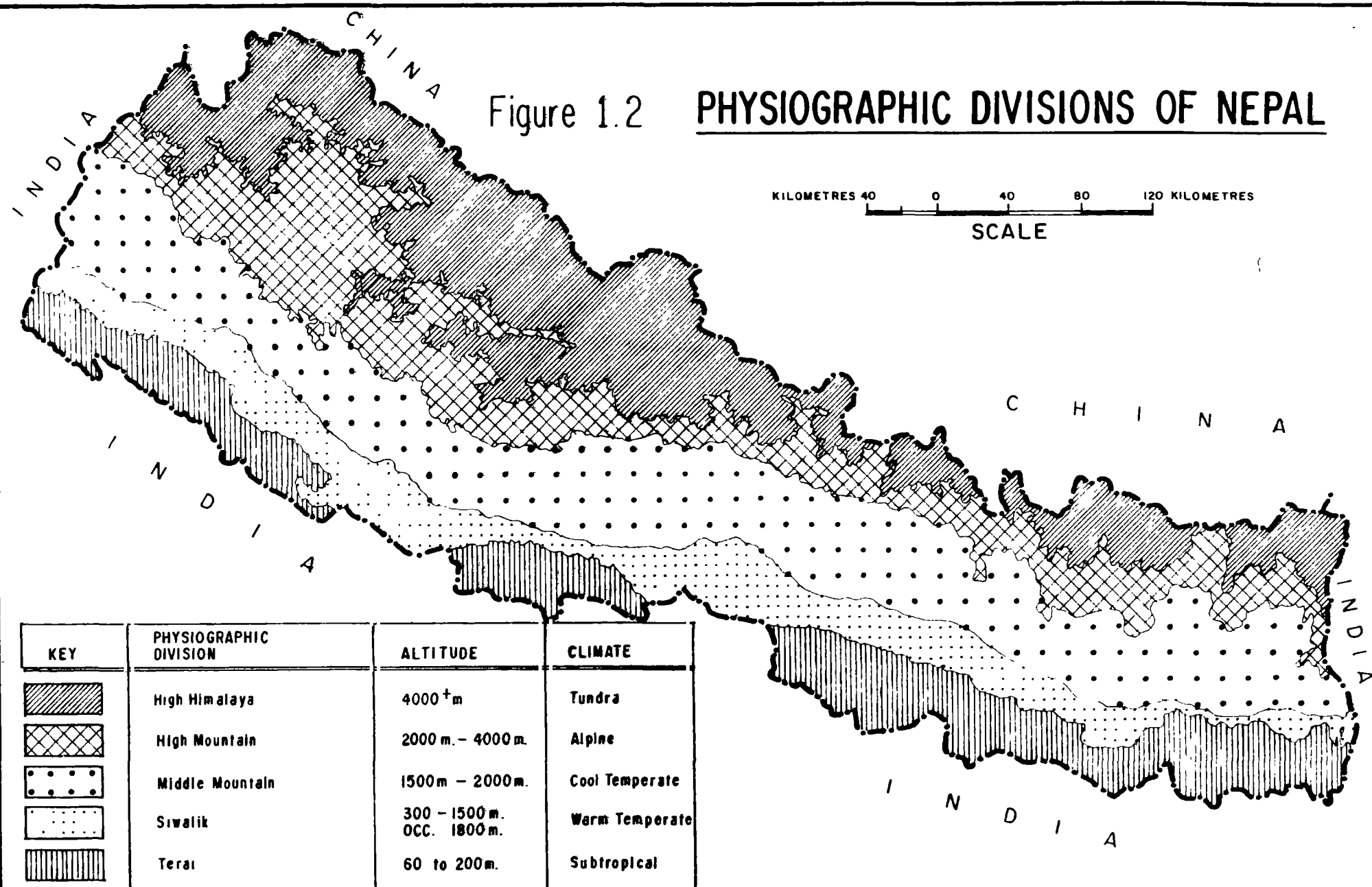
The first part of this Status Report aims to review UNICEF's past and present assistance to the sector and to assess the actual status of activities in the sector. In the light of this information, the second part of the report will propose the general direction for the next Plan of Operations detailing the proposed cooperation between UNICEF and HMG in the sector.



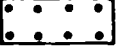
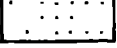

## 1.2 COUNTRY BACKGROUND

### 1.2.1 Physical Characteristics

Nepal's location with regard to her imposing neighbors, China in the north and India in the south is shown in Figure 1.1. Nepal is a landlocked country of 147,100 km.sq.; measuring on average 885 kms. east to west and from 145 km to 240 kms. north to south.

Figure 1.2 PHYSIOGRAPHIC DIVISIONS OF NEPAL



KEY	PHYSIOGRAPHIC DIVISION	ALTITUDE	CLIMATE
	High Himalaya	4000 <sup>+</sup> m	Tundra
	High Mountain	2000 m. - 4000 m.	Alpine
	Middle Mountain	1500 m - 2000 m.	Cool Temperate
	Siwalik	300 - 1500 m. OCC. 1800 m.	Warm Temperate
	Terai	60 to 200 m.	Subtropical

loosely defined in belts which run east to west across the country. Within a relatively short distance the climate can vary from sub-tropical to arctic. This is mainly due to changes in elevation which vary from about 70m in the Terai to 8848m at the highest point in the country.

Precipitation in Nepal varies according to the season and topography. Over 80% of the annual precipitation in most areas of the country falls during the monsoon months from July till October. In general, the monsoon is longer and wetter in the east than in the west. Rainfall in the Terai increases with proximity to the Siwalik hills. North of the Siwaliks precipitation decreases, to increase again with proximity to the High Himalayas.

Throughout Nepal there are numerous rivers. The four main river systems are the Mahakali, the Karnali, the Narayani and the Sapta Koshi. Drainage in Nepal is south towards the Ganges River. Rivers are subject to extreme variations in flow, increasing during the monsoon and during the post-winter melt of snow and ice in the mountains.

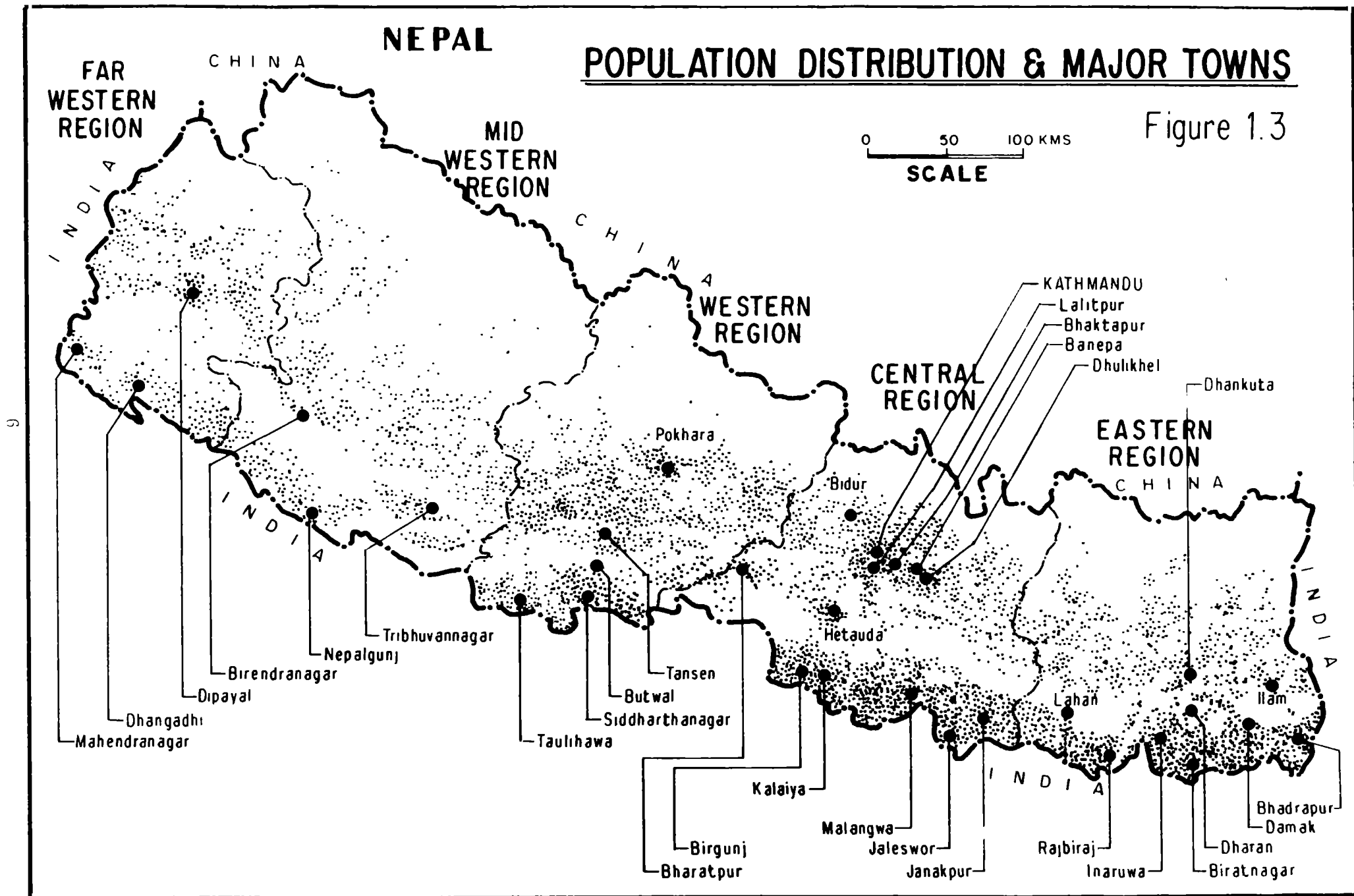
For obvious reasons, groundwater exploration and abstraction has, until now, been limited to the Terai areas. Depending on the hydro-geological characteristics of the area, groundwater in the Terai may be found in shallow or deep aquifers, which sometimes produce artesian wells.

The Siwaliks form the foothills of the Himalayas and run parallel to the Nepal-India southern border. In the Siwaliks small springs may be found on north slopes, but south slopes are usually dry and do not retain enough water to produce sources that yield year round.

In the Middle Mountains springs are abundant and yield water year round.

# NEPAL POPULATION DISTRIBUTION & MAJOR TOWNS

Figure 1.3



major towns and rural population settlement patterns.

Until 1990 the country had a fairly stable, but ambivalent political climate for the past three decades. Except for a period immediately after the hereditary rule of the Ranas ended in 1951, when there was a multi-party political system, the country has had a nominal constitutional democracy with a party-less Panchayat system under the leadership of the King. The spring of 1990 saw the abolishment of the Panchayat system and presently Nepal has an interim government formed by a coalition of parties.

A new constitution is being drafted and the first democratic multi-party elections in thirty years are tentatively planned for the spring of 1991. Changes within the government continue, making the present climate difficult for long-range planning and programming. The 7th Five Year Plan period has been extended by 12 to 24 months and the start of the 8th Plan has been postponed by the same period.

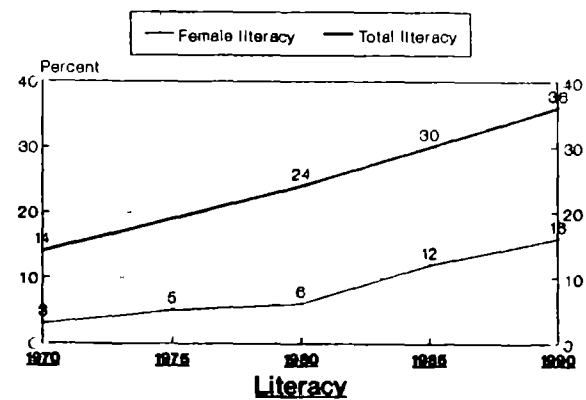
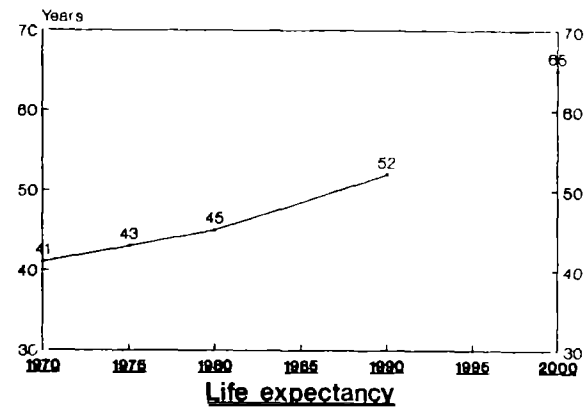
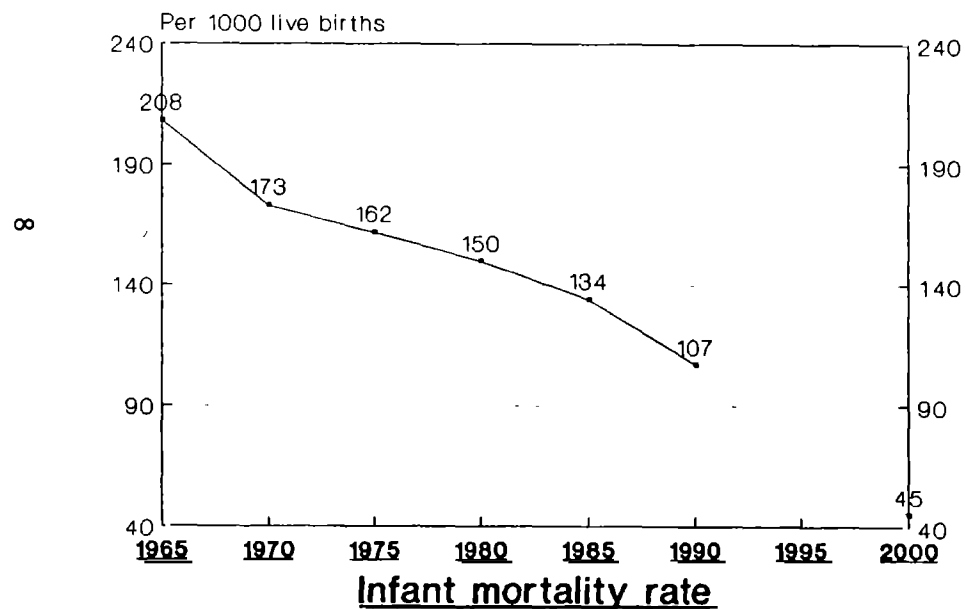
### 1.2.3 Social and Demographic Characteristics

The last two decades have seen great changes in Nepal: not all for the better. Although infant and child mortality rates have decreased, Nepal still ranks among the countries classified as having very high child mortality rates.

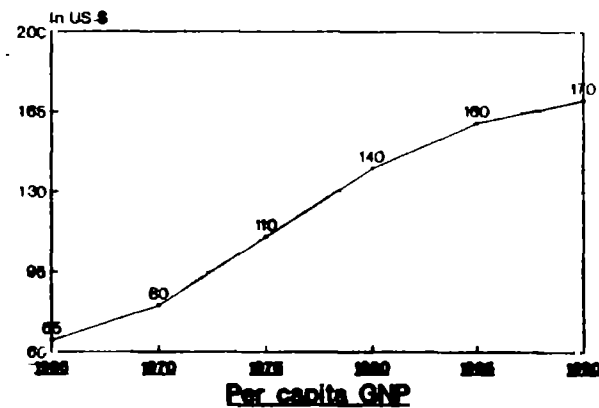
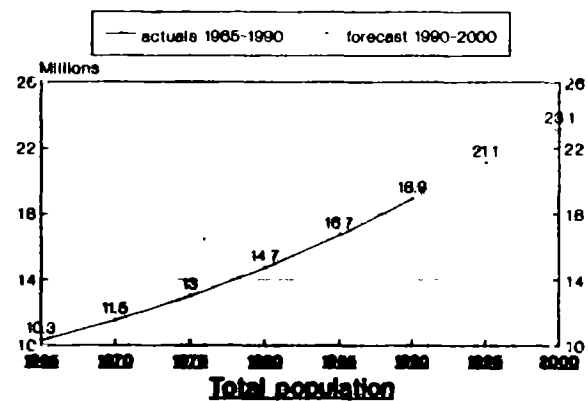
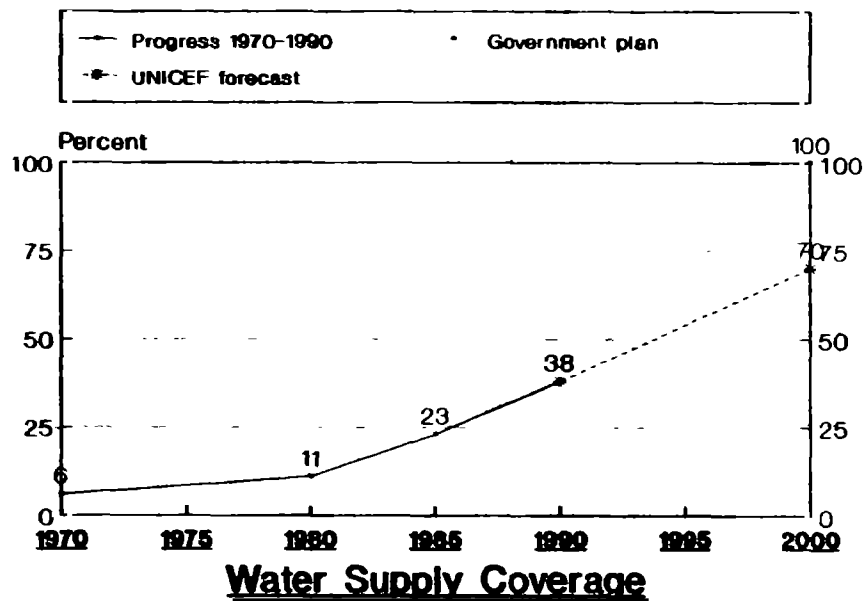
In UNICEF's "State of the World's Children 1990" Nepal's 1988 under-five mortality rate of 197 ranks 18th among 131 countries. In the last two decades the quantities of foreign aid coming into the country have increased markedly. In 1987 Nepal received US\$ 345 million in overseas development assistance; equal to 13% of the GNP.

The graphs in **Figure 1.4** show some development indicators and how these have changed for Nepal over the last 20 years.

## Trends in Development Indicators 1970 - 1990



# Trends in Development Indicators 1970 - 1990







from 17.1 million in 1985 to 21.4 million in 2000, a rise of 71%. The proportion of the population living in urban areas is expected to increase from 7.3% in 1990 to 10.5% in 2000. Nepal has the highest rate of urbanisation of all the SAARC member countries.

The population of Nepal is more concentrated in the Central and Eastern Regions of the country than in the Mid- and Far Western Regions where access to many areas is still difficult. The population distribution shows two predominant migratory trends: one from the hilly areas to the Terai and one from rural areas to the urban centers.

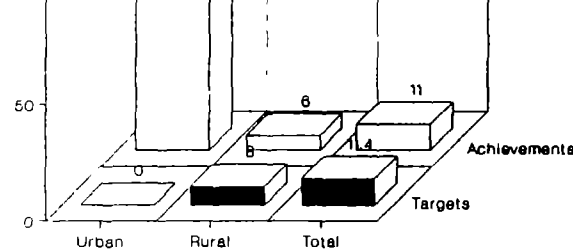
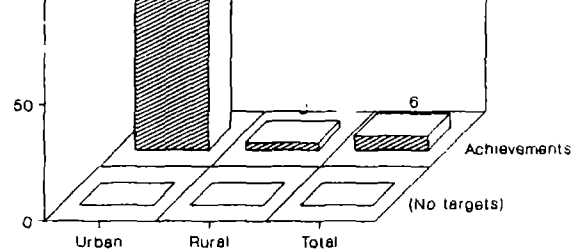
### Social Well-Being

Nepal is still one of the poorest countries in the world and has one of the worst health records.

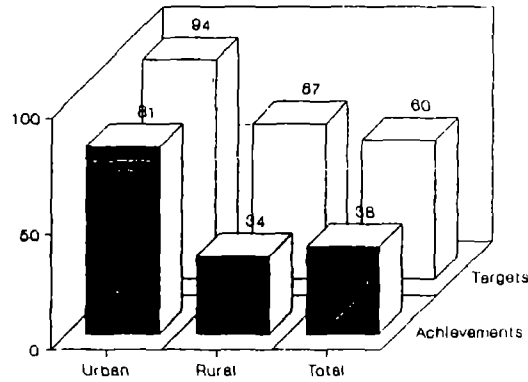
Poor water supply and sanitation are among the leading causes of diseases. Diarrhoea, dysentery, hepatitis, gastro-enteritis and parasitic infections are the most common diseases reported at the health centres throughout the country. Children suffer worst: the number of diarrhoeal episodes per child per year is estimated at 6.2 (1988). Indeed, of the death rate for children age one to five of 35 per 1000, 46% is associated with diarrhoea.

The government has put forth policies to improve the well-being of the general population in two strategies: "Basic Needs for All by the year 2000" (1985) and "Health for All by the year 2000".

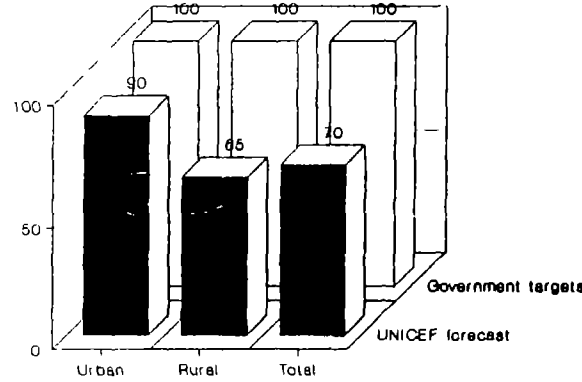
Although there have been improvements in the provision of basic services to the population, achievements are offset by the considerable population growth rate and the dispersed nature of the rural population mostly living in remote, rugged terrain, which make it difficult to reach people with services.



**End of Seventh Plan: 1990**  
**Total Population = 18,900,000**



**Planning for the year 2000**  
**Total Population = 23,075,000**



**Sources:** 1970: Targets: Not available  
 Achievements: Fourth Plan report of achievements in the first three Five Year Plans

1980: Targets: Fifth Plan targets  
 Achievements: Sector Study; Proctor and Redfern; 1986 (p.16)

1990: Targets: Original 1981/90 Decade Plan figures; revised downwards in 1985  
 Achievements: Government statements for mid-1990

2000: Targets: 'Basic Needs for All by the Year 2000'

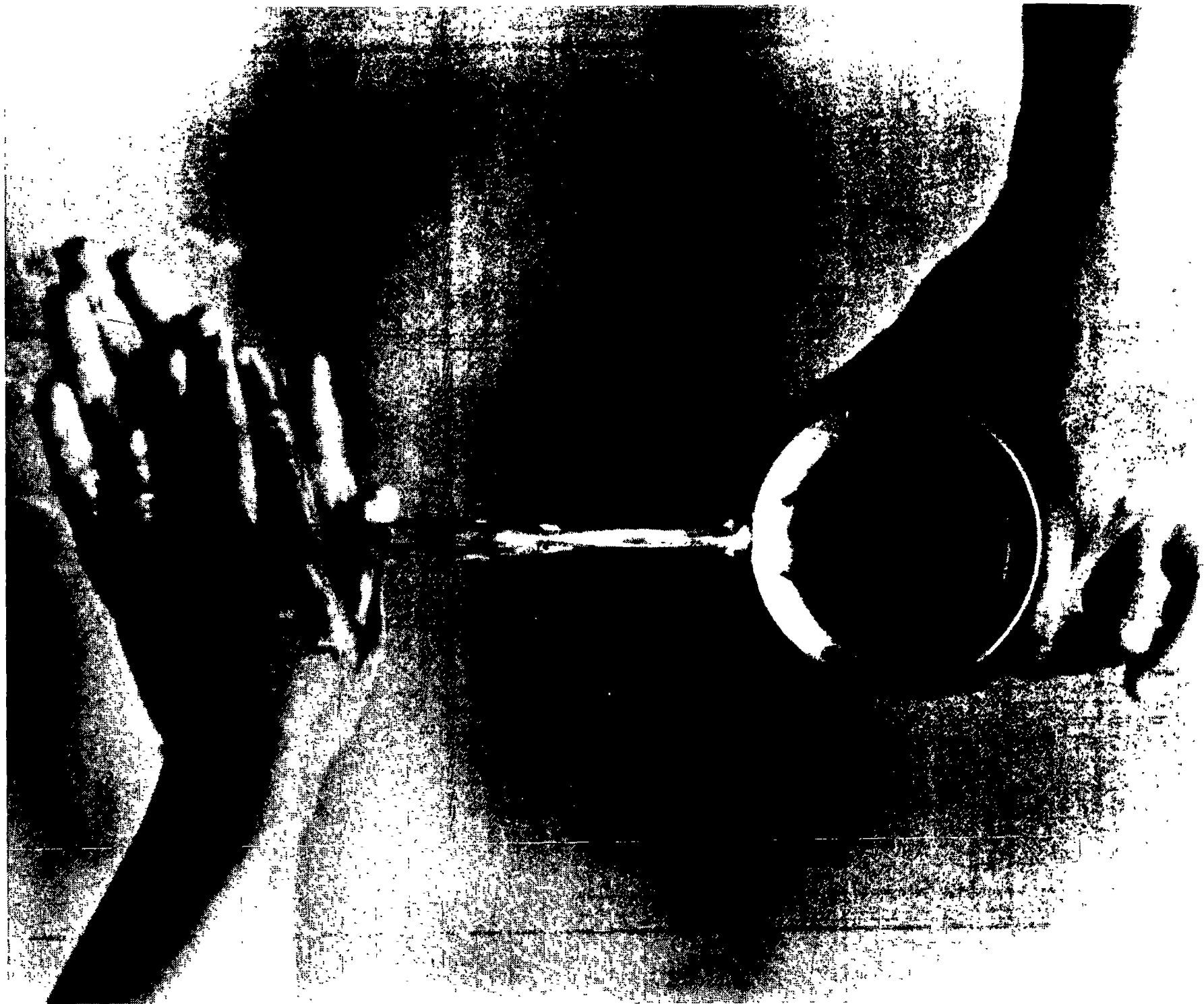
targets for water supply coverage are set in five year Development Plans and in sectoral decade plans such as the IDWSSD Plan. Special plans such as the strategies for Basic Needs for All by the year 2000 and Health for All by the year 2000 also contain targets for water supply and sanitary services.

According to the 1986 UNDP-financed Water Supply and Sanitation Sector Study, most of Nepal's progress in water supply has been achieved from 1970 onwards. Figure 2.1 shows government Plan targets and actual coverage for 1970, 1980 and 1990 as well as projected coverage for the year 2000.

As indicated by Figure 2.1, in 1970 the domestic water supply situation in Nepal was poor: rural coverage was a paltry three percent and urban coverage was about 70%. The government had neither the resources nor the trained manpower to undertake a programme on the scale necessary to address the problem. Financial and technical resources to supplement the government's own resources were obtained from foreign donors. Programme focus was on urban areas, even though the urban areas accounted for only 5% of the total population.

Progress in water supply during the 1970s did not significantly improve the situation for the rural population of Nepal. From 1975 to 1985 about half of the sector development expenditure was from external sources.

According to the government's Seventh Five Year Plan, 94% urban water supply coverage and 67% rural water supply coverage were to be attained by 1990. These targets were included in the government's Basic Needs Programme which covers the period 1985 to 2000. Responding to the impetus of the International Drinking Water Supply and Sanitation Decade, the government set these ambitious targets in order to provide the population with water by the year 2000.



The IDWSSD Plan is among the first to define targets for rural and urban use of sanitary latrines: these targets were set at 13% and 33% respectively.

