

ETS

Monitoring and Evaluation Study of the Rural Water Supply and Sanitation Programme

Study undertaken for Rajiv Gandhi Drinking Water Mission
Ministry of Rural Areas and Employment

Gujarat



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Ecotech Services



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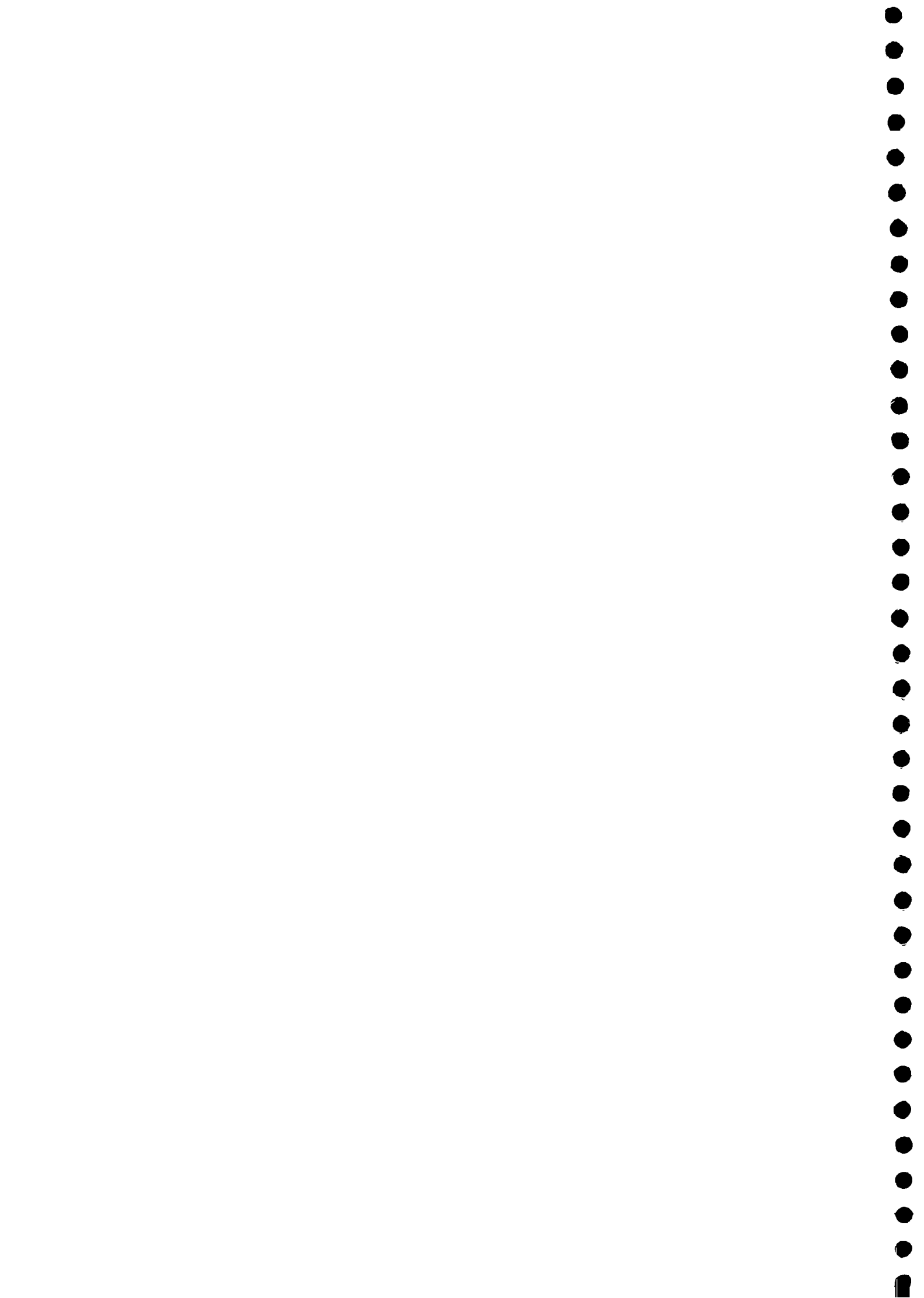
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List of Abbreviations

RGNDWM	Rajiv Gandhi National Drinking Water Mission
M & E	Monitoring and Evaluation
NC	Not Covered
PC	Partially Covered
FC	Fully Covered
lpcd	litres per capita per day
SC	Scheduled Caste
ST	Scheduled Tribe
RRA	Rapid Rural Appraisal
GoI	Government of India
GoG	Government of Gujarat
CGWB	Central Ground Water Board
WHO	World Health Organisation
GWSSB	Ground Water Supply and Sewerage Board
MNP	Minimum Needs Programme
ARWSP	Accelerated Rural Water Supply Programme
NGO	Non-Government Organisation
CEE	Centre for Environment Education
CHETNA	Centre for Health Education, Training and Nutrition Awareness
RWSS	Regional Water Supply Scheme
NWR & WSD	Narmada Water Resources and Water Supply Department
TDO	Taluka Development Officer
HRD	Human Resource Development
IEC	Information, Education and Communication
GJTI	Gujarat Jalseva Training Institute
SEU	Socio-Economic Unit
CE	Chief Engineer
SE	Superintending Engineer
EE	Executive Engineer



1. Introduction

The Rajiv Gandhi National Drinking Water Mission (RGNDWM), Ministry of Rural Areas and Employment, Government of India, vide their letter no Q-14019/42/97-TM (Stat) dated 26.02 98 sanctioned the conduct of a Monitoring and Evaluation (M&E) Study for the States of Gujarat & Rajasthan to Ecotech Services. This report presents the summary of the M&E study done for the State of Gujarat

The mandate of the study was to evaluate the status of and appropriateness/ viability of norms set for the sustainable drinking water and sanitation coverage in the rural areas. The study also aims at gauging the perceptions pertaining to present lacunas in the delivery mechanism and suggestions to improve them

1.1 The Study Objectives

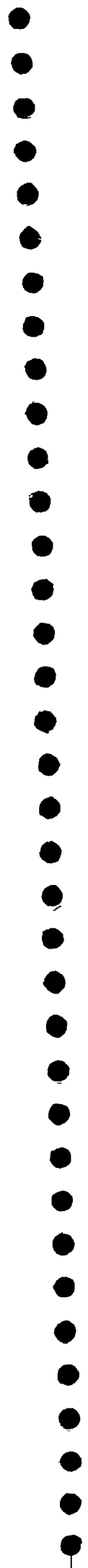
The objectives for the study as laid down by the RGNDWM are as follows

- 1 To assess the present coverage & status of rural water supply and rural sanitation with a special emphasis on the coverage of backward classes / areas .
- 2 To evaluate the safe water supply coverage in areas, where the quality of drinking water was a major problem
- 3 To monitor and evaluate the people's response and perceptions about the coverage of rural water supply and sanitation and to evaluate community involvement in the planning and implementation of water supply schemes
- 4 To evaluate the operation and maintenance status of the water supply schemes.
- 5 To monitor and evaluate the contribution by the users and willingness to pay towards capital and recurring cost for the rural water supply schemes
- 6 To monitor current knowledge, attitude and practices in rural areas with regards water supply and sanitation.

1.2 Structure of the main report

The main report of the study is structured into 10 sections. This introductory section is followed by the methodology in Section 2 and a state profile in Section 3. Section 4 presents the findings of the study with respect to drinking water coverage, status, quality and government initiatives. Section 5 highlights the observations on the rural sanitation situation in the state. This is followed by observations on programme administration, organisation, institutional arrangements, planning, operation and maintenance, presented in Sections 6 to 8. Section 9 discusses the sustainability of the programme while section 10 concludes the report and presents recommendations for bringing some improvements to the drinking water supply and sanitation situation.

This main report is supported by a Reference Document, which presents District reports for the three selected districts in the state of Gujarat. The Reference Document basically concerns itself with the district specific findings and observations.



2. Methodology

The study is based on a review of secondary data furthered by the findings of a primary survey conducted in the State. Three districts, viz. Amreli, Banaskantha and Panchmahals¹ of the state were covered. The selection of the districts was done in consultation with RGDWM and was done so as to ensure that the areas sampled were representative of the varied physical, social and technical conditions prevalent in the state. The following specific criteria were used

- Coverage of the State in terms of physical spread, various climatic conditions and rainfall characteristics.
- Coverage in terms of the representation of backward districts of the state
- Coverage of areas having different water quality problems
- Coverage in terms of different conditions (availability, practices, redressal by the department) that exist with respect to the rural drinking water and rural sanitation sectors

In each of the districts an average of 15 villages were selected for conducting the primary survey. The village selection was done based on consultations with the district level PHED officials & inferences drawn from the available secondary data², with regards the drinking water and sanitation sector. Again, to ensure a representative selection, the following criteria were used

- All types of schemes in the district be covered under the villages surveyed, so as to get an idea of the performance and effectiveness of all schemes in a district
- A view of the not covered (NC), partially covered (PC), fully covered (FC) coverage of the habitations in the district³.
- The Scheduled caste/ Scheduled tribe (SC/ST) population should be adequately represented in the respondent samples. For this the villages needed to be taken in regions with sufficient concentration of such settlements/ inhabitants

Within each village 15-20 households were selected for the survey. This selection was based on the following criteria

¹ During a recent administrative decision, Panchmahal district has been reorganised into two separate districts, namely Panchmahal and Dahod

² List of secondary information requested for at the state level and district level is provided in Annexure 2.1

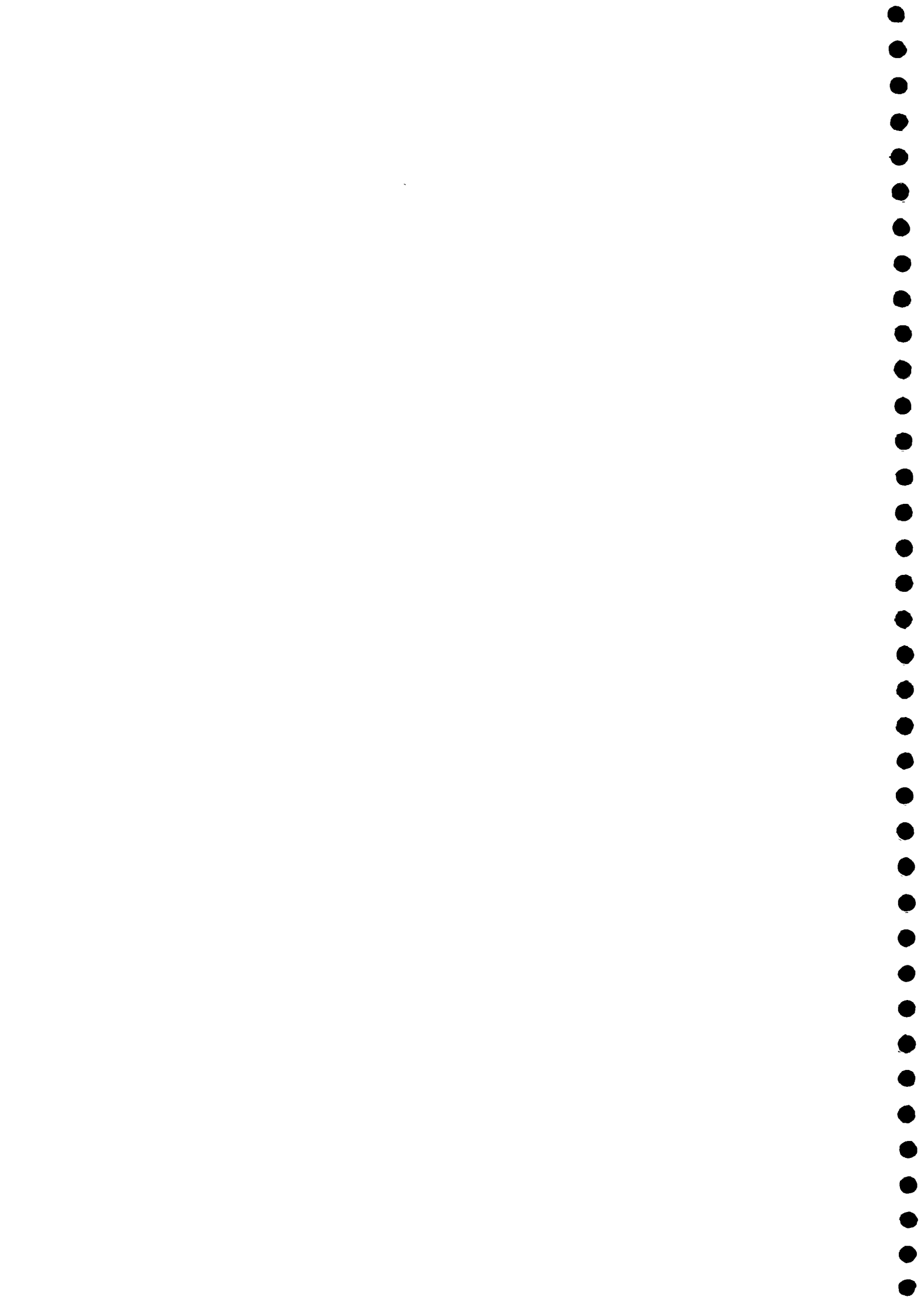
³ The three categories are defined as follows:

FC Fully covered by a public source providing safe drinking water amounting to atleast 40 litres per capita per day (lpcd) for a maximum population of 250 for the whole year

PC Fully covered by a public source providing safe drinking water amounting to less than 40 litres per capita per day (lpcd) for a maximum population of 250 for the whole year

NC Not covered by any public source of drinking water supply

Also the water source should exist within 1.6 kilometers in plains and within 100 meters elevation difference in hills



- All settlements (phalas/ dhanis etc) should be covered i.e. all communities to be covered
- The backward classes, SC/ST populations should form at least one third of the respondents surveyed. This criteria was subject to suitable amendments where the number of SC/ST households in a village, were found to be less than seven, out of which if possible and applicable at least one was a women and/or backward class.
- At least half the respondents to be females.
- No two members from the same household to be taken as respondent

The components of the study at the village level were. a village level panchayat members survey⁴, a household survey⁵ and a rapid rural appraisal (RRA)⁶. The RRA involved a mapping exercise, where in specifications pertaining to drinking water (operational status, nature of associated problems, dependent households, nature of ownership and capacity addition, distances) and drainage vis-vis the settlements and main landmarks associated with the village, were illustrated. This exercise was done in a village meeting called, with representation from all settlements (phalas/ dhanis/ magras etc) wherein female respondents were encouraged to participate. The mapping exercise helped initiate the discussions on issues related to the sector under study.

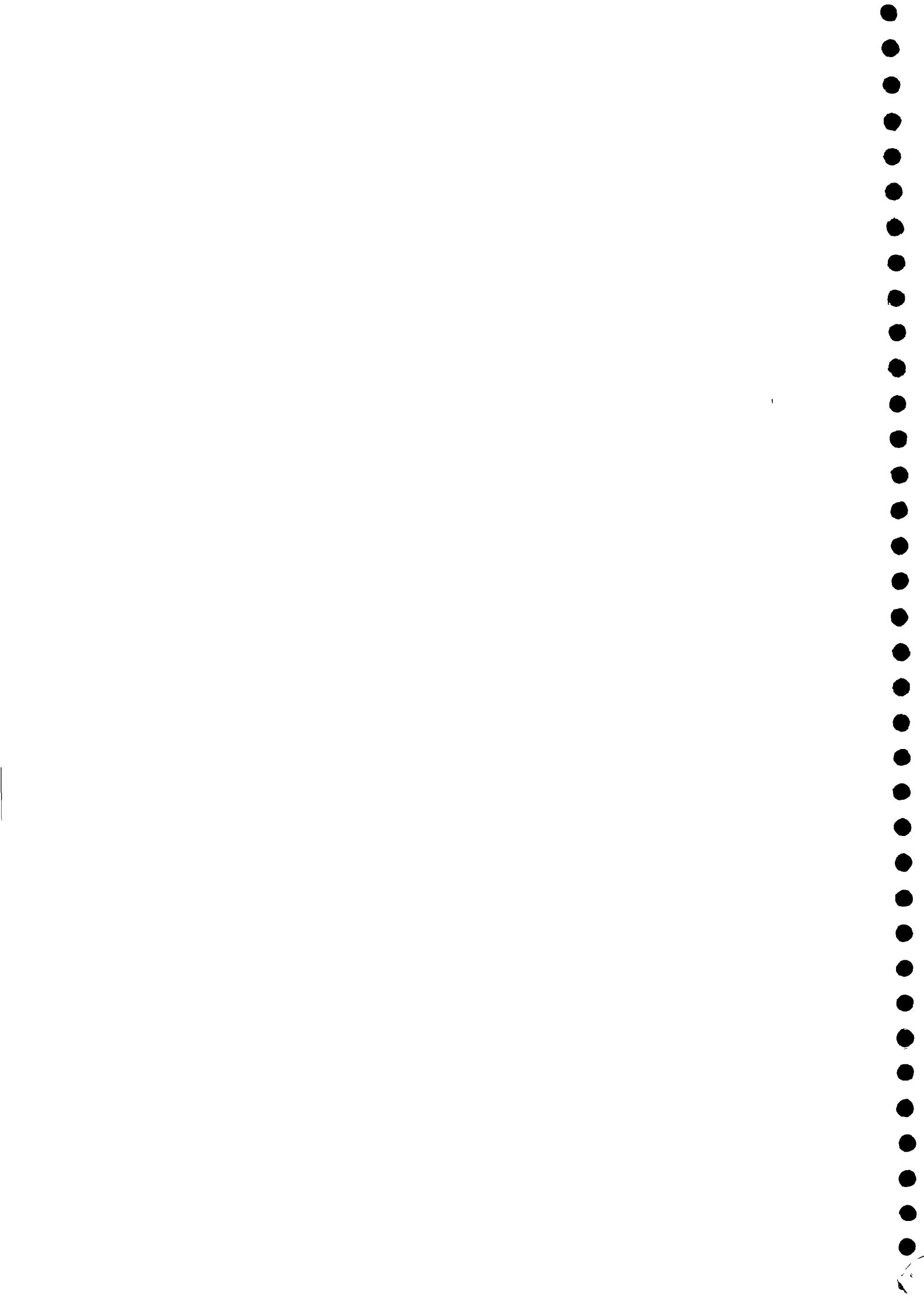
In addition to the village level survey, discussions were also held with the relevant Government departments, Non-Government Organisations and other agencies⁷.

⁴ Questionnaire provided in Annexure 2.2

⁵ Questionnaire provided in Annexure 2.3

⁶ Sample RRA maps have been provided in Annexure 2.4

⁷ List of people met has been provided in Annexure 2.5



3. Gujarat State

3.1 Introduction

Gujarat State, located on the West coast of India, has an area of about 1,96,024 sq.km. making it the seventh largest state in the country. The coastline, extending from Lakhpat in the north to Daman in the South, is 1600 km in length and constitutes one-third of the country's coastline.

The 20 districts of Gujarat are divided in five geographic regions, namely North Gujarat, South Gujarat, Central Gujarat, Saurashtra (peninsular) region and Kachchh region. North Gujarat, Central Gujarat, Saurashtra and Kachchh chiefly comprise of plains, whereas South Gujarat is hilly.

Gujarat has a tropical monsoon climate with mean monthly temperatures varying from 18-23 degrees Celsius in January to 32-34 degrees Celsius in May. The rainfall in the state varies across regions from about 340 mm in the western arid district of Kachchh to about 1800 mm in South Gujarat. Nearly 25% of the state's area located in the western part is arid. Another 34% of the area in north is semi-arid. The rainfall pattern is quite erratic with most parts experiencing long dry spells during the monsoons.

The rainfall in the state usually follows a cyclical pattern, with two to three years of plentiful rainfall, followed by one or two years of sparse rainfall making the state prone to regular droughts. About 20% of the state's area (42 talukas in 19 districts) is considered drought prone.