As the Decade draws to a close there is no doubt that for the rural population even the modest target of 13% was unrealistic. The use of sanitary latrines is estimated by the government to be around five percent in rural areas and about 47 percent in urban areas.

Despite the growing realisation that improvements in sanitary conditions in Nepal are essential to the goal of Health for All by the year 2000, the government is yet to formulate policies or plans for sanitation, or to allocate significant resources for the purpose.

The water and sanitation sector's proportion of total development expenditure has increased steadily. Between the 4th Plan (1970-1975) and the 5th Plan (1975-1980), the proportion of total development expenditure allotted to the water sector more than doubled.

The allocations for sanitation reflect the low priority accorded to this component. In the DWSS budget, the allocation for sanitation was 0.2% and 0.4% of the rural water supply budget in the 6th and 7th Plan respectively. In the Ministry of Health, the budget for environmental sanitation was 0.12% and 0.15% of the development budget for this Ministry in 1987-88 and 1988-89 respectively.

Figure 2.2 gives sector expenditures as a percentage of the total development budget starting with the 3rd Development Plan.

(Source for Figure 2.2 and 2.3: Project Preparation for Rehabilitation of DWSS Water Supply Projects; MITS, 1990)



allocated for development in each plan. It was expected that external support would contribute 75% of the budget necessary to achieve IDWSSD targets. In reality, external support accounted for only about 40% of the expenditure in both the 6th and 7th Five Year Plans. From the first plan period, when virtually all external support was in grant form, there has been a marked increase in the proportion of external funds for the sector which Nepal takes in the form of loans.

The following table lists the largest donors of the 1980s and the extent of their contributions.

Figure 2.3

Donor Aid to the Water and Sanitation Sector  
1981-1990

(in Rs. '1000)

<u>Donor</u>	<u>Amount</u>	<u>Recipient Agency</u>
ADB	273,794	DWSS/MPLD
Britain	124,068	DWSS
IDA	517,867	NWSC
Japan	50,000	DWSS
Netherlands	943	MLPD/IRD
UNICEF	292,209	DWSS/MPLD
UNDP	13,849	DWSS/NWSC
U.S.A.	8,694	MLPD
W.Germany	49,090	DWSS/NWSC
<b>TOTAL:</b>	<b>1,330,514;</b>	<b>equals about US\$ 65 million</b>





Activities have expanded from water supply for hilly areas to cover Terai areas also. Pure construction activities are increasingly being complemented with training, health education, latrine construction and maintenance and operational activities.

In spite of targets having been set for achievements in latrine use in the Health for All by the year 2000 strategy and in the 7th Plan, the construction of latrine facilities continues to be neglected in the government's programme. This comparative neglect of the sanitation component is clearly reflected in the failure to achieve significant improvements in this component over the past decade.

The chronological listing below covers some of the major contributions and events in the sector.

### The early years

1894 The first piped water system for Kathmandu installed. This system, Bir Dhara, continues to function to-date.

pre-

1951 Construction of core urban water supply schemes.

### The 1950s and 1960s

1954 WHO assistance to the sector starts

1966 The government establishes the Department of Irrigation and Water Supply; aimed at a planned development of the sector.

56-70 First three Plan Periods: little progress in rural water supply. At the end of the 3rd Plan: urban coverage: 70%; rural coverage: 3%.



1973 Water Supply and Sewerage Board (WSSB) established to execute an IDA funded project for Kathmandu valley towns and six other towns outside the valley.

75-80 5th Plan: water supply coverage increase to 11%;  
78% urban and 6% rural.

### The 1980s

The International Drinking Water Supply and Sanitation Decade: health education, latrine construction, women's involvement and operation and maintenance gain importance in most of the donor assisted programmes. The government's programme without external assistance expands in project construction, but fails to widen it's scope to sanitation, training and community participation. Many NGOs start work in the sector: by end of the decade there are 15 involved in water supply.

80-85 6th Plan: about 50% achievement of targets. Water supply coverage increases to 23%; 84% urban and 19% rural.

81-90 Decade Plan for IDWSSD: Nepal's National Decade Plan was launched on 10 November 1980 and aimed to increase water supply coverage from 11% to 68%.

1981 Implementation of shallow tubewells programme for rural water supply in the Terai started.

1982 Sanitation Cell in MPLD. Decentralisation Act. Environmental Sanitation Section and Health Education Section created in the Ministry of Health (MoH).

1984 Decentralisation Rules which intend to give more power to district- and village-level bodies. In the water sector, the intentions are not translated into meaningful practice.



sanitation programmes and staff transferred to DWSS.

- 1988 MoH, in cooperation with the Nepal Women's Organisation, launches the Female Community Health Volunteer (FCHV) programme. This programme planned to select and train one FCHV in each of the 36,144 wards of the country by the end of 1991. FCHVs are supervised by the Village Health Workers (VHWs) from the 'ilakha' healthposts.
- 1989 Nepal Water Supply Act: WSSC becomes the semi-autonomous NWSC (February 1990).
- 1989 National Sanitation Workshop: MHPP/WHO

The 1990s: a new political climate.

- Jan. DWSS directives for the implementation of water supply  
1990 projects: emphasis on community management of construction through Users Committees.
- Apr. Panchayat system abolished. Interim multi-party government.  
1990 8th Plan delayed until after the planned 1991 elections. Seventh Plan period extended by one year.
- Aug. HMG ratifies the Convention on the Rights of the Child.  
1990
- Sept. World Summit for Children. Access to safe water supply and  
1990 sanitary waste disposal included among the basic rights of each child.
- Oct. Creation of the National Water Supply and Sanitation  
1990 Committee (NWSSC), composed of high ranking officials (Secretary, Additional Secretary level) of the concerned governmental agencies (MHPP, MoH, MLD, MoEC, SSNCC, NPC and MoF) and one WHO adviser.



activities in the different development sectors and outlines UNICEF's and HMG's commitments. The first HMG/UNICEF Plan covered the period 1971 to 1975. At this time the Plan of Operations covered approximately the same period as the government's Five Year Plans for development. Later a decision was made to stagger the process so that UNICEF could more effectively contribute to the government planning process without the additional concern of producing the PlanOps at the same time. For 1980/81 and 1981/82 there were separate Plans, followed by a new Plan of Operations for 1982 to 1986. The present PlanOps covers the period from January 1988 to December 1992. A joint HMG-UNICEF mid-term review of the current Plan of Operations is planned for end-November 1990.

Figure 3.1 shows the percentage of the UNICEF budget allocated to water supply by PlanOp period; it also outlines the main components of UNICEF assistance during these periods.

The actual implementation of the Plan of Operations is further refined in individual project agreements within each sector.

### 3.1.2 The Water and Sanitation Sector

UNICEF assistance to the drinking water and environmental sanitation sector has always focussed on the rural areas where currently nearly 90% of the population resides. UNICEF is assisting two main programmes: Community Water Supply and Sanitation (CWSS) for gravity-flow water supplies in the hills, and Terai Rural Water Supply and Sanitation (TRWSS) for shallow tubewells in the Terai. The TRWSS programme is also referred to as 'CWSS in the Terai' but is more commonly known as the Terai Tubewell Project (TTP). Presently, TTP encompasses the UNICEF/HMG Project and the NRCS Primary Health Care-Drinking Water (PHC-DW) Programme.

UNICEF WES COMMITMENTS  
(As recorded in the Plans of Operations)  
(1975 - 1992)

Figure 3.1

(In US \$ '000)

YEAR	WATER SUPPLY			SANITATION			Grand
	Suppl.	Gen. Res.	Total	Suppl.	Gen. Res.	Total	Total
1975		274.0	274.0			0.0	274.0
1976	685.0	252.0	937.0			0.0	937.0
1977	604.0	268.1	872.1			0.0	872.1
1978		276.4	276.4			0.0	276.4
1979		82.5	82.5			0.0	82.5
1980	104.0	61.0	165.0		63.0	63.0	228.0
1981	1,283.5	227.0	1,510.5	14.0	87.0	101.0	1,611.5
1982	82.0	573.0	655.0	14.0	44.0	58.0	713.0
1983	2,162.0	773.0	2,935.0		62.9	62.9	2,997.9
1984	2,454.0	651.6	3,105.6		82.4	82.4	3,188.0
1985	2,951.0	758.3	3,709.3		73.7	73.7	3,783.0
1986	754.0	851.0	1,605.0		47.0	47.0	1,652.0
1987	No Plan of Operations			No Plan of Operations			
1988	2,799.0	131.0	2,930.0	43.0	90.0	133.0	3,063.0
1989	2,529.0	148.0	2,677.0	67.0	107.0	174.0	2,851.0
1990	2,853.0	142.0	2,995.0	124.0	159.0	283.0	3,278.0
1991	2,856.0	158.0	3,014.0	118.0	143.0	261.0	3,275.0
1992	1,683.0	162.0	1,845.0	119.0	159.0	278.0	2,123.0
<b>TOTALS:</b>	<b>23,799.5</b>	<b>5,788.9</b>	<b>29,588.4</b>	<b>499.0</b>	<b>1,118.0</b>	<b>1,617.0</b>	<b>31,205.4</b>



## The 1970s

- 1971 UNICEF's assistance in the sector begins with the Rural Water Supply Programme (RWSP). Implemented by the Local Development Department (LDD) of the Ministry of Water Resources (MWR) with UNICEF funding from general resources, sites are chosen in remote hilly areas on a country-wide basis with programme emphasis on physical construction, design standardisation and on the training of manpower. Shortages of skilled technical manpower are alleviated by assigning substantial numbers of expatriate volunteers. The UNICEF WES section has a staff of two, based in Kathmandu.
- 74-76 Change of RWSP focus to sites in the Small Area Development Programme, implemented by LDD.
- 1977 Evaluation of 70 water supply systems constructed under the RWS Programme from 1971 to 1976 (New Era, July 1977):
- 6% functioning completely satisfactorily.
  - 44% functioning with minor shortcomings.
  - 50% functioning with major problems or are not functioning at all.

### Constraints:

- Lack of skilled manpower resulting in poor quality construction.
  - Poor operation and maintenance; poorly supported Village Maintenance Workers (VMWs).
- 1976 A new programme, now named CWSS, is started to improve the quality of construction and to increase the rate of implementation. Executed through MPLD, community participation is the cornerstone of this programme. Increasingly, emphasis is placed on maintenance, rehabilitation, health education and latrine construction.

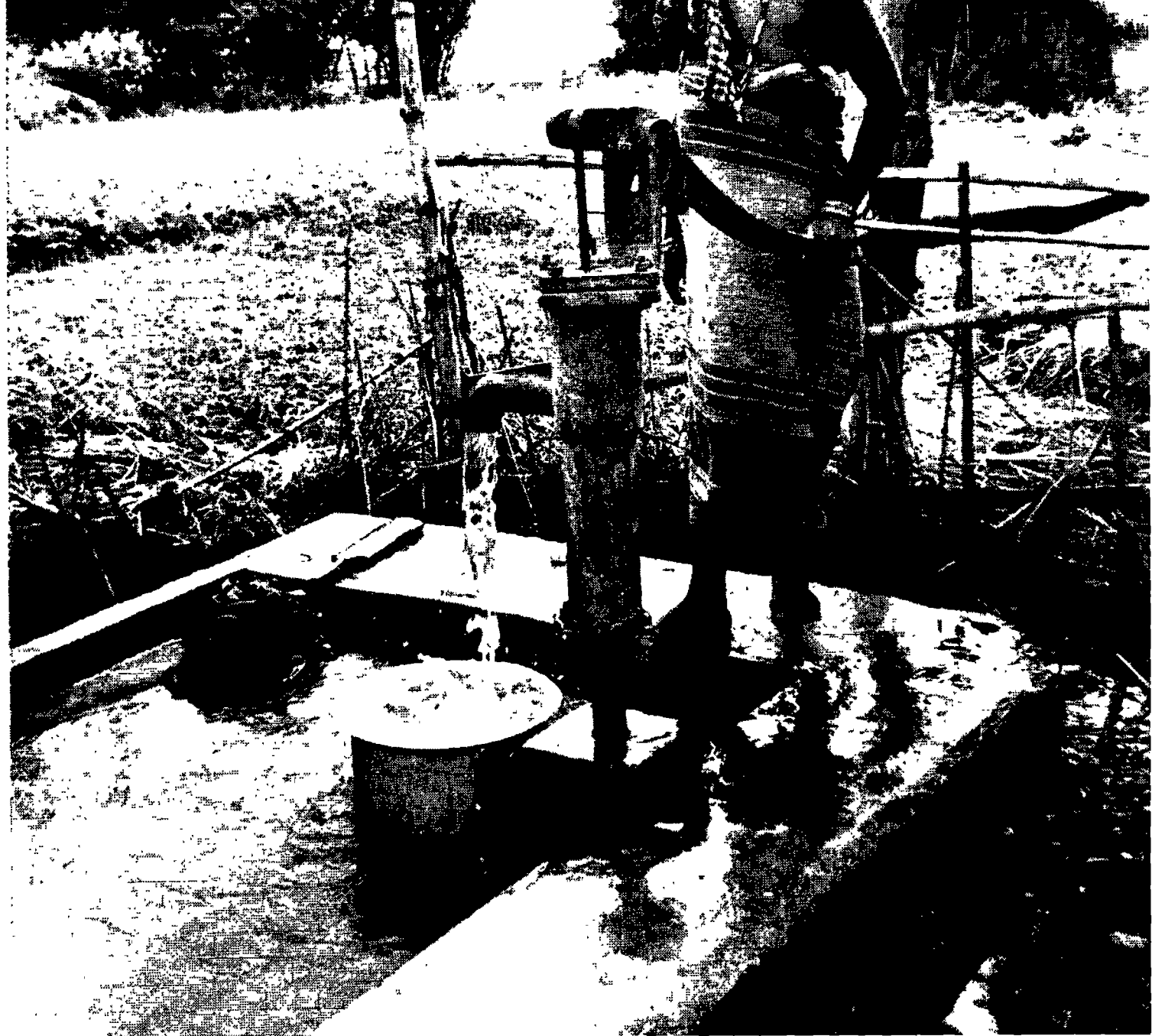


government of the Netherlands, the Netherlands National Committee for UNICEF and the Fuji Network Benefit Campaign.

- 1980 Joint MPLD/UNICEF conference in Jhapa. Basic policies and procedures formulated for the implementation of CWSS.
- 1980 Start of sanitation activities in CWSS.
- 1981 Funding from UNCDF for the second phase of CWSS in the Eastern region and Mid- and Far-Western regions.
- 1983 CWSS Central region; supplementary funding from the European Economic Community (EEC) received in 1985.
- 1986 Evaluation of CWSS Eastern region and Mid- and Far-Western regions. (Motor Columbus, 1986)
- 1988 Evaluation of CWSS Western region.
- progress in eliminating the shortcomings of the RWSP.
  - successes in the area of manpower training, development of technical standards, maintenance and rehabilitation.
  - little achievement in sanitation.
- 1990 Evaluation of CWSS Central region and TTP Eastern region.
- Evaluation of the UNICEF-assisted Semi-Urban Sanitation Programme (1982-89) and East Consult's Sanitation Action Programme (EASTAP). (New Era, August 1990)

#### Development of the TTP Programme

For one decade, UNICEF's assistance in the sector was solely for the provision of improved water supplies in hilly areas using gravity-flow schemes. In 1981 the government initiated the Terai Rural Water Supply and Sanitation Project (TRWSSP) to install shallow tubewells for drinking water in the southern plains of Nepal.



1986 Evaluation of the Pilot Phase by New Era (1986):

- 21% of the tubewells sampled were inoperable.
- Widespread structural and maintenance problems.
- Sanitation component ignored.
- Substantial progress in the development of managerial procedures and technical standards for tubewell installation.

1986- Pilot Phase Extension with supplementary funds from EEC.

1990 Implemented by MPLD until 1988; afterwards by DWSS (MHPP).  
Project area largely limited to Jhapa, Morang and Sunsari districts.

1986- Joint UNICEF/NRCS/JRCS Primary Health Care-Drinking Water

1990 Project. Implementation by NRCS in Parsa, Bara and Rautahat districts.

Comments: Even though the TTP and CWSS programmes are implemented in different geographic areas and by different personnel, common threads can be discerned in the development of both projects: community involvement as the basic philosophy; an initial emphasis on good quality construction followed by the development of a sustainable maintenance system; formulation of implementation procedures; training of manpower; a gradual introduction of health education and a recognition of the importance of involving women in the programme.

The CWSS and TTP programmes have had a significant impact on the formulation of subsequent sector programmes; both NGO- and government-sponsored. Basic concepts of CWSS are also discernable in the 1990 MHPP/DWSS directives for the construction and operation of water supply projects. Over the past two decades all concerned parties, governmental, non-governmental and UNICEF, have amassed a wealth of experience in the sector. The basic concepts of CWSS and TTP have been demonstrated over time to be appropriate for small to medium water supply and sanitation schemes.

Timeline: UNICEF Involvement in Water and Sanitation Since 1971

Figure 3.2

23

Project or Programme	Funding	Implementing Agency	Outputs	Year																			
				1971	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
Rural Water Supply Programme	UNICEF GR	LDD	70 systems	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
CWSS Western Region	SWISS Govt.	SATA/MPLD	95 Systems					Phase 1	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
	SWISS Govt.	SATA/MPLD						Phase 2	xxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
	SWISS Govt.	SATA/MPLD/MHPP	87 Systems									Phase 3	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	
	SWISS Govt.	HELVETAS/MHPP	69 Systems														Phase 4	xxxx	xxxx	xxxx	xxxx	xx	on-going
CWSS Eastern Region	NNCU	LDD	55 Systems					Phase 1	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
	UNCDF	MPLD	100 Systems									Phase 2	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
	CUC/UNCDF	MHPP	80 Systems											Phase 3	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xx	on-going	
CWSS Mid/Far West Region	NNCU, FBC	LDD	21 Systems					Phase 1	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
	UNCDF	MPLD	135 Systems									Phase 2	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
	CUC/UNCDF	MHPP	80 Systems													Phase 3	xxxx	xxxx	xxxx	xxxx	xx	on-going	
CWSS Central Region	EEC	MPLD/MHPP	80 Systems													xxxx	xxxx	xxxx	xxxx	xxxx	xx	on-going	
TTP (HMG)	EEC	MPLD/MHPP	1666 tubewells									Pilot Phase:	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
			2289 Tubewells (till end 89)															Pilot Phase Extension	xxxx	xxxx	xxxx	xxxx	xx
TTP (NGO)	JAWU/CUC CIDA	NRCS	1560 tubewells (till 07/90)														xxxx	xxxx	xxxx	xxxx	xx	on-going	
Semi-Urban Sanitation	UNICEF GR	MPLD/MHPP												xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Sanitation Action Program	UNICEF GR	EASTAP												xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx
Urban Basic Services	UNICEF GR	MPLD/MHPP																		xxx	xx	on-going	
CWSS for SFDP Sites	CUC/CIDA/FRG CU	ADB/N																		xxx	xx	on-going	

throughout the regions, where the programmes are implemented, which efficiently ensures the timely delivery of materials to project sites.

The programme's physical output includes the construction of 725 gravity-flow water supply systems; 5085 shallow tubewells; 14,000 household latrines; 700 institutional latrines and a number of office buildings. The number of beneficiaries of these water supply facilities is about 1,130,000, more than 5% of the present population of Nepal.

The proportion of the total population served, which benefits from UNICEF-funded water supplies installed from 1976 to mid-1989, is shown on the map in Figure 3.3: this proportion varies from 16% in the Mid-Western region to 32% in the Western region. Annex 2 contains more information on these and other coverage figures.

The map in Figure 3.4 shows the numbers of household and institutional latrines built in the programmes assisted by UNICEF.

### 3.2.2 Manpower Development

At the start of the programme, trained manpower was not available and the quality of construction reflected this lack. Hence, the development of a cadre of technical personnel to implement the projects was a top priority.

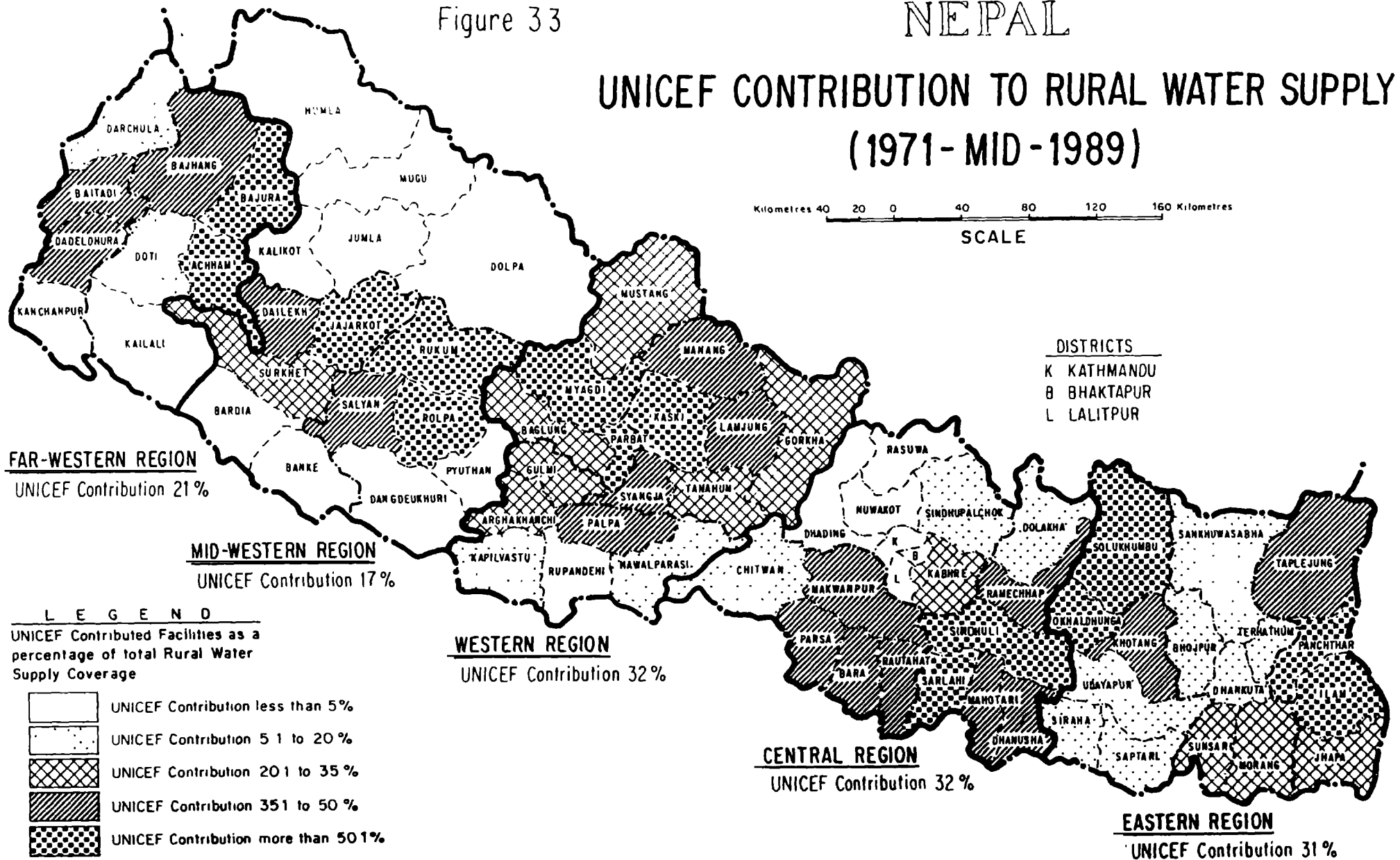
One of the most important achievements of the UNICEF-assisted programme has been the introduction of Water Supply and Sanitation Technicians (WSSTs). In TTP, WSSTs are called Tubewell Technicians (TTs). These technicians organise and supervise work in the villages and quickly proved indispensable in project implementation.

In contrast to the earlier years of implementation, the programme now has access to a competent cadre of technical personnel, from government engineers to overseers and technicians.

Figure 33

# NEPAL

## UNICEF CONTRIBUTION TO RURAL WATER SUPPLY (1971-MID-1989)

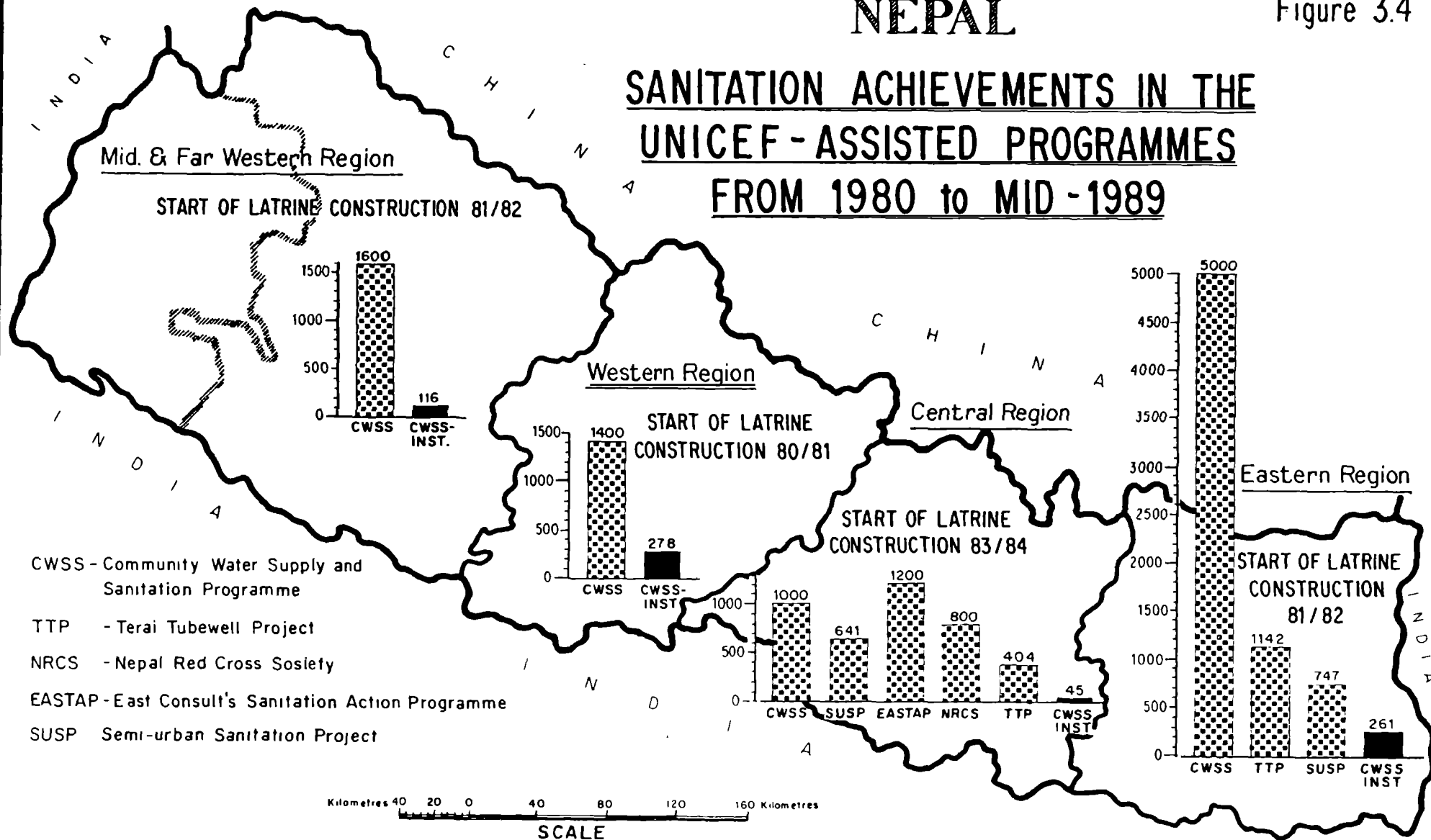




# NEPAL

Figure 3.4

## SANITATION ACHIEVEMENTS IN THE UNICEF - ASSISTED PROGRAMMES FROM 1980 to MID - 1989



Note See Figure 39 for Location of Sanitation Pilot Project Areas

ACHIEVEMENTS IN TRAINING SINCE 1981

FIGURE 3.5

TYPE OF TRAINING	TRAINEES	REGION	1981	1982	1983	1984	1985	1986	1987	1988	TOTAL
			(1981/82)	(1982/82)	(1983/84)	(1984/85)	(1985/86)	(1986/87)	(1987/88)	(1988/89)	
Basic, Upgrading, Refresher Training	WSSTs and TTs	East	61	106	28	102	73	34	104	*	508
		Central			27	54	58	22	62	18	241
		West		48	62	24	20	16	12	67	249
		Mid & Far West	54	32	22	19	60	26	59	56	328
		Totals	115	186	139	199	211	98	237	141	1326
Overseer Training		East			32					*	32
		Central						17	8		25
		West							14	14	28
		Mid & Far West							8		8
		Totals	0	0	32	0	0	17	30	14	93
Training for VMSC, VMSW and VHV members	VMSWs, HCs, VHVs, VMSC- members	East				116	46	72	70	*	304
		Central					8	73	383	388	852
		West	28	22	40	37	44	26	44	36	277
		Mid & Far West							29	43	72
		Totals		22	40	153	98	171	526	467	1477

FIGURE 3.5

TYPE OF TRAINING	TRAINEES	REGION	1981	1982	1983	1984	1985	1986	1987	1988	TOTAL
			(1981/82)	(1982/82)	(1983/84)	(1984/85)	(1985/86)	(1986/87)	(1987/88)	(1988/89)	
Basic and Refresher Training	MSTs	East				9	6	10	10		35
		Central							11		11
		West	28	22	40	37	44	26			197
		Mid & Far West			28	34	35	34			131
		Totals	28	22	68	80	85	70	21		374
Training for Sanit. & Health Education and Women Workers	WAs SWs WVs	East		14			19		63		96
		Central						30	19	83	132
		West	20		15	68	16	15	22	8	164
		Mid & Far West							25		25
		Totals	20	14	15	68	35	45	129	91	417
Special Training: - Ferrocement - Bamboo-cement - Smokeless Chulo	Technicians	East					13				13
		Central									0
		West			20	35	116	58	64	14	307
		Mid & Far West									0
		Totals			20	35	129	58	64	14	320
1. Engr. Orientation 2 Management Seminars	Regional and District officials	East				27	23			*	50
		Central						8	3	19	30
		West			38	24	75	171	148	116	572
		Mid & Far West	*	*	15	23	10		10	*	58
		Totals			53	74	108	179	161	135	710

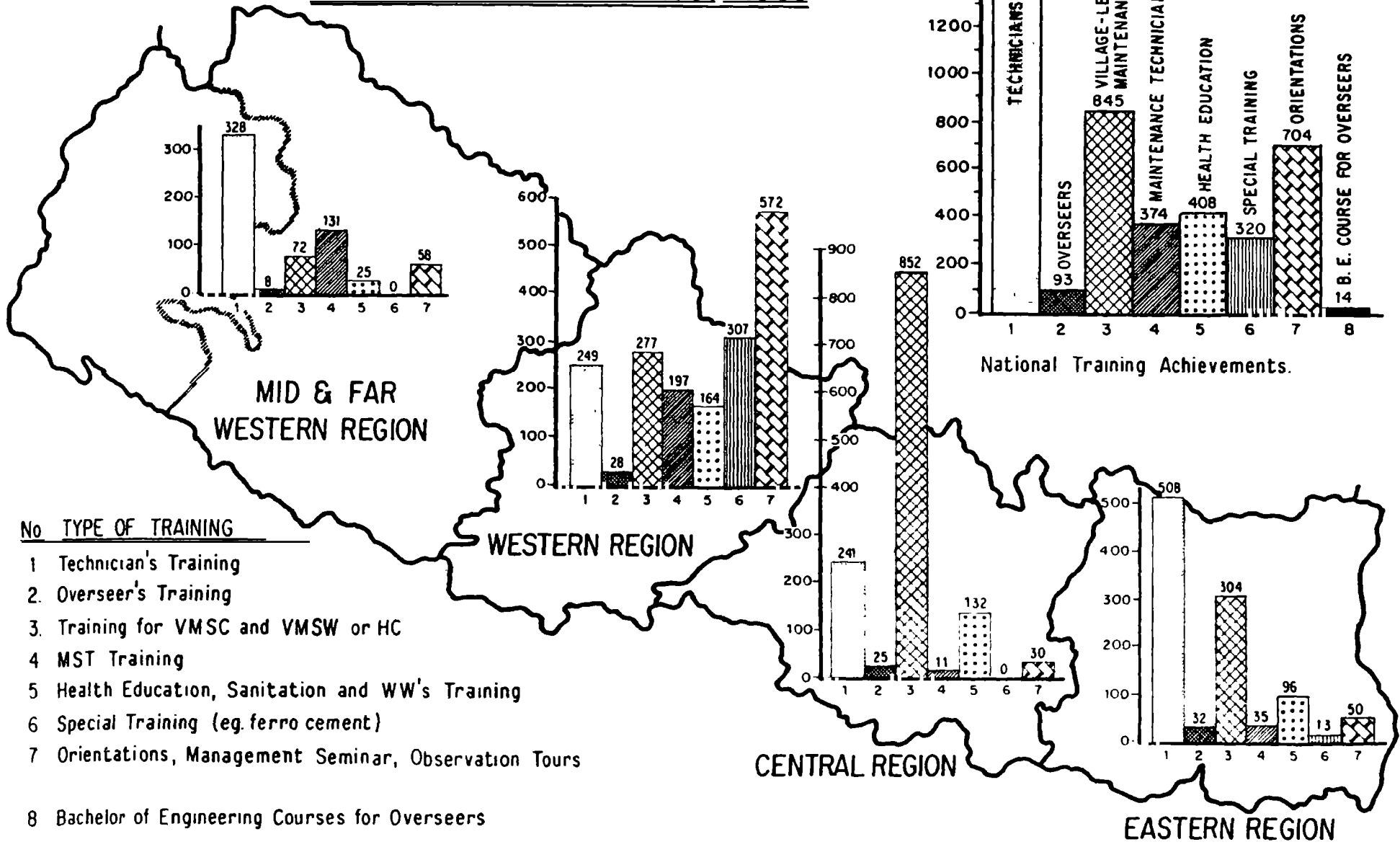
\* - For some years, project reports indicate training conducted, but do not give numbers

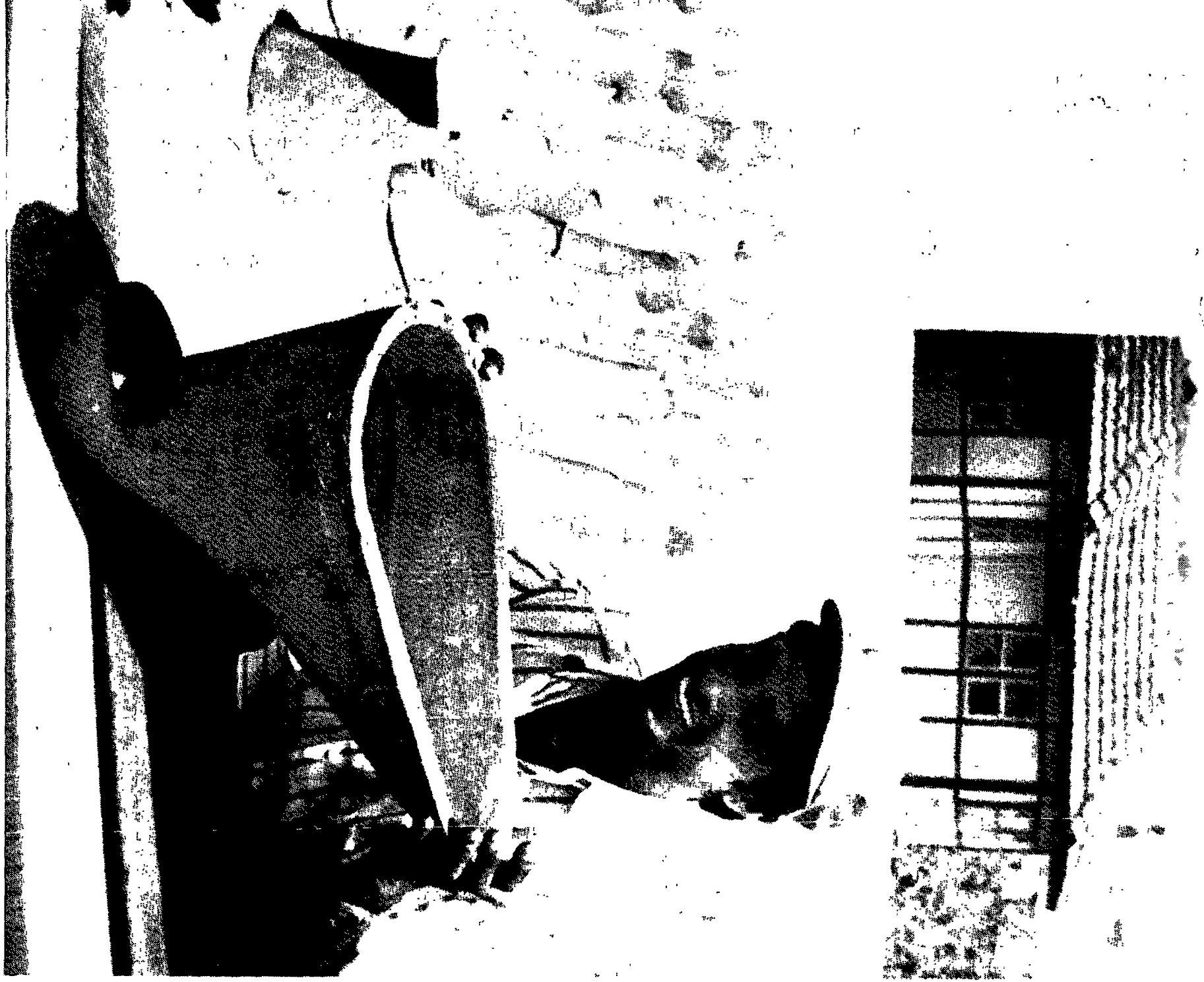


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**TRAINING ACHIEVEMENTS IN THE UNICEF ASSISTED PROGRAMME 1981-1989**

Figure 3.6





of a technician's skills.

Special Training Courses for Technicians: Special courses are held for training technicians in subjects like ferro-cement techniques.

MST Training: Selected technicians are trained as Maintenance and Sanitation Technicians (MSTs). During a one week course the technicians are taught communication skills and methods to motivate the Users Committee. One-week refresher courses are also offered for MSTs.

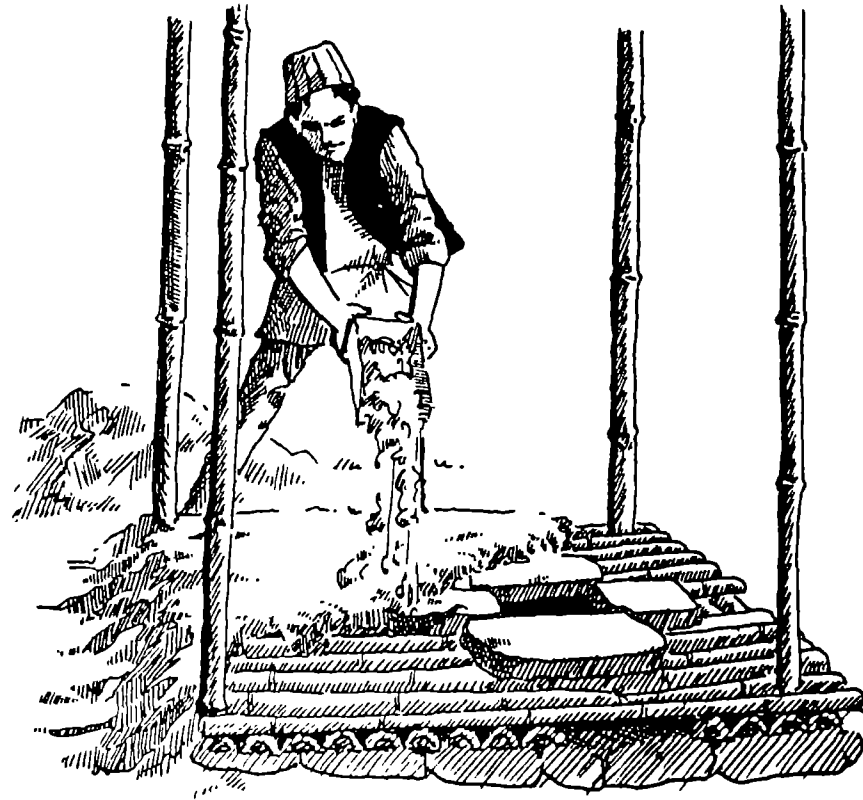
Users Committee Training: Three day training courses are organised for selected members of the Users Committees, covering programme policies and procedures, community contributions, sanitation, etc.

Handpump Caretaker Training: Training courses are held for the Handpump Caretaker (HC) to teach skills necessary for maintaining the handpump.

VMSC/VMSW Training: One-week training courses are run to develop the technical skills of the Village Maintenance and Sanitation Worker (VMSW). During the course; maintenance skills, operation routines and the importance of household latrines and improved hygiene are taught.

Three-day training courses are conducted for the Village Maintenance and Sanitation Committee (VMSC) chairman to familiarise him with maintenance policies and to improve his efficiency in raising the salary of the VMSW.

Overseer's and Engineer's Familiarisation Training: Courses are held to familiarise overseers, district engineers and other government staff involved in the programme with CWSS and TTP policies and procedures.





Women Volunteers: In the villages, WWS hold courses to train village women volunteers in health and sanitation subjects.

Special Workshops and Seminars: These are held as forums for the discussion of topics of importance to the programme.

ii) Budget For Training

Training in the UNICEF assisted programmes has generally been paid from supplementary funds and general resources. The amount allocated in the government's budget for training has been small.

iii) MHPP's CHRDU

MHPP's new policy directives which call for the formation of Users Committees and a village-based maintenance system will require major re-orientation of DWSS staff in general and specialised training of staff working in the villages. The Central Human Resources Development Unit (CHRDU) of DWSS is charged with the development of a programme to train DWSS staff in the new implementation procedures. CHRDU has already developed training modules for Users Committee members and for Village Maintenance Workers.

UNICEF is supporting CHRDU training activities with resource persons and materials and would like to increase assistance to the CHRDU to strengthen its capacities.

iv) Other Support

Many NGOs have also received support from the UNICEF WES section for their training activities. The section has developed a substantial volume of training materials. A list of these materials can be found in Annex 3.

# MAINTENANCE



Report of the Conference  
held in Pokhara 6-11 October 1982

Sponsored by UNICEF

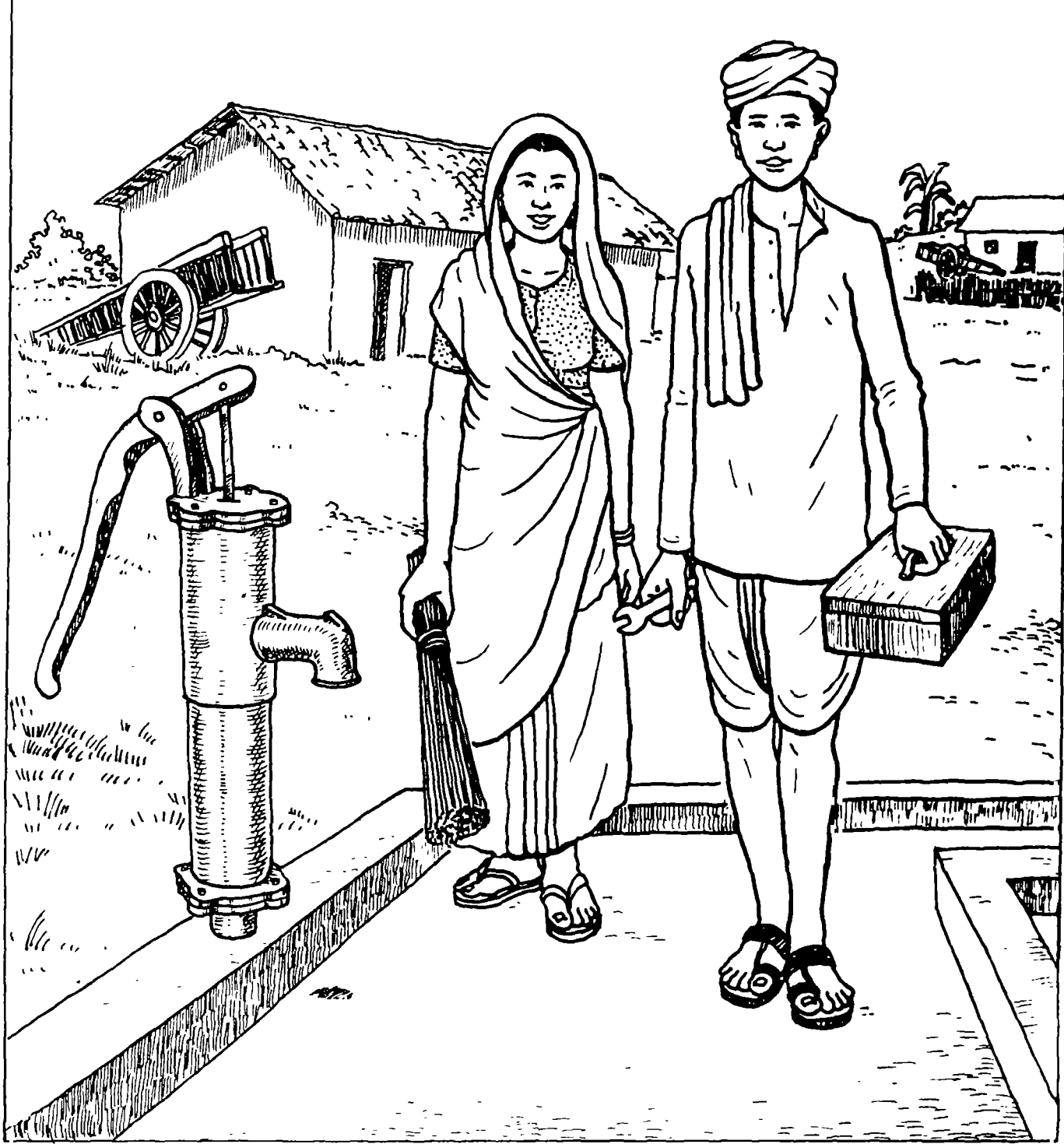
Kathmandu  
November 1982

## The 1970s

Initial programme policy was for the government agency to construct water supply systems and for the beneficiaries to take over responsibility for operation and upkeep upon completion. However, most villagers lacked experience in maintaining sophisticated technical systems and rarely took up their responsibilities as expected by programme planners. Without involvement in planning and constructing their water supplies and without proper training, villagers lacked motivation and organisational skill to enable them to succeed at operation and maintenance. As a result, the operational status of the earlier systems was poor.

## The 1980s - CWSS

- 1982 Pokhara conference on the maintenance of rural water supply systems; a maintenance policy is developed. Attempts are made to define the responsibilities of those involved at different levels.
- 1986 Eastern region CWSS holds a workshop to refine the responsibilities as outlined at the Pokhara conference.
- 1988 Establishment of 'Maintenance Units' comprising a maintenance coordinator and Maintenance Technicians: each unit is responsible for three to five districts.
- 1989 Maintenance policy for the Western region CWSS finalised.
- 1990 DWSS regional and district maintenance units established in the Mid- and Far-Western regions.



- MSTs support VMSWs and VMSCs.
- spare parts are distributed through DWSS, free of cost.

#### 1980s - TTP (NRCS and MPLD/MHPP)

- 1985 Policy and procedures for TTP formulated and applied.
- 1986 Caretaker manual and posters produced for use in the training of Handpump Caretakers; such training courses are still not run regularly.
- 1987 NRCS Village Health Volunteer (VHV) training incorporates intensive training on handpump maintenance and repair.
- 87/88 Training module for field training of caretakers developed.
- 88/89 Caretaker training module field tested and used.

#### Basics of the MHPP maintenance system in TTP:

- At each tubewell, five users are elected to form the Users Committee (UC), including two women.
- The handpump caretaker (HC) is one of the five members of the UC.
- The HC is usually an unpaid male volunteer.
- Tubewell technicians (TTs) are responsible for the instruction of the HC in handpump maintenance and repair.
- Spare parts are sold through cooperative societies at a subsidised rate.

#### Basics of the NRCS maintenance system in PHC-DW:

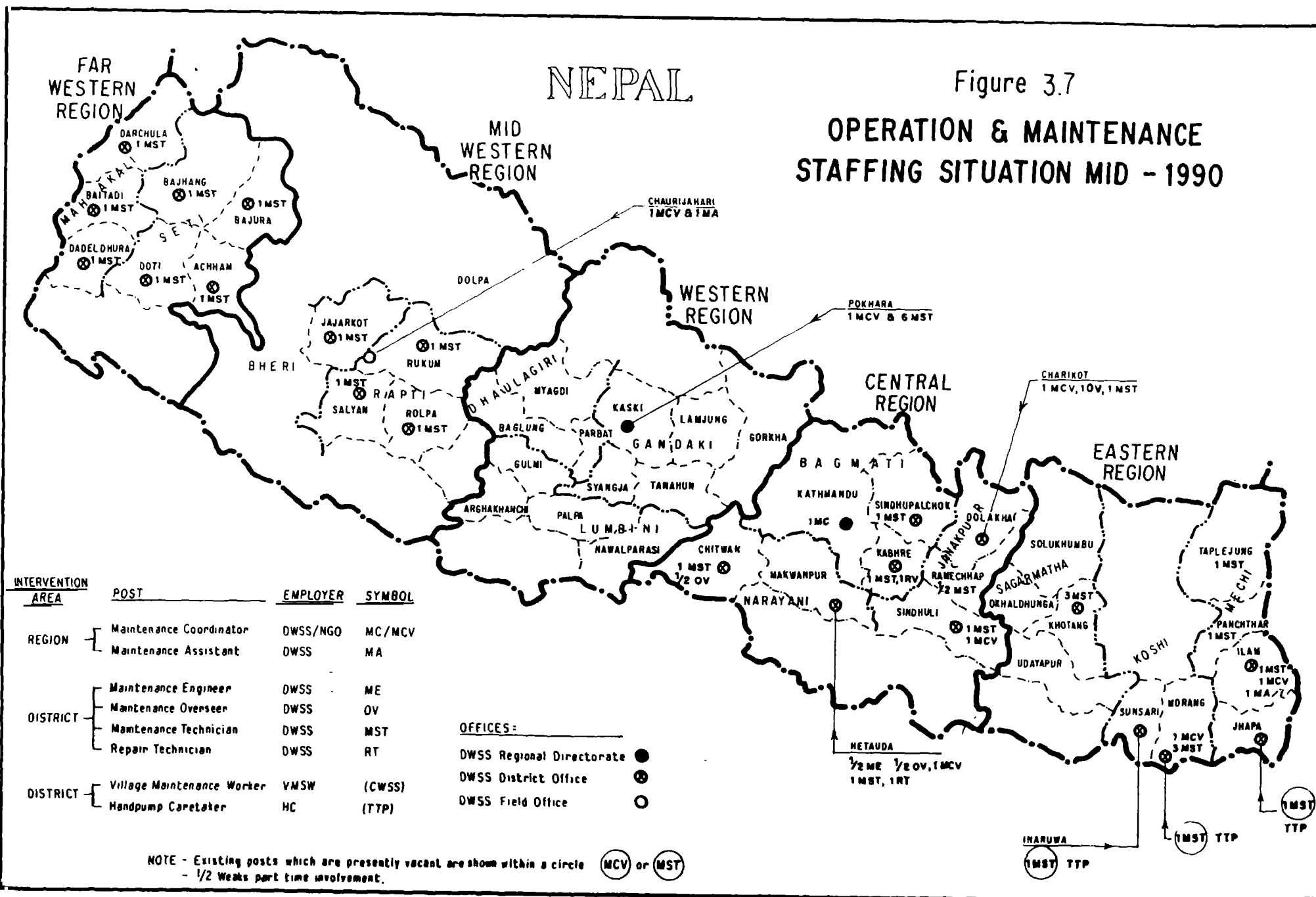
- Maintenance arrangements developed along lines similar to the governmental TTP programme.

# NEPAL

Figure 3.7

## OPERATION & MAINTENANCE STAFFING SITUATION MID - 1990

34



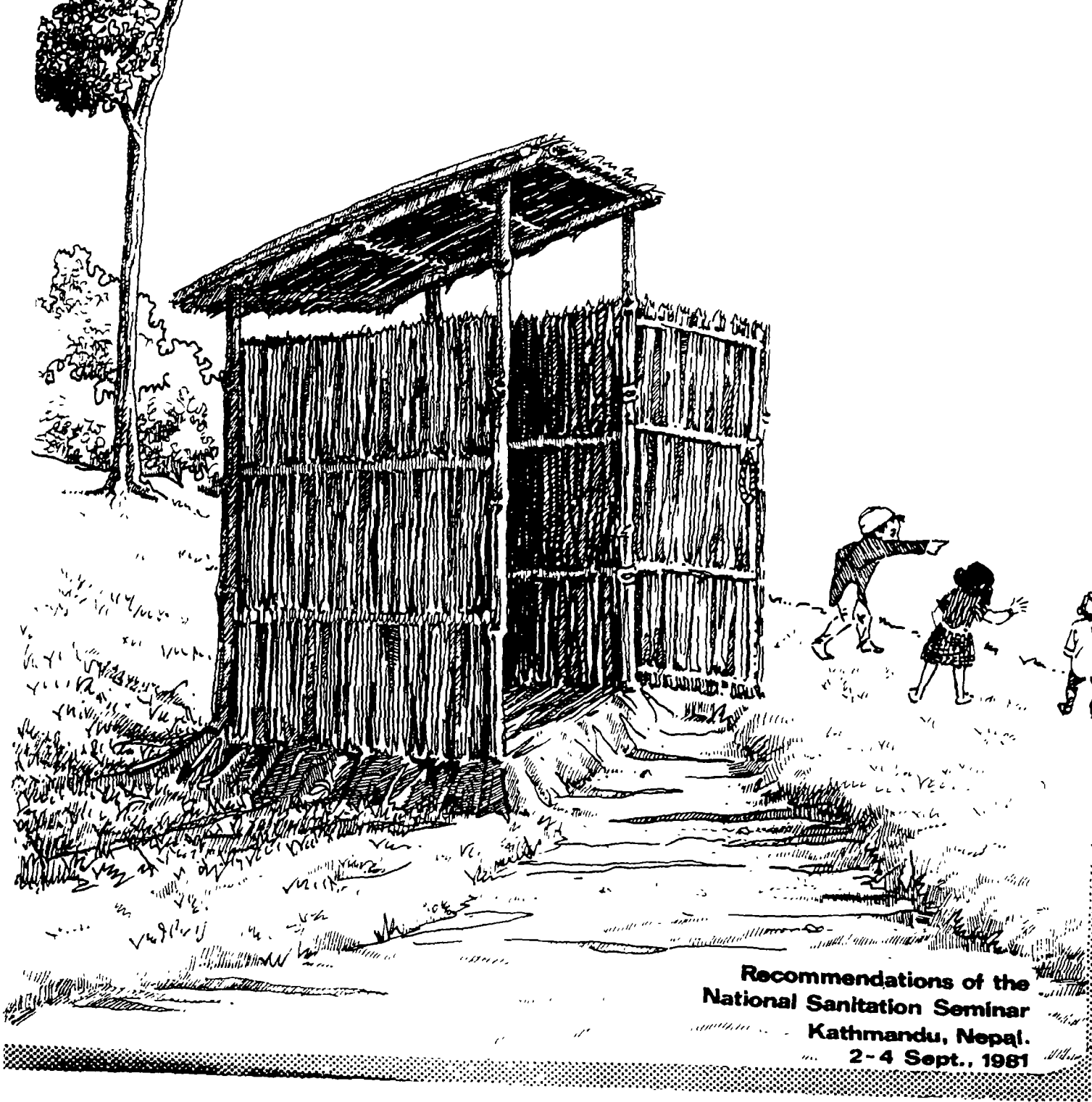
administrative and financial management to be able to take on full responsibility for the O&M of their systems.