Table 3.1: Climatic Characteristics of the Surveyed Districts

Districts	Region	Rainfall in mm*	Climate
Panchmahal	Central Gujarat	989.1	Semi arid
Banaskantha	North Gujarat	758.4	Semi-arid
Amreli	Saurashtra	545.5	Semi-arid

Source: ETS (1991), The Policy Review of the Land and Water Sector in Gujarat

* Socio-Economic Review - Gujarat State 1996-97, Directorate of Economics and Statistics

The population of Gujarat in 1991 was 413.1 lakhs, which is 4.93% of the total population of the country. Of this, 22.3% belongs to scheduled caste and scheduled tribe category. The details of the demographic characteristics for the study districts are given in table 3.2.

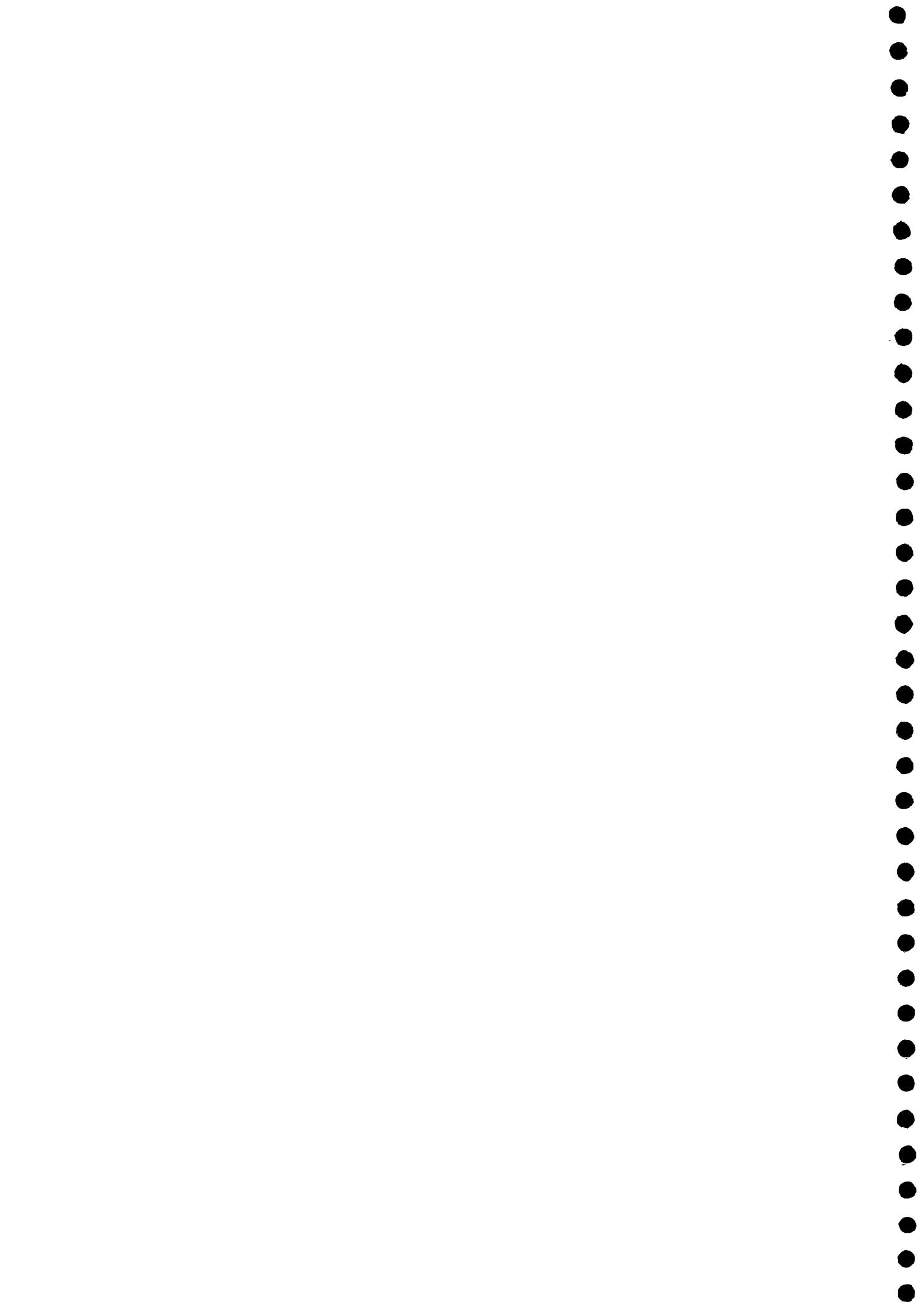


Table 3.2: Demographic Characteristics of the Surveyed Districts

	Population Size (in lakhs)	Area (sq km.)	Population density (in persons/sq km)	% of SC/ST Population
Amreli	12.53	6800	185	9.28
Banaskantha	21.63	12700	170	17.74
Panchmahal	29.56	8870	333	50.86
Gujarat	413.1	196024	211	22.33

Source: Socio-Economic Review - Gujarat State 1996-97, Directorate of Economics and Statistics

The Panchmahal district has a relatively high density of population and a very high percentage of tribal population. Both Panchmahal and Banaskantha are relatively backward districts of the state.

The literacy level in Gujarat has increased significantly from 49.9% in 1981 to 61.3% in 1991, making Gujarat the ninth most literate state of the country. The literacy rate for rural areas is also very high at 53.1%, with that of urban areas being 76.5%.

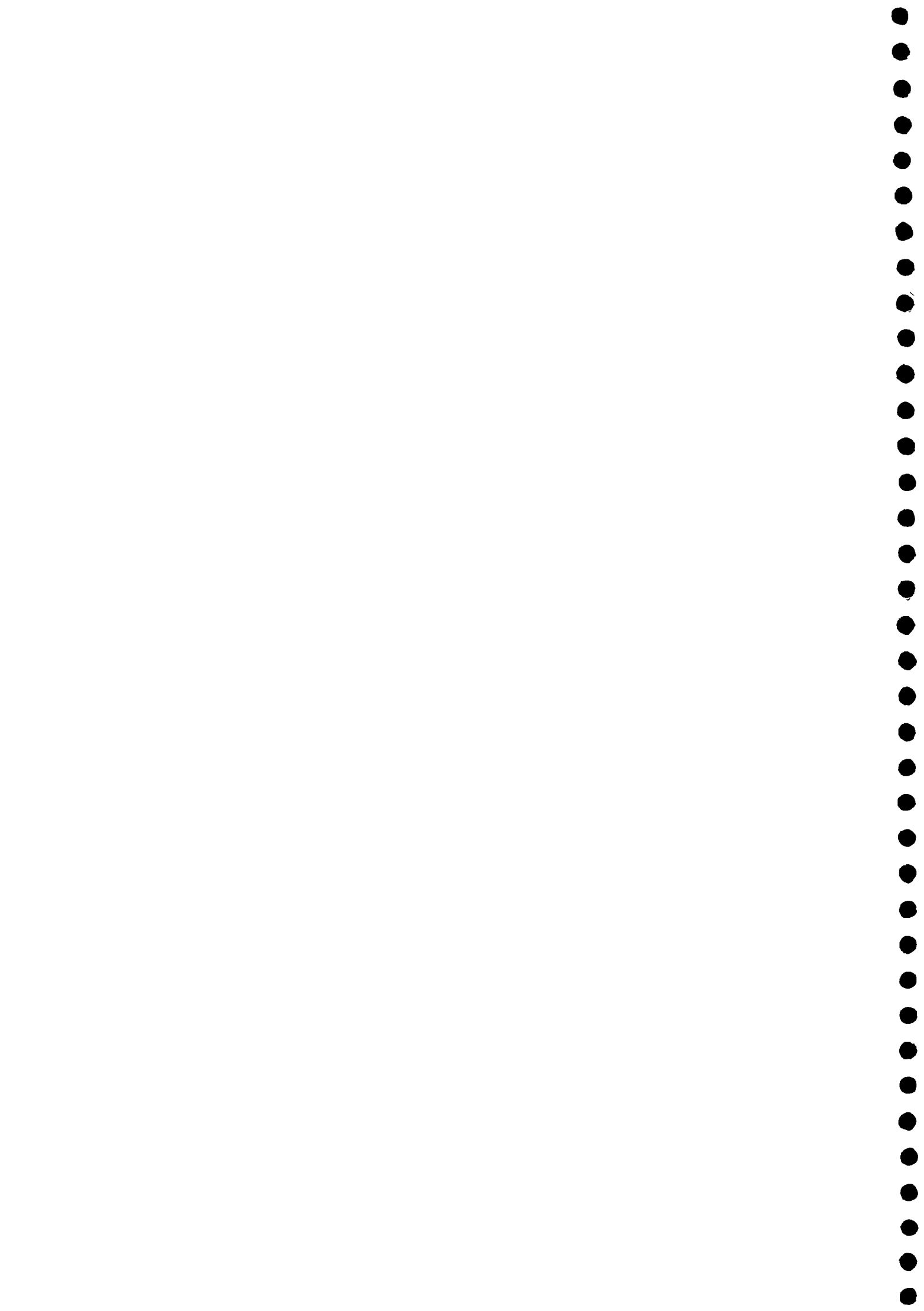
3.2 Water Resource - An Overview

The erratic rainfall in the state places a severe stress on the water resources and their availability in the region, which has an impact both on the drinking water supply and irrigation. Hence, although the main source of water in the state is surface water, the dependence on ground water supplies for provision of drinking water is fairly high. The groundwater in the state is under considerable stress with multiple demands placed on it by irrigation, industry and drinking water which is evident in the declining water levels.

Numerous studies reveal that groundwater resources in the state are being dangerously depleted. A study conducted by CGWB regarding the groundwater level from 1984-8, indicated an average decline of 5 metres in the Saurashtra region, 5.7 metres in Kachchh and 4.5 metres in north Gujarat. The taluka-wise estimates of groundwater status reveal that 24 of the total 184 talukas of the state are grouped in over-exploited category, with net annual groundwater draft exceeding the utilisable groundwater recharge, 10 talukas are in dark/critical category with the groundwater development of more than 85% of the utilisable recharge and 26 talukas in grey/semi-critical category, where the level of groundwater development varies between 65% to 85% of utilisable recharge.

3.3 Quality of Water

In Gujarat, three factors: salinity, fluoride and nitrates, have a widespread effect on the suitability of groundwater sources for drinking purposes. In addition there are a number of localised instances of groundwater pollution occurring from industrial and household sewage disposal. District wise details are presented in the subsequent sections.



4. Findings : Rural Drinking Water Sector

This section presents the analysis of the secondary information collected from the department and the primary survey conducted in the selected districts and brings out the main findings and examines the emerging issues with respect to drinking water. The section especially refers to the overall coverage status, availability of drinking water and status of sources, the quality issue, main problems expressed by the community and the department. Also presented are the various Government and non-government initiatives taken in the sector.

4.1 Coverage

There are 18509 inhabited villages in the State as per the 1991 Census, covering about 60% of the total population of the State. There are about 14928 'No Source' villages in the State, of which 14565 have been covered till March, 1996, leaving 363 villages.

Table 4.1: Status of Coverage Under Rural Drinking Water Supply Schemes (as % of total habitations)

	Amreli **	Banaskantha**	Panchmahals	Gujarat *
Fully Covered 'FC'	61.87	84.05	Not Available	65.97
Not Covered 'NC'	0.29	9.19		4.35
Partially Covered (0-10 lpcd)	6.84	0.72		3.88
Partially Covered (10-20 lpcd)	17.71	0.56		6.77
Partially Covered (20-30 lpcd)	13.38	5.48		19.03
Total No. Of Habitations	994	1241		30296

Source * Figures for 1994, Government of Gujarat, Annual action Plan 1997-98⁸

** Figures for 1997, Circle Offices of the Gujarat Water Supply and Sewerage Board

The district statistics show a large percentage of villages as fully covered under the water supply scheme (e.g. Banaskantha 84.05%). For the whole state of Gujarat, only 4.4% of the habitations are not covered. The primary survey results are in agreement with the secondary data and show a good coverage of the rural households under drinking water supply with a drinking water source for 66-80 households and a functional water source for 94-116 households. However, the difference arises in terms of the percentage of households that can be classified as fully covered. In sharp contrast to the secondary data, the primary data indicates that 100% of respondents in Banaskantha and 57% of the respondents in Panchmahals were getting less than 40 lpcd of water and hence fell in the category of partially covered.

⁸ 470 NC habitations were covered during 95-96, leaving 848 habitations to be covered in the coming years. The next priority of the Government is to provide water to PC (0-10 lpcd) habitations followed by 10-20 lpcd habitations. During 1995-96, 578 PC habitations were covered, leaving 8403 habitations.

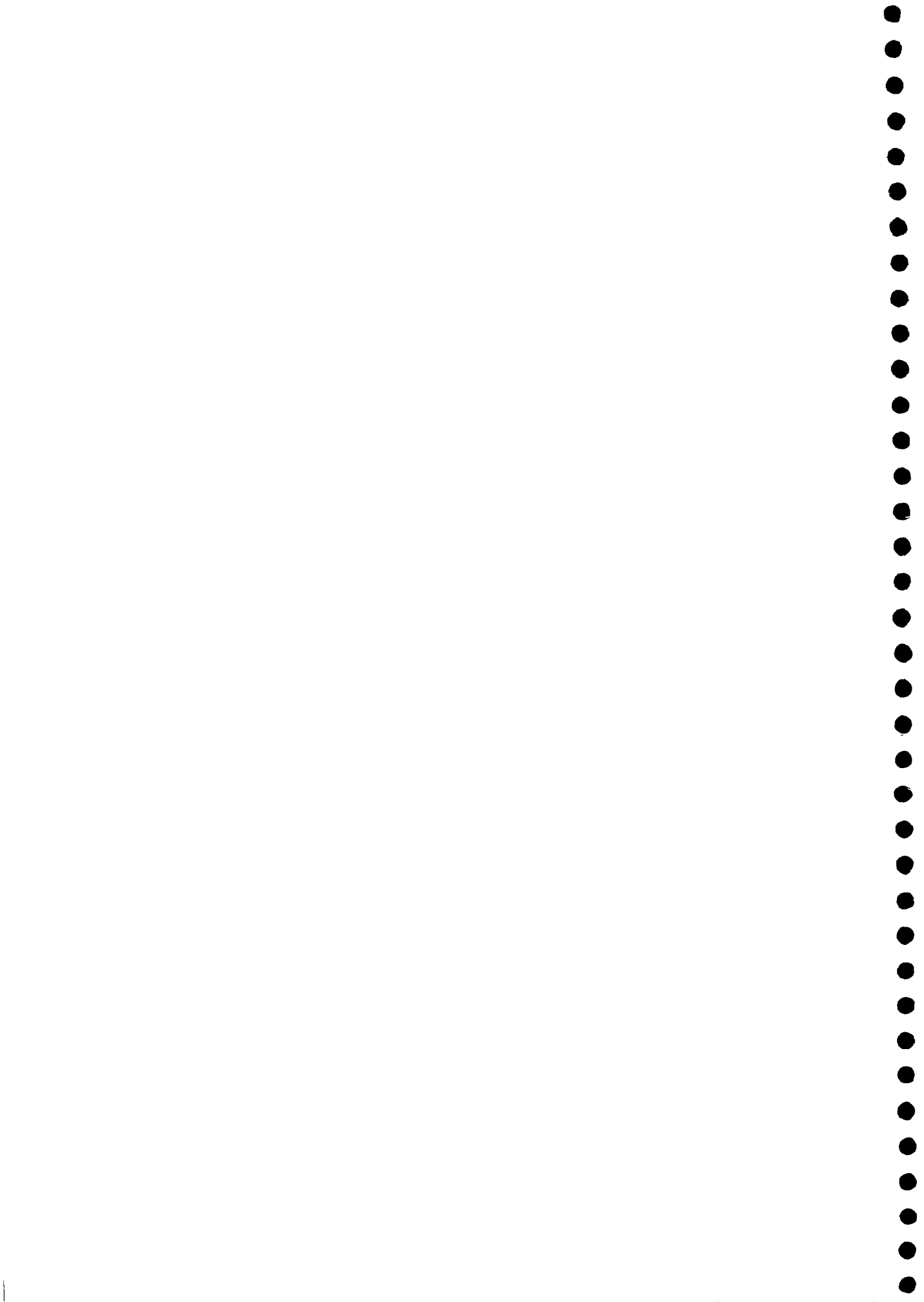


Table 4.2: Coverage and Per Capita Drinking Water Consumption

	Amreli	Banaskantha	Panchmahals
Coverage (Avg No of households per drinking water source)	67	66	80
Coverage (Avg No of households per functional drinking water source)	94	96	116
Water Consumption (lpcd) as a percentage of responding households			
<40	4	100	57
40-80	50	-	12
80-120	41	-	5
>120	5	-	26

Source. Household Questionnaire Survey, 1998

This could be attributed to a large percentage of drinking water sources lying unfunctional or defunct, accompanied with inadequate supply of water in the functional sources.

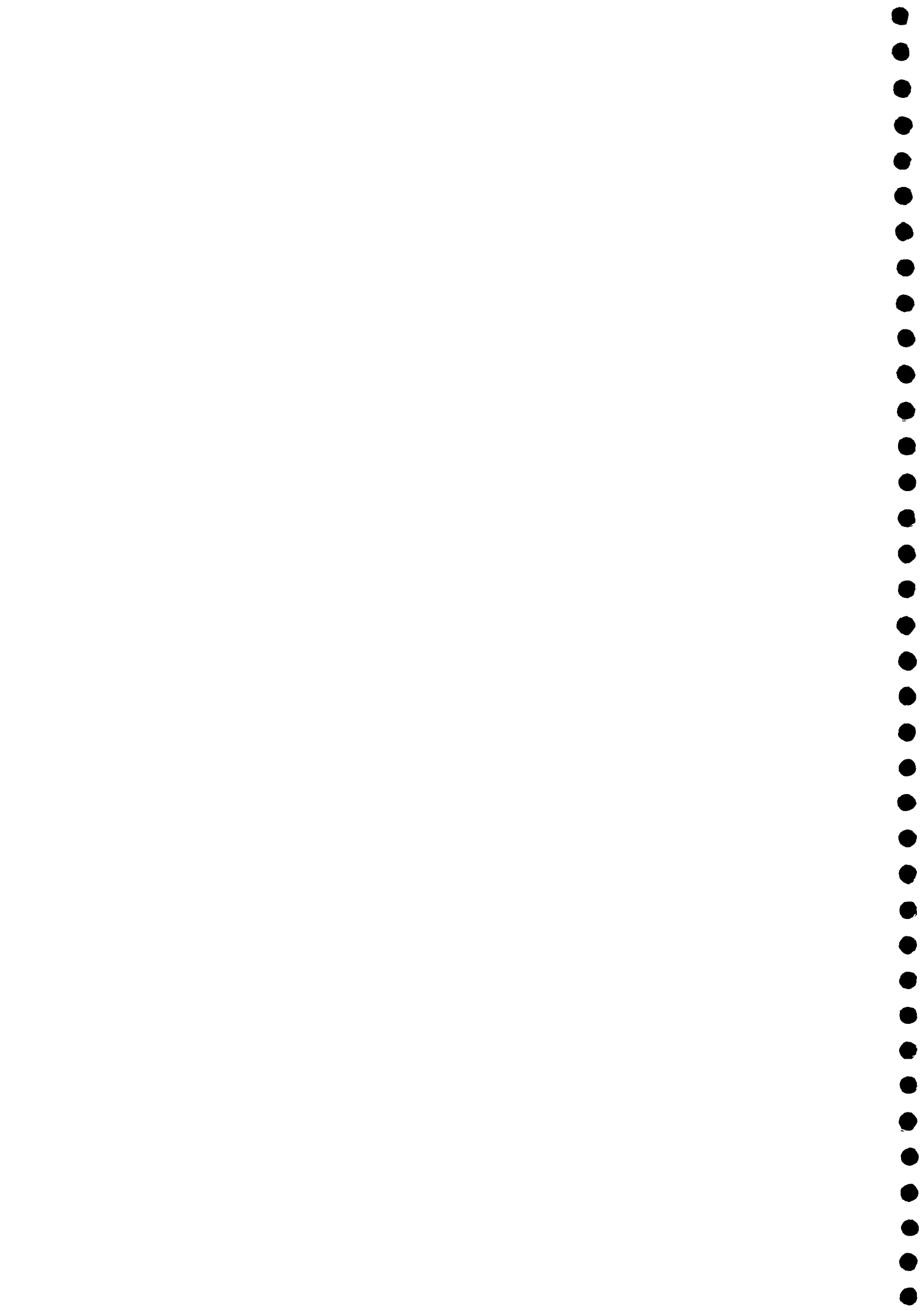
4.1.1 Coverage of Backward Areas

As per the 1991 census, about 60% of the total rural households in the State had an access to safe drinking water. In the districts of Amreli and Banaskantha more than 70% of rural households have an access to safe drinking water but the picture is very dismal for Panchmahals district, where only 36% of households have access to safe drinking water.