To enable the users to take on the responsibilities to be entrusted to them, it is essential that the users committee members are thoroughly trained and closely involved during project preparation and construction. Following the hand over of the completed facilities, continuous advice and technical support are required to enable them to maintain records, keep accounts, purchase spare parts, etc.

The role of providing assistance to the users committees has been assigned to 'Maintenance Units'. This support structure is beginning to be institutionalised at the regional and district levels. These proposed O&M sections will also be responsible for monitoring the status of water supply and sanitation facilities, for evaluating the needs for external interventions and planning these interventions.

Maintenance coordinators are not yet supplied by the government, but are foreign volunteers or development associates. Until the government appoints sufficient staff for this activity, the maintenance system cannot be an integral part of the government programme.

Until recently there has been little commitment at the central level for assistance to the community-based O&M system. The 1986 Sector Study recommended that cost recovery in both urban and rural water supplies would have to increase substantially. The 1990 MHPP policy directives for water supply reflect this concern. The government is now beginning to institute community-based maintenance systems for all drinking water supply schemes, irrespective of the source of funding. With the change in policy for O&M, more government support for personnel and funds for this activity can be expected in the near future. With increasing support, the prospects for sustainability in this activity are greatly enhanced.



**Recommendations of the  
National Sanitation Seminar  
Kathmandu, Nepal.  
2-4 Sept., 1981**



*Health Service*  
the users. The necessity for an integrated approach in the sector, combining the provision of physical systems with health and sanitation education, was belatedly realised.

Since women have the prime responsibility for water collection and for domestic hygiene, they are obviously the prime audience for such activities. Experience has shown that for effective education of rural women in sensitive subjects like hygiene, the educators to teach these topics must also be female.

### The 1970s

UNICEF assistance is almost exclusively oriented towards the construction of water supply systems.

### The 1980s - CWSS

1980 Training of WSSTs in sanitation starts in the Eastern and Western regions. Development of latrine designs and teaching kits. Start of latrine construction in the Western region by the WSSTs.

1981 Latrine construction also starts in the Eastern and the Mid- and Far-Western regions. Seminar on sanitation in Kathmandu. Booklet 'Sanitation, Why and How' published.

1982- UNICEF assistance to the Sanitation Cell in MPLD.

1986 UNICEF assistance to the Health Education Section of MoH to develop capacity to deliver health education services.

1982- UNICEF assistance to the Environmental Sanitation Section of MoH.

1989 UNICEF assistance to MPLD for the Semi-Urban Sanitation Programme (SUSP) in four sites.



most time spent on repair and maintenance activities; neither WSSTs nor MSTs have time for sanitation.

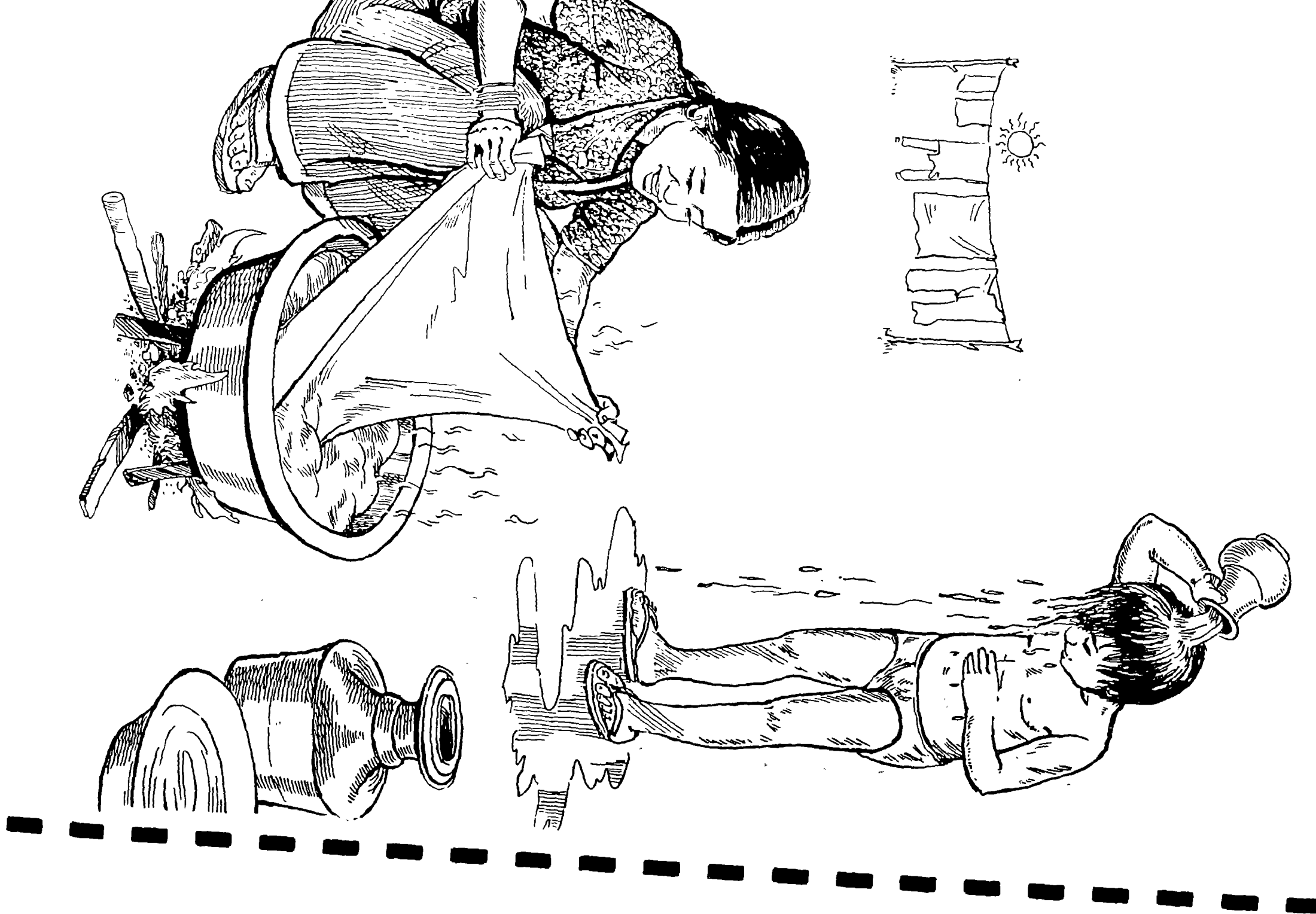
- 1985 Selected WSSTs appointed as Sanitation Technicians at the Lamidanda Field Office (Khotang).
- 1986 Post of Women Development Officer (WDO) created in CWSS Western region to develop approaches for S&WI.
- 1987 S&WI pilot project started in Chaurjahari (Rukum). Similar pilot projects later started in Dolakha (1988), Ilam (1989) and Makwanpur (1989). New positions created: sanitation coordinator; sanitation supervisor; women workers; women volunteers. Western region approach paper on women's involvement in water supply and sanitation issued.
- 1989 MHPP/WHO National Workshop on Sanitation: participants from MHPP, DWSS, WSSC, MoH, UNICEF, WHO and UNDP. 'Sanitation & Women's Involvement' document prepared by the Mid-Western region. Workshop on sanitation organised by SNV/WaterAid/UNICEF. Creation of the Central Sanitation and Training Unit (CSTU) in UNICEF Kathmandu.

CWSS Sanitation & Women Involvement Programme basics:

- Presently different approaches are being tried in different regions.
- A network of sanitation personnel is being developed including staff from the government, UNICEF, NGOs and voluntary agencies.

1980s - TTP

- 1987 Position of Women Worker (WW) created in TTP; four WWs are hired. A UNICEF field assistant is assigned for the supervision and training of these WWs.



Users Committee (UC).

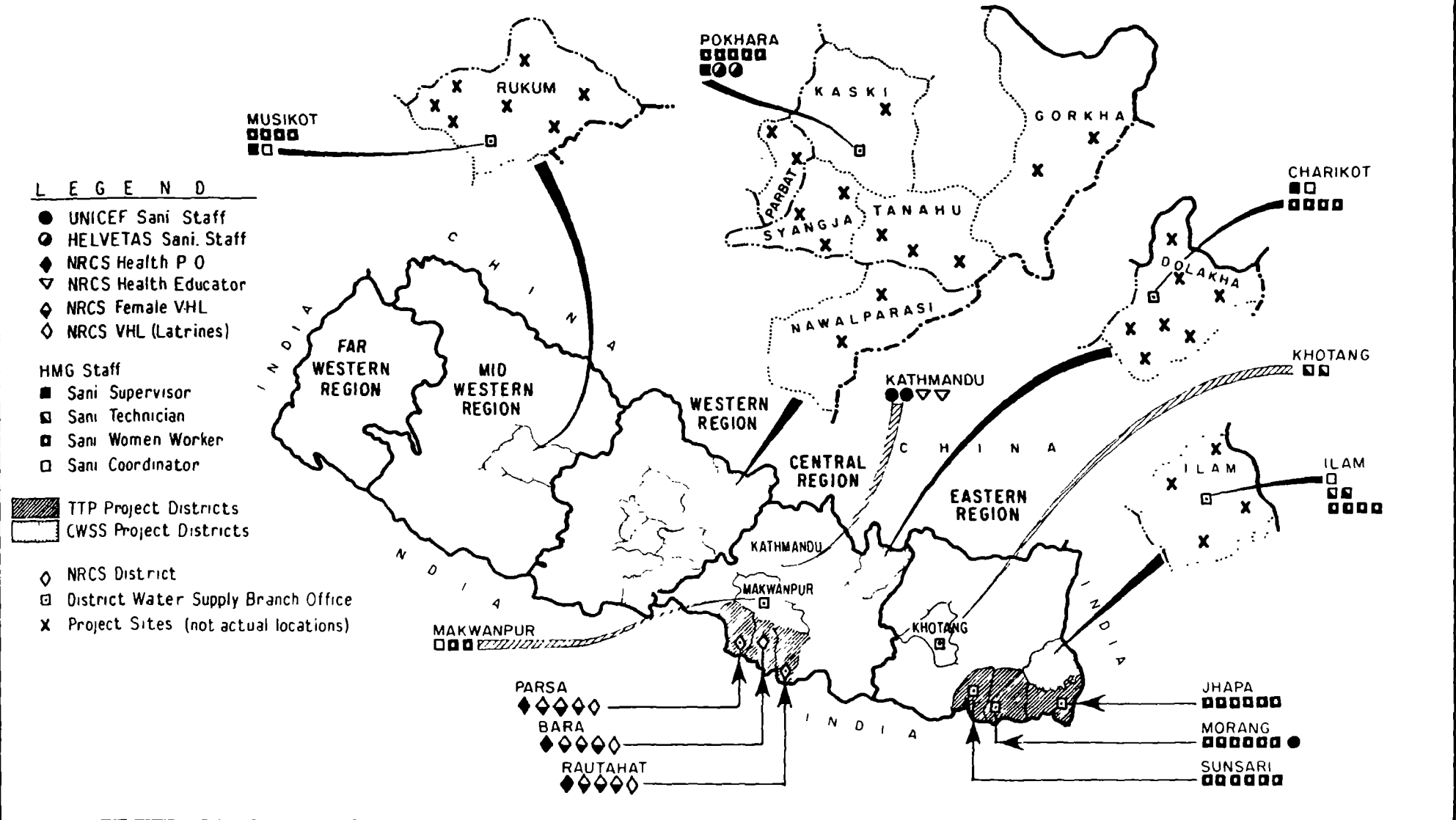
- In each project district, six WWs work under the supervision of one sanitation supervisor.
- This level of staffing is sufficient to bring a limited programme of health education to about half of the population reached with improved water supplies.

Comments: The HMG/UNICEF Plan of Operations for 1988 to 1992 specifically aims to improve hygiene practices among women and mothers. Until 1986 sanitation centered on the promotion and construction of latrines with superficial health education. The start of pilot programmes for sanitation and women's involvement dramatically increased emphasis on sanitation. New posts have been created to provide the necessary manpower to this essential programme component.

Pilot schemes promoting hygiene, latrine use and women's involvement are currently in progress in CWSS in the Eastern, Central, Western and Mid-Western regions and in TTP in the Eastern region. These pilot programmes aim to develop a workable, effective strategy for hygiene promotion for wider implementation in CWSS and TTP. The different approaches are yet to be evaluated for effectiveness and impact.

There is, as yet, little commitment to these programmes in MHPP or DWSS. Lacking government posts, coordinators in the sanitation and women involvement programme are often expatriate volunteers. In the Eastern region TTP, regular supervision for the WWs in the field is not yet available. These factors are serious constraints to the effectiveness of the WWs and to the gradual expansion of these pilot programmes. Increased government commitment to this important programme component, initially demonstrated by formulating policies and procedures and the creation of additional temporary posts, followed by the allocation of financial resources, is crucial for the sustainability of this programme.

**Figure 3.8**  
**SANITATION & WOMEN'S INVOLVEMENT PROGRAM**  
 (Staffing Situation 1990)



assisted programmes.

It is inevitable that in the coming years HMG will put increasing emphasis on the development of this component. At the same time, UNICEF must be ready to support increased HMG efforts by allocating a greater share of the WES budget to this component.

ii) Output of the Sanitation Programme

Figure 3.4 on page 26 shows the number of household and institutional latrines constructed in each region: about 14,000 household latrines and 700 institutional latrines have been built.

From 1986 onwards pilot S&WI programmes were started at selected CWSS project sites. From region to region, these programmes are testing different approaches: in the Western region an extensive approach is being tested, whereas in the other regions more intensive approaches are being tried out. Till mid-1989 the S&WI programmes have progressed as follows:

Year	No. of districts	No. of projects	No. of staff	Annual coverage	Cumulative coverage
1986	4	4	3	2,810	2,810
1987	5	10	3	6,269	9,079
1988	10	28	8	8,269	17,347
1989	12	37	23	10,289	27,645

The staff in the above table includes Women Development Officer, Adviser WIP, Sanitation Coordinators, Sanitation Supervisors and Sanitation Women Workers.

Figure 3.8 shows the areas where the pilot programmes are being tested and the staff involved in the S&WI programme. More details on staff engaged in the S&WI programme are given in Figure 3.9.

Sanitation Technician	(4/4)					(4/4)	
Sanitation Women Worker	(4/4)	(18/18)	(6/6)		(5/5)	(5/5)	(38/38)
Volunteers and DAS							
Sanit. Coordinator/ Women Involvement Officer	(1/1)		(2/2)			(1/1)	(4/4)

NGOs and UNICEF Central Staff:

UNICEF Sanitation staff			(2/2)			(2/2)
Helvetas Sanitation staff				(2/2)		(2/2)
Programme Officer (Health) (NRCS)			(3/3)			(3/3)
VHL (NRCS) Latrine Construction			(3/3)			(3/3)
Female VHL (NRCS)			(9/18)			(9/18)
Health PO (NRCS)			(3/3)			(3/3)
Total HMG, UNICEF & NGO						(71/84)

Village-level workers:

Women Volunteer	2 per committee	2 per committee	2 per committee		2 per committee	2 per committee
Village Health Volunteer				1 male and 1 female per hand- pump		

FN: FIG3-9.WKQ



### 3.2.5 Institutional and Policy Development

#### i) Development of Policies and Procedures

Over the years considerable effort has been devoted to develop procedures for the CWSS and TTP programmes to facilitate implementation and define the roles of all involved. HMG and UNICEF have generally worked in close contact to develop policies, guidelines and other programme documentation. Annex 4 contains a list of guidelines and standards relevant to the sector.

Standardisation: Both the CWSS and TTP programmes have standardised all technical project components; including structures and materials.

Policy and Procedures: In TTP, detailed policies and procedures have been refined over years of implementation to cover all programme components. Both NRCS and DISVI have used these guidelines extensively for application in their Terai water supply and sanitation programmes.

For CWSS, general policies and procedures were formulated in the 1980 conference in Jhapa. Policies specific to maintenance and sanitation were drafted at the 1982 conference in Pokhara. The original documents were repeatedly revised and further detailed in later years as the programme gained more experience.

Manuals: The CWSS and TTP programmes have produced several manuals describing technical features. These manuals cover topics such as ferro-cement tank construction, hydraulic pipe line design, handpump maintenance and repair and latrine construction.

## NEPAL GOVERNMENT AGENCIES WORKING IN THE WATER SUPPLY AND SANITATION SECTOR

Government Agency	Ministry of Local Development			Ministry of Health		Ministry of Forest and Soil Conservation	Ministry of Labour and Social Welfare	Ministry of Housing and Physical Planning					
	Division or Departmental Programme	Village Level Program	Grant-in-Aid Division	IRDs	Public Health Division	Policy Planning, Monitoring and Supervision Div.	Topographical Survey Branch	SSNCC	DWSS			Solid Waste	NWSC
					Environmental Sanitation Section	Health Education Section		Coordination of INGOs and NGOs in WES Sector	Rural Water Supply	IRDS	URBAN (small)		URBAN (large)
Programme Area	Selected Villages	Villages	IRD Sites	Limited number of health-posts	Selected Schools and Communities		Entire Country	Communities throughout the country	Countrywide	Selected sites in IRDs	Selected Urban Centres	Kathmandu Valley	14 Urban Centres
Type of Output	Community Water Supply and Sanitation	Water Supply	Water Supply	Health Education	Construction of Latrines	Health Promotion	Mapping	Community Development including Water Supply, Health Education and Latrine Promotion	GFS, Wells, Sanitation and Health Education	Water Supply Sanitation Health Education	Water Supplies Construction and Operation	Solid Waste Collection	Piped Water Supply Sewerage

From 1982 to 1989 UNICEF provided assistance to this Unit to support sanitation activities of agencies involved in sanitation.

#### 4. THE WATER AND SANITATION SECTOR SITUATION 1990

Until recently sector-wide monitoring of achievements in water and sanitation was difficult. Assessments of progress were made periodically in sector studies conducted by the World Bank, UNDP, ADB and others.

In response to the need for an improved system for the collection, processing and reporting of information related to the water and sanitation sector, UNDP funded the Management Information for Technical Support (MITS) Project, which was executed by the World Bank. This project established a system to monitor on a bi-monthly basis the progress of construction in the sector. MITS also set up a detailed inventory of completed water supply facilities. After the completion of the project in July 1990 DWSS has taken over the management of the inventory data base. It is expected that this system will provide an invaluable source of information to the institutions involved in the sector.

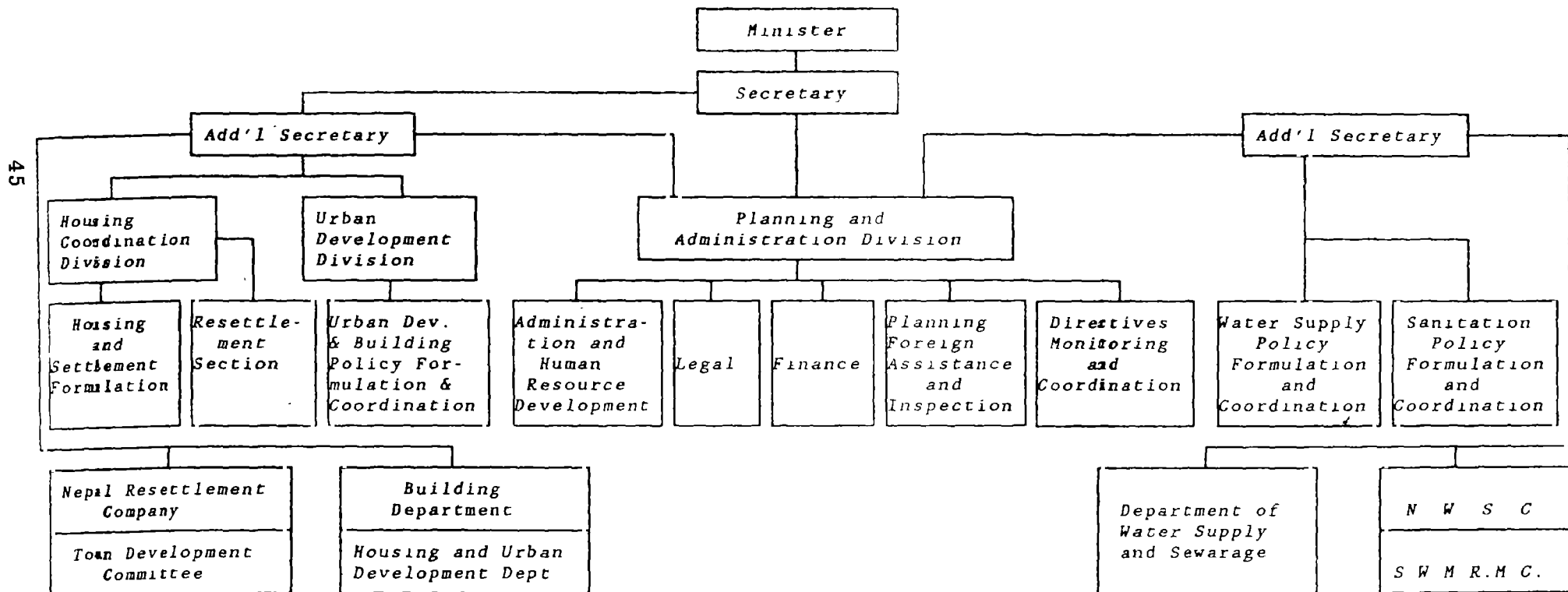
##### 4.1 INSTITUTIONS

##### 4.1.1 Government Institutions

The main government institutions involved in the sector and their fields of activity are shown in the diagram in Figure 4.1. A brief description of each of these agencies follows.

FIGURE 4.2

HIS MAJESTY'S GOVERNMENT  
 Ministry of Housing and Physical Planning  
 Organisational Chart



agency. DWSS has responsibility for all rural water supply and for water supply in 19 of the 33 urban centers. DWSS has a Regional Directorate in each of the five regions and a District Drinking Water Supply Branch Office in each of the 75 districts. The organisational chart for the Department is shown in Figure 4.3.

ii) Solid Waste Management & Resource Mobilisation Centre

Started in 1978, the objective of this project is to reduce environmental pollution through the collection and disposal of solid waste; with a high degree of internal resources recovery. Activities are limited to the Kathmandu valley.

iii) The Nepal Water Supply Corporation (NWSC)

In 1973 the Water Supply and Sewerage Board was created under the Ministry of Water Resources. In 1984 it was renamed the Water Supply and Sewerage Corporation.

In 1988, "to reflect the close links between the basic needs of housing and drinking water and sewage disposal", the government transferred WSSC from the Ministry of Water Resources to MHPP. In February 1990, WSSC became the NWSC which is a semi-autonomous body governed by the Nepal Water Supply Act of 1989. NWSC has responsibility for water supply in 14 large urban areas including the centers in the Kathmandu valley. This load will increase as urban centers in Nepal continue to expand. The organisational chart for the Corporation is shown in Figure 4.4.

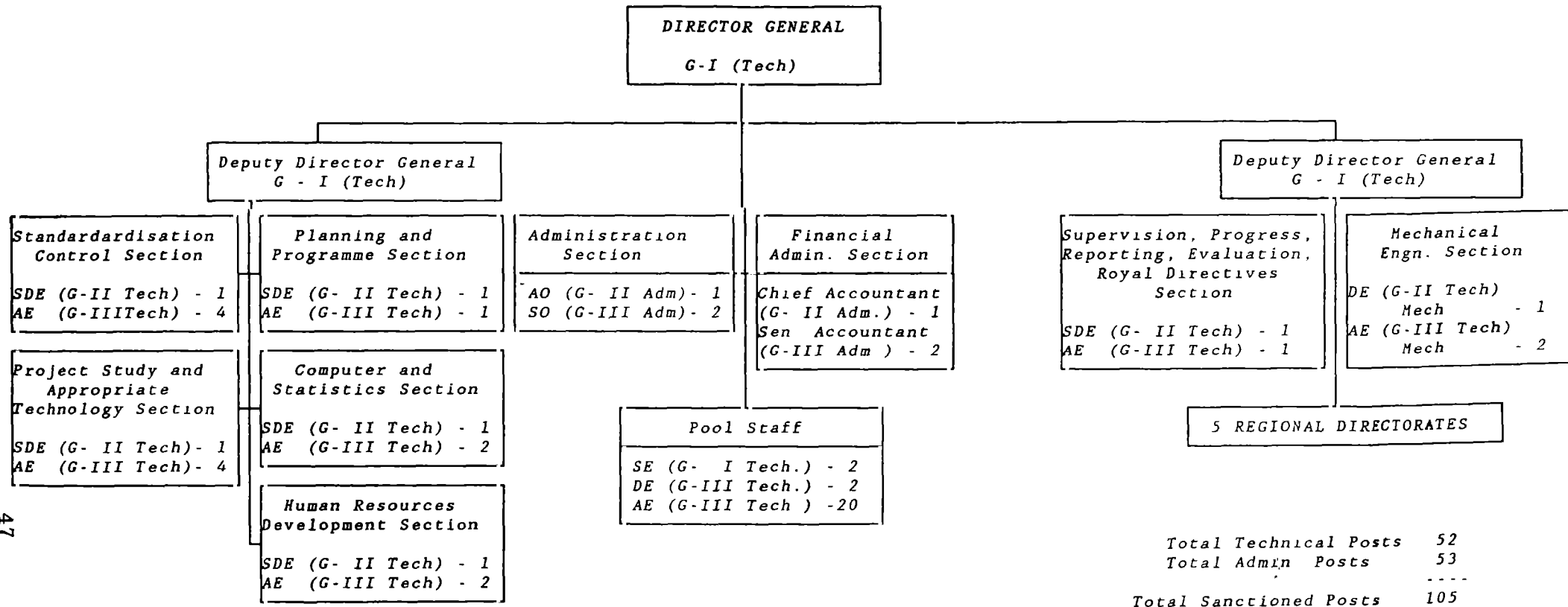
**MINISTRY OF LOCAL DEVELOPMENT (MLD)**

Initially the Local Development Department, then MPLD; this Ministry was given responsibility for small to medium rural water supply schemes serving less than 1500 people. MPLD implemented the UNICEF-assisted CWSS programme as well as part of TTP. After the 1988 sectoral reorganisation these tasks were passed on to MHPP and DWSS became responsible.

HIS MAJESTY'S GOVERNMENT  
 Ministry of Housing and Physical Planning  
 Department of Water Supply and Sewerage  
 Central Office

Figure 4 3

ORGANISATION CHART



47

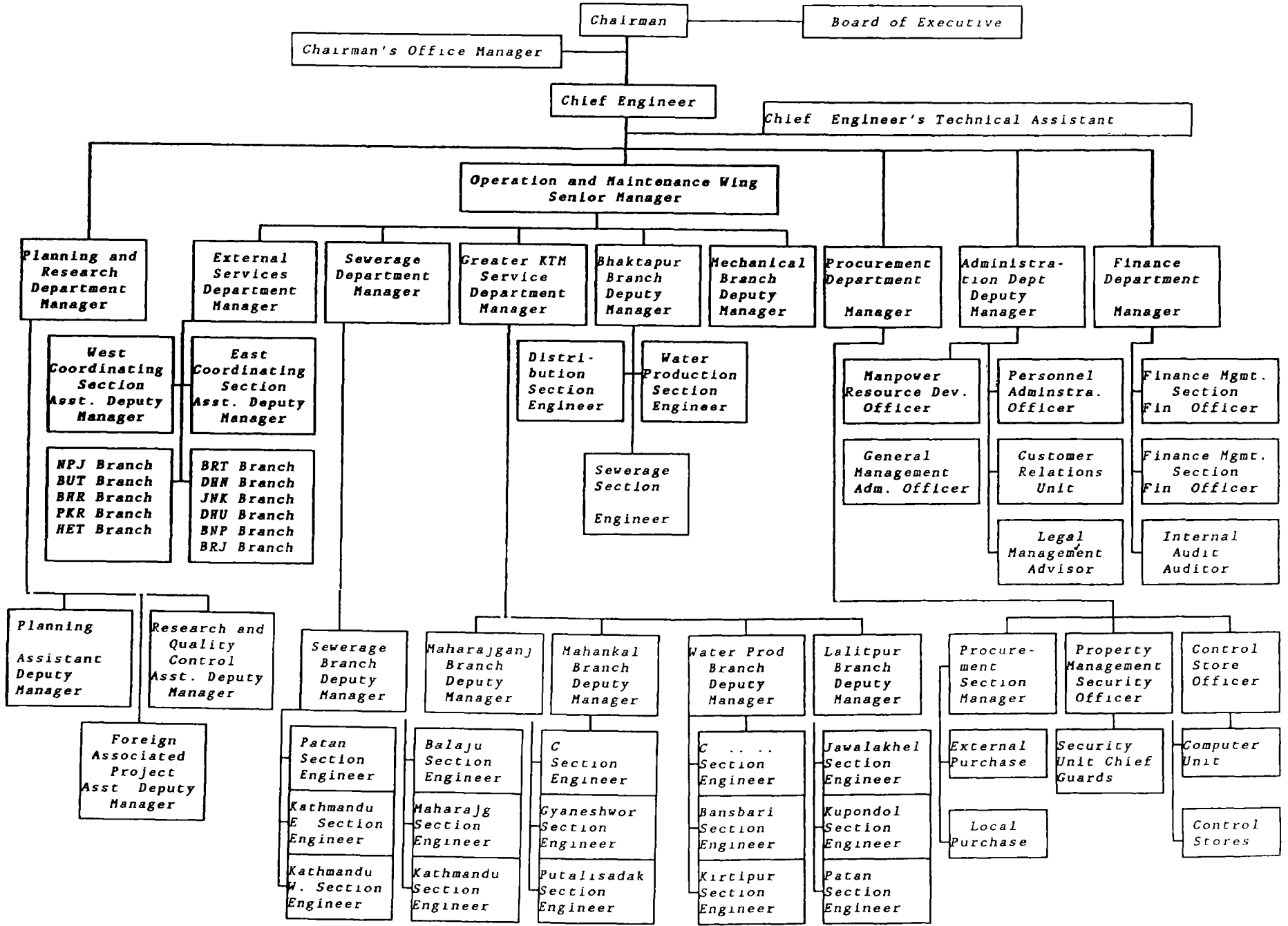
NOTE: S D.E. - Senior Divisional Engineer  
 A.E. - Assistant Engineer  
 D.E. - Divisional Engineer  
 A.O - Administrative Officer  
 S.O. - Section Officer

Total Technical Posts	52
Total Admin Posts	53
	----
Total Sanctioned Posts	105

NEPAL WATER SUPPLY CORPORATION  
Organization Chart

Figure 4 4

48



3.	Karnali-Bheri IRD Project	CIDA (Grant)	MW	Surkhet, Dailekh, Jumla	1981	On-going
4.	Repti IRD Project	U.S.AID (Grant)	MW	Dang, Salyan, Rukum, Pyuthan, Rolpa	1980	On-going
5.	Palpa district Integrated Development (PDP) Project	Helvetas (Swiss/ German)	WR	Palpa	1988/ 1995	On-going
6.	Gulmi, Arghakhanchi IRDP	EEC	WR	Gulmi, Arghakhanchi	1987	On-going
7.	Sagarmatha IRDP (SIRDP)	ADB (Loan)	ER	Siraha, Saptari, Udaypur	1978	On-going
8.	Integrated Hill Development (IHDP)	SDC (Grant)	CR	Sindhupalchowk, Dolakha	1974	Completion Mid-1990
9.	Koshi Hill Area Rural Development (KHARDEP Phase III)	UK (Grant)	ER	Dhankuta, Terhathum, Bhojpur, Sankhuwa S.	1979	Third phase on-going
10.	Mechi Hills Irrigation and Related Development Program	Netherlands (Grant)	ER	Ilam, Panchtar, Taplejung	1987	On-going
11.	Dhading District Development Programme	GTZ (Grant)	CR	Dhading	1983	Package programme on-going

Proposals:						
1.	Upper Sagarmatha	ADB (Loan)	ER	Solukhumbu, Khotang Okhaldhunga	Proposed	Project appraisal

Completed IRD Project						
1.	Mahakali Hills	World Bank (Loan)	FW	Baitadi, Darchula	1978	Completed



## MINISTRY OF WATER RESOURCES (MWR)

Prior to the reorganisation of 1988, DWSS was under MWR. Although in the past MWR through DWSS played a role in the supply of potable water, present activities are almost exclusively in irrigation and hydro-electricity.

## MINISTRY OF HEALTH (MoH)

### The Environmental Sanitation Section

Within the Public Health Section of MoH there is an Environmental Sanitation Section which is responsible for the promotion of low cost sanitation facility designs, public hygiene and education programmes and coordination with executing ministries. Because of low budget allocations and limited manpower the impact of activities of this section has been low.

### The Health Education Section

Within the Policy Planning, Monitoring and Supervision Section of MoH there is a Health Education Section which is concerned with community health education, school health training and effective communication methods. Budget allocations for the Section's activities have been low and activities have had little impact in the sector.

## MINISTRY OF EDUCATION AND CULTURE (MoEC)

The Curriculum Textbook Supervision Development Training Centre (CTSDC) of MoEC is responsible for the development of school textbook curriculum up to class ten. The inclusion of health and sanitation related subject matter is receiving increasing importance. Staff of CTSDC work closely with the UNICEF WES Section to determine priority and presentation of subjects. Health and hygiene is included as a part of the science curriculum, which is a compulsory subject from grade one to eight,

3	Dhulikhel Water Supply Scheme (Under UDLE scheme)	GTZ	Dhulikhel town area (Kavre)	US\$ 1.0 million (grant)	Urban Water Supply	14,300	1987-90
4	Rural Water Supply and Sanitation Phase I	ADB	- All districts of the Mid & Far Western Regions	US\$ 12.5 million (loan)	-- All rural water supply -74 new grav-flow schemes -5800 shallow tubewells		1986-92
5	Rural Water Supply and Sanitation Phase II	ADB	- All districts of the Mid & Far Western Regions - All districts of the Eastern Region	US\$ 18.7 million (loan)	-Rehab of town supplies Taulihawa, Dipaya, Bidur, Jalashwar, Birendranagar -96 new grav-flow schemes - shallow tubewells		1989-93
UNICEF ASSISTED WATER SUPPLY and SANITATION (all rural)							
7	Community Water Supply and Sanitation (Central) and Terai Rural Water Supply and Sanitation (East)	EEC	CVSS 7 districts in Central Region TRWSSP 3 districts in Easter Terai	US\$ 3.7 million (grant)	-80 new grav-flow schemes -20 rehab schemes -2500 shallow tubewells -3750 latrines	80,000 250,000	1985-91
8	Community Water Supply and Sanitation (East)	UNCDF/ CUC/CIDA	7 districts in Eastern Region	US\$ 2.68 million (grant)	-80 new grav-flow schemes -20 rehab schemes -1020 latrines	100,000	1987-91
9	Community Water Supply and Sanitation (West)	SDC	12 district in Western Region	US\$ 1.98 million (grant)	-40 new grav-flow schemes -29 rehab schemes -2312 latrines	81,000	1987-91
10	Community Water Supply and Sanitation (N & F West)	UNCDF/ CUC/CIDA	11 districts in M & F Western Region	US\$ 2.74 million (grant)	-80 new grav-flow schemes -20 rehab schemes -1020 latrines	100,000	1987-91
TRAINING AND MANAGEMENT							
11	Training of Manpower for Water Supply Phase II	UNDP, WHO	Country wide	US\$ 0.64 million (grant)	Training	N/A	1988-91
12	Management Information Technical Support Proj	UNDP	Countrywide	US\$ 0.49 million (grant)	-Inventory of water systems -Monitor implem progress	N/A	1988-90

Many bilateral and multilateral agencies work directly with government ministries to implement their programmes. In Nepal these agencies include ADB, CIDA, EEC, FINNIDA, GTZ, IBRD, JICA, ODA, UNICEF, UNDP, USAID and WHO. Some programmes are concerned directly with the provision of water supply and, sometimes, sanitary facilities while others build the capacity of sector agencies to manage their programmes.

The following are examples of programmes: FINNIDA's Rural Water Supply Project; UNDP and WHO's joint project with HMG for Training of Manpower for the Drinking Water and Sanitation Programme, UNICEF's CWSS and TRWSS Programmes and JICA's Project for Water Supply to Urban and Semi-Urban Centers in Nepal. UNDP has contributed to the sector by providing "a focal point for mobilising technical assistance and capital support to the government" under the International Drinking Water Supply and Sanitation Decade programme. A complete list of these projects appears in the table in Figure 4.6.

#### 4.1.3 The NGOs - National and International

The contribution of NGOs, both national and international, is mainly coordinated by the Social Services National Coordination Council (SSNCC).

The following NGOs have been particularly active in the sector: the Gorkha Welfare Scheme; Foster Parents Plan International; Save the Children (USA); the Nepal Red Cross Society; Lutheran World Service and United Mission to Nepal.

Within SSNCC, WaterAid plays a special role. WaterAid is a British NGO which "provides services on request (to NGOs) which are undertaking projects in the fields of drinking water supply, sanitation and associated health education".

3.	ACTION AID	1983	Integrated Community Development Programme	Hygiene education	Many water supply supplies, serving 35,000	Chitwan, Panchthar, Sindhupalchok
4.	SAVE THE CHILDREN (USA)	1981	Community Based Resource Development Programme	-Hygiene education -Latrine construction -Adult literacy	-197 rural water taps; 13,000 beneficiaries	Gorkha, 14 villages (since 1981) Siraha, 6 villages (since ....
5.	LUTHERAN WORLD SERVICE	1984	-Water Resources Development Project -Community Development Project	Pit latrines construction (using local materials), Health, hygiene education	-36 rural water supplies; 17,000 beneficiaries -15 schemes under constr.	Baglung
6.	WATER AID	1987	Provide services to NGOs working in water supply, sanitation, health education	-Health education is part of all projects. -Support for latrine construction.	-Support to 19 projects of Nepal NGOs and VMSCs -19 water supplies -2 rehab. schemes -186 tubewells -39 spring protect. -4 hydraulic rapids	Kavre, Gorkha, Chitwan, Banke, Lalitpur, Sindhupalchok, Kathmandu, Lamjung, Kailali, Bardiya, Sankhuwasabha
7.	DISVI	1986	-Water and sanit. in earth-quake affected areas -Water testing laboratory	-Hygiene education; construction of latrines -Water quality testing	-2 rural water supplies; 1000 beneficiaries -109 tubewells	Saptari, Morang, Sunsari, Dhankuta, Lalitpur, Nawal Parasi
8.	GORKHA WELFARE SCHEME	1978	Construction of rural water supplies; hygiene education	Since 1989 hygiene educ. in project villages	-Approx 200 rural water supplies	Solukhumbu, Ramechhap, Khotang, Rolpa, Gorkha, Rukum
9.	JAPANESE RED CROSS/ NEPAL RED CROSS SOCIETIES	1983	Primary Health Care- Drinking Water Project	Extensive health education; Latrine construction.	-79 rural water supplies, -2859 tubewells, -1928 latrines, -2853 VHVs trained	Nawal Parasi, Rupandehi, Banke, Kapilvastu, Bardya, Surkhet, Tanahun, Kaski, Syangja
10.	UNITED MISSION TO NEPAL	1973	Community Primary Health Care programmes	Community health awareness; Promotion of latrine use.	-Latrine construction in 42 villages.	
11.	SOUTH ASIA PARTNERSHIP					
10.	CARE	1984	Integrated rural development	No sanitation yet	-4 rural water supplies; -5 wells.	Kaski, Mustang, Mahottari

water supply and sanitation activities.

Figure 4.7 lists NGOs which are currently implementing water supply and/or sanitation projects in Nepal according to the Management Information for Technical Support Project (MITS).

## 4.2 CONTRIBUTIONS AND RESULTS

### 4.2.1 Water Supply Coverage

Sector-wide there is some discrepancy regarding the present levels of water supply coverage. The MITS project has been a valuable source of information in compiling data for piped water supplies in the hills. MITS data for tubewell installations in the Terai is as yet incomplete.

Government figures for mid-1990 put urban coverage at 81%, rural coverage at 34% and total coverage at 38%. The actual proportion of the population using safe water for domestic purposes is likely to be substantially lower.

A compilation of data from a variety of sources, including the MITS inventory, gives a total coverage till mid-1989 of 27% only. This indicates that a substantial portion of the facilities constructed is not yet on record.

A full discussion of available data on water supply services appears in Annex 2.

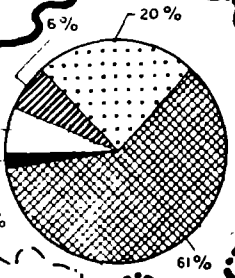
The map in Figure 4.8 shows the contribution of different agencies to the reported coverage. These figures give an indication of the quantitative contributions of the different agencies relative to each other, while the documented coverage figures in percentages of the population are presented in Figure 4.9.

# NEPAL

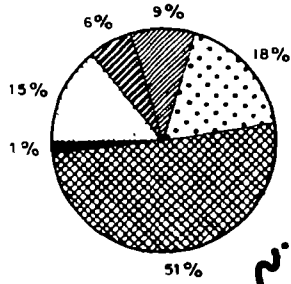
Figure 4.8

## REGIONAL BREAKDOWN OF TOTAL WATER SUPPLY COVERAGE BY IMPLEMENTING AGENCY

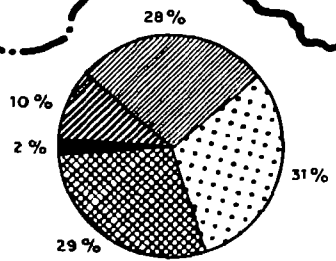
FAR WESTERN REGION WATER SUPPLIES



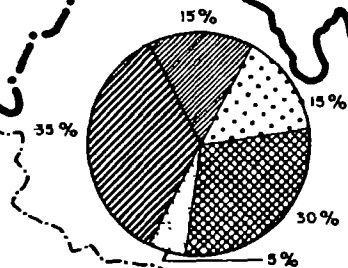
MID WESTERN REGION WATER SUPPLIES



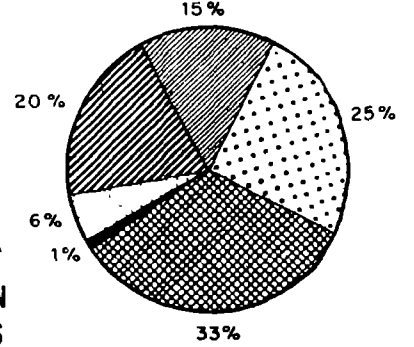
WESTERN REGION WATER SUPPLIES



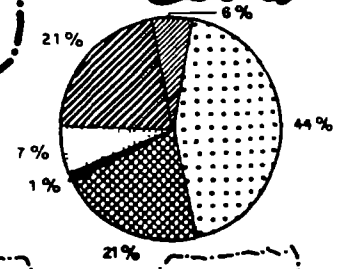
CENTRAL REGION WATER SUPPLIES









NEPAL WATER SUPPLIES



EASTERN REGION WATER SUPPLIES



### LEGEND

-  NGO
-  DWSS UNICEF
-  DWSS HMG
-  MPLD HMG
-  MPLD IRD
-  URBAN

### SCALE



# NEPAL

Figure 4.9

## TOTAL WATER SUPPLY COVERAGE FROM ALL SOURCES MID 1990 \*\*

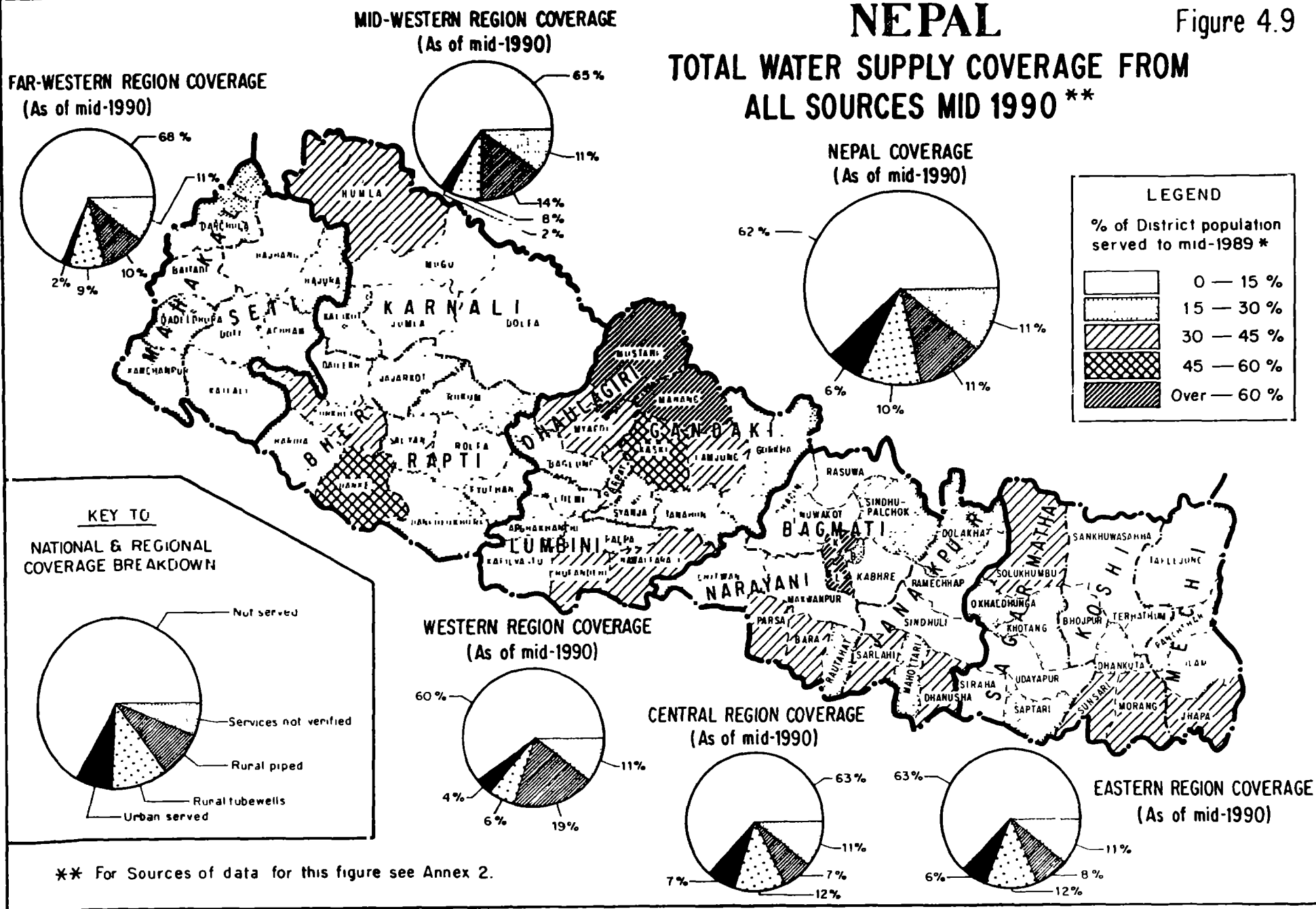
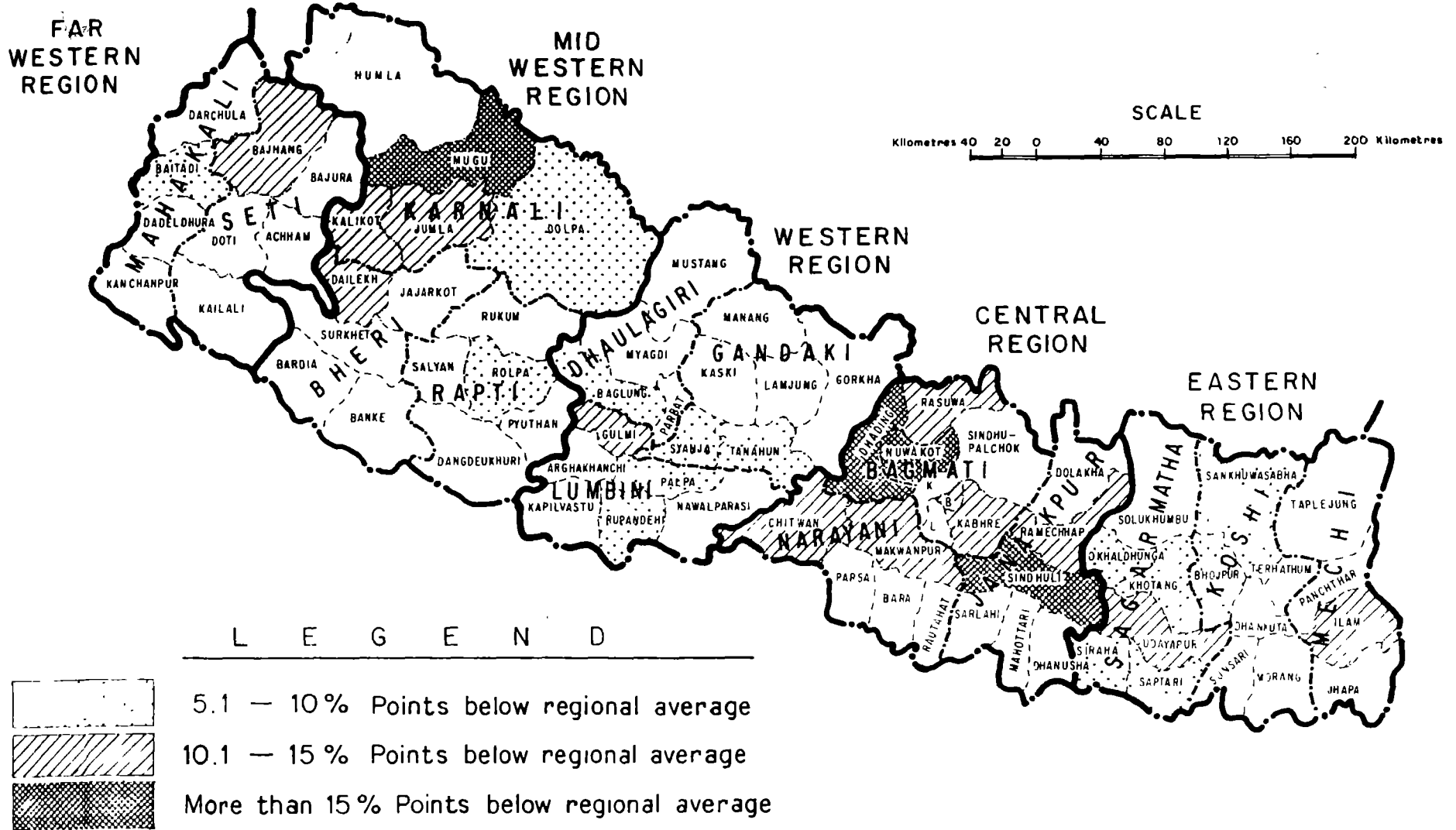


Figure 4.10

# NEPAL

## DISTRICTS WITH RURAL COVERAGE BELOW REGIONAL AVERAGE





examination of water quality, which showed high levels of pollution, only demonstrates that even a population considered covered does not necessarily use safe water.

It is evident that water supply coverage throughout Nepal is not uniform. The best covered areas are the Western and Central Regions. Coverage in the hills in the Mid-West is low whereas tubewell coverage in the Terai in the same Region is relatively high. Figure 4.10 shows which districts are under-served in terms of rural water supply in comparison with regional averages.

#### Coordination among sector agencies

Coordination among agencies working in the sector is nominal. One clear benefit of more effective cooperation and improved information sharing among sector agencies is that it would eventually permit regional disparities in coverage to be eliminated. Figure 4.11 indicates, by region, where external support agencies are involved in on-going projects. Most regions have programmes funded by bi-lateral or multi-lateral donors in addition to projects funded from the governments own resources. NGOs have very little involvement in the Far-Western Region.

#### 4.2.2 Sanitation

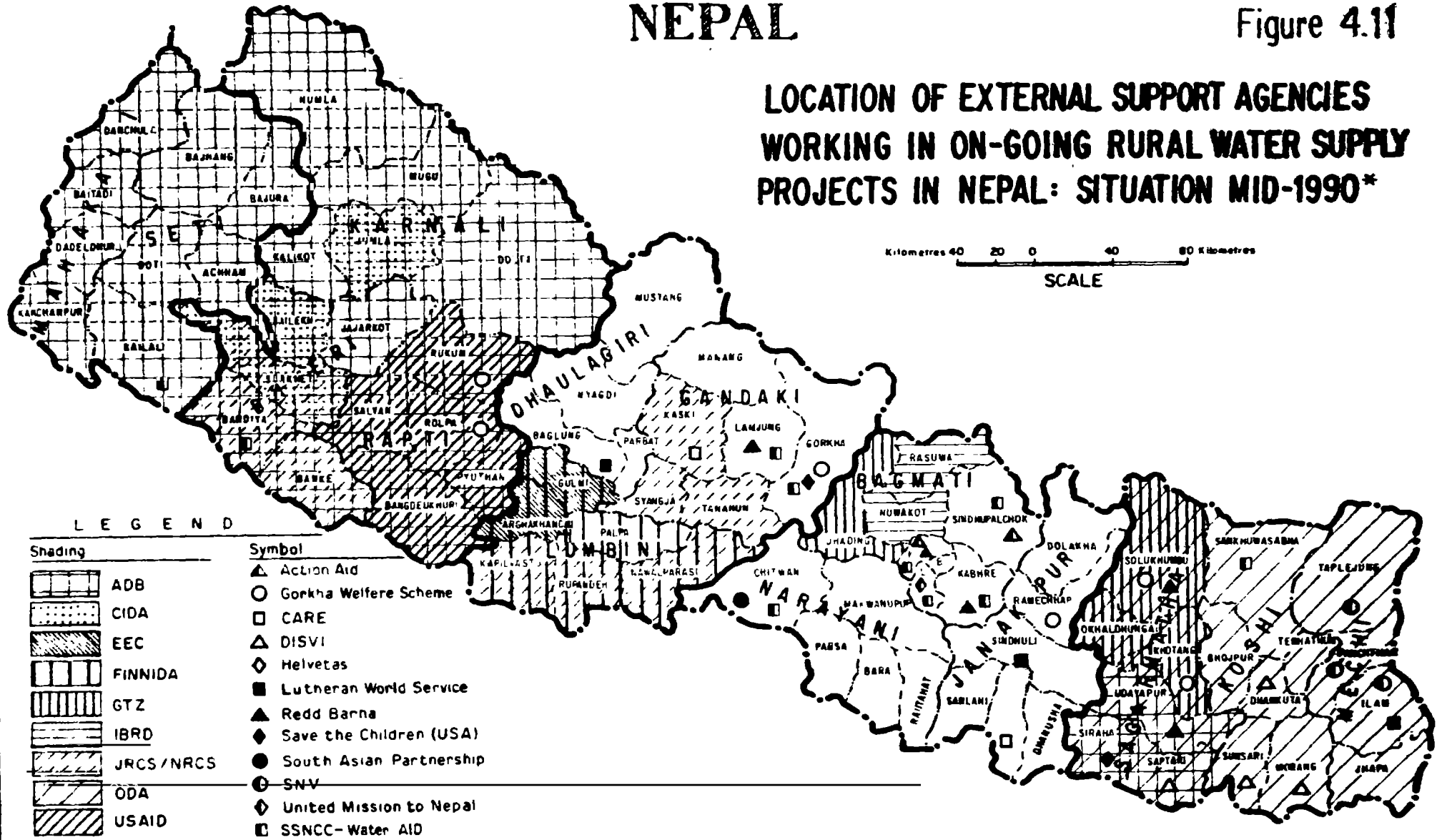
Records on sanitary latrine use are not available. No attempts at systematic data collection have ever been made. Numerous projects have promoted and even subsidised the construction of household latrines. Units built at the initiative of individual households probably account for the majority of latrines.