The accessibility to safe drinking water is extremely poor in some of the backward districts of the state like the Dangs, Panchmahals and Valsad where only 9%, 36% and 42% of the total rural households have access to safe drinking water (refer Annexure 4 I). It is also evident from the primary survey that the situation in the backward districts of the state is worse than the others, which is reflected in the low per capita water availability in Panchmahals and Banaskantha districts.

The Dangs and Valsad districts, despite having high rainfall, have a rather low percentage of households having access to safe drinking water facilities. This could be attributed to the undulating hilly topography of these districts and the fact that these districts are predominantly occupied by the tribes who are considered to be socially unimportant. Panchmahals too, being a predominantly tribal region, has poor coverage under drinking water facilities.

Other factors which have been found to be influencing the coverage status are accessibility, population density and competing claims of urban and industrial water requirement. The remote areas of the state suffer with relatively poor distribution of the water supply facilities as it is somewhat difficult and cumbersome to access these areas. The department also finds it uneconomical to provide facilities in remote regions and regions having low density of population distribution.



4.1.2 Coverage of Quality Afflicted Areas

As per the 1991 census, certain districts like Panchmahal, Surat and Bhavnagar that are afflicted with quality problem have less than 60% coverage of the rural households under safe drinking water schemes. This implies that no special consideration has been granted to areas afflicted by quality problem with respect to coverage under safe drinking water supply scheme.

Table 4.3: Percentage of Households Having Access to Safe Drinking Water in Quality Afflicted Areas

Quality Problem	Districts	% age of households
Salinity	Kachchh	73 87
	Amreli	74 48
	Bhavnagar	58 97
	Surat	45 01
Fluoride	Amreli	74 48
	Kachchh	73 87
	Mahesana	81 16
	Surat	45 01
	Bharuch	65 74
Nitrate	Sabarkantha	63 40
	Kheda	62 70
	Panchmahal	35 59
	Mehsana	81 16
	Banaskantha	70 48

Source: Centre for Media Studies (1996), Socio-Economic Development Status in Different States

As per the primary survey, 29% and 25% of the total respondents in Panchmahals and Amreli districts, respectively recognised poor quality of water as the most important problem in their villages. 8% of the total respondents in Banaskantha viewed poor quality of water as the most important problem.

4.2 Status of Drinking Water Sources

4.2.1 Types of Sources

The drinking water is supplied through various types of sources, normally decided by the hydrology and the status of ground water and surface water in an area. While piped water supply schemes are most prevalent in Amreli (52.4% of the total villages) and Banaskantha (47.5% of villages), a large area is covered under hand-pumps in Panchmahals and Dahod.



Table 4.4: No. of Villages Covered Under Different Types of Schemes

Type of scheme	Amreli	Banaskantha	Panchmahal	Dahod
Piped Water Supply	312	540	134	62
Regional Water Supply Scheme	36	318	-	-
Hand-pump	Not Available	241	420	759
Dug-well	Not Available	37	57	48
Total	595	1136	611	869

Source GWSSB, 1998

As per the primary survey, although most of the people are dependent on the government sources for their drinking water requirements (mainly handpumps and community wells), there are still people who are dependent on private sources (mainly farm wells) and unsafe sources like ponds or river for drinking water. The high dependence of households on private sources in Amreli is owing to the higher ownership of irrigation wells in the district. Generally, with the approach of summers, as the sources of water dry up, more and more people get drinking water from farm wells

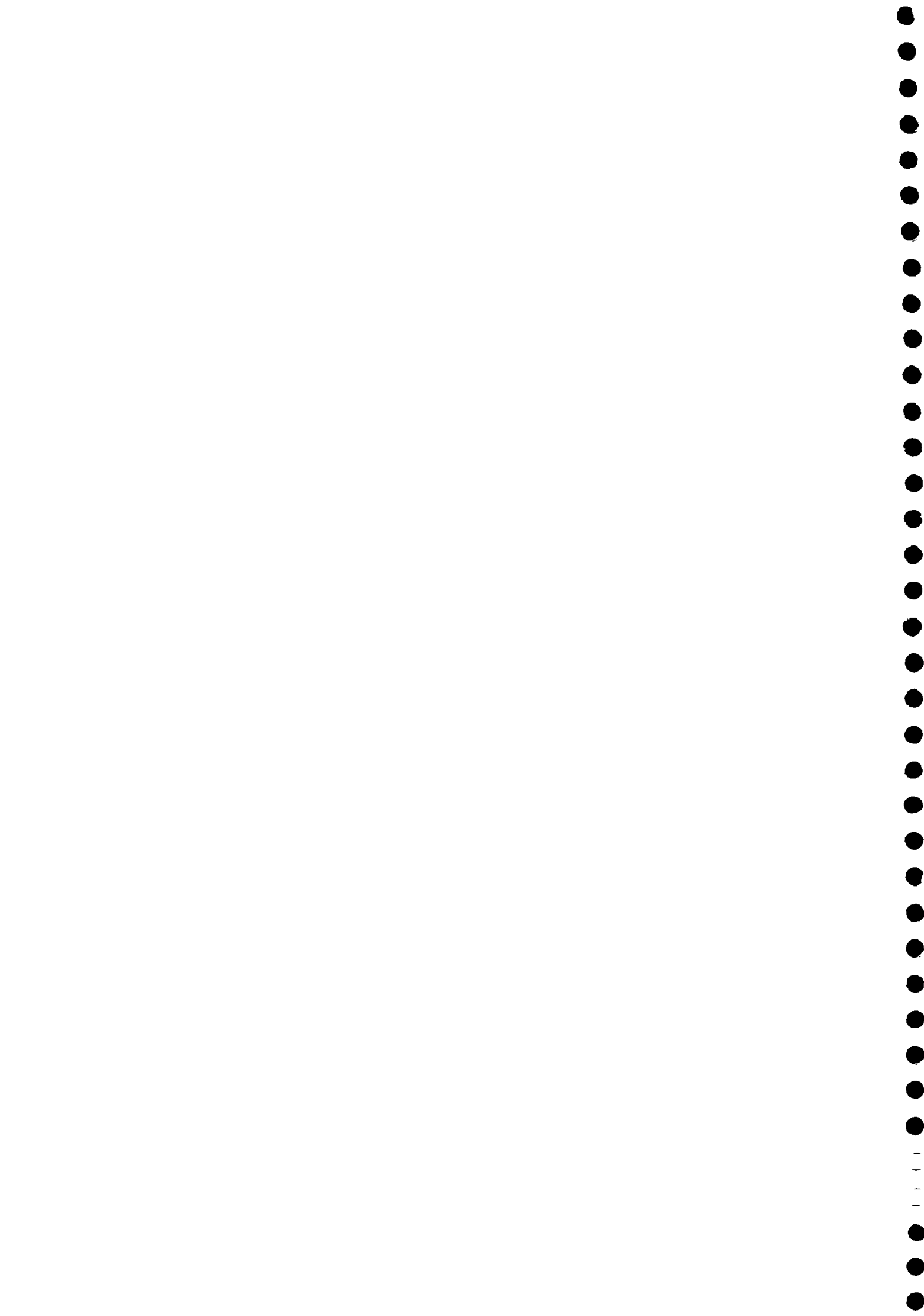
Although 75% of the households in Amreli District reported the existence of a pipe-line water supply scheme, only 9% of the total households depended on it for domestic water. This was owing to the irregular water supply timings and less quantity of water supplied by the system. At the tail-end of the regional water supply schemes, where the availability of water is erratic and restricted to a very short period of time very day, equitable access among users is a crucial issue.

Table 4.5: Dependence of Surveyed Households on Different Water Sources (in percentage)

Supply Scheme	Amreli	Banaskantha	Panchmahal
Hand-pump	37	19	30
Community well	10	10	32
Pipeline	9	7	18
Stand post	11	47	-
Total Government	67	83	80
Private Wells	18	2	15
Others	15	15	5

Source Primary Survey- Village Level Questionnaire, 1998

Tanks have traditionally been a dominant source of water for domestic as well as protective irrigation needs in many parts of the State. Most of the villages have access to traditional water sources, for example at least one tank/pond and usually several wells. In times of drought and sometimes during summer months these sources run dry.



4.2.2 Defunct and Inoperational Sources

A critical aspect of the water supply scenario in the state is the existence and emergence of a large number of defunct sources. On an average 30% of the total drinking water sources were found to be defunct during the primary survey⁸. It is pertinent to mention here that almost all the surveyed villages reported the presence of atleast one or more defunct sources.

Table 4.6: No. of Defunct Sources (Defunct sources as a percentage of total sources)

Source	Amreli	Banaskantha	Panchmahal
Hand-Pumps	14 (29%)	12 (32%)	21 (36%)
Community Wells	5 (18%)	4 (19%)	9 (25%)
Others	1	3	1
Total	20 (27%)	19 (31.4%)	31 (33.3%)

Source: Primary Survey - Village Level Questionnaire, 1998

The statistics with regards the in-operational sources available with the department are indicative of only those sources which have not been working for a few months due to reasons of maintenance or seasonality; i.e. are "not out of operation permanently". Thus, per-se, if we define defunct sources as those which are "out of operation permanently/ not operational for a period of more than a year", no proper separate records exist for such sources. The non-operational sources assessment is an inadequate indicator of actual status and "extent of in-operationality" of sources in the area which would help understand the type of inputs required to revitalise the source, if possible at all. Further, in the case of RWSS schemes, though the scheme may be operational, the status for the villages at the tail end may be a "not operational" one as the villages at the tail end may not be getting any water at all either due to low pressure or low availability etc. This aspect regarding operational status of schemes, is also not well reflected in the statistics kept at the departmental level.

According to the official records (on 11th May, 1998), of the total villages covered under the pipeline schemes in Amreli District, in 17.6% of villages the schemes are not functional. In Panchmahal District as well, as per the GWSSB records, 22.4% of the pipeline schemes are lying inoperational primarily owing to the defunct pump. Also, in those villages where these schemes are functional, the quantity of available water is not adequate, as it is supplied only for a limited number of hours (varying between 1-2 hrs per day) and also the timing of water supply is not regular.

Hand-pumps are generally considered as the most cost-effective and handy devices for safe water supply in the rural areas. However, as per the department officials, the chances of these becoming inoperational/defunct increase when they are installed as public source because of indiscriminate overuse, poor maintenance and negligence. But during the primary survey, the falling of ground water level during the summer has been cited as the reason for the sources running dry by the local communities. A high incidence of breakdown of hand-pumps, as has been reported during

⁸ The villagers mostly reported that the sources had been defunct for quite some time, but were not able to say exactly how many years.



the village survey, may be attributed to these reasons⁹, besides the declining ground water level

Community wells go out of use primarily because of the lowering of the ground water table. The traditional sources like tanks and ponds get silted over time and as a result go out of use. The communities rarely show interest in desilting these structures on their own, reportedly owing to the paucity of funds. The department officials are of the view that such sources are generally contaminated or unsafe and hence, show little interest in their rejuvenation or revival.

In the case of RWSS and piped water supply schemes, the underground pipelines are plagued by both man-made and natural break-downs causing large loss of water due to leakages. The concerned officials reported that the farmers break the pipes to divert water for irrigation and to access water for their cattle. Roots of trees also cause cracks in the pipes. Resultantly it is common for the downstream villages to not receive water. At times farmers also hinder the repair works of pipes passing through their fields.

The main reasons for in-operational drinking water supply systems as identified by the department include failure of pumping machinery, drying up of water source, drying up or damage to the source, deterioration in water quality, fluctuation of power / electricity and irresponsibility / incompetence on the part of operators. Another factor for low maintenance of water supply schemes is the low level of community participation in the maintenance of these schemes. This is an important factor, as the department is unable to maintain all the schemes because of limited staff strength which appears to be inadequate to undertake the maintenance of the water supply schemes.

Majority of the local community has expressed inadequate quantity of potable water as the most important problem being faced by them, followed by the poor water quality. It needs to be noted that inadequate water availability is faced mainly in the summers and as the survey was conducted in the summer months of April and May when the availability of water is at its lowest in the state, this was cited as the major problem in the surveyed districts. The low percentage of households indicating distance as a problem implies that scarcity of water is not being mitigated by travelling further on to other sources, but only through relief measures like supplies from a tanker or by reducing consumption levels and making do with whatever is available.

Table 4.7: Main Problems Expressed by the Local Communities with respect to Drinking Water (as a percentage of respondents)

Problem	Amreli	Banaskantha	Panchmahals
Quantity	67%	80%	47%
Quality	25%	8%	29%
Distance	8%	8%	18%
Quantity + Quality	-	4%	6%

Source: Primary survey- Household Questionnaire, 1998

⁹ As reported by GWSSB, in the year 1997 alone 21,000 handpump repair works were carried out in the Panchmahal district



4.3 Government Initiatives to Tackle Supply Issue

Water is a scarce resource in the state. The Ninth Five Year Plan lays emphasis on recognising water as a scarce resource to be utilised prudently. The main focus of the Annual Plan of 1997-98 was on safe drinking water supply with 13.33% of the total outlay allocated for water supply and sanitation. This allocation is considerably higher than the outlays allocated for this sector in the last five annual plans (refer Annexure 4.2). The expenditure in the last five annual plans has been less than the allocated outlay. Of the total allocation under the water supply and sanitation sector, only 22.3% has been allocated for rural water supply. A large part of the funds (73.3%) are to be directed towards the Sardar Sarovar Project, which is expected to provide drinking water to about 8215 villages and 135 towns.

The State Government priorities, policy frame and strategies as per the Eighth Five Year Plan were .

- Covering the identified 'No Source' villages under the Water Supply Schemes
- Highest priority is accorded to tackle the problems of quality in drinking water supply like the problem of excessive fluoride, nitrate and salinity etc
- Augmentation of the Water Supply to the normative supply of 40 LPCD
- Undertake rejuvenation programme for ensuring sustained water supply
- Conversion of simple wells and hand-pumps into piped water supply schemes in a phased manner for ensuring more reliable and sustained supply of water
- Undertake Research and Development activities, such as technology on groundwater recharge, water harvesting water conservation methods, design of pumps, desalination technique, defluoridation methods etc
- Monitoring of quality of water supply to ensure the supply of safe drinking water which ultimately reduces the incidence of water borne diseases
- Decentralisation and people's participation in the process of planning i.e. plan formulation, implementation and maintenance process under the water supply and sanitation sub-sector. Enabling village panchayats to effectively operate and maintain the village water supply schemes through financial help and technical assistance
- Involvement of local leadership, local institutions and voluntary organisations in the management and effective execution of rural water supply schemes, low cost sanitation programme etc
- Under the sanitation programme, the approach for rural areas is focussed on construction of low cost latrines on a large scale
- Application of innovative and scientific technologies proven in tackling the problems of providing safe and potable drinking water and sanitation to both rural and urban areas

During the year 1997-98, sector programme aimed at covering different categories of habitations. All villages under no source category, all NC habitations. Also, in stead of all 1175 habitations under PC (0-10 lpcd) only 400 had been proposed to be covered, while 688 of 2049 of PC (10-20 lpcd) category have been proposed to be covered. The fund requirements for these schemes will be provided under Minimum Needs Programme (50% share of Government of Gujarat) and Accelerated Rural Water Supply Programme. This coverage will include regional schemes, schemes under Desert Development, schemes for tribal areas and anganwadies etc (Annexure 4.3). It will include works during summer and scarcity period under special component of plan, provision of canal lining and purchase of dams/reservoirs from irrigation department. For the provision of hand-pumps in tribal areas a provision of Rs 1000 lakh (16.7% of the sectoral outlay) has been provided in 1997-98, to be borne by Government of Gujarat (Details in Annexure 4.4)

Apart from the central and state run programmes and schemes, special programmes under "scarcity plan" are also run during drought years and periods of scarcity in summer. During drought years, the government spends large amounts of money in transporting water from long distances to different affected areas. Supply of water through tankers is a major arrangement for supply of water in Saurashtra and Kachchh.



The State Government has to prepare special Master Plans to meet with the acute drinking water scarcity in rural and urban areas and has spent huge amounts on drinking water supply in addition to normal water supply programmes¹⁰.

Government of India has agreed to assist Government of Gujarat for carrying out Information, Education and Communication (IEC) and Human Resource Development (HRD) programme in four districts of the State. An HRD cell has recently opened in GWSSB

There is no allocation directed especially towards the rejuvenation works for individual and regional schemes in the Annual Plan for 1997-98. The State priority is also not directed towards popularising localised water harvesting systems for drinking water as are being promoted by some NGOs in the state.

The allocation under the survey and investigation head are not adequate, if regular monitoring of water quality have to be undertaken in the whole of the State. Considering the State's thrust on ensuring the supply of safe drinking population to the people, it is important that more allocations should be diverted towards the water quality monitoring

One of the policies of the State Government is directed towards decentralisation and encouraging people's participation in the process of planning and enabling village panchayats to effectively operate and maintain the village water supply schemes through financial help and technical assistance. But so far very little has been done in this direction except some efforts made under the Dutch funded project, whereby Pani Samitis have been set up in a few villages of the districts of Amreli, Banaskantha and Mahesana under the Socio-Economic Unit (SEU) of the department

4.4 Water Quality

The state faces a major problem of salinity ingress from its long coastline. The normal coastal salinity is also accompanied by inherent salinity of the marine sedimentary formations. Salinity has invaded deep into the inland from the coast through the aquifer system. Coastal areas, western portions of Gujarat's central alluvial belt and some of the older sedimentary deposits in Kachchh have highly saline ground water. Saurashtra and Kachchh are the worst affected areas, followed by parts of north Gujarat

In Gujarat 11.2% of the villages have drinking water sources that are contaminated by fluoride levels beyond acceptable limits.¹¹ Amreli District of Gujarat has villages with fluoride content as high as 11 ppm with an average of 4.4 ppm (the WHO prescribed standards are 1.5 ppm). High concentration of fluoride have also been reported from Kachchh, Surat, Mehsana and Bharuch districts

¹⁰ Years from 1985-86 to 1987-88 were a period of severe drought in the State of Gujarat. Some 13,700 villages and 24 urban centres experienced acute water scarcity and in some cases special railway trains had to be run to carry drinking water over a distance of 250 km. During the last drought year alone a sum of Rs. 115 crores had to be spent for providing water supply to affected villages and towns

¹¹ Gujarat Water Supply and Sewerage Board in draft copy of The State of Gujarat's Environment, 1994



Maps prepared by Central Ground Water Board show nitrate concentrations exceeding the WHO maximum of 45 mg/l in over 370 sample sites scattered throughout the state. Rural areas of Sabarkantha district have reported the nitrate levels as high as 800 mg/l. In Kheda district nitrate rates ranged between 125-200 mg/l. Panchmahal, Mehsana and Banaskantha districts are also characterised by high levels of nitrate pollution¹²

4.4.1 Health Implications

Of the three main factors affecting the quality of drinking water in Gujarat, fluoride and salinity have received maximum attention. The high salinity content in water restricts its use for drinking purposes because of unpalatable taste and occurrence of short term health impacts. Nitrate contamination levels found in Gujarat can cause methaemoglobinemia in infants, carcinogenic nitrosamines in the stomach and gastric carcinoma. However, the presence of these effects has not been widely reported in the state.

Prolonged exposure to high fluoride levels affects people in three different ways. Non-skeletal fluorosis causes gastrointestinal problems, muscle weakness, skin rashes and urinary tract ailments. Dental fluorosis causes mottled pitted and chipped teeth, especially among children. Skeletal fluorosis involves the whole skeleton, especially the spinal column and causes pain and stiffness in joints as well as mild to severe crippling. It often affects people in their most productive years and can cripple to such an extent that they are unable to do any physical work. Although statistics for the size of affected population are not available, but discussions at the field level and with NGOs have revealed that some of these problems have begun to afflict the people in severely affected areas.