Based on an estimate by concerned district officials in 1990, household latrine use stands at 6%; 3% in rural areas and 34% in urban areas. The official government figures for latrine use are 5% for rural areas and 47% for the urban population.

# NEPAL

Figure 4.11

## LOCATION OF EXTERNAL SUPPORT AGENCIES WORKING IN ON-GOING RURAL WATER SUPPLY PROJECTS IN NEPAL: SITUATION MID-1990\*



NOTE Shading is used for Programmes with District wide or Regional Impact  
Symbols are used for Programmes with a more Limited Scope and Area

\* UNICEF - Assisted Programme Areas are not shown here, but are shown in Figure 5 2

to 20%. This compared to an estimated national average for latrine use in rural areas of only 1 to 5%.

Most of the IRDPs include sanitation components but commitments and actual results vary considerably from project to project.

NGOs working at the community-level have long been concerned with developing health education and latrine construction components in their programmes. The summary in Figure 4.7 on page 53 indicates on-going activities of this type being undertaken by NGOs in the country.

United Mission to Nepal (UMN)'s Community Primary Health Care Project and the Japanese Organisation for International Cooperation in Family Planning (JOICFP)'s Integrated Family Planning and Parasite Control Project have worked to promote the construction and use of latrines in rural areas.

#### 4.2.3 Financial Resources

Figure 4.12 shows the budgets allotted by the government for water supply and sanitation for the 1989/90 and 1990/91 fiscal years.

Figure 4.12

HMG Budget for WES for 1989/90 and 1990/91  
(in millions of Rupees)

Year	Urban		Rural		Total	
	Water	Sani.	Water	Sani.	Water	Sani.
89/90	60.9	16.2	456.4	0.5	517.3	16.7
90/91	102.9	18.5	538.0	0.9	640.8	19.4

Source: Ministry of Finance figures.

	WATSAN Budget 1980/90 (million Rupees),,			#				3,490
	Population (1000)			19,100 #		2,000		21,100
	Expected (1000)			12,870 #		1,900		14,770
8th Plan 1990	Coverage %			67% #		95%		70%
	Additional Pop. (1000)	4,003	2,927	6,930 #	500	140	640	7,570
	Per Capita Cost (Rs)	50	975	#	4,500	1,500		
1995	Requirement for new const.	200	2,850	3,050 #	2,250	210	2,460	5,510
	Requirement for extension, renewal, rehabilitation			180 #			2,000	2,180
	Total requirements (M. Rps)			3,230 #			4,460	7,690
	Population (1000)			20,200 #		3,000		23,200
	Expected (1000)			20,200 #		3,000		23,200
9th Plan 1995	Coverage %			100% #		100%		100%
	Additional Pop. (1000)	2,578	4,752	7,330 #	600	500	1,100	8,430
	Per Capita Cost (Rs)	50	975	#	4,500	1,500		
2000	Requirement for new const.	130	4,630	4,760 #	2,700	750	3,450	8,210
	Requirement for extension, renewal, rehabilitation			200 #				
	Total requirements (M. Rps)			4,960 #			3,450	8,410
Total 10 Years	Additional Population	6,581	7,679	14,260 #	1,100	640	1,740	16,000
	Requirement (M. Rps.)			8,190 #			7,910	16,100

FN·INVSTWS.WKQ

100% urban, 80.5% rural), are estimated to require Rs.15,307 million till the year 2000. (See Figure 4.13).

(Source: Summit Sector Paper on Water Supply and Sanitation by Mr. S.N. Sharma, DWSS Director General)

These investments are for construction of water supply facilities only. These estimates do not include the requirements of the essential sanitation component which in future programmes will increasingly complement water supply construction.

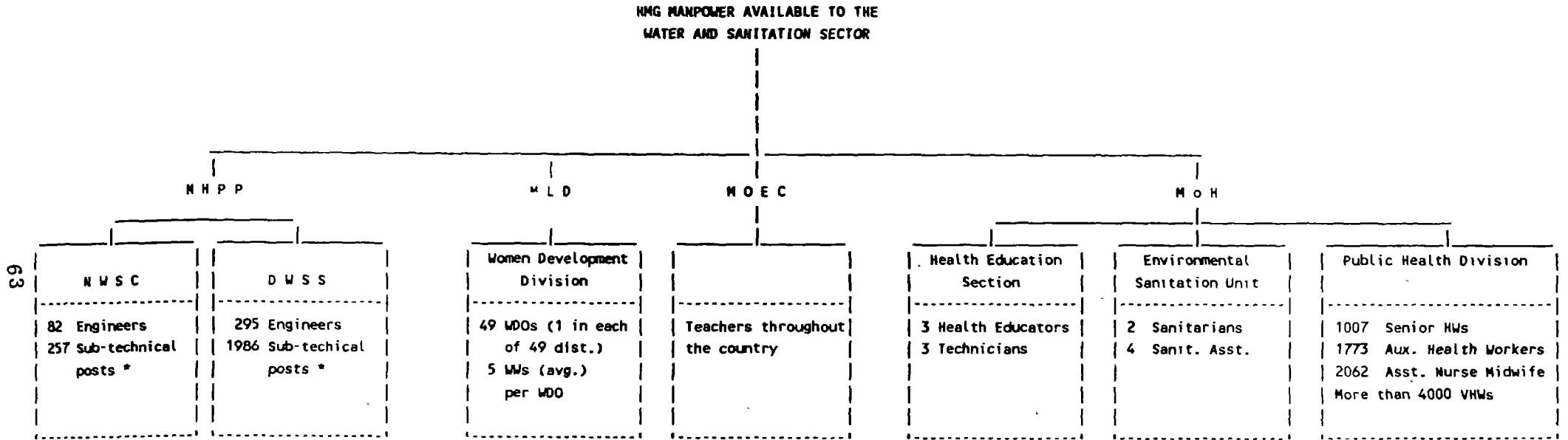
About 75% of the funds are needed for the urban sector, where both rehabilitation of existing facilities and the construction of new schemes will be very costly. The per capita cost for urban water supplies is some six times the cost of rural piped services.

#### Availability.

The present estimated sector requirements for the period 1990 - 2000 of Rs. 15,000 to 16,100 million represents about 8% of the draft 8th and 9th Five Year Plan outlays. In the 6th and 7th Plans the sector allocations accounted for about 4% of the total budget. With many competing priorities, it is unlikely that the government will be able to raise sector priority and increase the current proportion of 4% substantially.

Inevitably, external assistance will continue to constitute a substantial portion of future sector investments. The proportion of external assistance is likely to be in the range of 50 to 60% of the total budget. This would be equivalent to US\$ 250-300 million for the ten year period; requiring US\$ 20-40 million annually for the sector.

Figure 4-14



\* Includes Overseers, Draughtsmen, WSSTs, Plumbers.

Source: "Situation Statement (Rural Water Supply)" (Wijayarathne, 1990)

## Conclusion

With substantial externally funded projects requiring many years of preparation, it is imperative that the government work closely with the donor community in formulating sector plans, programmes and budgets. Ultimately, the willingness of donors to contribute to investment in the sector will depend to a large extent on the performance of the lead agency: DWSS. For numerous reasons, both internal and external, the past performance of the Department in implementing externally funded projects has not always been equally successful. Thus, while the availability of funds may eventually become a serious constraint; the ability of MHPP and DWSS to utilise presently available resources efficiently and expeditiously will be even more crucial to sector performance.

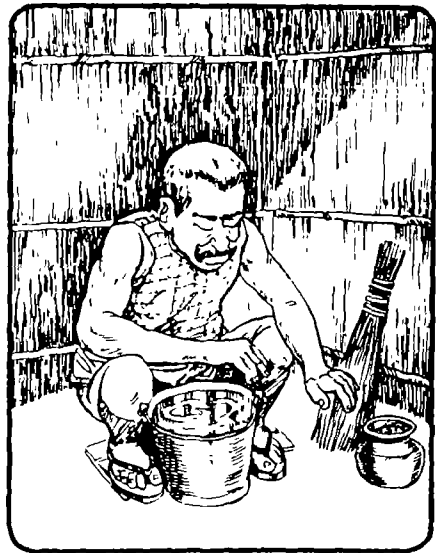
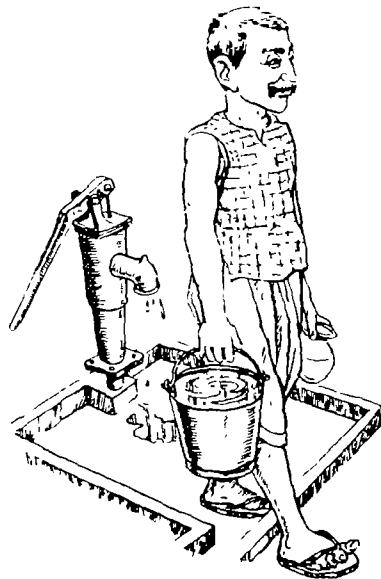
Similarly, the commitment of DWSS to diversify programmes to include latrine promotion, hygiene education, women's involvement and, above all, to cooperate closely with the benefitting communities will be decisive to both sustainability and donor interest in the sector.

### 4.2.4 Manpower

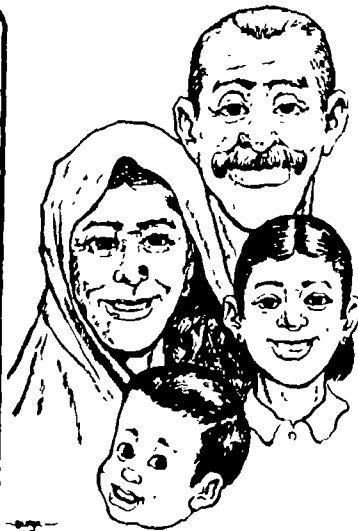
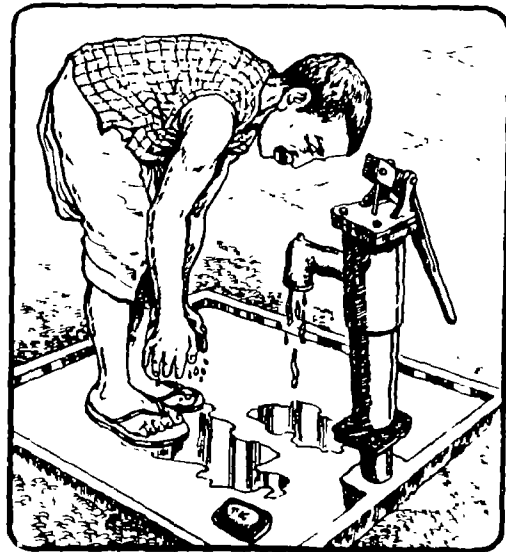
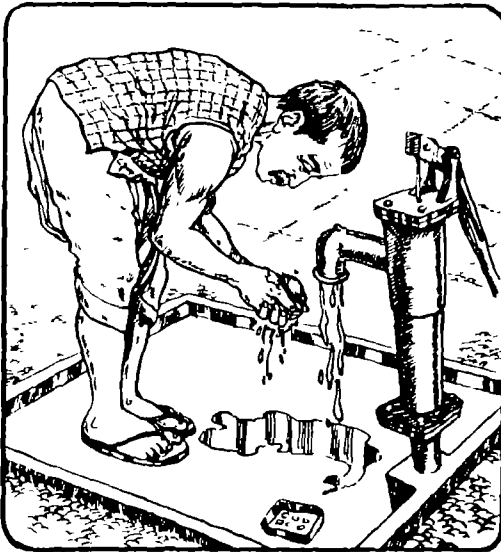
Figure 4.14 gives an indication of the type and numbers of government staff available for work in the water and sanitation sector.

DWSS is the main source of manpower for sectoral activities with (in 1988/89) 2169 permanent and 2244 temporary posts, of which 2281 posts in the technical category. Nearly all staff is employed solely for water supply activities. This number of staff should be adequate to manage the construction of the 900 projects which DWSS has presently on hand.

NWSC has a staff of 873, of which 339 of a technical nature.



के तपाईंलाई स्वस्थ  
परिवार चाहिन्छ ?  
१. आफ्नो चर्पी सफा  
राख्नुहोस् ।  
२. दिसा गरेपछि तपाईंको  
हात साबुनले धुनुहोस्।





the public. The section presently has a staff of three Health Educators and six Technicians.

Ministry of Health - Environmental Sanitation Unit (ESU)  
This unit supports sanitation activities of sector agencies. The unit presently has a staff of two Sanitarians and four Assistants.

MoH - Female Community Health Volunteer Programme (FCHV)  
The FCHV programme was started in 1988 and aimed to have one Mother's Group selecting one FCHV in each of the nine wards of all 4016 villages of Nepal. The programme expanded to cover the Western Region and Central regions by 1990. Further expansion of the programme was, possibly temporarily, halted in 1990 with the abolishment of the Panchayat system. The healthposts are responsible for training of the FCHVs and for their supervision through the VHWS.



support agencies are making progress against these constraints: infant and child mortality continue to decline; life expectancy continues to increase.

Improvements in living conditions are more difficult to gauge. Rural and urban water supply coverage rates are increasing, but not at the rate foreseen a decade ago.

The quality of life of most rural Nepali has not improved significantly in the last decade in terms of annual earnings or basic health services received.

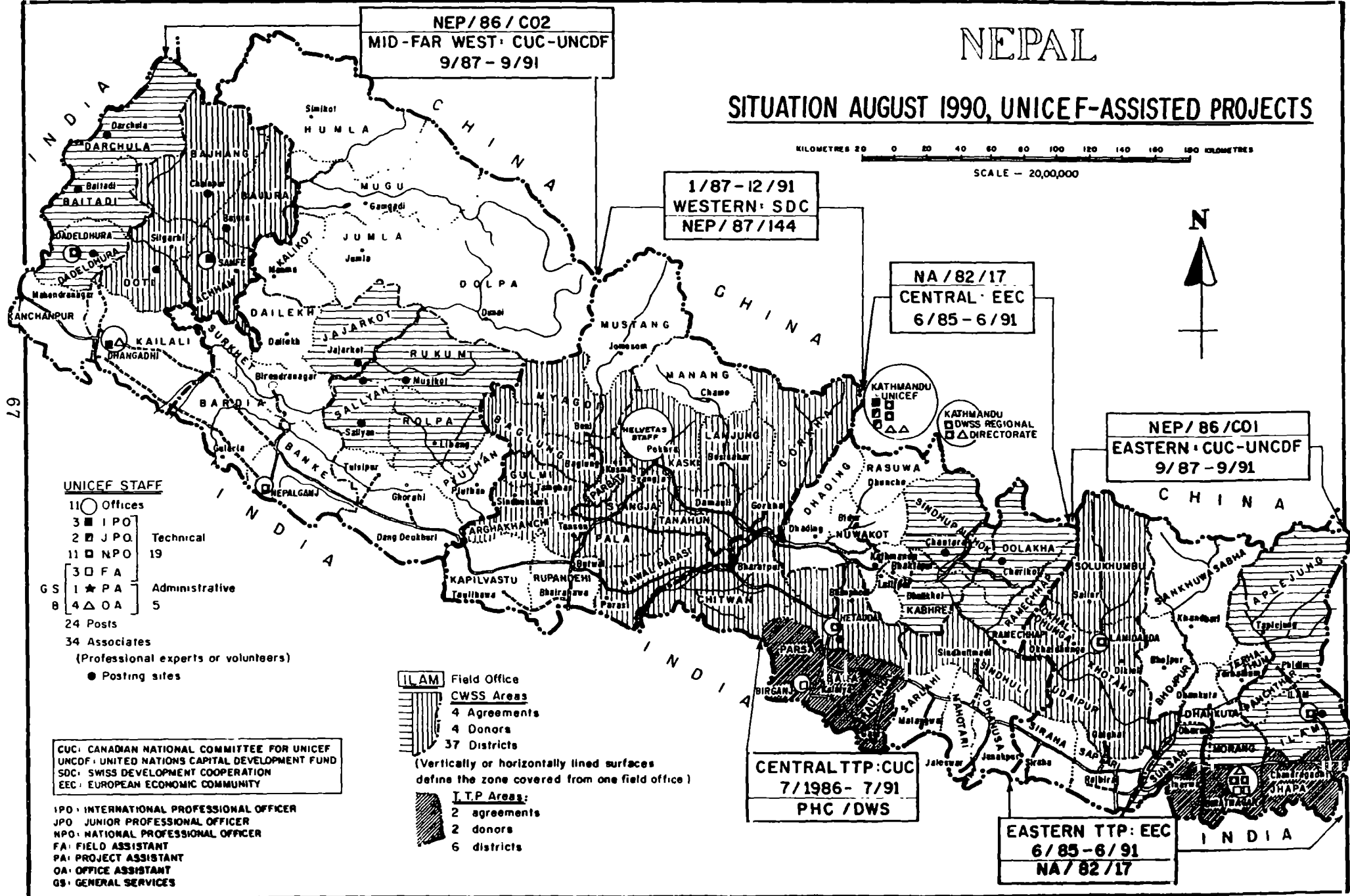
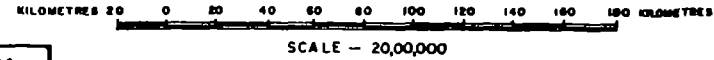
Recent fundamental political changes have great potential to shape the things to come. The country is still struggling to promulgate a new constitution to document the transition from a near absolute monarchy to a multi-party democracy and a constitutional monarchy.

Within the water and sanitation sector the restructuring of the sectoral institutions and the new MHPP Directives for the Implementation of Water Supply Projects have already had considerable impact on sectoral activities. Both events have increased decentralisation of sectoral activities: the restructuring by establishing technical offices in each of the 75 districts and the Directives by transferring the responsibility for operation and maintenance to the communities.

The last decade has seen a large increase in the number of NGOs working in Nepal. The same is true for bi-lateral donors. Foreign aid as a whole has almost doubled in the past decade. The clear message is that foreign donors are willing to support the development of the sector in Nepal with financial and technical resources. It remains for the government to decide how it can best use the resources offered.

# NEPAL

## SITUATION AUGUST 1990, UNICEF-ASSISTED PROJECTS



NEP/86/C02  
MID-FAR WEST: CUC-UNCDF  
9/87 - 9/91

1/87-12/91  
WESTERN: SDC  
NEP/87/144

NA/82/17  
CENTRAL: EEC  
6/85 - 6/91

NEP/86/C01  
EASTERN: CUC-UNCDF  
9/87 - 9/91

CENTRAL TTP: CUC  
7/1986 - 7/91  
PHC/DWS

EASTERN TTP: EEC  
6/85 - 6/91  
NA/82/17

- UNICEF STAFF**
- 11 ○ Offices
  - 3 ■ IPO
  - 2 □ JPO
  - 11 □ NPO
  - 3 □ FA
  - 1 ★ PA
  - 8 4 △ OA
  - 24 Posts
  - 34 Associates
  - (Professional experts or volunteers)
  - Posting sites
- Technical**
- 19
- Administrative**
- 5

- ILAM**
- Field Office
  - CWSS Areas
  - 4 Agreements
  - 4 Donors
  - 37 Districts

(Vertically or horizontally lined surfaces define the zone covered from one field office)

- I.T.P. Areas:**
- 2 agreements
  - 2 donors
  - 6 districts

CUC: CANADIAN NATIONAL COMMITTEE FOR UNICEF  
UNCDF: UNITED NATIONS CAPITAL DEVELOPMENT FUND  
SDC: SWISS DEVELOPMENT COOPERATION  
EEC: EUROPEAN ECONOMIC COMMUNITY

IPO: INTERNATIONAL PROFESSIONAL OFFICER  
JPO: JUNIOR PROFESSIONAL OFFICER  
NPO: NATIONAL PROFESSIONAL OFFICER  
FA: FIELD ASSISTANT  
PA: PROJECT ASSISTANT  
OA: OFFICE ASSISTANT  
GS: GENERAL SERVICES

Nepal, it is still possible that Nepal will manage large increases in the rate of water supply coverage. However, meeting the goal of complete coverage by the year 2000 would involve covering 16 million people in the 1990s, which is more than triple the coverage achieved in the 1980s. In any event, improving coverage rates in the next decade will require extraordinary commitment, both on the part of the government and on the part of donors who will have to contribute a large portion of the financial resources required.

In the second part of this report UNICEF will review, in the context of this first part, the ongoing HMG-UNICEF programme of cooperation and suggest an amended plan of action for the final two years of the Plan of Operations 1988-1992. The second part will also propose the broad outline and the strategy for the next programme of cooperation between UNICEF and HMG in preparation for discussion and negotiation with the Government.



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The district-wise populations chosen for use in this report were calculated using the ratio method with a total fertility rate (TFR) of 4.0 in the year 2000. By this method, the following populations can be found extrapolating from the 1981 census population:

1985	16,682,300	
1990	18,916,300	(13% increase from 1985)
1995	21,113,600	(12% increase from 1985)
2000	23,075,700	(9 % increase from 1995)

## A.2 URBAN AND RURAL POPULATION

The population of the present 33 urban centres is anticipated to rise at an average rate of 5% as shown in the table below:

1985:	1,035,000	
1990:	1,375,600	(33% increase from 1985)
1995:	1,889,000	(37% increase from 1990)
2000:	2,434,100	(29% increase from 1995)

Most of the 33 municipalities also include a substantial rural population. The above figures represent the population of the urbanised areas only.

In 1989, the size of the urban population varied from the legal minimum of 10,000 to over 350,000; with 15 of the 33 towns in the 10,000 to 20,000 range.

The urban population as a proportion of the total population is expected to increase as follows:

1985:	6.2% of the total population
1990:	7.3% of the total population
1995:	8.9% of the total population
2000:	10.5% of the total population



Sunsari	474046
Dhankuta	147586
Terhathum	84257
Bhojpur	197456
Sanhuwasabha	133909
Solukhumb	93891
Khotang	213147
Okhaldhunga	146187
Udaypur	212442
Siraha	455790
Saptari	475374
-----	-----
Eastern	4750165
-----	-----

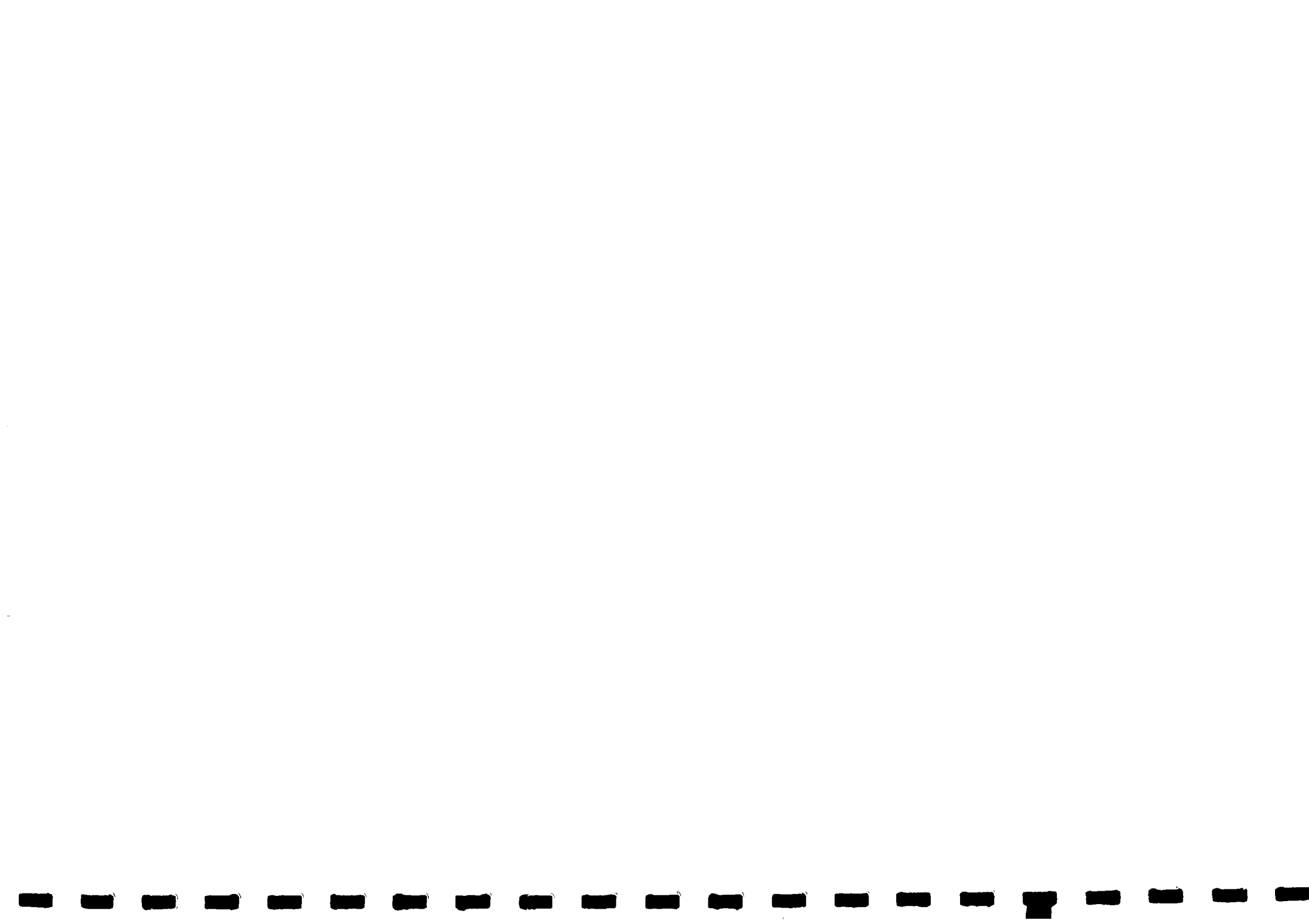
Dolakha	162166
Rasuwa	32718
Nuwakot	225053
Dhading	272402
Sindhupal	252349
Kavre	372667
Kathmandu	505499
Bhaktapur	201696
Lalitpur	230323
Makwanpur	331979
Bara	419457
Parsa	381861
Chitwan	362278
Rautahat	427265
-----	-----
Central	6068319
-----	-----

WESTERN REGION

<u>District</u>	<u>Population</u>
Nawalparasi	467351
Kapilvastu	343629
Palpa	251208
Archakhanchi	183990
Gulmi	265003
Rupandehi	545448
Syangja	282875
Kaski	286575
Lamjung	180859
Tanahun	287046
Gorkha	276736
Manang	5821
Mustang	15585
Myagdi	102574
Parbat	138622
Baglung	250905
-----	-----
Western	3884227
-----	-----

MID-WESTERN REGION

<u>District</u>	<u>Population</u>
Rolpa	173523
Pyuthan	176470
Rukum	165757
Salyan	156480
Dang	362762
Banke	299042
Bardiya	325045
Surkhet	241257
Dailekh	175768
Jajarkot	111407
Dolpa	24947
Jumla	74614
Kalikot	104152
Mugu	61125
Humla	15812
-----	-----
Mid-Western	2468161
-----	-----





Darchula 104815

-----  
Far-Western 1745432  
-----



in the past. In July 1990 UNICEF commissioned the first tests of water quality from shallow tubewells and dugwells (DISVI,1990). Water quality tests have also been done for some gravity flow systems in the western Region.