Apart from human beings, sheep, cattle, goats and other animals can also suffer from skeletal deformities causing decreases in milk and wool production.

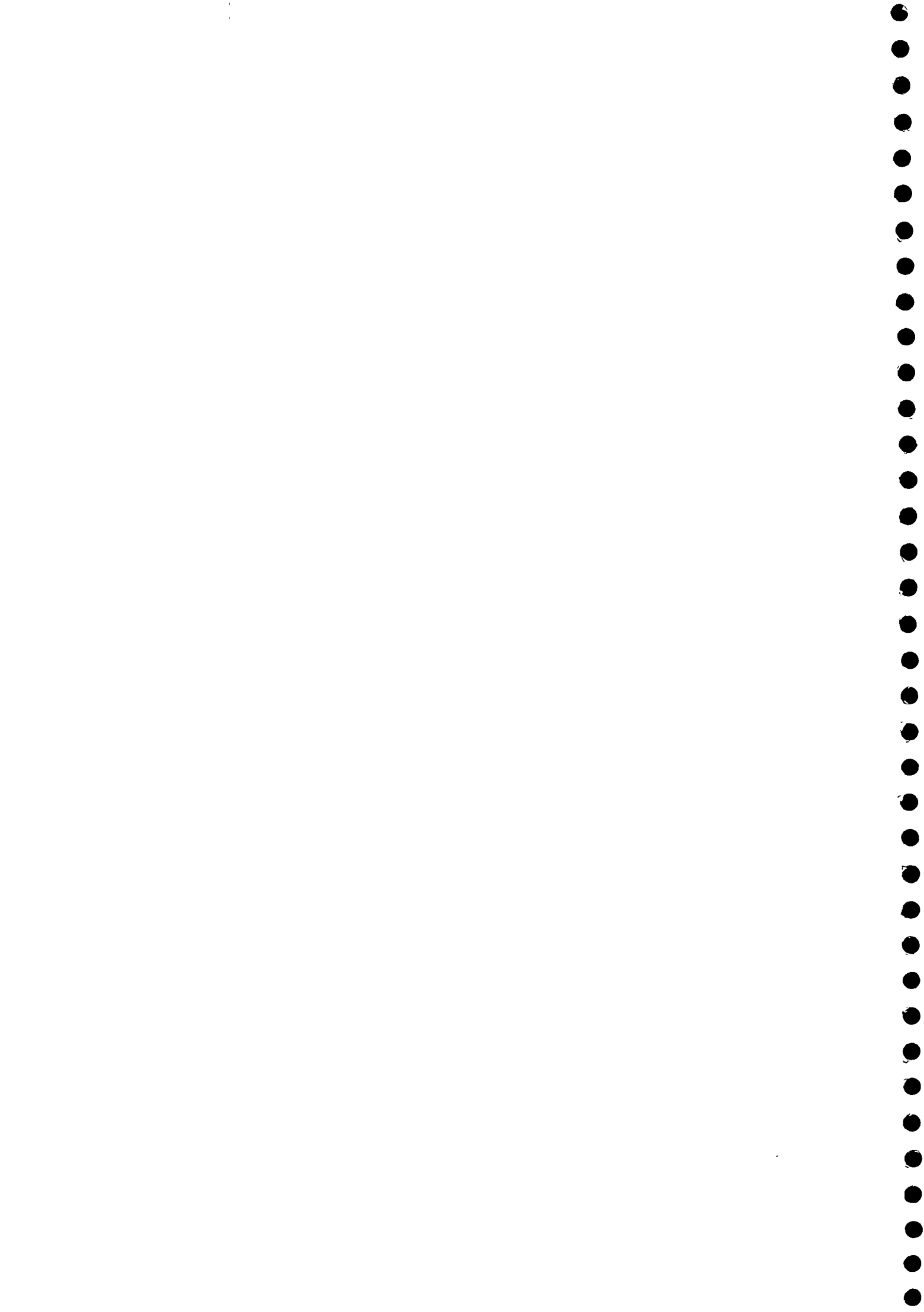
4.4.2 Water Quality Testing

A number of organisations maintain records of quality of water within the state, the prominent ones among them being the Salinity Ingress Prevention Circle of the Narmada & Water Resources Development Department, Gujarat Pollution Control Board, Gujarat Ground Water Board, GWSSB and a number of research institutes. But no comprehensive baseline data exists for the state as a whole.

GWSSB has its laboratories for running quality tests on the collected samples of water from different areas. Under Gujarat Jal Sewa Training Institute central laboratories at Gandhinagar and Vadodara, 2 regional laboratories at Rajkot and Palanpur and 5 district laboratories at Valsad, Bhavnagar, Jamnagar, Bhuj and Mehsana are working in addition to a mobile laboratory. It is mandatory for the organisation to conduct tests to ascertain the potability of water from a particular source before developing it for drinking water purposes.

As per the primary surveys as well as discussions with concerned officials, monitoring of water

¹²Matzer, H. and Moench, M. (1994), Ground Water Availability for Drinking Water in Gujarat. Quantity, Quality and Health Dimensions, Economic and Political Weekly, XXIX (13), March 26



quality is not conducted regularly, and is usually a one time activity at the time of setting up of a source. According to the local people, the officials sometimes come to the village to collect water samples from the drinking water sources to test the quality of water but rarely share the results with the people.

There is a need for a regular testing of water quality in most of the areas of the state as the water quality along with water level fluctuates in the different seasons of the years. A well that gives potable water in monsoon may start giving un-potable / contaminated water during summer months or years of drought. But none of the villages have reported a regular testing of water quality in their area.

4.4.3 Programmes for Mitigation of Problems Relating to Water Quality

The State government has accorded highest priority to tackling the drinking water quality problems in the state. Governmental response for tackling the quality problem has been directed towards identification and development of clean water supply sources. Examples of this are the Indo-Dutch projects in parts of Gujarat, which involve supply of water to areas facing quality problem through long pipeline systems¹³.

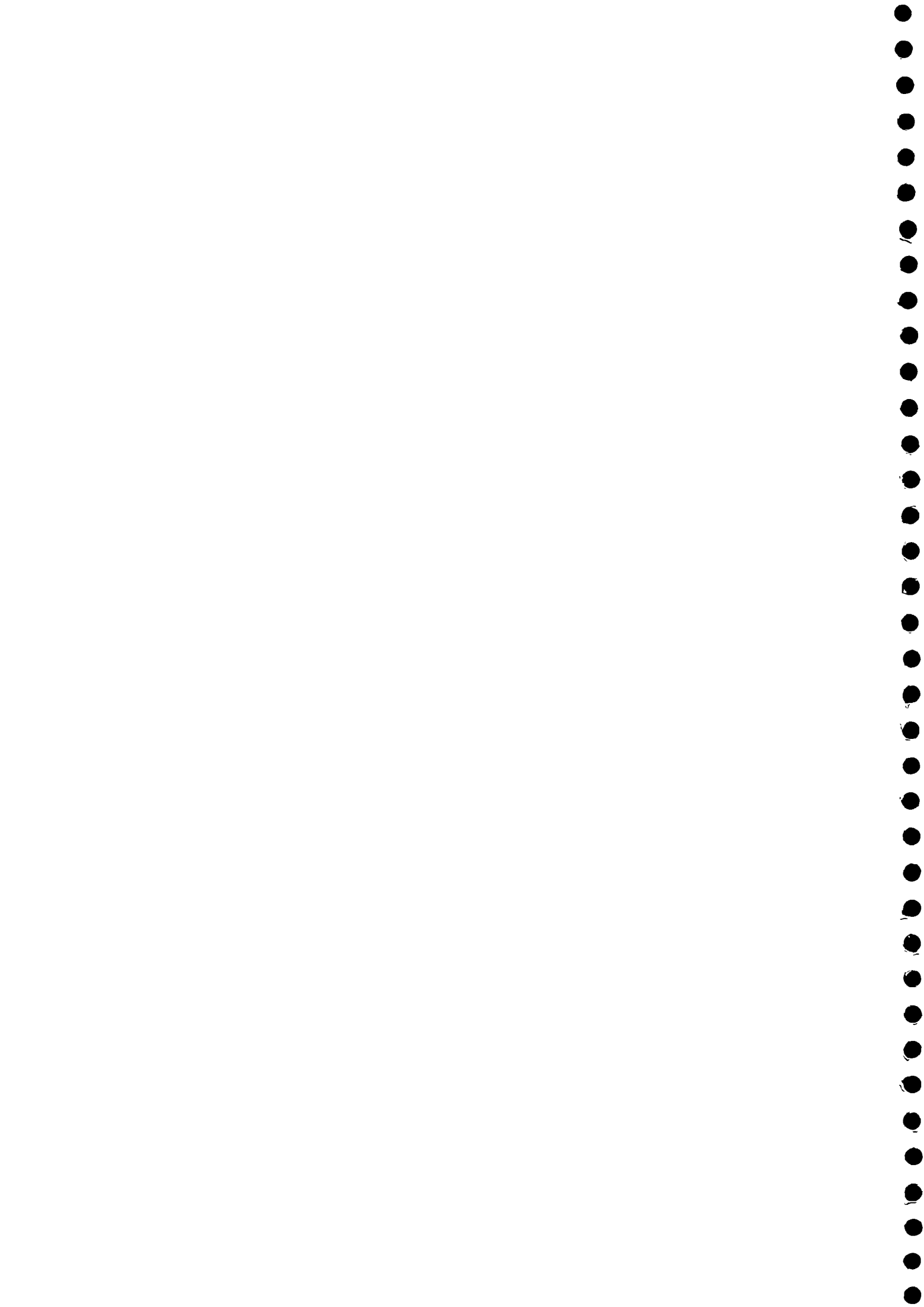
Different schemes like installation of defluoridation plants, individual water supply schemes, regional water supply schemes etc. have been sanctioned by the Government of India under submission for control of fluorosis. The total estimated cost of these projects is about Rs 7500 lakhs. The funding pattern for these projects is 75:25 of Government of India and Government of Gujarat respectively. Provision of Rs.900 lakhs was made for the year 1997-98 by the Government of Gujarat and a matching grant of Rs. 2700 lakhs was expected from Government of India.

Besides the supply side responses, methods for treatment of available water for use at the village level have been developed. In the case of fluoride, addition of alum in prescribed doses to drinking water has been found to be effective. However, the experience of Centre for Environmental Education (CEE), an NGO, demonstrated that this task is not easily performed as the concentration of alum has to be in exact proportions and the water has to be stirred at a constant rate for 8-10 minutes. Village women often have neither the time nor patience to perform this task.

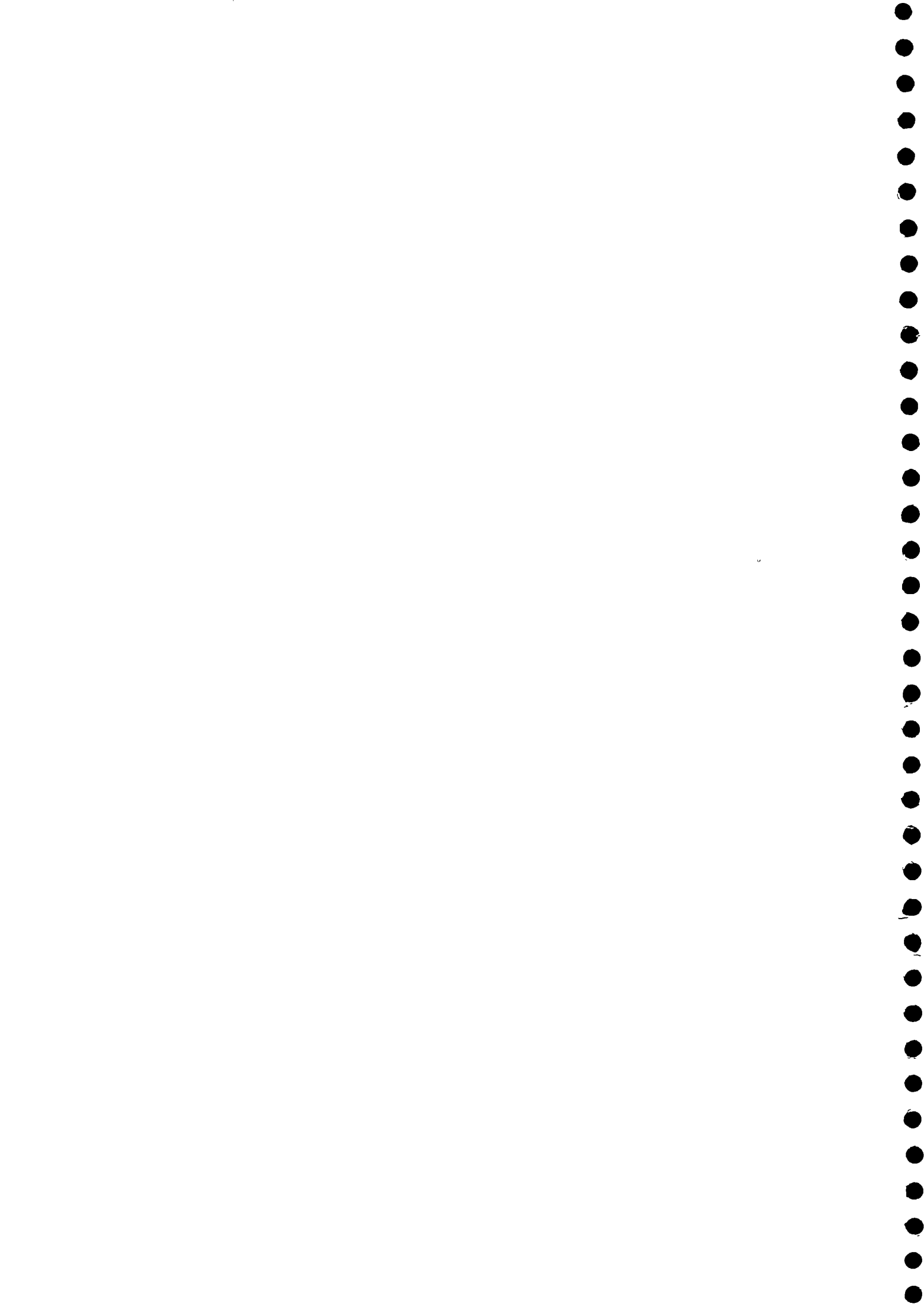
¹³ Implementation of 3 Regional Rural Water Supply Projects had been taken up with the bilateral aid of Government of Netherlands during the Seventh Five Year Plan Period at an estimated cost of Rs 4021.00 Lakhs. The details are as under

Scheme	Villages	Water Problem
Lathi Liliya (Dist Amreli)	36 villages + 1 town	High Fluoride Content
Santral Extension (Dist Banaskantha)	76 villages + 1 town	Scarcity
Samī Harij (Dist. Mehsana)	111 villages + 1 town	Scarcity and Salinity

Netherlands Government is providing financial assistance of Rs 500 lakhs for Gogha Regional Water Supply project (estimated at Rs 2592 lakhs) covering 79 villages, in the Ninth Five Year Plan



In addition to Government efforts, NGOs like Mahiti, CEE, CHETNA are also working towards the promotion of measures for treating the affected water, creating alternative sources of safe water and also general awareness of the people. Mahiti has successfully promoted the use of plastic lined ponds for storing rainwater and other indigenous systems of roof-top water harvesting in rural areas. CEE too has worked extensively in Mehsana district in rural water and sanitation sector. These organisations conduct health education camps on issues related to water and promotion of effective methods for avoiding or dealing with biological contamination of water.



5. Rural Sanitation

5.1 Coverage Under Rural Sanitation

As per 1991 census, about 11% of the total rural households in the State had an access to sanitation facility. The situation vis-a-vis rural sanitation, as compared to the state average is poor in all the three districts, being the worst in Panchmahal district.

Table 5.1: Percentage of Rural Households with Access to Sanitation

State / District	%age of Rural Households
Gujarat	11.16
Amreli	7.89
Banaskantha	6.08
Panchmahals	4.77

Source: Centre for Media Studies (1996), Socio-Economic Development Status in Different States

Under the Rural Sanitation Programme, the State Government has been assisting the Nagar Panchayats and Gram Panchayats by giving grant-in-aid to them for their underground drainage projects. However, over the years it has been found that Nagar/Gram Panchayats are unable to bear the financial burden of underground drainage projects. The focus has therefore shifted towards the adoption of large scale programmes for construction of low cost latrines to facilitate the effective disposal of human waste.

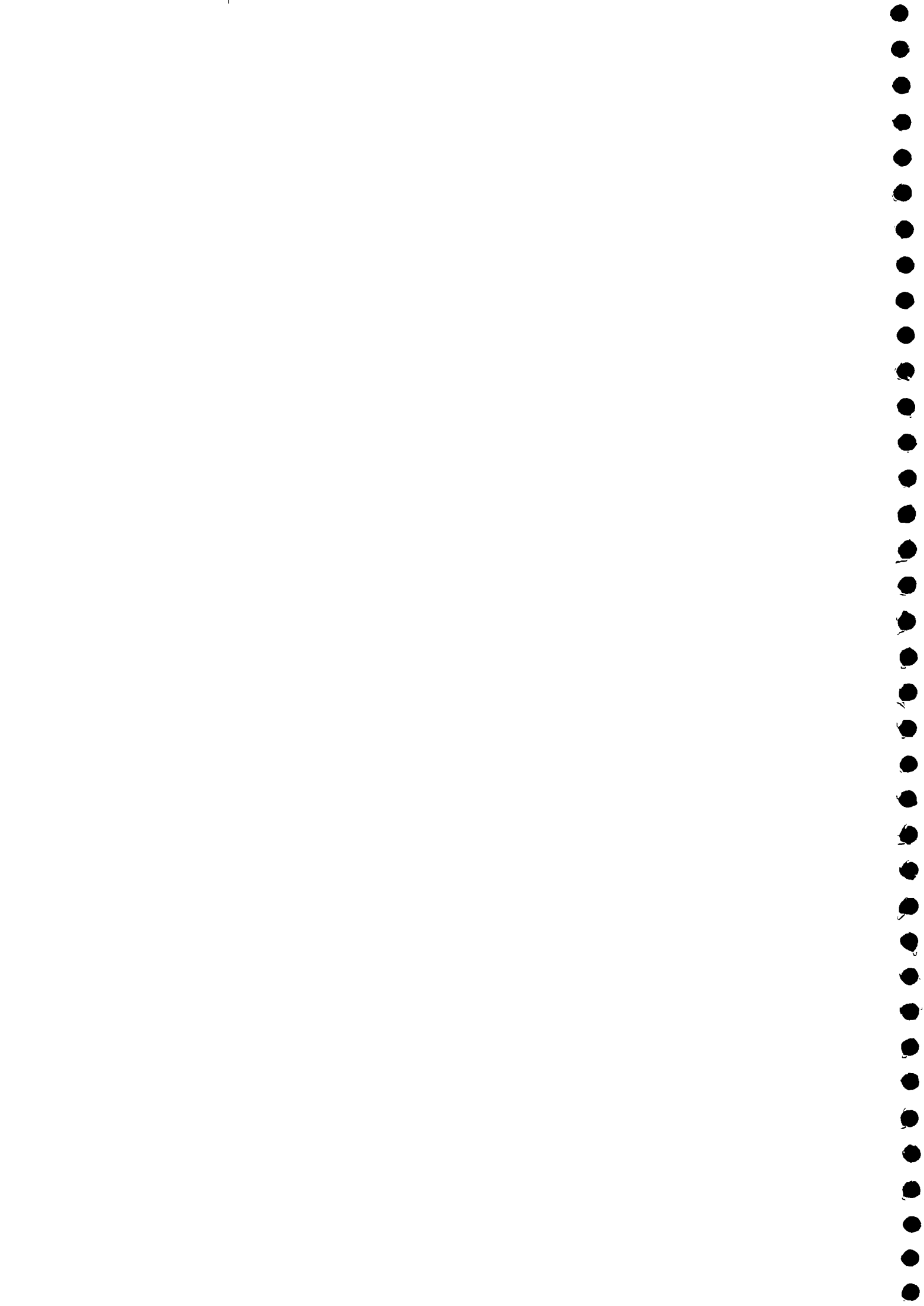
With the objectives of providing door to door facility of disposal of human waste in rural areas, a programme for construction of low cost latrines has been formulated by the State Government from the year 1989-90. The target has been to construct 5300 low cost latrines in rural areas against which 11,114 have been constructed in the year 1989-90. Till March, 1996, a total 1,27,490 low cost latrines have been constructed in rural areas. As mentioned earlier, a provision of Rs. 1000.00 lakhs (only 1.7% of the total allocation for rural water supply and sanitation sector in the state) was provided for rural sanitation in 1997-98.