Table 2.1 (5 pages) presents the water supply coverage recorded in Nepal till mid-1989. Including the use of private tubewells, recorded water supply coverage is 27%; 22.5% rural and 87.7% urban.

Data used to compile the tables 1 through 4 in this Annex has been collected from a number of sources:

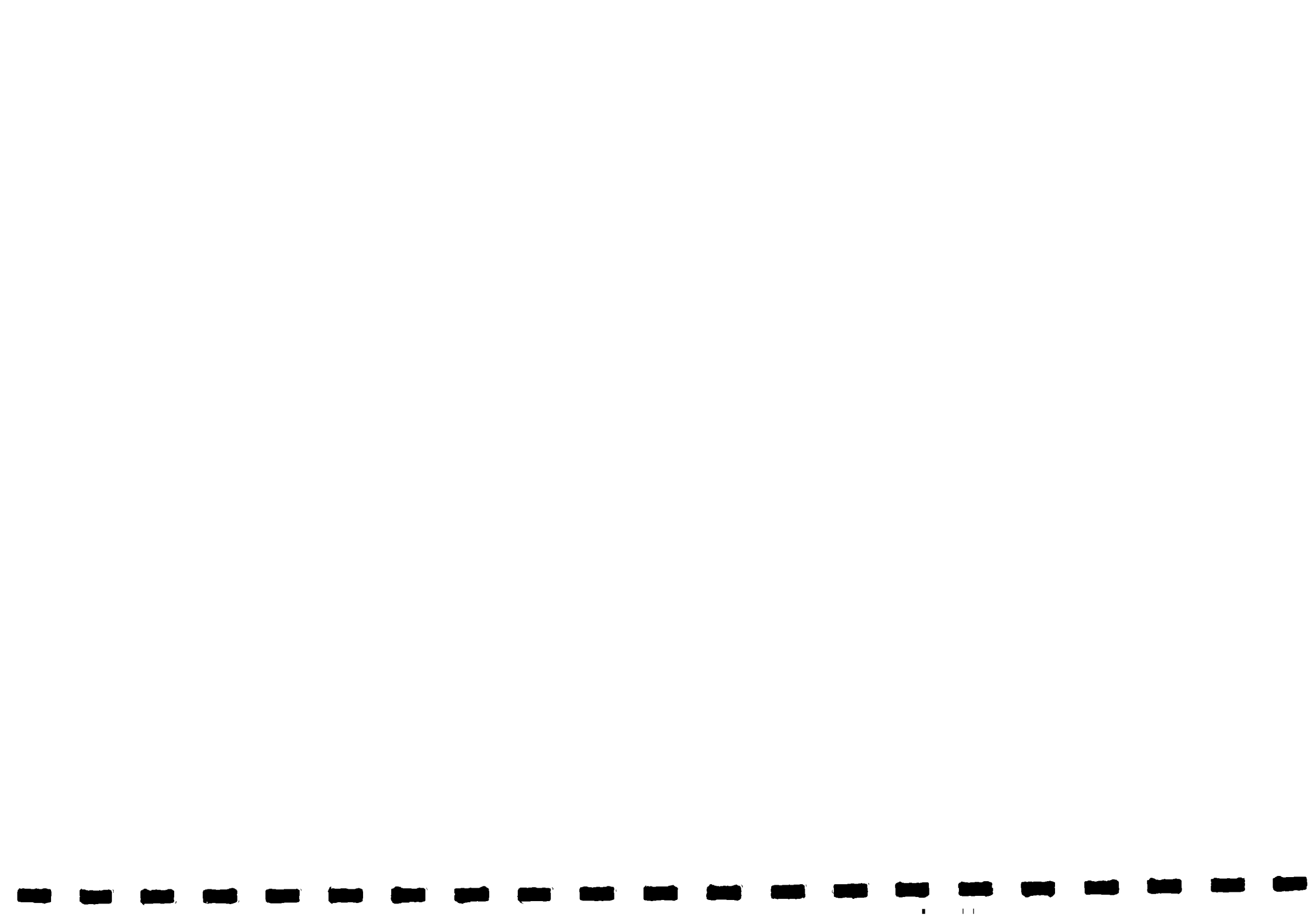
1: MITS inventory

The Management Information and Technical Support (MITS) Project at DWSS has prepared an inventory of completed water supply schemes. This inventory is the main source of information on piped water supply systems. At the moment, the MITS inventory is neither complete nor well updated. The data base does not reflect actual service provided by the systems listed. Data on piped schemes presented in this Annex must be read with the above in mind. The UNICEF assisted CWSS programme output appears to be reasonably well documented in the inventory.

To allow for inevitable system deterioration and to reflect the migratory trend away from the hills, the base-year population figures have been used unaltered to calculate the present number of beneficiaries. For systems where only the design population is given, the actual number of users is taken as 75% of the design population.

2: NRCS

NRCS supplied detailed information on tubewells and gravity flow schemes constructed as part of the PHC-DW project. For tubewells, the average number of users per well has been estimated at 100 for wells installed before 1986 and at 130 for wells installed in later years.



reports. Average numbers of well users vary from 80 in the Eastern to 130 per well in the Central and Western Terai. Of the wells installed before 1986, 40% is assumed to be out of order.

#### 5: Urban Water Supplies

In 1989 the UNDP/IBRD NEP/88/046 project prepared a study on urban water supplies in Nepal. Table 2.4 summarizes data on actual water use in the 33 urban centres as presented in the NEP/88/046 report. Data in Table 2.4 has been adjusted to reflect increases in the urban population since the report base year of 1987. The actual number of users of piped urban water supply schemes as reported by NEP/88/046 is substantially less than the design population of these schemes in the MITS inventory data base.

#### 6: Private Tubewells

An attempt has been made to include the water use obtained from private tubewells, both in the Terai and in the Kathmandu valley. There are two reasons why coverage from this source should be included. The most important reason is that water from private tubewells is of nearly the same quality as water from project tubewells (DISVI, 1990). The second reason is that, for all intents and purposes, people already using private tubewell water are hardly a target for a public shallow tubewell programme any more because they already have access to a similar water source located more conveniently than any public well is likely to be.

For the Terai, the use of private tubewells for domestic water supply has been estimated at 5 to 15% of the population not using piped systems or existing public wells. Incidental surveys in some districts of the Terai provide no more than an indication of the use of private tubewells. For most of the Terai, no data on private well use is available at all. Private tubewells nevertheless constitute an important source of water in the Terai; rivalling public wells in service provided.



in the rural areas. For CWSS systems, coverage data as on record in the MITS inventory is shown.

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NEPAL WATER SUPPLY SITUATION - 1990

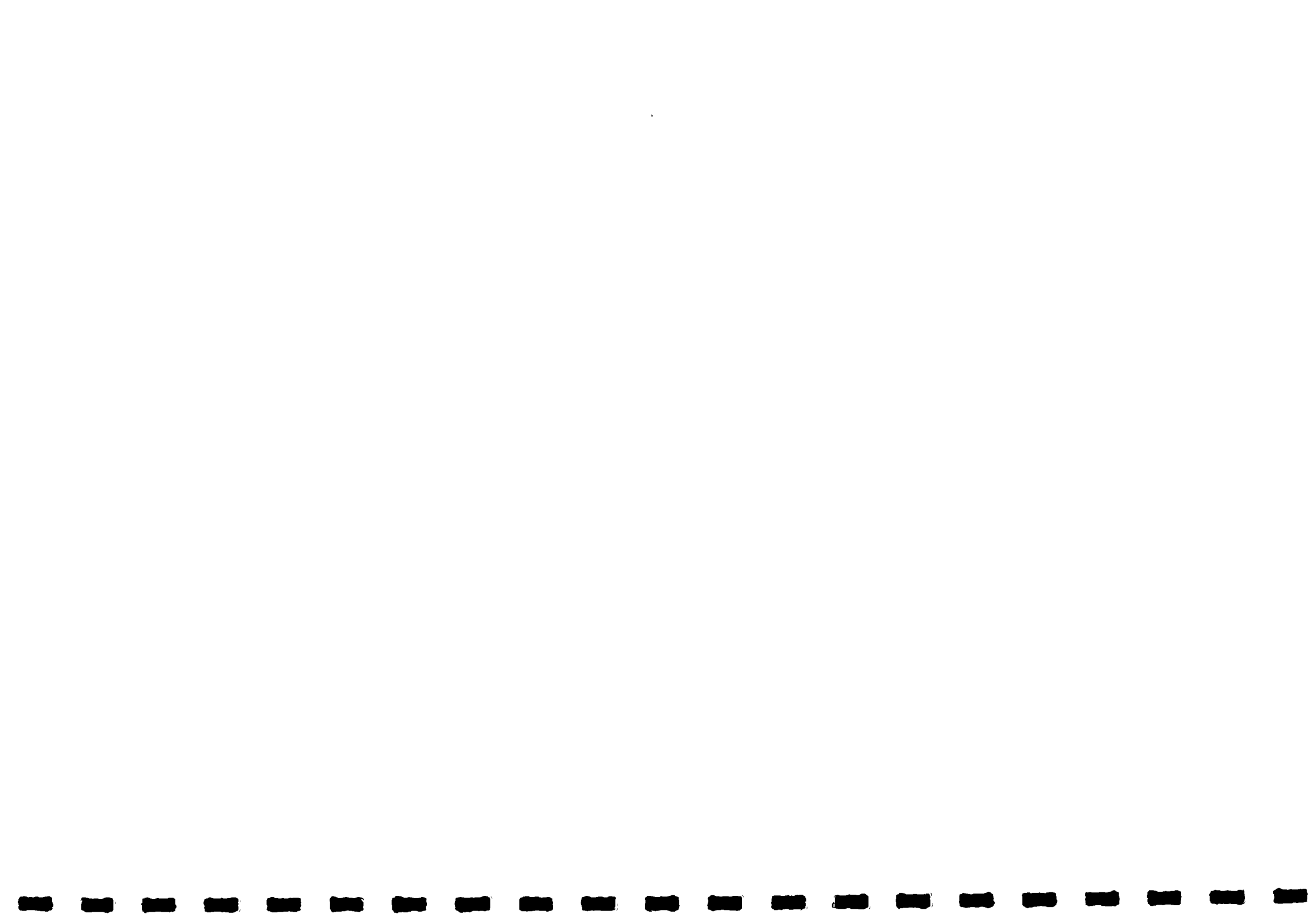
(Coverage recorded till mid-1989)

Table 2.1  
Page 1 of 5

Eastern Region

=====

Sl. No.	District	Population ('000)			Water Supply Coverage								Total Coverage (%)	
		Total	Rural	Urban	Rural				Urban					
					Piped	Tubewells		Rural Coverage (%)	Piped	Urban Coverage (%)	Tubewells (private)			
						Public	Private				Public	Private		
1	Taplejung	124.3	124.3		27.3			22.0%						22.0%
2	Panchthar	153.2	153.2		41.6			27.2%						27.2%
3	Ilam	209.3	204.7	4.6	21.9			10.7%	4.6	100.0%			100.0%	12.7%
4	Jhapa	781.3	759.4	21.9	30.4	55.2	134.8	29.0%	9.0	41.1%	12.9	100.0%	100.0%	31.0%
5	Morang	848.0	698.0	150.0	18.9	38.4	127.6	26.5%	25.0	16.7%	90.0	76.7%	76.7%	35.4%
6	Sunsari	474.0	381.3	92.7	11.9	23.6	69.8	27.6%	75.0	80.9%	11.5	93.3%	93.3%	40.5%
7	Sankhuwa S.	133.9	133.9		18.0			13.4%						13.4%
8	Terhathum	84.3	84.3		24.3			28.8%						28.8%
9	Solu Khumbu	93.9	93.9		28.7			30.6%						30.6%
10	Okhaldhunga	146.2	146.2		23.2			15.9%						15.9%
11	Khotang	213.1	213.1		33.7			15.8%						15.8%
12	Udaypur	212.4	212.4		21.7			10.2%						10.2%
13	Bhojpur	197.5	197.5		27.9			14.1%						14.1%
14	Dhankuta	147.6	138.8	8.8	38.4			27.7%	5.0	56.8%		56.8%	56.8%	29.4%
15	Saptari	475.4	430.3	45.1		13.6	41.7	12.9%	15.0	33.3%	30.1	100.0%	100.0%	21.1%
16	Siraha	455.8	445.7	10.1	1.6	13.8	43.0	13.1%	3.0	29.7%	4.0	69.3%	69.3%	14.3%
Sub-Totals:		4,750.2	4,417.0	333.2	369.5	144.6	416.9	21.1%	136.6	41.0%	148.5	85.6%	85.6%	25.6%



NEPAL WATER SUPPLY SITUATION - 1990

(Coverage recorded till mid-1989)

Table 2.1  
Page 2 of 5

Central Region

=====

Sl. No.	District	Population ('000)			Water Supply Coverage								Total Coverage (%)
		Total	Rural	Urban	Rural				Urban				
					Piped	Tubewells		Rural Piped Coverage (%)	Piped	Tubewells (private)		Urban Piped Coverage (%)	
						Public	Private			Public	Private		
1	Mahottari	442.1	434.6	7.5	1.1	51.9	38.2	21.0%	3.0	40.0%	2.0	66.7%	21.8%
2	Dhanusha	545.0	476.0	69.0	6.8	90.1	37.9	28.3%	7.5	10.9%	30.0	54.3%	31.6%
3	Sarlahi	533.5	522.4	11.1		110.2	41.2	29.0%	5.5	49.5%	3.0	76.6%	30.0%
4	Sindhuli	216.2	216.2		13.9			6.4%					6.4%
5	Ramechhap	153.8	153.8		21.0			13.7%					13.7%
6	Dolakha	162.2	162.2		42.0			25.9%					25.9%
7	Rasuna	32.7	32.7		2.4			7.3%					7.3%
8	Nuwakot	225.1	213.6	11.5	14.2			6.6%	10.0	87.0%		87.0%	10.8%
9	Dhading	272.4	272.4		16.1			5.9%					5.9%
10	Sindhupalchok	252.3	252.3		60.4			23.9%					23.9%
11	Kavre	372.7	353.8	18.9	33.6			9.5%	13.2	69.8%		69.8%	12.6%
12	Kathmandu	505.5	173.8	331.7	44.2			25.4%	286.5	86.4%	3.0	87.3%	66.0%
13	Bhaktapur	201.7	164.7	37.0	18.8			11.4%	34.0	91.9%		91.9%	26.2%
14	Lalitpur	230.3	124.9	105.4	78.3			62.7%	105.4	100.0%		100.0%	79.8%
15	Makawanpur	332.0	293.3	38.7	22.7			7.7%	15.0	38.8%	8.0	59.4%	13.8%
16	Bara	419.5	400.8	18.7	6.7	92.4	30.2	32.3%	6.0	32.1%	7.0	69.5%	33.9%
17	Parsa	381.9	291.9	90.0	19.9	83.1	18.9	41.8%	25.0	27.8%	40.0	72.2%	48.9%
18	Chitwan	362.3	323.1	39.2	33.7			10.4%	15.0	38.3%	8.0	58.7%	15.7%
19	Rautahat	427.3	427.3		7.0	83.9	33.6	29.1%					29.1%
Sub-Totals		6,068.5	5,289.8	778.7	442.8	511.6	200.0	21.8%	526.1	67.6%	101.0	80.5%	29.4%



NEPAL WATER SUPPLY SITUATION - 1990

(Coverage recorded till mid-1989)

Table 2.1  
Page 3 of 5

Western Region

=====

Sln.	District	Population ('000)			Water Supply Coverage								Total Coverage (%)	
		Total	Rural	Urban	Rural				Urban					
					Piped	Tubewells		Rural Coverage (%)	Piped	Urban Tubewells (private)		Urban Coverage (%)		
						Public	Private			Piped Coverage	Private			
1	Nawal Parasi	467.4	467.4		68.2	62.6	16.8	31.6%						31.6%
2	Kapilvastu	343.6	336.1	7.5	12.1	48.1	27.6	26.1%	3.7	49.3%	2.0	76.0%	27.2%	
3	Palpa	251.2	235.0	16.2	40.1			17.1%	13.0	80.2%		80.2%	21.1%	
4	Argakhanchi	184.0	184.0		42.1			22.9%					22.9%	
5	Gulmi	265.0	265.0		57.0			21.5%					21.5%	
6	Rupandehi	545.4	466.5	78.9	10.6	47.4	40.9	21.2%	26.0	33.0%	51.0	97.6%	32.3%	
7	Syangja	282.9	282.9		56.7			20.0%					20.0%	
8	Kaski	286.6	225.0	61.6	106.9			47.5%	52.0	84.4%		84.4%	55.4%	
9	Lamjung	180.8	180.8		65.9			36.4%					36.4%	
10	Tanahun	287.0	287.0		56.3			19.6%					19.6%	
11	Gorkha	276.7	276.7		71.0			25.7%					25.7%	
12	Manang	5.8	5.8		4.8			82.8%					82.8%	
13	Mustang	15.6	15.6		14.9			95.5%					95.5%	
14	Myagdi	102.6	102.6		39.1			38.1%					38.1%	
15	Parbat	138.6	138.6		43.3			31.2%					31.2%	
16	Baglung	250.9	250.9		53.7			21.4%					21.4%	
Sub-Total		3,884.1	3,719.9	164.2	742.7	158.1	85.3	26.5%	94.7	57.7%	53.0	90.0%	29.2%	



NEPAL WATER SUPPLY SITUATION - 1990

(Coverage recorded till mid-1989)

Table 2.1  
Page 4 of 5

Mid-Western Region

\*\*\*\*\*

Sln.	District	Population ('000)			Coverage								Total Coverage (%)
		Total	Rural	Urban	Rural			Urban			Total (%)		
					Piped	Tubewells		Piped	Urban Tubewells (private)	Urban Coverage (%)			
						Public	Private					Rural Coverage (%)	
1	Rolpa	173.5	173.5		24.2			13.9%					13.9%
2	Pyuthan	176.5	176.5		35.2			19.9%					19.9%
3	Rukum	165.8	165.8		47.2			28.5%					28.5%
4	Salyan	156.5	156.5		29.5			18.8%					18.8%
5	Dang	362.8	351.8	11.0	42.6	13.8	14.8	20.2%	9.5	86.4%	1.0	95.5%	22.5%
6	Banke	299.0	253.7	45.3	22.5	73.7	15.8	44.1%	14.0	30.9%	25.0	86.1%	50.5%
7	Bardiya	325.0	325.0		18.7	49.3	25.7	28.8%					28.8%
8	Surkhet	241.3	229.7	11.6	65.9			28.7%	7.0	60.3%		60.3%	30.2%
9	Dailekh	175.8	175.8		11.5			6.5%					6.5%
10	Jajarkot	111.4	111.4		21.8			19.6%					19.6%
11	Dolpa	24.9	24.9		3.4			13.7%					13.7%
12	Jumla	74.6	74.6		7.9			10.6%					10.6%
13	Kalikot	104.2	104.2		10.0			9.6%					9.6%
14	Mugu	61.1	61.1		4.1			6.7%					6.7%
15	Humla	15.8	15.8		5.5			34.8%					34.8%
Sub-Total		2,468.2	2,400.3	67.9	350.0	136.8	56.3	22.6%	30.5	44.9%	26.0	83.2%	24.3%





Sln.	District	Population ('000)			Rural								Urban		Total
		Total	Rural	Urban	Piped	Tubewells		Rural Coverage (%)	Piped	Urban Coverage (%)	Tubewells (private)	Urban Coverage (%)	Total Coverage (%)		
						Public	Private								
1	Bajura	87.6	87.6		18.8			21.5%					21.5%		
2	Bajhang	136.6	136.6		10.5			7.7%					7.7%		
3	Achham	201.7	201.7		37.5			18.6%					18.6%		
4	Doti	178.5	169.1	9.4	37.3			22.1%	9.4	100.0%		100.0%	26.2%		
5	Kailali	417.2	407.3	9.9	1.8	66.8	33.9	25.2%	3.0	30.3%	6.9	100.0%	26.9%		
6	Kanchanpur	303.4	291.1	12.3		30.0	26.1	19.3%	5.0	40.7%	7.3	100.0%	22.5%		
7	Dadeldhura	118.7	118.7		34.7			29.2%					29.2%		
8	Baitadi	197.0	197.0		23.5			11.9%					11.9%		
9	Darchula	104.8	104.8		18.6			17.7%					17.7%		
Sub Total		1,745.5	1,713.9	31.6	182.7	96.8	60.0	19.8%	17.4	55.1%	14.2	100.0%	21.3%		

## NATION-WIDE SUMMARY

Sln.	Region	Population ('000)			Rural								Urban		Total
		Total	Rural	Urban	Piped	Tubewells		Rural Coverage (%)	Piped	Urban Coverage (%)	Tubewells (private)	Urban Coverage (%)	Total Coverage (%)		
						Public	Private								
	Eastern	4,750.2	4,417.0	333.2	369.5	144.6	416.9	21.1%	136.6	41.0%	148.5	85.6%	25.6%		
	Central	6,068.5	5,289.8	778.7	442.8	511.6	200.0	21.8%	526.1	67.6%	101.0	80.5%	29.4%		
	Western	3,884.1	3,719.9	164.2	742.7	158.1	85.3	26.5%	94.7	57.7%	53.0	90.0%	29.2%		
	Mid-Western	2,468.2	2,400.3	67.9	350.0	136.8	56.3	22.6%	30.5	44.9%	26.0	83.2%	24.3%		
	Far-Western	1,745.5	1,713.9	31.6	182.7	96.8	60.0	19.8%	17.4	55.1%	14.2	100.0%	21.3%		
	Nepal	18,916.5	17,540.9	1,375.6	2,087.7	1,047.9	818.5	22.5%	805.3	58.5%	342.7	83.5%	27.0%		
	Terai districts (20)	9,209.9	8,489.7	720.2	314.5	1,047.9	818.5	25.7%	250.2	34.7%	331.7	80.8%	30.0%		
	Hilly districts (55)	9,706.6	9,051.2	655.4	1,773.2			19.6%	555.1	84.7%	11.0	86.4%	24.1%		



- Dhanusha	(TTP)	125	124	128	377	36.700
- Sarlahi	(TTP)	0	217	78	295	28.700
- Parsa	45	60	50	102	257	25.000
- Bara	50	65	50	187	352	34.300
- Kailali	15	150	121	400	686	66.800
- Kanchanpur	15	0	158	125	308	30.000
- Banke	25	60		363	448	43.700
- Bardiya	24	65		350	439	42.800
-----						
- Rautahat			135	130	265	25.800
- Siraha				65	65	6.300
- Saptari				40	40	3.900
- Rupendehi				25	25	2.400
- Dang				142	142	13.800

DWSS.wkq

Note: \*Wells installed before mid-1985 disregarded

\*\*TTP wells not included

\*\*\*25% of wells assumed out of order.

NRCS Tubewell construction

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1983-1989  
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District	Year						Total
	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	
Rautahat	0	47	53	TTP	TTP	TTP	100
Bara	0	37	63	TTP	TTP	TTP	100
Parsa	0	36	64	TTP	TTP	TTP	100
Nawal Parasi	109	0	87	101	100	81	478
Rupendehi	139	0	62	100	61	87	449
Kapilvastu	0	0	0	100	100	40	240
Banke	0	0	0	100	82	49	231
Bardiya	0	0	0	0	0	50	50



NEPAL WATER SUPPLY SITUATION - 1990  
(Coverage recorded till mid-1989)

COVERAGE BY AGENCY  
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Table 2.2  
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EASTERN REGION

S. No.	District	DWSS HMG/IRD	DWSS UNICEF	MPLD HMG	MPLD IRD	NGO	URBAN	TOTAL
1.	Taplejung	2.5	12.0	1.8	2.7	8.3	0.0	27.3
2.	Panchthar	9.5	21.3	0.0	3.9	6.9	0.0	41.6
3.	Ilam	1.0	19.3	0.0	1.1	0.5	4.6	26.5
4.	Jhapa	14.6	71.0	0.0	0.0	0.0	9.0	94.6
5.	Morang	4.2	53.2	0.0	0.0	0.0	25.0	82.4
6.	Sunsari	0.0	34.0	0.0	0.0	1.5	75.0	110.5
7.	Sankhuwasabha	7.4	2.2	1.2	5.6	1.6	0.0	18.0
8.	Terhathum	14.2	3.5	0.0	4.1	2.5	0.0	24.3
9.	Solukhumbu	9.7	17.0	1.4	0.0	0.7	0.0	28.8
10.	Okhaldhunga	4.3	15.4	0.9	0.4	2.1	0.0	23.1
11.	Khotang	4.6	16.0	1.7	0.4	11.1	0.0	33.8
12.	Udaypur	7.2	3.8	0.0	10.7	0.0	0.0	21.7
13.	Bhojpur	16.5	1.6	2.2	5.5	2.1	0.0	27.9
14.	Dhankuta	25.7	3.5	0.0	8.5	0.7	5.0	43.4
15.	Saptari	3.9	9.7	0.0	0.0	0.0	15.0	28.6
16.	Siraha	7.9	7.5	0.0	0.0	0.0	3.0	18.4
	Total	133.2	291.0	9.2	42.9	38.0	136.6	650.9
	Percentage	20.5%	44.7%	1.4%	6.6%	5.8%	21.0%	100%



NEPAL WATER SUPPLY SITUATION - 1990  
(Coverage recorded till mid-1989)

COVERAGE BY AGENCY  
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Table 2.2  
page 2 of 5

CENTRAL REGION

S. No.	District	DWSS HMG/IRD	DWSS UNICEF	MPLD HMG	MPLD IRD	NGO	URBAN	TOTAL
1.	Mahottari	20.4	32.6	0.0	0.0	0.0	3.0	56.0
2.	Dhanusha	43.5	53.4	0.0	0.0	0.0	7.5	104.4
3.	Sarlahi	28.7	81.5	0.0	0.0	0.0	5.5	115.7
4.	Sindhuli	6.4	7.5	0.0	0.0	0.0	0.0	13.9
5.	Ramechhap	7.0	7.6	0.0	0.0	6.4	0.0	21.0
6.	Dolakha	10.9	5.0	0.0	26.0	0.0	0.0	41.9
7.	Rasuwa	0.8	0.0	0.0	1.6	0.0	0.0	2.4
8.	Nuwakot	9.9	0.0	0.0	4.3	0.0	10.0	24.2
9.	Dhading	12.2	0.0	0.0	2.9	0.9	0.0	16.0
10.	Sindhupalchowk	16.7	8.2	0.0	33.0	2.6	0.0	60.5
11.	Kavrepalanchowk	16.4	9.1	0.0	2.9	5.2	13.2	46.8
12.	Kathmandu	17.0	0.0	0.0	4.1	23.1	286.5	330.7
13.	Bhaktapur	15.8	0.0	0.0	0.0	3.0	34.0	52.8
14.	Lalitpur	77.8	0.0	0.0	0.0	0.5	105.4	183.7
15.	Makwanpur	12.5	10.2	0.0	0.0	0.0	15.0	37.7
16.	Bara	41.0	0.0	0.0	0.0	58.1	6.0	105.1
17.	Parsa	44.9	0.0	0.0	0.0	58.1	25.0	128.0
18.	Chitwan	27.9	5.4	0.0	0.0	0.4	15.0	48.7
19.	Rautahat	32.8	0.0	0.0	0.0	58.1	0.0	90.9
Total		442.6	220.5	0.0	74.8	216.4	526.1	1,480.4
Percentage		29.9%	14.9%	0.0%	5.1%	14.6%	35.5%	100%