External assistance to this sector is available mainly from the World Bank under a programme aimed at construction of low cost latrines in both rural and urban areas. During the Seventh Plan 15664 low cost latrines had been constructed under this programme and upto March 1992, 29625 latrines had been constructed.

5.2 Knowledge, Attitude and Practices

The primary surveys were directed at gathering information about the percentage of households having access to sanitation facilities and understanding the communities response to the provision of such facilities. The attention was also focussed at appreciating the practices considered to be hygienic by the local people and their perception of problems that may afflict their neighbourhood because of unsanitary conditions

21% of the surveyed households in Panchmahal district have reported that they have private



latrines, while 71% of the households have regarded the provision and use of latrines as highly important for the maintenance of sanitary conditions around them. The picture was almost similar in Amreli where 24% of the surveyed households reported an access to latrines while more than 80% regarded them as highly important for general health and hygiene of the community. The provision of toilets was considered to be important especially by the women of the household as they faced greater problems due to the lack of such a facility in the village.

75% of the respondents in Amreli, 74% in Panchmahals and 100% in Banaskantha said that there was a satisfactory level of cleanliness maintained around the sources of drinking water, while rest were of the opinion that the conditions around the drinking water sources were less than satisfactory.

80% of surveyed households in Amreli and 87% in Panchmahals regard washing hands after defecating as an important practice for maintenance of health and hygiene. Other practices that are also considered important by the community are the use of latrine facilities and washing hands before meals.

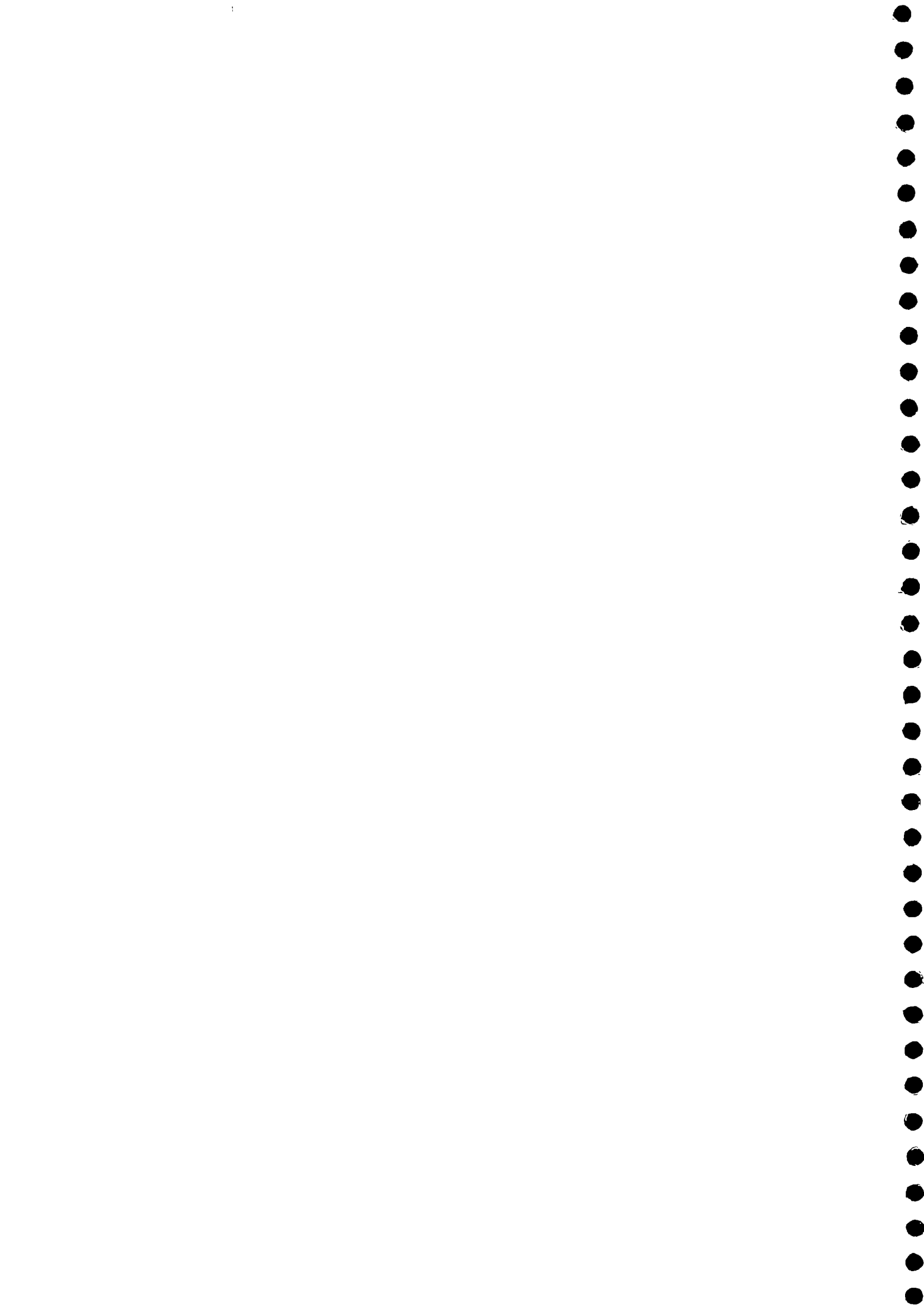
As far as the drainage of the wastewater in the village is concerned, 99% of the households in Amreli and 90% in Panchmahals, reported a lack of a proper drainage for water. About 25% of the surveyed households said that the wastewater stagnates within the village. The situation gets worse during the monsoon months when there are heavy spells of rain. Disease and bad smell are the main problems perceived by the people because of improper drainage of wastewater. Although the main concern of the people is the spread of disease because of the stagnation of wastewater in the village, people feel that it also causes making certain parts of the village inaccessible.

In Banaskantha District although none of the households reported the presence of soak pits or drainage channels, they did not perceive drainage of waste water as a problem.

5.3 Peoples' Participation

Acceptance for community latrines was not very high among the surveyed villages. Even those who did find them acceptable refused contribution in any form for their construction.

Even in the case of household latrines in Panchmahal district 59% of the households felt that it was the sole responsibility of the government to make provisions for them. While 39% of the respondents agreed to provide labour contribution, only 2% agreed to give monetary and labour contribution. In Amreli district also, 50% of the surveyed households have expressed willingness to extend labour contribution for the construction of toilets, while only 4% of the households agreed to contribute in terms of labour as well as money. In Banaskantha district, all the respondents considered it as the duty of the government to provide latrines for the improvement of sanitary conditions in the village.



6. Programme Administration

6.1 Structure

The Public Health Engineering Cadre working under the Department of Health and Family Welfare was transferred to the Gujarat Water Supply and Sewerage Board (GWSSB), which was constituted under the Gujarat Water Supply and Sewerage Board Act, 1978. Since the formation of the GWSSB, all the responsibilities of the erstwhile Public Health Engineering Department of the state are shouldered by the Board. The Board has the primary responsibility to prepare, execute, promote and finance the schemes for supply of water and for sewerage and sewage disposal. It also has the responsibility to operate, run and maintain any water works and sewerage system, as and when directed by the State Government.

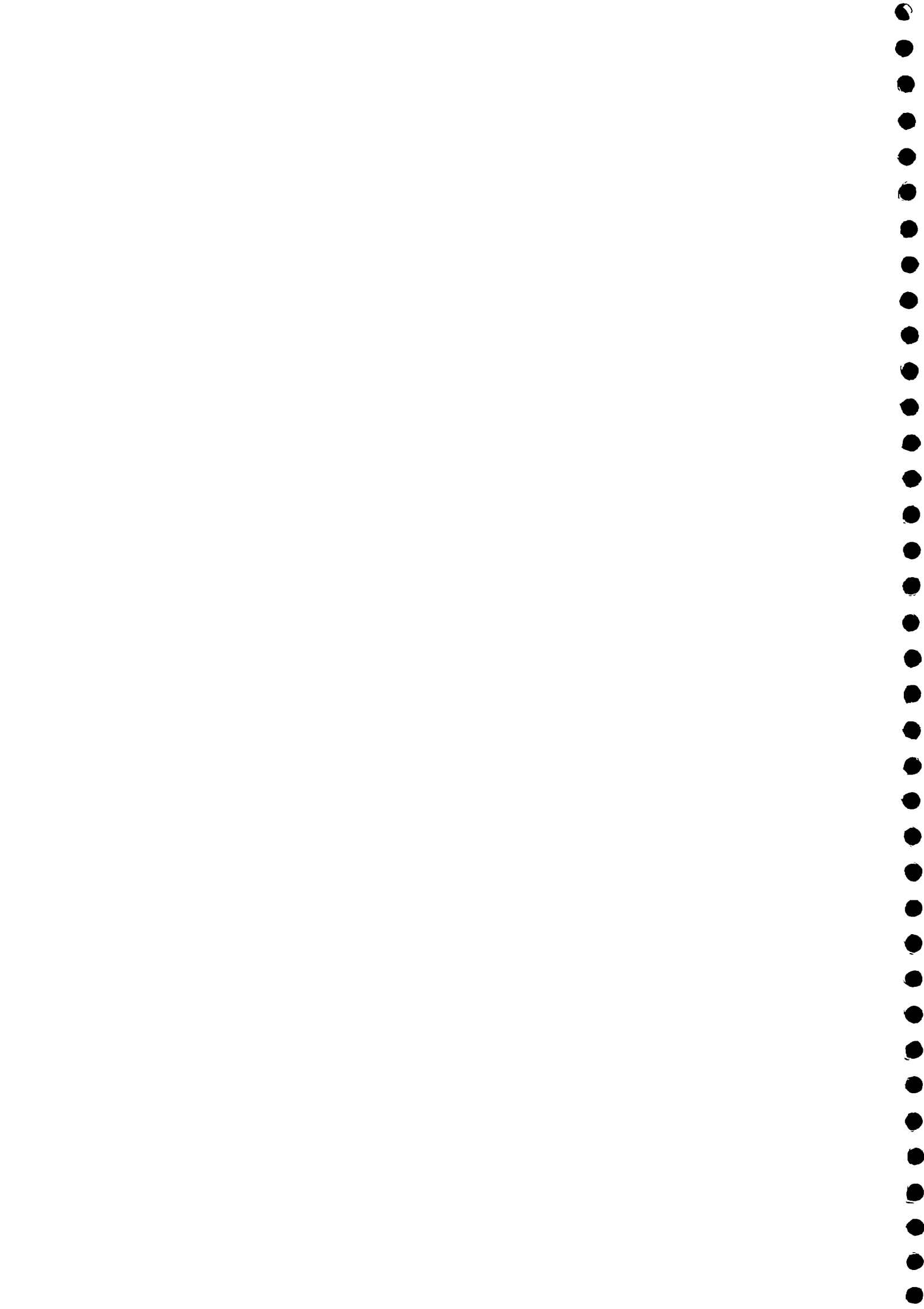
GWSSB is headed by a Chairman, under whom there is the Member Secretary. The department has seven chief engineers: three Chief Engineers overlooking three Zones - Baroda, Ahmedabad and Rajkot, a Chief Engineer Monitoring and Planning, a Chief Engineer Material - Civil, a Chief Engineer Material - Mechanical, a Chief Engineer Mechanical-IEC, and a Superintending Geohydrologist (For details refer to Figure 1).

The State Government has identified application of innovative and scientific technologies, proven in tackling the problems of providing safe and potable drinking water to both rural and urban areas, as an important strategy. Gujarat Jalseva Training Institute (GJTI) has been established under GWSSB for research work and imparting technical in-service training for water supply programmes. The Institute has been declared as a 'Nodal Agency' for the country. It imparts technical training to engineers from other states as well. Grass-root level training to village people is also imparted to make them self-reliant and capable of handling minor repairs of water supply schemes and hand pumps.

The set up of the department is highly centralised with most of the powers vested with the Chief Engineers and the Board. Comparing the sanctioning powers with the departmental cost norms for various schemes¹⁴, it is evident that even for some localised schemes the approval of the Chief Engineer at the zonal level is required¹⁵, which at times leads to a delay in the implementation of such schemes.

¹⁴ Cost Norms of the Department. Hand pump - Rs 50,000, Well - Rs 75,000 to 1,00,000, Tube well - Rs 3 to 4 lakhs + motor pump, distribution system Rs 9-10 lakhs.

¹⁵ This creates problems in the areas, where hand-pumps and tube wells are not technically appropriate and the focus has to be on piped water supply schemes, like Banaskantha and Amreli districts. In such areas, the implementation of schemes either gets unduly delayed or is undertaken in a piece-meal manner by the department, in order to provide immediate relief.



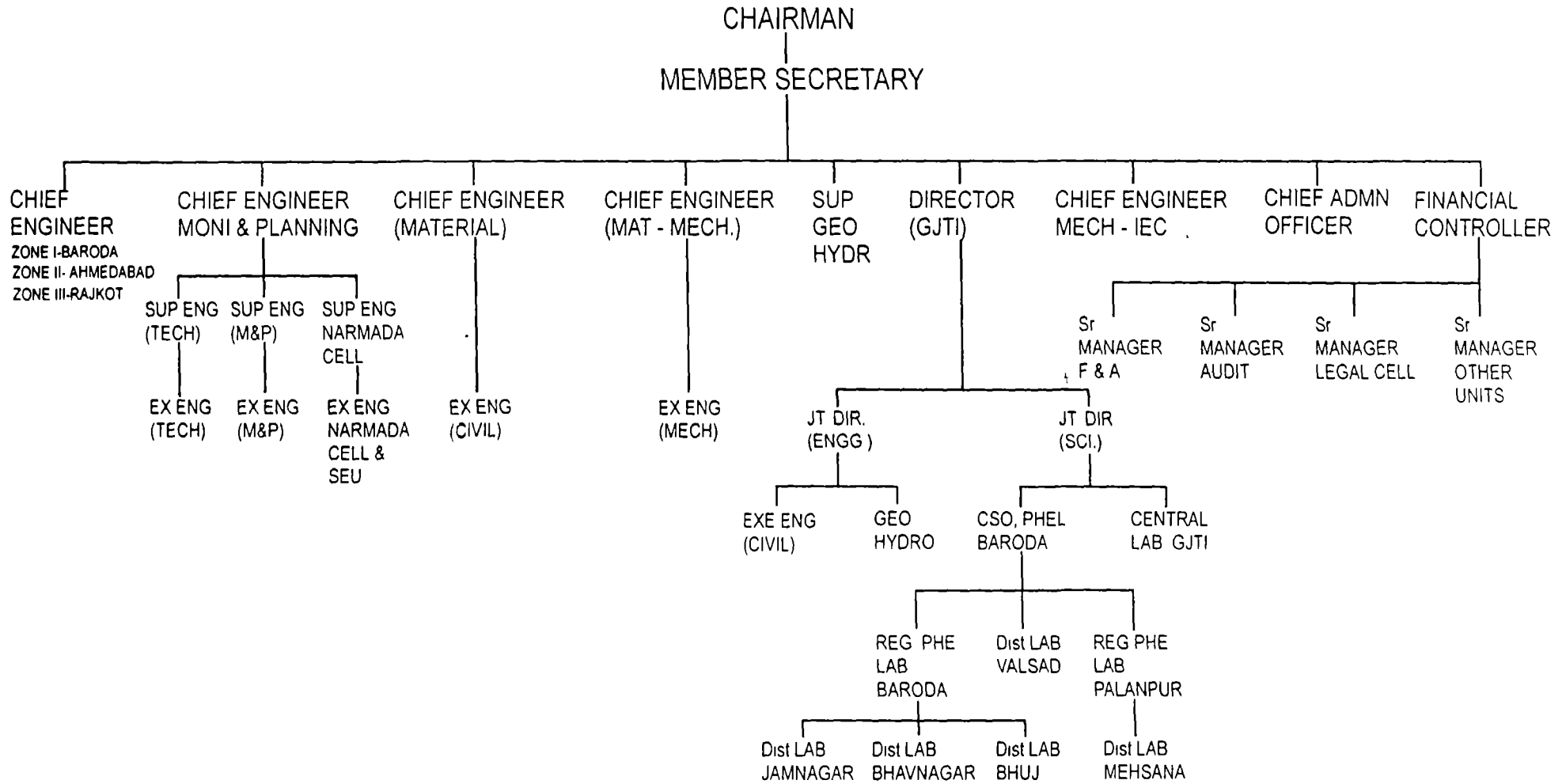


Figure 1 GUJARAT WATER SUPPLY AND SEWERAGE BOARD ORGANISATION CHART

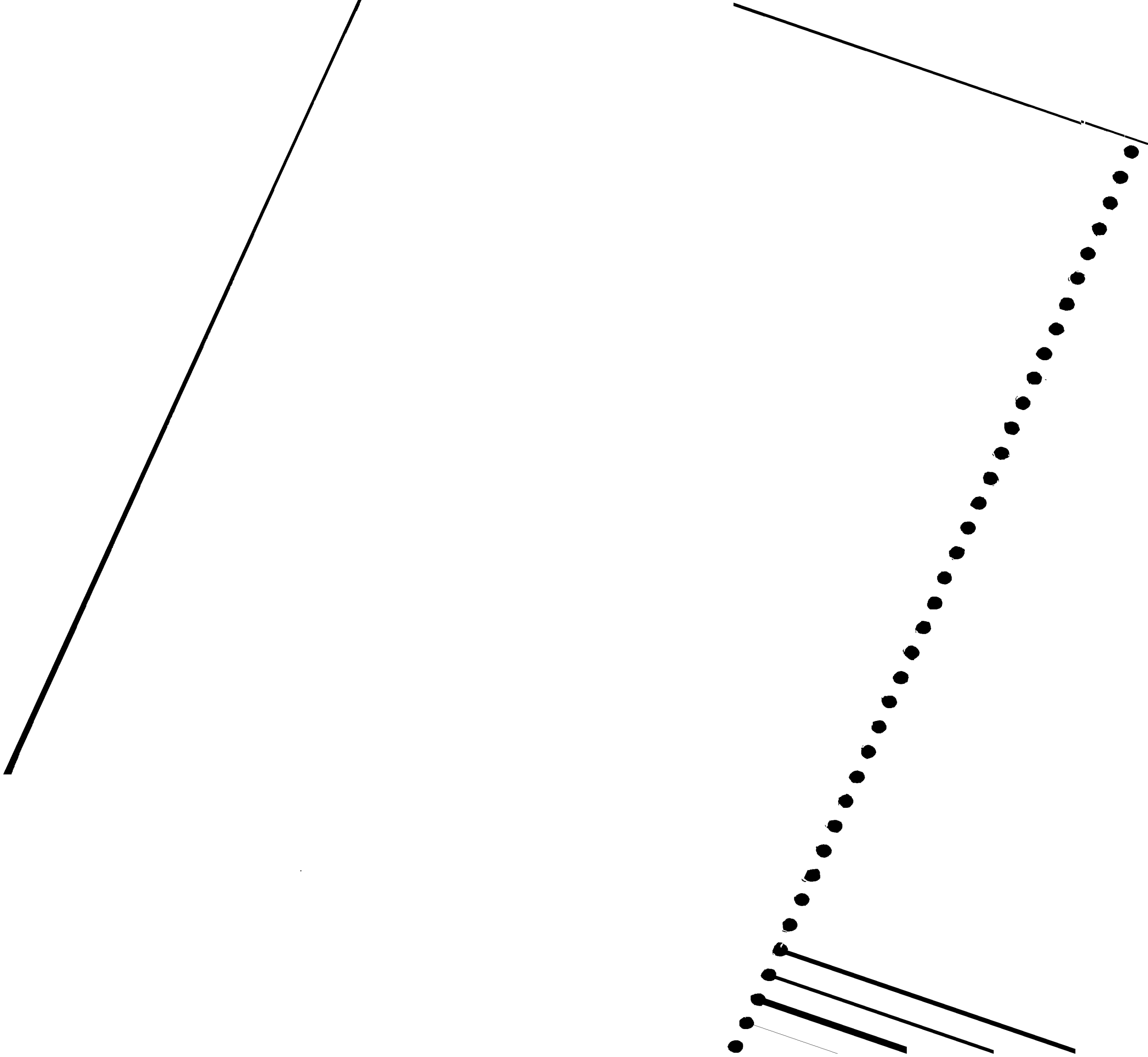


Table 6.1: Limits of Technical and Administrative Approval for Various Sanctioning Authorities.

Sanctioning Authority	Limit of Administrative Approval	Limit of Technical Approval
Board	More than 25 Lakhs	
Chief Engineer	Upto 25 Lakh	Full Powers
Superintending Engineer	Upto 5 Lakh	Upto 25 Lakh
Executive Engineer	Upto 1 Lakh	Upto 5 Lakh

Since approvals and clearances normally take time, during the period of distress (i.e. summer months) schemes like hand-pumps and wells get sanctioned and implemented because of less time required in their approval and subsequent implementation¹⁶.

6.2 Village Level Institutional Arrangements

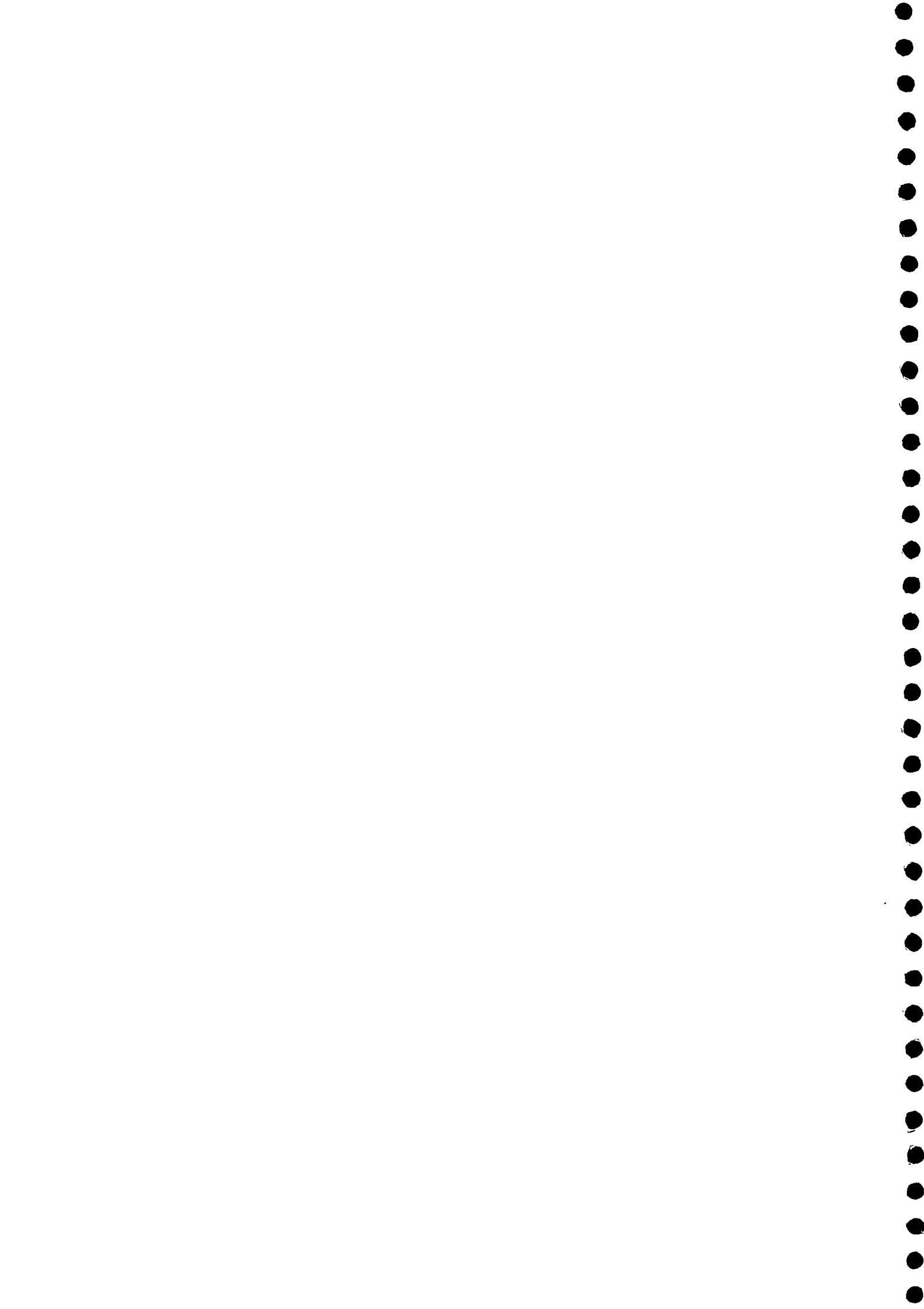
As mentioned in an earlier section, at the policy level a commitment is spelt out by the State Government for the involvement of local leadership, local institutions and voluntary organisations in the management and effective execution of rural water supply schemes, low cost sanitation programme etc.

The level of participation of the local communities is minimal in both the localised and regional water supply schemes. During the implementation of the localised water supply schemes, the local communities participate in the selection of the source of supply for drinking water and site selection for a storage tank or stand post. But this participation is generally limited to the sarpanch and panchayat members and does not extend to the community as a whole.

Participation of local communities is only evident in the areas where Pani Samitis are existing; namely in parts of Banaskantha and Amreli districts. Pani Samiti is a voluntary board, with a legal status, as per a resolution passed in April 1995, by the Government of Gujarat. A number of Pani samiti members are from the village Panchayat and the term of the samiti thus, linked with the term of the panchayat (for details refer Annexure 6.1). The purpose of the committee is to monitor water supply, collect water tariffs and promote water conservation amongst the people in their communities and ensure the basic mandate of localised maintenance of water supply schemes while also initiating a cost recovery mechanism. As per the resolution, the pani samitis are empowered to collect annual water charges @ Rs. 14.00 per capita and retain Rs. 5 of the same for maintenance of the public facilities. The guideline regarding the retention of a certain amount is still pending approval.

The village panchayat plays an important role in the provision of drinking water in the villages. The panchayats are especially active during the years of drought and make arrangements for bringing drinking water in to the village by making arrangements for the water tankers etc. The panchayats also do some work towards maintaining cleanliness and sanitary conditions around the sources of drinking water.

¹⁶ The State Government has now proposed a strategy of conversion of simple wells and hand-pumps into piped water supply schemes in a phased manner for ensuring more reliable and sustained supply of water



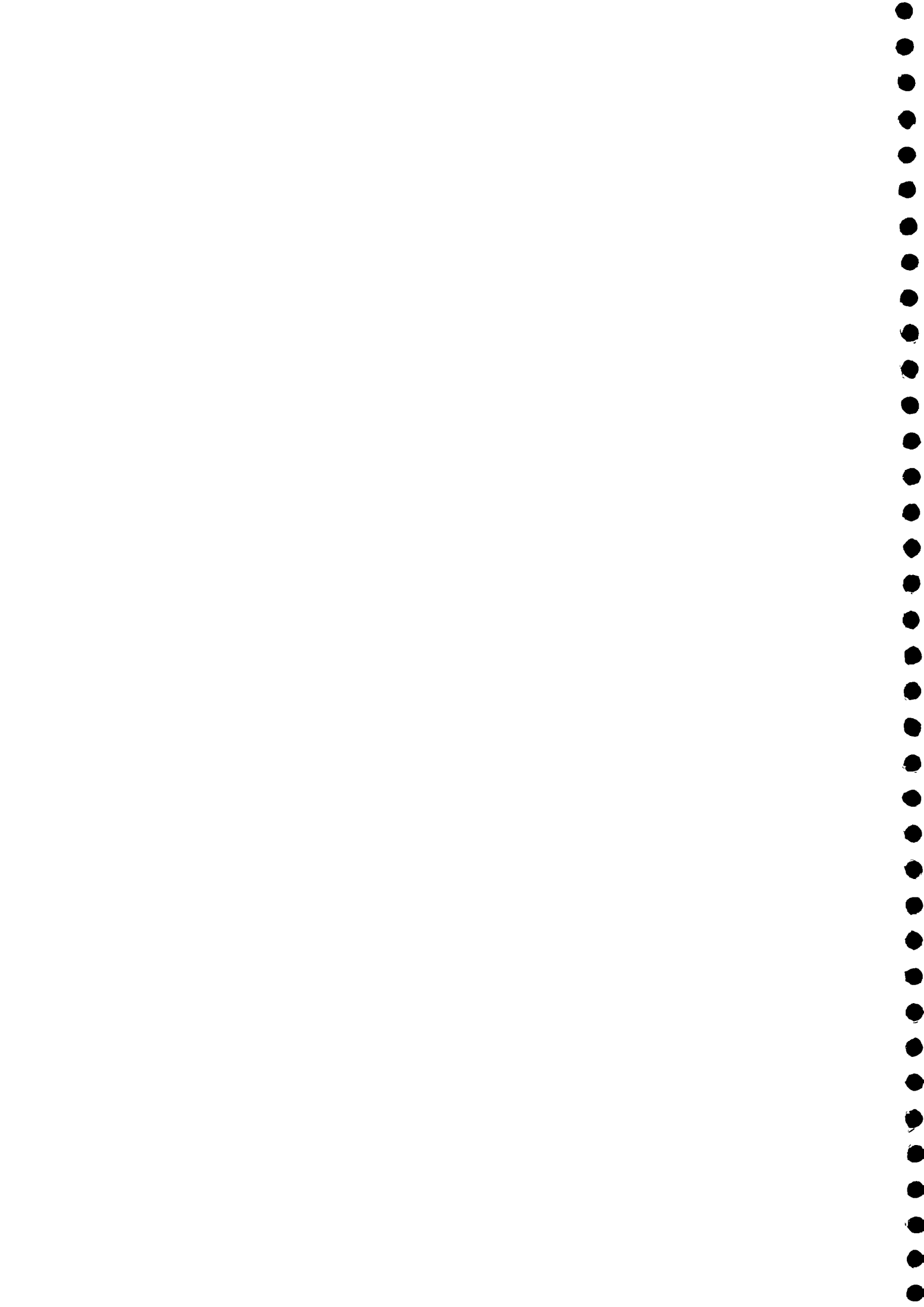
As per the primary survey, at present there is little participation of the local population at large in the management of the system, operation and maintenance and monitoring and evaluation of the scheme. In none of the surveyed villages, the local community reported of any contribution for operation and maintenance of the drinking water schemes. In fact the officials report that the repair and maintenance of pipelines passing through the farmers' fields is at times hindered by the local people because of potential damage to the crop.

Interestingly, the primary survey has revealed a rather high level of willingness among the local communities for taking up the responsibility for operation and maintenance of the drinking water schemes. 90% of surveyed households in Amreli expressed willingness to take up the responsibility of upkeep of drinking water sources. The corresponding figures for Banaskantha and Panchmahals are 66% and 80%, respectively.

As per the primary survey 48% of the households in Amreli, 44% in Panchmahals, 71% in Banaskantha expressed willingness to contribute towards the implementation and maintenance of drinking water schemes. Although cost sharing capability and willingness to pay with regards drinking water supply in rural areas exists, but there is a need to pay attention to the institutional arrangement/mechanism under which such an initiative is undertaken. Most of the users are willing to pay for a reliable, transparent and accountable mechanism¹⁷, provided they are offered satisfactory service levels in terms of quality, timeliness and adequate quantity. Most of the surveyed households felt that user groups along with Panchayat or Government would be the most appropriate mechanism for operation and maintenance of drinking water schemes.

¹⁷ In this regard, some issues that had been raised by the members of Pani Samitis from Dutch funded Lathi-Liliya RWSS at a Seminar held by Centre for Environment Education were

- Need for reasonable certainty on the hours of water supply and prior information regarding this
- Improvement of sanitation conditions around stand posts and cattle troughs
- Review of no. of taps/ stand posts provided and distance from the farthest houses
- Willingness to pay Rs 14 if regular water supply is assured
- Collection of Rs 14 should be done by a GWSSB field staff and a receipt issued



7. Planning and Implementation

There are two main aspects that may be discussed under the overall assessment of the planning and implementation mechanism in the state; one is the aspect of inter and intra departmental coordination and the other is the factor of participatory planning.

7.1 Inter and Intra Departmental Coordination

During the course of implementation of various water supply schemes, it is usual to consult and seek permission from some other government departments as well. The prominent among them are the Irrigation Department, Forest Department and Gujarat Electricity Board¹⁸. The channels for inter-departmental coordination are not very smooth and the mechanisms for such coordination are not clearly spelt out. As a result of this the schemes involving more than one department are invariably delayed.

There is also insufficient coordination between the institutions responsible for the development of water resources and the various water consuming sectors (domestic, agriculture and industrial) during the planning of water resources development projects, at times leading to inadequate allocation of water for drinking purposes. It is only recently that the supply of drinking water has been considered as a priority over other uses (mainly in Saurashtra and Kachchh).

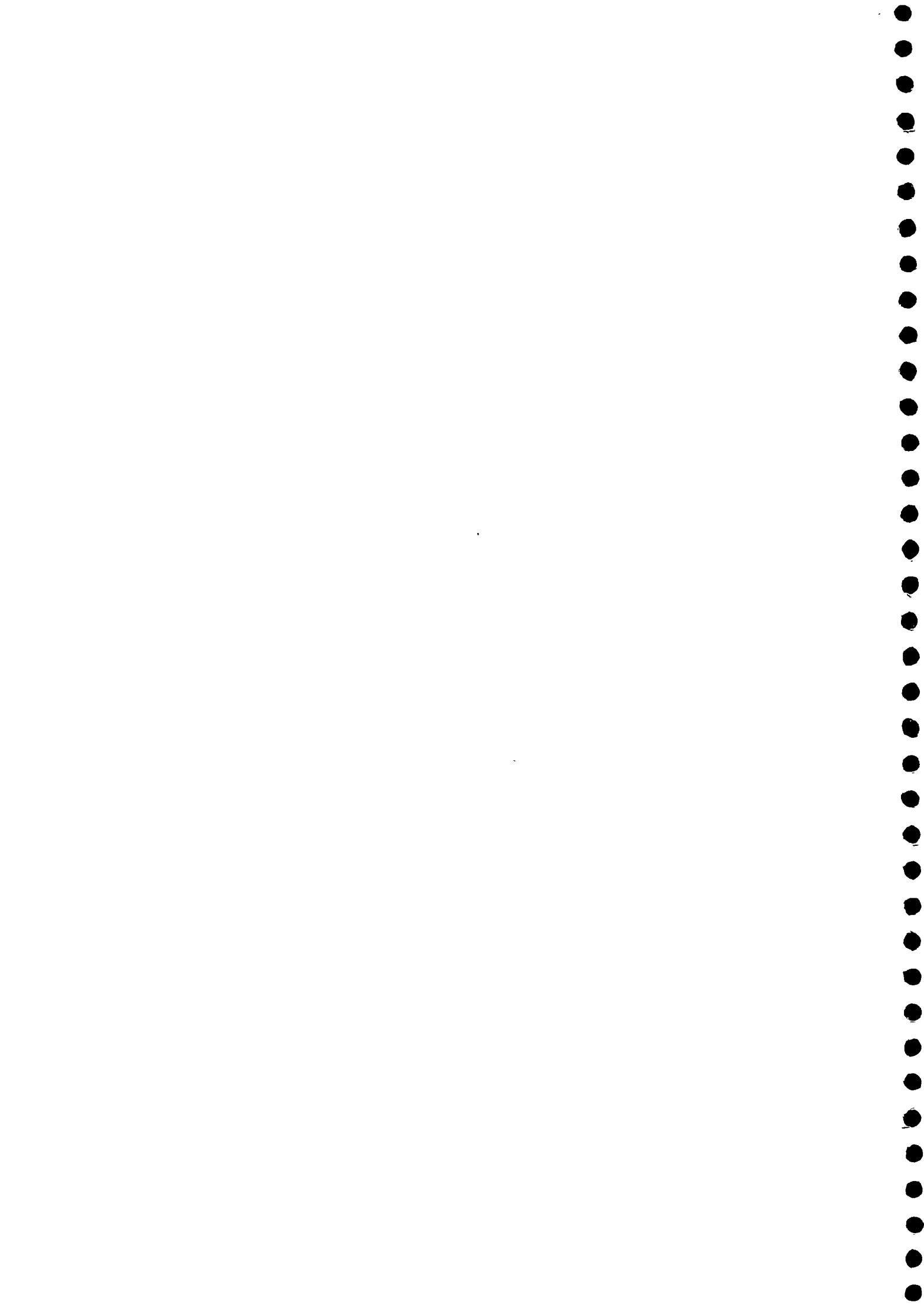
The absence of proper co-ordination between the planning, works and mechanical departments was found to be the critical factor in the public management, adversely affecting the functioning of water supply systems in the rural areas. The department officials are of the view that there is not adequate control, metering and pricing system to ensure the efficient management of supply system in the state.

7.2 Participatory Planning

At the local level, as reported during primary survey, although peoples' opinion is solicited for works related to water schemes, rarely is the work carried out according to peoples' needs or demands.

It has been proposed by the state that the selection of hand-pump bore sites should be carried out in consultation with the Gram Panchayat. But both the department and the village panchayat functionaries feel that it will increase the percentage of unsuccessful bores, resulting in wastage of time and cost over-runs.

¹⁸ For running the pumps put up in the water supply schemes there is a need for getting an electricity connections for which GWSSB has to approach the Gujarat Electricity Board for seeking clearance. Whenever the department has to take water from an irrigation dam for supplying water under a regional water supply scheme, GWSSB has to seek the permission of the State Irrigation Department. Even before the construction of a well or a water source near a river bank, the GWSSB has to contact the Irrigation Department and seek their permission for doing so. In an event of the pipeline for supply of water, under a regional water supply scheme, passing through forest area, the approval of the forest department is sought before laying out the pipeline.



8. Operation and Maintenance

The hand pumps are maintained by service teams of the mechanical division of the department on the basis of information received from the sarpanch¹⁹ of the gram panchayat and the taluka development officer (TDO) on a regular basis.

Every year the department (mechanical division of the GWSSB) receives Rs 400 per hand-pump for repair and maintenance. Contract arrangements are resorted to for increasing departmental capacity pertaining to installation of new works in the summer months²⁰.

The State Government has the responsibility for the maintenance of Regional Rural Water Supply Schemes

According to the present policy, the villages covered by Group Water Supply Schemes are supposed to pay a nominal water charge at Rs.5/- per capita per annum to the State Government through Village Panchayats. However, due to financial constraints and lack of awareness of the people about the need for payment of such charges, village panchayats are not able to pay the required charges to the State Government.

In regional water supply schemes illegal tapping of water supply pipelines is a major problem. Line men employed by the board are responsible for preventing tapping, however in summer and drought years there are instances when mounted police has to be used to overcome forcible tapping.