NEPAL WATER SUPPLY SITUATION - 1990  
(Coverage recorded till mid-1989)

COVERAGE BY AGENCY  
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Table 2.2  
page 3 of 5

WESTERN REGION

S. No.	District	DWSS HMG/IRD	DWSS UNICEF	MPLD HMG	MPLD IRD	NGO	URBAN	TOTAL
1.	Nawalparasi	59.8	10.5	0.0	0.0	60.5	0.0	130.8
2.	Kapilvastu	12.1	16.9	0.0	0.0	31.2	3.7	63.9
3.	Palpa	12.0	19.5	0.0	0.0	8.6	13.0	53.1
4.	Argakhanchi	32.6	9.5	0.0	0.0	0.0	0.0	42.1
5.	Gulmi	23.1	22.1	0.0	0.0	11.8	0.0	57.0
6.	Rupandehi	12.4	0.6	0.0	0.0	45.0	26.0	84.0
7.	Syangja	10.8	24.3	0.0	0.0	21.5	0.0	56.6
8.	Kaski	15.3	77.4	0.0	0.0	14.2	52.0	158.9
9.	Lamjung	16.4	30.3	0.0	0.0	19.3	0.0	66.0
10.	Tanahun	12.9	14.7	0.0	0.0	28.6	0.0	56.2
11.	Gorkha	28.3	17.2	10.4	0.0	15.0	0.0	70.9
12.	Manang	2.3	1.8	0.7	0.0	0.0	0.0	4.8
13.	Mustang	7.7	4.6	2.6	0.0	0.0	0.0	14.9
14.	Myagdi	9.6	25.3	2.4	0.0	1.8	0.0	39.1
15.	Parbat	11.6	25.0	0.0	2.4	4.4	0.0	43.4
16.	Baglung	21.7	16.7	0.0	0.0	15.4	0.0	53.8
	Total	288.6	316.4	16.1	2.4	277.3	94.7	995.5
	Percentage	29.0%	31.8%	1.6%	0.2%	27.9%	9.5%	100%



NEPAL WATER SUPPLY SITUATION - 1990  
(Coverage recorded till mid-1989)

COVERAGE BY AGENCY

Table 2.2  
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MID WESTERN REGION

S. No.	District	DWSS HMG/IRD	DWSS UNICEF	MPLD HMG	MPLD IRD	NGO	URBAN	TOTAL
1.	Rolpa	3.5	15.9	0.0	4.4	0.3	0.0	24.1
2.	Pyuthan	12.3	0.0	0.0	21.8	1.1	0.0	35.2
3.	Rukum	12.6	24.4	0.0	8.7	1.5	0.0	47.2
4.	Salyan	8.3	14.1	0.0	7.0	0.0	0.0	29.4
5.	Dang	35.3	0.0	0.0	21.0	0.0	9.5	65.8
6.	Banke	66.2	0.0	0.0	0.0	30.0	14.0	110.2
7.	Bardiya	61.5	0.0	0.0	0.0	6.5	0.0	68.0
8.	Surkhet	32.1	14.8	0.0	11.6	7.4	7.0	72.9
9.	Dailekh	3.0	4.4	0.0	4.1	0.0	0.0	11.5
10.	Jajarkot	5.9	15.9	0.0	0.0	0.0	0.0	21.8
11.	Dolpa	1.7	0.0	1.7	0.0	0.0	0.0	3.4
12.	Jumla	2.9	4.5	0.0	0.5	0.0	0.0	7.9
13.	Kalikot	10.0	0.0	0.0	0.0	0.0	0.0	10.0
14.	Mugu	2.7	0.0	0.8	0.5	0.0	0.0	4.0
15.	Humla	2.6	0.0	2.9	0.0	0.0	0.0	5.5
	Total	260.6	94.0	5.4	79.6	46.8	30.5	516.9
	Percentage	50.4%	18.2%	1.0%	15.4%	9.1%	5.9%	100%



NEPAL WATER SUPPLY SITUATION - 1990  
(Coverage recorded till mid-1989)

COVERAGE BY AGENCY

Table 2.2  
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FAR WESTERN REGION

S. No.	District	DWSS HMG/IRD	DWSS UNICEF	MPLD HMG	MPLD IRD	NGO	URBAN	TOTAL
1	Bajura	6.6	10.3	0.0	2.0	0.0	0.0	18.9
2	Bajhang	4.7	4.9	0.8	0.2	0.0	0.0	10.6
3	Achham	17.7	19.4	0.0	0.4	0.0	0.0	37.5
4	Doti	28.8	6.6	0.0	1.9	0.0	9.4	46.7
5	Kailali	68.3	0.0	0.0	0.4	0.0	3.0	71.7
6	Kanchanpur	30.0	0.0	0.0	0.0	0.0	5.0	35.0
7	Dadeldhura	11.3	16.1	0.0	7.2	0.0	0.0	34.6
8	Baitadi	8.0	10.9	0.0	4.5	0.0	0.0	23.4
9	Darchula	5.0	3.6	5.1	4.9	0.0	0.0	18.6
Total		180.4	71.8	5.9	21.5	0.0	17.4	297.0
Percentage		60.7%	24.2%	2.0%	7.2%	0.0%	5.9%	100%

NATION-WIDE SUMMARY

S. No.	Region	DWSS HMG/IRD	DWSS UNICEF	MPLD HMG	MPLD IRD	NGO	URBAN	TOTAL
1	Eastern Region	133.2	291.0	9.2	42.9	38.0	136.6	650.9
2	Central Region	442.6	220.5	0.0	74.8	216.7	526.1	1,480.7
3	Western Region	288.6	316.4	16.1	2.4	277.3	94.7	995.5
4	Mid Western Region	260.6	94.0	5.4	79.6	46.8	30.5	516.9
5	Far Western Region	180.4	71.8	5.9	21.5	0.0	17.4	297.0
Total		1,305.4	993.7	36.6	221.2	578.8	805.3	3,941.0
Percentage		33.1%	25.2%	0.9%	5.6%	14.7%	20.4%	100%

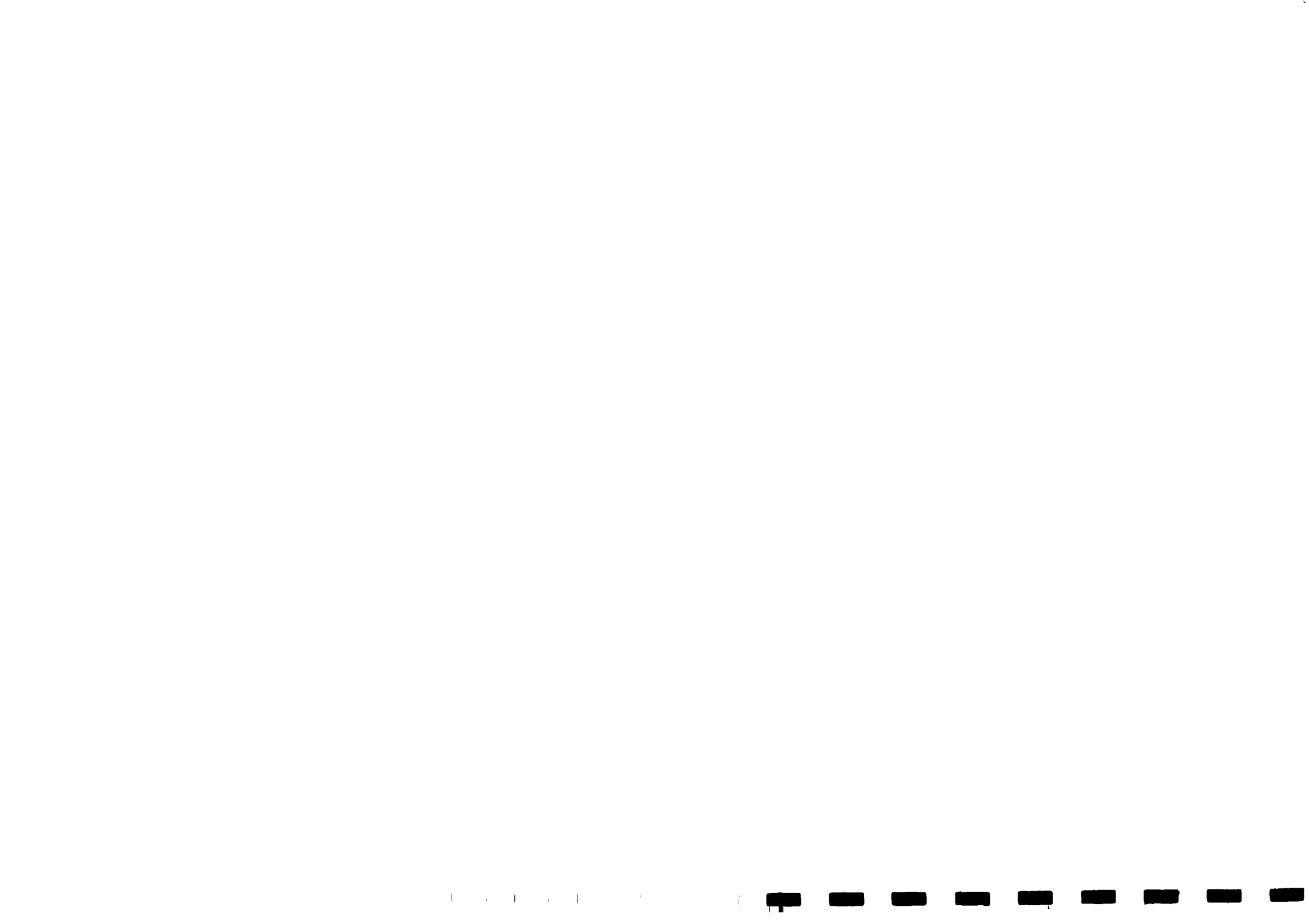


UNICEF Contribution to Nepal Water Supplies 1976 - mid-1989

Table 2.3  
page 1 of 5

Eastern Region CWSS and TTP Coverage since 1976

District	Numbers of:		Beneficiaries ('000)		Total	1990 rural population ('000)	Total rural coverage (%)	UNICEF contribution to coverage % of total
	CWSS systems	TTP wells	CWSS	TTP				
Taplejung	20	0	12.0	0	12.0	124.3	22.0	43.9%
Panchthar	26	0	21.3	0	21.3	153.2	27.2	51.1%
Ilam	37	0	19.3	0	19.3	204.7	10.7	88.1%
Jhapa	11	737	15.8	55.2	71.0	759.4	29.0	32.2%
Morang	10	512	14.8	38.4	53.2	698.0	26.5	28.8%
Sunsari	6	315	10.4	23.6	34.0	381.3	27.6	32.3%
Sankhuwa Sabha	4	0	2.2	0	2.2	133.9	13.4	12.3%
Terhathum	4	0	3.5	0	3.5	84.3	28.8	14.4%
Solu Khumbu	23	0	17.0	0	17.0	93.9	30.6	59.2%
Okhaldhunga	21	0	15.4	0	15.4	146.2	15.9	66.2%
Khotang	20	0	16.0	0	16.0	213.1	15.8	47.5%
Udaypur	4	0	3.8	0	3.8	212.4	10.2	17.5%
Bhojpur	4	0	1.6	0	1.6	197.5	14.1	5.7%
Dhankuta	6	0	3.5	0	3.5	138.8	27.7	9.1%
Saptari	0	65	0.0	9.7	9.7	430.3	12.9	17.5%
Siraha	0	50	0.0	7.5	7.5	445.7	13.1	12.8%
Sub-Totals	196	1,679.0	156.6	134.4	291.0	4,417.0	21.1	31.2%





UNICEF Contribution to Nepal Water Supplies 1976 - mid-1989

Table 2.3  
page 2 of 5

Central Region CWSS and TTP Coverage since 1982

District	Numbers of:		Beneficiaries ('000)		Total	1990 rural population ('000)	Total rural coverage (%)	UNICEF contribution to coverage % of total
	CWSS systems	TTP wells	CWSS	TTP				
Mahottari	0	418	0	32.6	32.6	434.6	21.0	35.7
Dhanusha	0	612	0	53.4	53.4	476.0	28.3	39.6
Sarlahi	0	1,046	0.0	81.5	81.5	522.4	29.0	53.8
Sindhuli	7	0	7.5	0.0	7.5	216.2	6.4	54.2
Ramechhap	7	0	7.6	0.0	7.6	153.8	13.7	36.1
Dolakha	8	0	5.0	0.0	5.0	162.2	25.9	11.9
Rasuwa	0	0	0.0	0.0	0.0	32.7	7.3	0.0
Nuwakot	0	0	0.0	0.0	0.0	213.6	6.6	0.0
Dhadhing	0	0	0.0	0.0	0.0	272.4	5.9	0.0
Sindhupalchowk	9	0	8.2	0.0	8.2	252.3	23.9	13.6
Kavre	11	0	9.1	0.0	9.1	353.8	9.5	27.1
Kathmandu	0	0	0.0	0.0	0.0	173.8	25.4	0.0
Bhaktapur	0	0	0.0	0.0	0.0	164.7	11.4	0.0
Lalitpur	0	0	0.0	0.0	0.0	124.9	62.7	0.0
Makwanpur	18	0	10.2	0.0	10.2	293.3	7.7	45.2
Bara	0	370	0.0	48.1	48.1	400.8	32.3	37.2
Parsa	0	370	0.0	48.1	48.1	291.9	41.8	39.4
Chitwan	10	0	5.4	0.0	5.4	323.1	10.4	16.1
Rautahat	0	370	0.0	48.1	48.1	427.3	29.1	38.7
<b>Sub-Totals</b>	<b>70</b>	<b>3,186</b>	<b>53.0</b>	<b>311.8</b>	<b>364.8</b>	<b>5,289.8</b>	<b>21.8</b>	<b>31.6</b>



UNICEF Contribution to Nepal Water Supplies 1976 - mid-1989

Table 2.3  
page 3 of 5

Western Region CWSS and TTP Coverage since 1976

District	Numbers of:		Beneficiaries ('000)		Total	1990 rural population ('000)	Total rural coverage (%)	UNICEF contribution to coverage % of total
	CWSS systems	TTP wells	CWSS	TTP				
Nawal Parasi	4	20	7.9	2.6	10.5	467.4	31.6	7.1
Kapilvastu	0	200	0	16.9	16.9	336.1	26.1	19.3
Palpa	20	0	19.5		19.5	235	17.1	48.5
Argakhanchi	7	0	9.5		9.5	184	22.9	22.5
Gulmi	14	0	22.1		22.1	265	21.5	38.8
Rupandehi	1	0	0.6		0.6	466.5	21.2	0.6
Syangja	23	0	24.3		24.3	282.9	20	42.9
Kaski	56	0	77.4		77.4	225	47.5	72.4
Lamjung	20	0	30.3		30.3	180.8	36.4	46.0
Tanahun	15	0	14.8		14.8	287	19.6	26.3
Gorkha	20	0	17.2		17.2	276.7	25.7	24.2
Manang	4	0	1.9		1.9	5.8	82.8	39.6
Mustang	9	0	4.6		4.6	15.6	95.5	30.9
Myagdi	26	0	25.3		25.3	102.6	38.1	64.7
Parbat	25	0	25		25	138.6	31.2	57.8
Baglung	16	0	16.6		16.6	250.9	21.4	30.9
<b>Sub-Totals</b>	<b>260</b>	<b>220</b>	<b>297</b>	<b>19.5</b>	<b>316.5</b>	<b>3,719.9</b>	<b>26.5</b>	<b>32.1</b>



UNICEF Contribution to Nepal Water Supplies 1976 - mid-1989

Table 2.3  
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Mid-Western Region CWSS Coverage since 1979

District	Numbers of:		Beneficiaries ('000)		Total	1990 rural population ('000)	Total rural coverage (%)	UNICEF contribution to coverage % of total
	CWSS systems	TTP wells	CWSS	TTP				
Rolpa	20		15.9		15.9	173.5	13.9	65.9
Pyuthan	0		0		0	176.5	19.9	0.0
Rukum	22		24.4		24.4	165.8	28.5	51.6
Sallyan	23		14.2		14.2	156.5	18.8	48.3
Dang	0		0		0	351.8	20.2	0.0
Banke	0		0		0	253.7	44.1	0.0
Bardya	0		0		0	325	28.8	0.0
Surkhet	11		14.8		14.8	229.7	28.7	22.5
Dailekh	8		4.4		4.4	175.8	6.5	38.5
Jajarkot	28		15.9		15.9	111.4	19.6	72.8
Dolpa	0		0		0	24.9	13.7	0.0
Jumla	0		0		0	74.6	10.6	0.0
Kalikot	0		0		0	104.2	9.6	0.0
Mugu	0		0		0	61.1	6.7	0.0
Humla	0		0		0	15.8	34.8	0.0
<b>Sub-Totals</b>	<b>112</b>	<b>0</b>	<b>89.6</b>	<b>0</b>	<b>89.6</b>	<b>2,400.3</b>	<b>22.6</b>	<b>16.5</b>



UNICEF Contribution to Nepal Water Supplies 1976 - mid-1989

Table 2.3  
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Far-Western Region CWSS Coverage since 1979

District	Numbers of:		Beneficiaries ('000)		Total	1990 rural population ('000)	Total rural coverage (%)	UNICEF contribution to coverage % of total
	CWSS systems	TTP wells	CWSS	TTP				
Bajura	8		10.3		10.3	87.6	21.5	54.7
Bajhang	6		4.9		4.9	136.6	7.7	46.6
Achham	17		19.4		19.4	201.7	18.6	51.7
Doti	7		6.6		6.6	169.1	22.1	17.7
Kailali	0		0		0	407.3	25.2	0.0
Kanchanpur	0		0		0	291.1	19.3	0.0
Dadeldhura	23		16.1		16.1	118.7	29.2	46.5
Baitadi	19		10.9		10.9	197	11.9	46.5
Darchula	7		3.6		3.6	104.8	17.7	19.4
Sub-Totals	87	0	71.8	0	71.8	1,713.9	19.8	21.2

Nation-wide CWSS and TTP Coverage since 1976

Region	Numbers of:		Beneficiaries ('000)		Total	1990 rural population ('000)	Total rural coverage (%)	UNICEF contribution to coverage % of total
	CWSS systems	TTP wells	CWSS	TTP				
Eastern	196	1,679	156.6	134.4	291.0	4,417.0	21.1	31.2
Central	70	3,186	53.0	311.8	364.8	5,289.8	21.8	31.6
Western	260	220	297.0	19.5	316.5	3,719.9	26.5	32.1
Mid-Western	112		89.6	0.0	89.6	2,400.3	22.6	16.5
Far-Western	87		71.8	0.0	71.8	1,713.9	19.8	21.2
Totals	725	5,085	668.0	465.7	1,133.7	17,540.9	22.5	28.7





Panchthar	Ilam	4.6	4.6	
Ilam	Bhadrapur	12.9	9.0	3.9
Jhapa	Damak	9.0		9.0
Jhapa	Biratnagar	150.0	25.0	90.0
Morang	Inerwa	17.1	5.0	11.5
Sunsari	Dharan	75.6	70.0	
Sunsari				
Sankhuwa Sabha				
Terhathum				
Solu Khumbu				
Okhaldhunga				
Khotang				
Udaypur				
Bhojpur				
Dhankuta	Dhankuta	8.8	5.0	
Saptari	Rajbiraj	45.1	15.0	30.1
Siraha	Lahan	10.1	3.0	4.0
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Sub-Totals:		333.2	136.6	148.5



Manottari	Chitwan	7.5	5.0	2.0
Dhanusha	Janakpur	69.0	7.5	30.0
Sarlahi	Malangwa	11.1	5.5	3.0
Sindhuli				
Ramechhap				
Dolakha				
Rasuwa				
Nuwakot	Bidur	11.5	10.0	
Dhading				
Sindhupalchowk				
Kavre	Banepa	11.2	5.5	
Kavre	Dhulikhel	7.7	7.7	
Kathmandu	Kathmandu	331.7	286.5	3.0
Bhaktapur	Bhaktapur	37.0	34.0	
Lalitpur	Lalitpur	105.4	105.4	
Makwanpur	Hetauda	38.7	15.0	8.0
Bara	Kalaya	18.7	6.0	7.0
Parsa	Birgunj	90.0	25.0	40.0
Chitwan	Bharatpur/N.ghat	39.2	15.0	8.0
Rautahat				
Sub-Totals		778.7	526.1	101.0



Kapilvastu	Taulihawa	7.5	3.7	2.0
Palpa	Tansen	16.2	13.0	
Argakhanchi				
Gulmi				
Rupendehi	Butwal	38.0	17.0	21.0
Rupendehi	Bhairahawa	40.9	9.0	30.0
Syangja				
Kaski	Pokhara	61.6	52.0	
Lamjung				
Tanahun				
Gorkha				
Manang				
Mustang				
Myagdi				
Parbat				
Baglung				
Sub-Totals		164.2	94.7	53.0



Pyuthan				
Rukum				
Sallyan				
Dang	Gorahi	11.0	9.5	1.0
Banke	Nepalgunj	45.3	14.0	25.0
Bardya				
Surkhet	Birendranagar	11.6	7.0	
Dailekh				
Jajarkot				
Dolpa				
Jumla				
Kalikot				
Mugu				
Humla				
Sub-totals		67.9	30.5	26.0





Bajhang				
Achham				
Doti	Dipayal	9.4	9.4	
Kailali	Dhangadhi	9.9	3.0	6.9
Kanchanpur	Mahendranagar	12.3	5.0	7.3
Dadeldhura				
Baitadi				
Darchula				
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Sub-Totals		31.6	17.4	14.2

Nation-wide summary

Region	Population 1990 ( '000)	Population served	
		pipel supply	private tubewells
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Eastern	333.2	136.6	148.5
Central	778.7	526.1	101.0
Western	164.2	94.7	53.0
Mid Western	67.9	30.5	26.0
Far Western	31.6	17.4	14.2
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Total	1,375.6	805.3	342.7



6	Teacher's Guide on Water and Sanitation	Booklet	School teachers
7	Communication Skills	Booklet	B
8	Water and Sanitation Poems	Booklet	A, B
9	Our Handpump, Our Responsibility	Booklet	A
10	Prime Messages	Booklet	A
11	Sanitation Drama	Booklet	A, B
12	Diarrhoea Drama	Booklet	A, B
13	Sanitation Poster (Hand washing)	Cloth Flyer	A
14	Latrine card	Flashcard	A
15	ORT Card	Flashcard	A
16	Worms	Flashcards; set of 12	A
17	Good and Bad Habits	Flashcards; set of 14	A
18	Good and Bad Mothers (ORT)	Flashcards; set of 2	A
19	Spread of diseases	Flashcards; set of 5	A
20	The Importance of Latrines	Flashcards; set of 6	A
21	Six major diseases	Flashcards; set of 6	A
22	Prevention of faecal-oral diseases	Flashcards; set of 6	A
23	How to build a Pit Latrine	Flipchart	A, B
24	Water System Repair and Maintenance	Flipchart	A (VMSW)
25	Water and sanitation education materials	Flipchart	Students, A
26	Sanitation and Immunisation Game	Game	A
27	Women Worker's Health and Sanitation Guide	Manual	B
28	Technician Guide	Manual	B
29	Transmission routes of faecal-oral diseases	Picture cards; set of 20	A
30	Problems and solutions (Matching game)	Picture cards; set of 20	A
31	Latrine Poster	Poster	A
32	Immunisation Card	Registration Card	A

Audiences: A stands for village level audience, such as women volunteers.  
 ----- - Caretakers, VMSWs, Committee members, etc.

B stands for lower level employees of sector agencies, such as  
 - Women Workers, Plumbers, Technicians, etc.

C stands for higher level workers, such as overseers, engineers,  
 - programme officers, etc.

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A9: DWSS General Policies and O & M (Volume VI)			
<b>B: Design and Estimation</b>			
B1: Handbook of gravity-flow water systems.	UNICEF	1987	English
B2: Design manual for gravity-flow systems	JOCV	1987	Nepali
B3: Design guidelines for rural water supply systems	CWSS Western Region	1990	English
B4: Standardisation for rural water supply systems	CWSS Western Region	1990	English
B5: CWSS Standardisation	CWSS Central Region	1986	Nepali
B6: CWSS Standardisation (based on HMG Norms)	CWSS Central Region	1989	English
B7: CWSS Standardisation (based on HMG Norms)	CWSS Eastern Region	1989	English
B8: DWSS Design Criteria (Volume I)	DWSS	1987	
B9: DWSS Analysis of Rates (Volume II)	DWSS	1987	
B10: DWSS Standard (type) Drawings (Volume III)	DWSS	1987	
B11: DWSS Schedule of Materials and Quantities (Volume IV)	DWSS	1987	
B12: DWSS Bill of Quantities (Volume V)	DWSS	1987	
B13: DWSS General Policies and O & M (Volume VI)	DWSS	1987	
B14: Review of the hydraulic design criteria (Part I, Part II)	UNICEF (A. Green)	1985	English
<b>C: Training</b>			
C1: WSS training manuals: 1- Pipe fitting; stone masonry; concrete 2- Setting out; technical drawings; sizes and measurements 3- Construction; standardisation	CWSS Central Region		Nepali
C2: Community Water Supply & Sanitation Foreman Course training manuals: 1- 2- 3- 4- Mathematics	CWSS Western Region		Engl./Nep.
<b>D: UNICEF</b>			
D1: Programme Guidelines - Water Supply, Sanitation and Hygiene (Vol. 3)	UNICEF	1988	English
D2: Programme Field Manual; Water Supply and Sanitation (Book E)	UNICEF	1985	English
<b>E: Miscellaneous</b>			
E1: Use of Hydraulic Rams in Nepal	UNICEF (M. Silver)	1977	English



**B: Training**

B1: Sanitation Handbook	MPLD/SATA	1983	Nep./Engl.
B2: Handbook for Women Workers (Terai only)	UNICEF	1990	Nepali
B3: Technician's guide book	UNICEF	1988	Nepali

**III: TERAJ TUBEWELL PROGRAMME****A: Policy and Procedures**

A1: Policy and procedures for the Terai Tubewell Project (proposed)	DWSS/UNICEF TTP	1990	English
A2: Policy and procedures for household latrine construction in TTP (proposed)	DWSS/UNICEF TTP	1989	English
A3: Policy and procedures for health education in TTP	DWSS/UNICEF TTP	1989	English

**B: Design, Estimation and Standardisation**

B1: Technical drawings for the Nepal No.6 suction pump. Set of six drawings.	UNICEF	1990	English
B2: Specifications for materials used in the construction of tubewells and latrines	UNICEF	1990	English
B3: Standard estimate for the installation of a shallow tubewell	DWSS/UNICEF	1989	English
B4: Specifications for the installation of shallow tubewells	DWSS/UNICEF	1989	English
B5: Standard drawings for shallow tubewell, platform, platform formwork	DWSS/UNICEF	1990	English
B6: Village survey format and tubewells allocation format	DWSS/UNICEF	1989	Nepali
B7: Tubewell site selection and agreement format	DWSS/UNICEF	1989	Nepali
B8: Boring log and tubewell diagram format	DWSS/UNICEF	1989	English
B9: Tubewell completion and hand over format	DWSS/UNICEF	1989	Nepali
B10: Tubewell inspection format	DWSS/UNICEF	1989	Nepali

**C: Training**

C1: 'Hamro Kaam'; a training aid for tubewell technicians	DWSS/MPLD	1989	Nepali
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