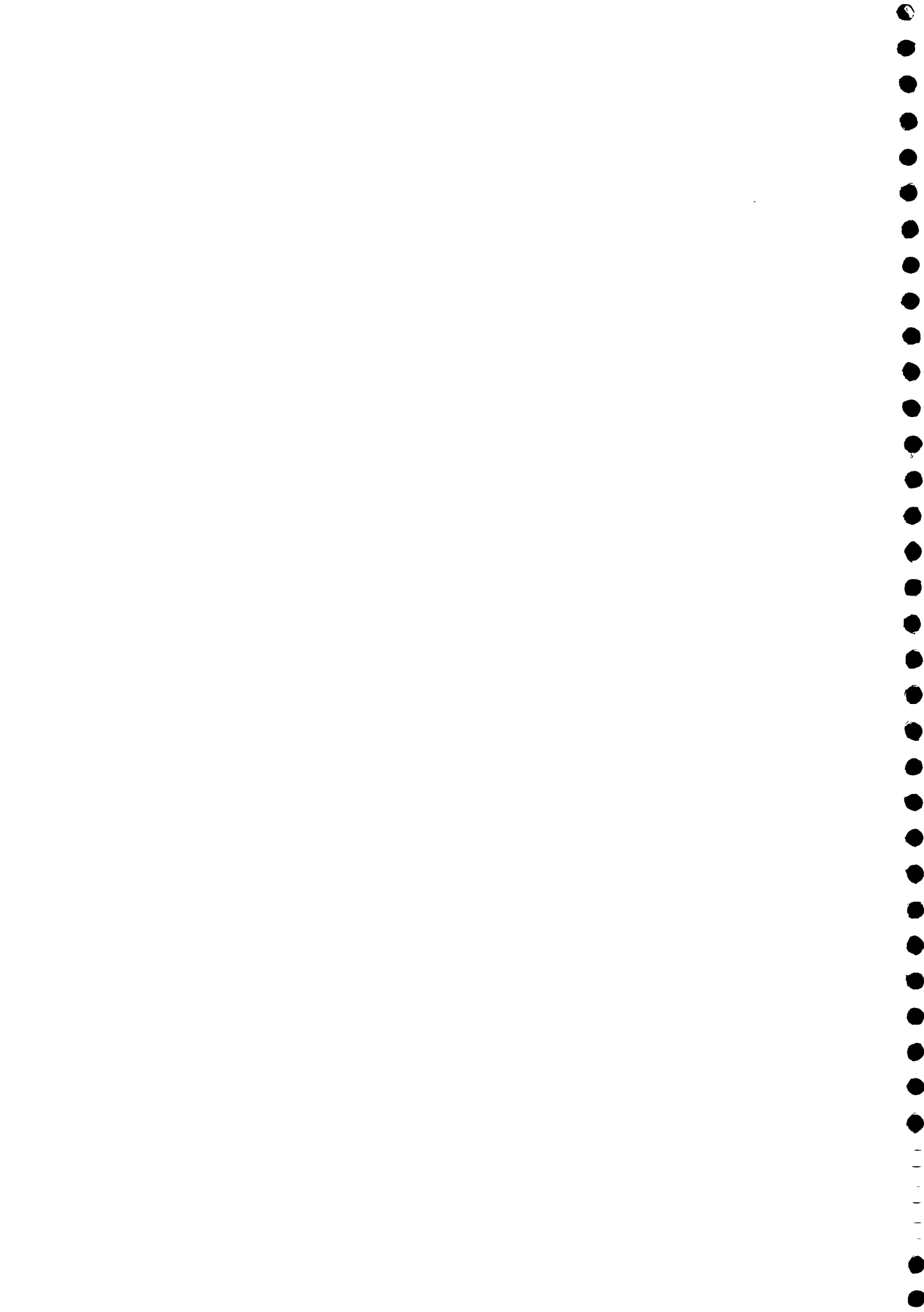
GWSSB is not able to ensure the operation and maintenance of drinking water schemes for all villages in Gujarat because of limited staff strength and paucity of funds. The cost involved in undertaking the tasks in remote areas is very high. The concerned officials of the department are of the view that the overall operation and maintenance will improve and the costs will be less if the villagers themselves can take this responsibility at the village level.

Although more than fifty percent of villages have acknowledged the visits of some official from the Water Supply and Sanitation Board, they are not very satisfied by the services rendered by them. They feel that the operation & maintenance of the drinking water sources is not adequately undertaken by the department as some of the sources have been lying defunct/inoperational for years.

The department is working on converting the predominant India Mark II hand pumps to India Mark III as they are less prone to maintenance problems and are easier to repair. This is in keeping with the plans to hand over the hand-pump repair and maintenance to the panchayats. It is also proposed to employ a mechanic directly under the Gram panchayat over a certain no. of hand pumps @ Rs 120 per hand-pump every year.

¹⁹ The Sarpanch corresponds in writing to the Deputy Engineer of the mechanical division.

²⁰ During the high pressure summer months, the five member teams of the department split up to supervise more teams, comprising of 5 members, out of which 4 are hired on the contract basis for the summer months.



9. Sustainability of the Programme

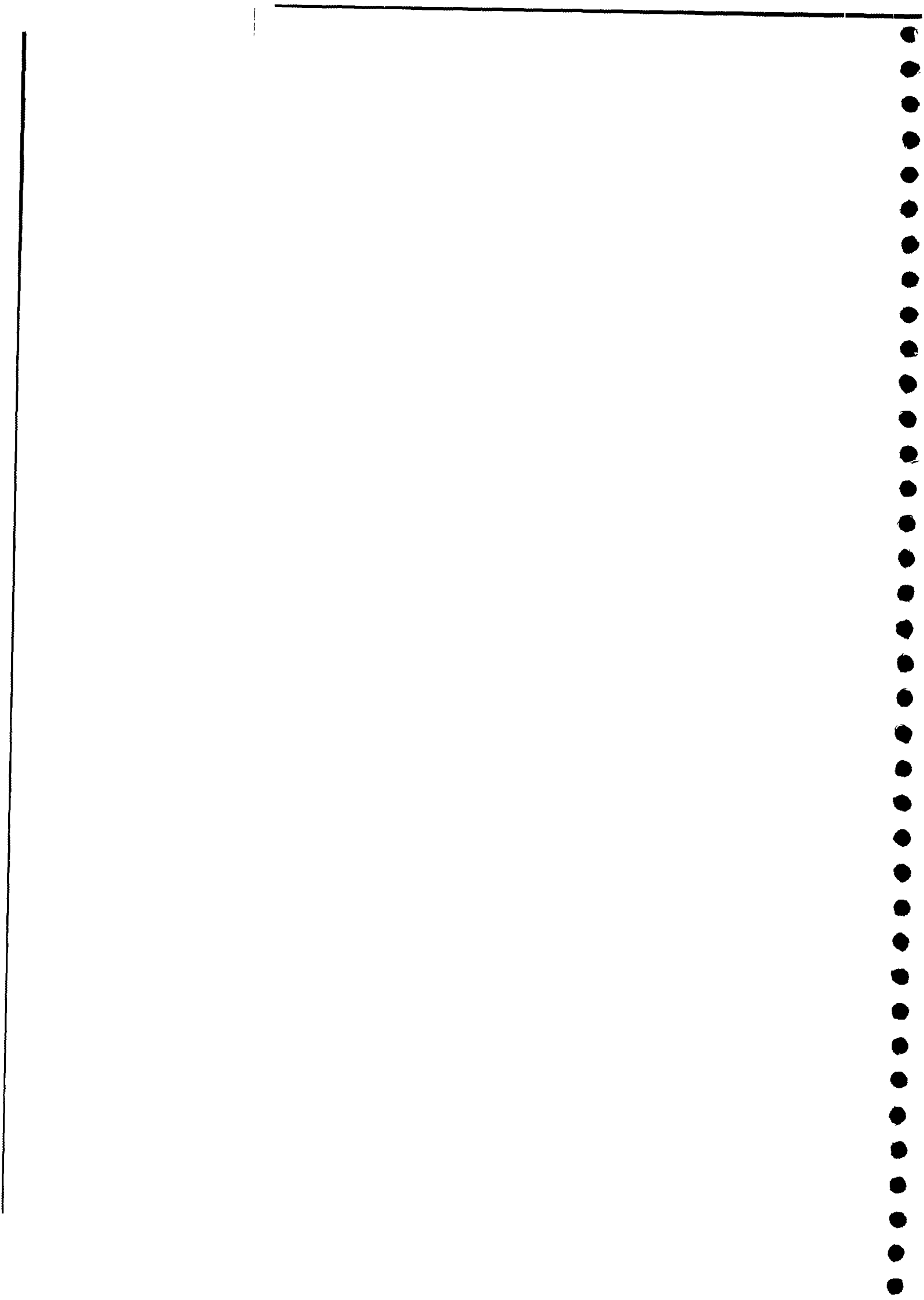
The continuous fall in the groundwater table and deterioration in the quality of the available water are the major causes of concern in the whole state of Gujarat, especially with respect to the sustainable supply of drinking water. The constraints imposed by the hydro-geological formations in the various parts of the state (especially Saurashtra, Kachchh, parts of Central and North Gujarat) and the increasing pressure put on the scarce water resource by the growing population and demands put by agriculture and industrial sector, place greater importance on the judicious management of the drinking water supply. A purely supply oriented approach is counter productive to the long term sustainability of the programme.

The problem of excess salinity in the ground water is common in the coastal areas while high fluoride levels are found in a number of districts as well. Both the communities and the officials have reported that the salinity as well as the fluoride content in the water has been increasing over the years. Concerned government officials have also described the present situation as highly critical as they were finding it increasingly difficult to identify new sources of safe water in areas where local sources were not available. Some efforts have been made by the department to prevent and treat salinisation and fluorination of water, but very little has been achieved so far.

Existence of a number of defunct sources in the surveyed villages points towards inadequate management of public sources. Lack of popular participation in the operation and management of public sources is also one of the reasons for inefficient management of the water supply system. Enhancing the role of rural population in the management of water sources is one of the critical issues for the sustainability of the programme.

The ever persisting attitude of "water is a public good and should be free" tends to negatively affect the willingness to pay and discourages interventions which try to promote this agenda both at the local as well as the policy level. An adequate metering and pricing system is indispensable for the financial sustainability of the whole programme and its continuity and replicability over time.

Raising the general awareness about health and hygiene are essential for improving the quality of life of the local communities. A partnership among the NGOs and the GWSSB will go a long way in promoting this agenda among the people and gaining popular support for these activities.



10. Conclusions & Recommendations

The continuous fall in the ground water table, combined with constraints imposed by unfavourable hydrogeological formations in the arid and semi-arid regions of the state and deterioration in the quality of potable water in Gujarat, are a cause of significant concern and pose a serious challenge for sustainable drinking water provisions in the future. Increasing pressures put on the already scarce water resource by the growing population further compound the problem

Among the major findings of the study is the encouraging point of a large number of habitations getting covered under the drinking water schemes of the government. The department statistics report that 95% of the total habitations in Gujarat are covered under a water supply scheme with 66% being 'fully covered'. Even the primary survey indicates a rather high degree of coverage. However, the point of concern is that in the two backward districts, namely Banaskantha and Panchmahals, 57% - 100% of the responding households are receiving less than the requisite 40 lpcd of water. Hence, only up to 43% of the responding households qualify as fully covered. This large variation in the coverage status between the statistics furnished by the department and primary survey results may be interpreted in many ways²²

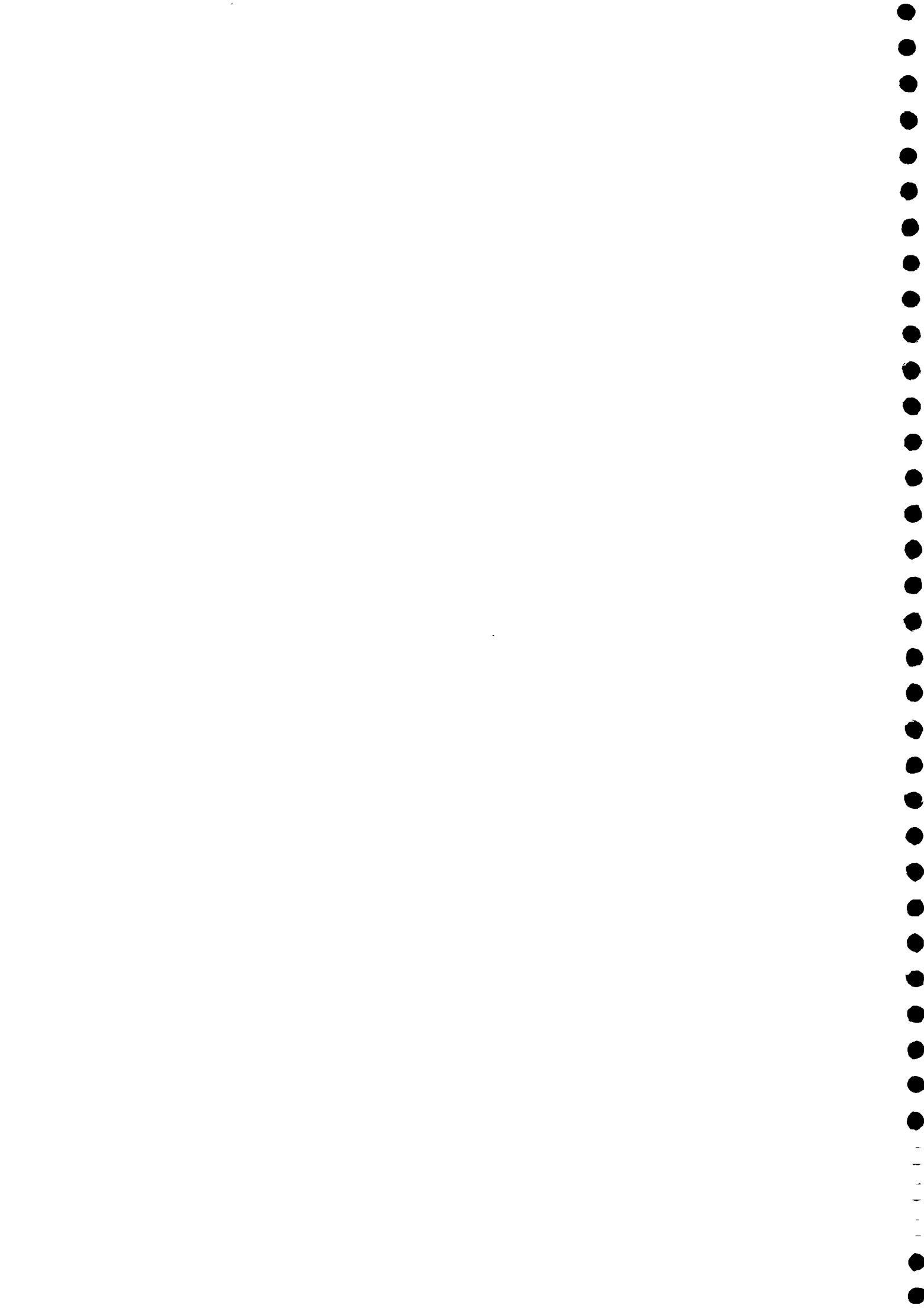
- Coverage status of a habitation is fixed once, at the time that the drinking water facility is created and is not regularly reviewed. However, the dynamic water situation coupled with the increase in demand owing to growth in population size, might over time result in the conversion of "fully covered" habitations into "partially covered" habitations. Hence the statistics do not reflect the current field situation
- The initial status ascribed to the habitation is itself erroneous as it relies more on discharge capacity rather than actual discharge from the installed sources
- Water supply infrastructure, that has a definite life span, is not written off even when it has outlived its utility or has become defunct. Hence, villages that are recorded as covered, may have shifted to another category over the years

The above brings to the fore the need to resolve these differences to not only get a clear understanding of the water supply situation, but also in order to understand the direction in which future programmes should go in order to improve the water supply situation

The primary survey also brings out that despite such good coverage by government installed drinking water sources, in districts like Banaskantha and Amreli, almost 15% of the respondents depend on sources like rivers and ponds, which are usually contaminated, for meeting their drinking water requirements. The situation assumes a far more acute dimension during drought years when the water availability falls drastically and people have to depend on water supplies through tankers. Again, water supply through tankers was found to be essentially an ad-hoc arrangement and almost non-existent in habitations located in the remote areas and in difficult terrain

The problem of defunct sources is equally serious both in terms of number of sources and low priority accorded to their rejuvenation. The primary survey has revealed that on an average 30% of the total sources have been lying defunct for a long time. Also, about 80% of the surveyed

²²Some amount of variation is also likely to be there because of the limited sample size



villages reported the presence of atleast one or more defunct sources

Though secondary data reveals water quality as assuming critical proportions, in rural Gujarat and infact in large parts of India, the idea of pure water is often clouded by sensory perceptions. Water that looks clean, is pleasant to taste and helps cook food quickly, is usually considered to be potable. Technical standards of water quality are of little consequence. Hence, not many respondents noted quality as a problem. However, quality does remain as a major issue in many areas

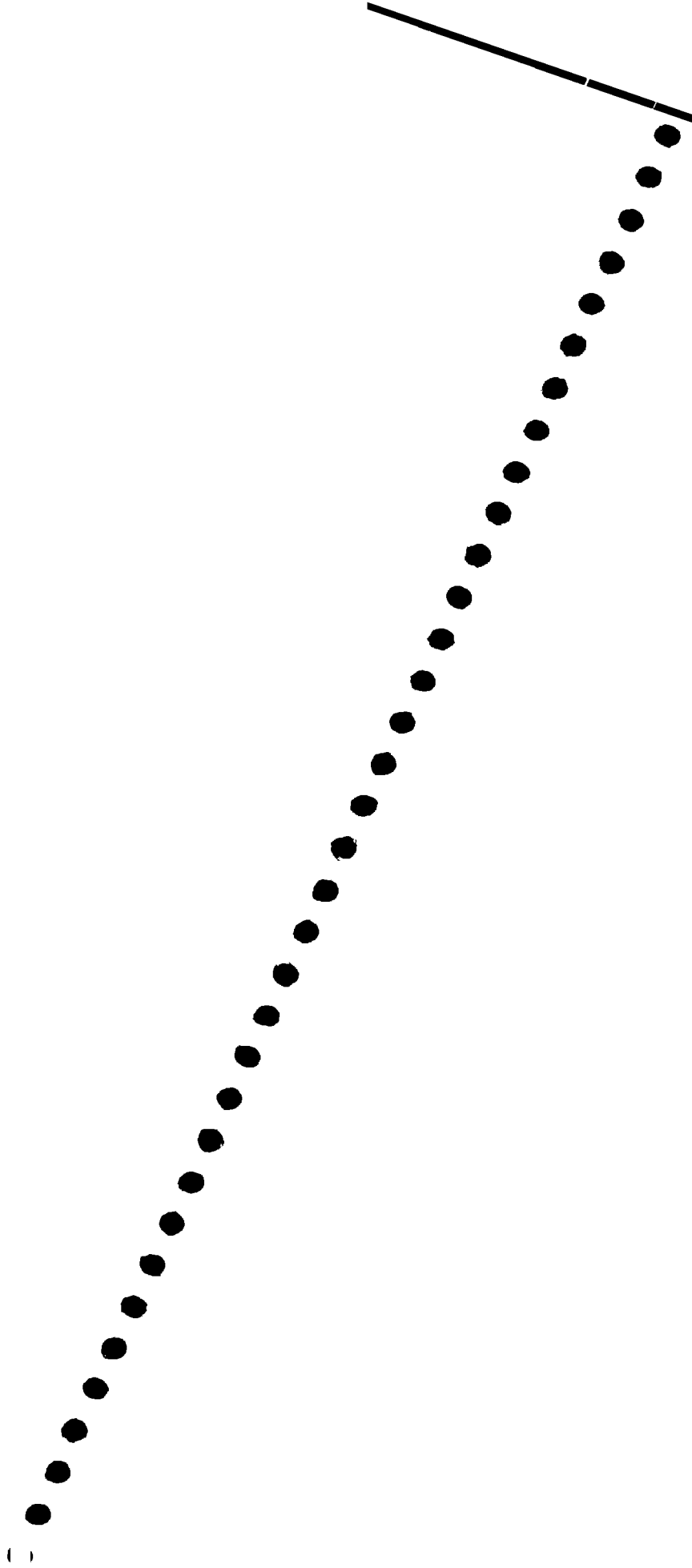
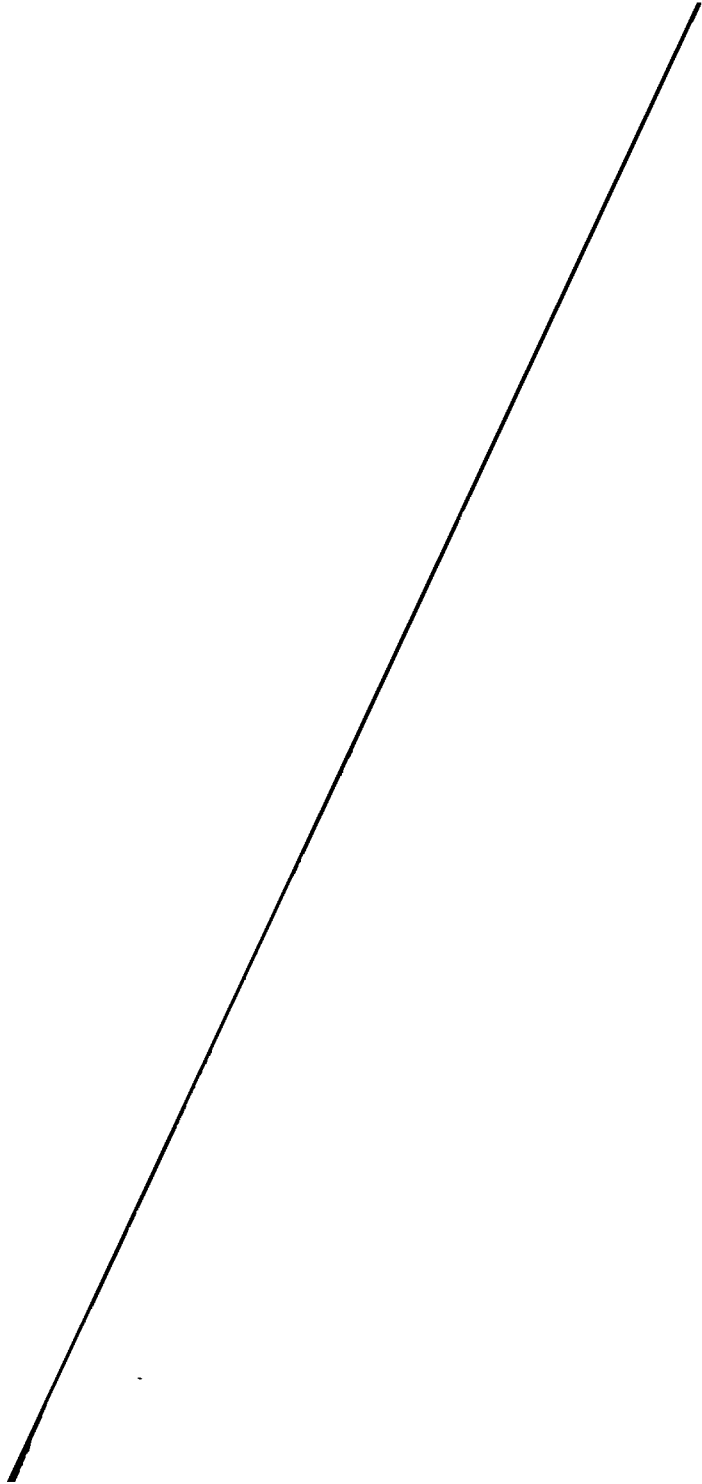
Panchayat and community involvement in planning, operation and maintenance of the schemes was found to be peripheral. In all three districts surveyed, though the department consulted with the village sarpanch in the selection of site for drinking water schemes, there were no consultations held with the community at large. Subsequent to installation, the panchayat involvement was mainly during the scarcity/ drought periods, in undertaking crisis management by making arrangements for the additional water to be brought into the village by tankers. General involvement of the local people in management or operation and maintenance of schemes was absent. However, 66%-90% of the respondents were willing to take on the responsibility of operation and maintenance, with up to 70% of them willing to make financial contribution. This was conditional upon formation of user groups with either panchayat or government involvement and institution of a proper mechanism for fund collection and use with greater transparency in the utilisation of funds along with enhanced reliability in water availability. Some attempts at community involvement have been made in the state under the Dutch funded Regional Rural Water Supply Projects.

The access of the rural population to sanitation facilities is rather poor in the whole of Gujarat, with only 11% of the rural households having access to some sanitation facility. The situation is much worse in the backward districts, especially Panchmahals. Owing to the lack of proper sanitation it is the women who face maximum inconvenience. The women have expressed a greater desire for latrines to be installed, not only for their own convenience but also for the general health hygiene of the entire family.

The general acceptance of community latrines is relatively low, as most of the households want individual facility to be provided. Most of the people consider it a duty of the government to facilitate and undertake the construction of latrines. While some people have expressed willingness to contribute labour for the construction of latrines, nobody is ready to extend any financial contribution for the purpose.

The stagnation of wastewater in the village is another point of concern to the local communities as they felt this could lead to spread of disease in the village. Washing of hands and maintaining cleanliness around drinking water sources are perceived to be the most important practices with respect to the general health and hygiene of the people.

A number of NGOs are present in the state, who are actively working towards popularising localised water harvesting systems, water treatment measures and also raising the general awareness of the community about better health and hygienic practices. Some such NGOs are fairly popular among the communities with whom they are working and are now increasingly gaining support from the government as well as bilateral organisations.

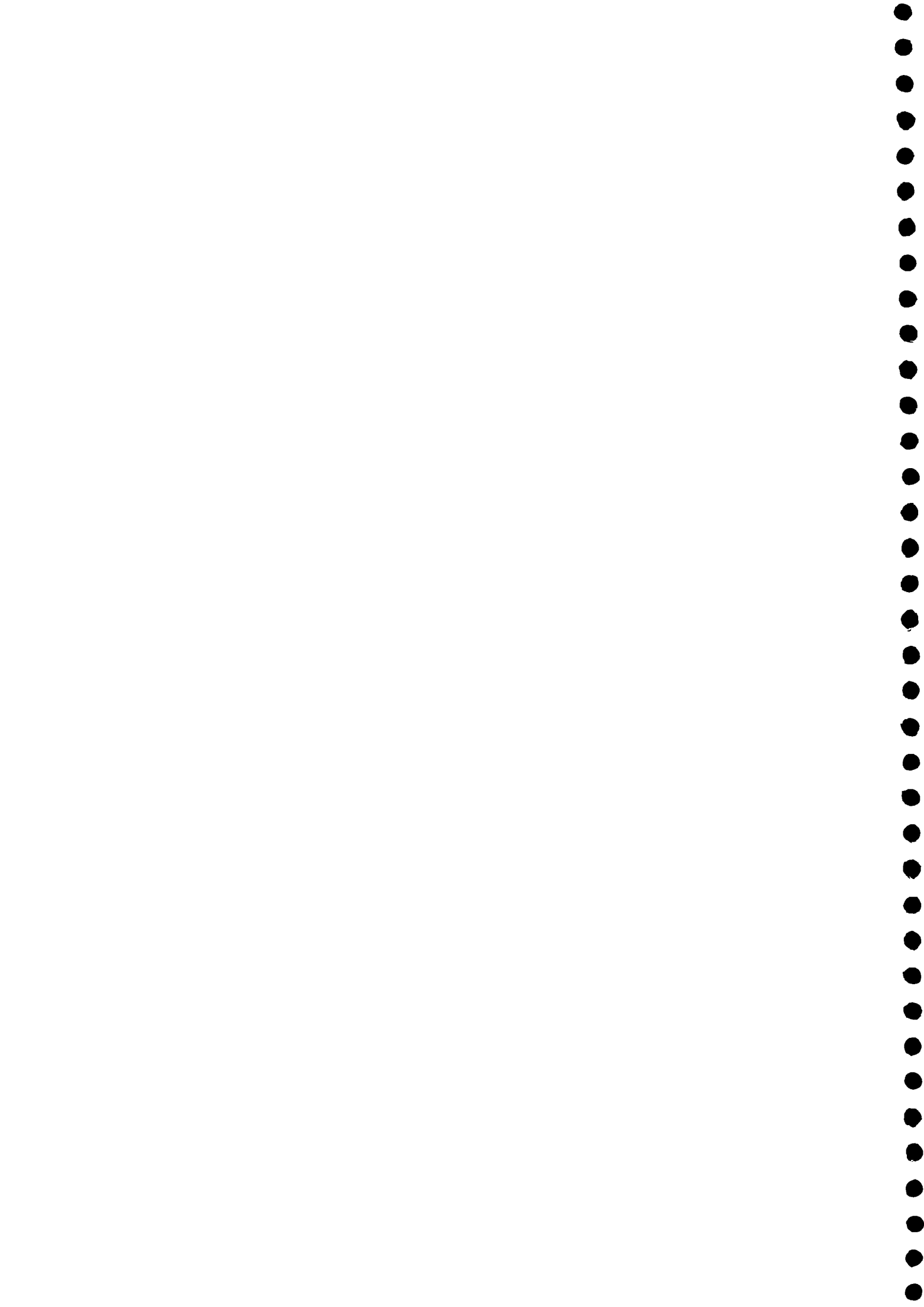


In light of the above it is recommended that the state consider the following aspects in order to strengthen the water supply and sanitation programme in the state

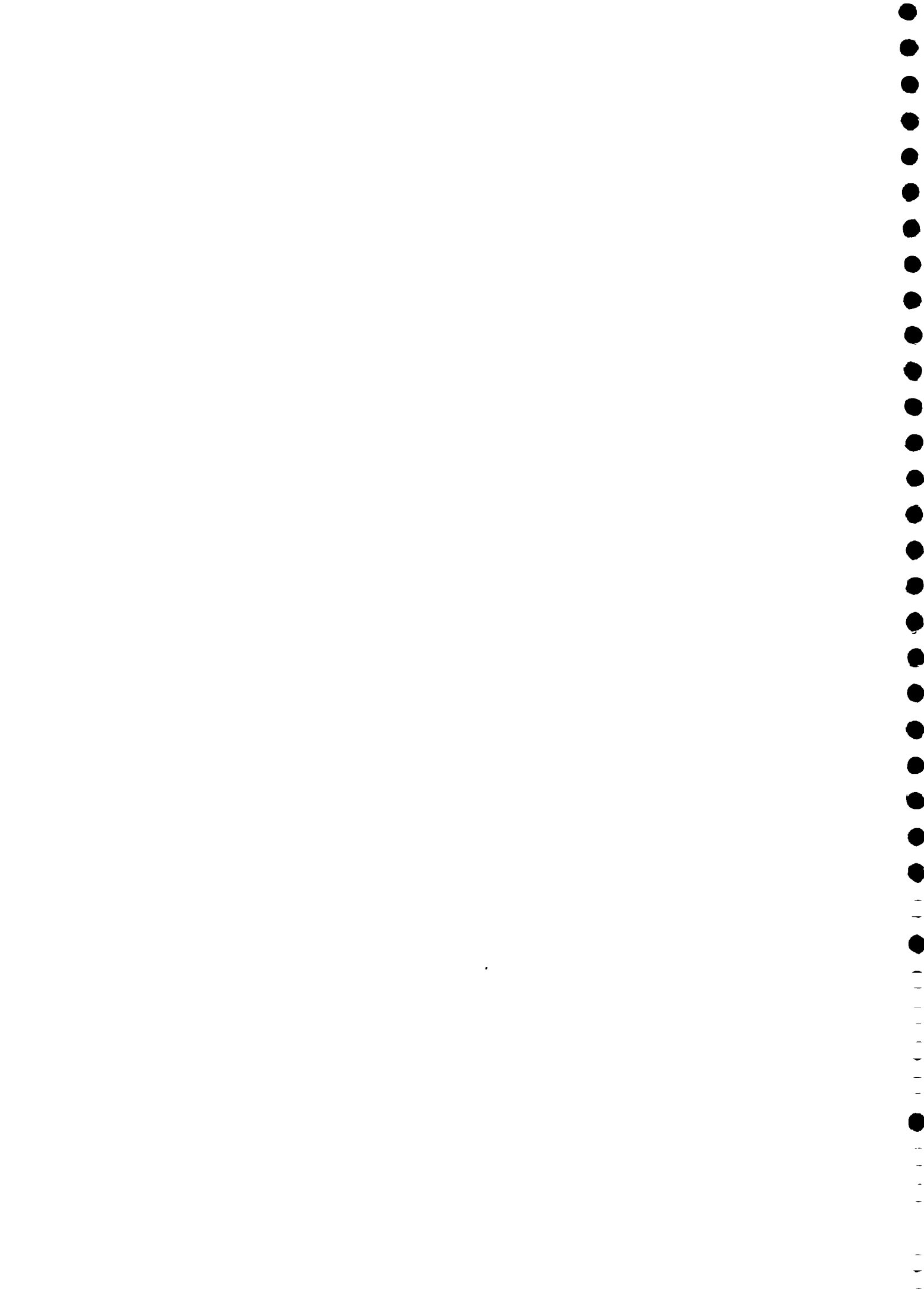
- Enhance the reliability of the existing water supply infrastructure. Since the infrastructure (both government & community owned) exists in a large part of the state, improvement and rejuvenation of the same would be cost-effective as well as time saving. On the basis of the primary survey conducted, improvement in the following areas would go a long way in this direction:
 - improving the inter-departmental coordination and functioning to ease out situations of stress created due to mismatched services from different departments,
 - improving operation and maintenance at the village level through the involvement of the local community, especially women, who have been traditionally also associated with the management of domestic water,
 - developing complementarity between traditional and new sources so as to capitalise on already existing traditional infrastructure as well as management systems that go with the traditional structures. Since present supply systems mainly rely on ground water and the traditional ones rely on either surface water or shallow aquifers, a complementarity between the two would also result in a complementarity between the use of surface and ground water
 - rejuvenation of defunct and traditional water sources

- Reclassify villages/ habitations to get a clearer picture of areas requiring installation of new water supply infrastructure. A reclassification is needed because, as mentioned earlier, a number of factors that influence the status of coverage have not been incorporated while developing the statistics for the same. The reclassification should be done on a regular basis and should primarily take into consideration the following factors:
 - the change in the availability of water from the sources provided due to the change in water level over the years. Where water levels are declining and sources are running dry, the status of coverage must reflect this
 - increase in demand for water because of population growth. With normal population increase, it is likely that sources that initially covered the habitations are no longer able to do so. The status must reflect this
 - actual discharge from the water supply sources instead of the potential discharge
 - effective life span of water supply infrastructure. It is necessary that the coverage take into account the fact that every year a percentage of sources will go out of use because their life is over. Sources need to be written off, like any other machinery or infrastructure

- Revisit the criteria for deciding the status of coverage, which elucidates the provision of at least 40 lpcd of safe drinking water. It is important to differentiate between the amount of water required for drinking and the other domestic requirements which do not necessarily require the best quality water. For instance, the ISO classifies different categories of water as being fit for drinking, bathing and washing etc (refer annexure 11.1). Along the same lines, it is imperative to classify the available water and focus on provision of a much lesser quantity of safe drinking water, but at the same time assure the required amount of water for other purposes. This is particularly so in areas where quality of water is a critical issue and where it is becoming increasingly difficult to identify new sources of safe water



- Provide new infrastructure, wherever required, on the basis of the findings of the reclassification and new norms
- Provide water supply systems that encourage conservation of water in drought prone and water scarce areas
- It is essential to undertake a detailed investigation of the localised options for increasing the water supplies as a complement or alternative to long distance piped water schemes. Surface water storage in plastic-lined ponds, roof top water harvesting etc. have been shown to be viable options for drinking water supply in many drought prone districts of Gujarat and other states as well, and need to be adopted on a wider scale
- It is also important to educate people about water quality issues prevalent in their area. The water testing arrangements need to be strengthened and at the same time, it is essential that the information is disseminated among the local communities. Measures for tackling the water quality problems must be discussed with the local people.
- There is a need for carrying out health education activities and raising the awareness in hygiene consciousness among the rural population of the state. A number of NGOs are already actively involved in these tasks in some parts of the state. There is a need for the government to promote such organisations as well as activities in other parts of the state.
- Finally, it is suggested that since declining groundwater levels cannot be looked at in isolation of the irrigation and industrial processes for which the water is being utilised, drinking water must be viewed as a part of all such water intensive developments in the area. Water for drinking has the highest priority over all other uses, but this policy of the government needs to be judiciously implemented. Allocation of the water resource for different uses must be carried out keeping this factor in mind.



References

Matzer, H and Moench, M. (1994), Ground Water Availability for Drinking Water in Gujarat Quantity, Quality and Health Dimensions, Economic and Political Weekly, XXIX (13), March 26.

Gujarat Water Supply and Sewerage Board , (1994), The State of Gujarat's Environment (Draft).

Das, K. and Kumar, B L., (1996), Managing Drinking Water Supply in Rural Gujarat: Issues and Evidence, Working Paper No. 71, Gujarat Institute of Development Research, Ahmedabad.

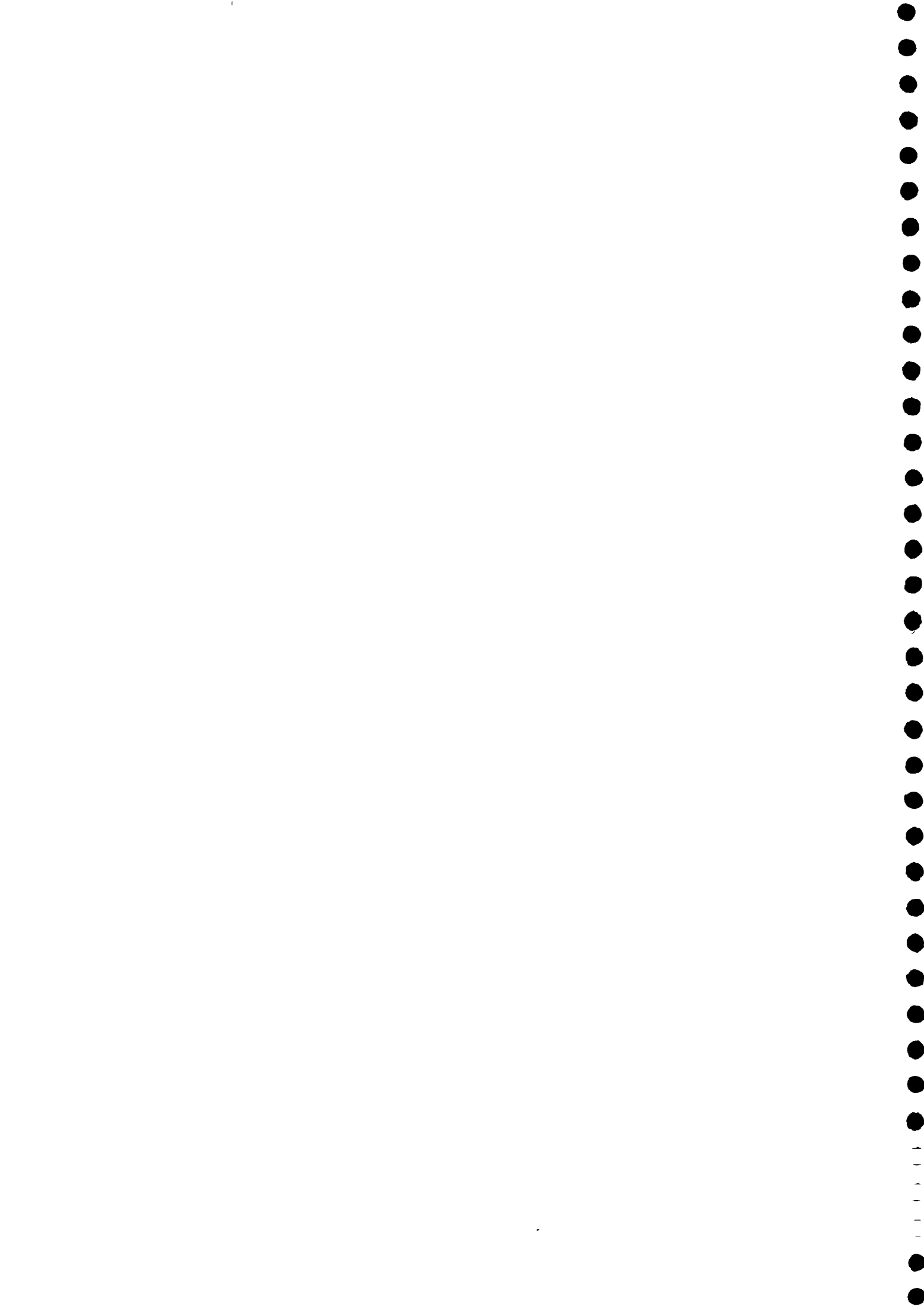
Government of Gujarat, (1992), Eighth Five Year Plan - 1992-97, General Administration Department, Gandhinagar

Government of Gujarat, (1997), Development Programme - 1997-98, General Administration Department, Gandhinagar.

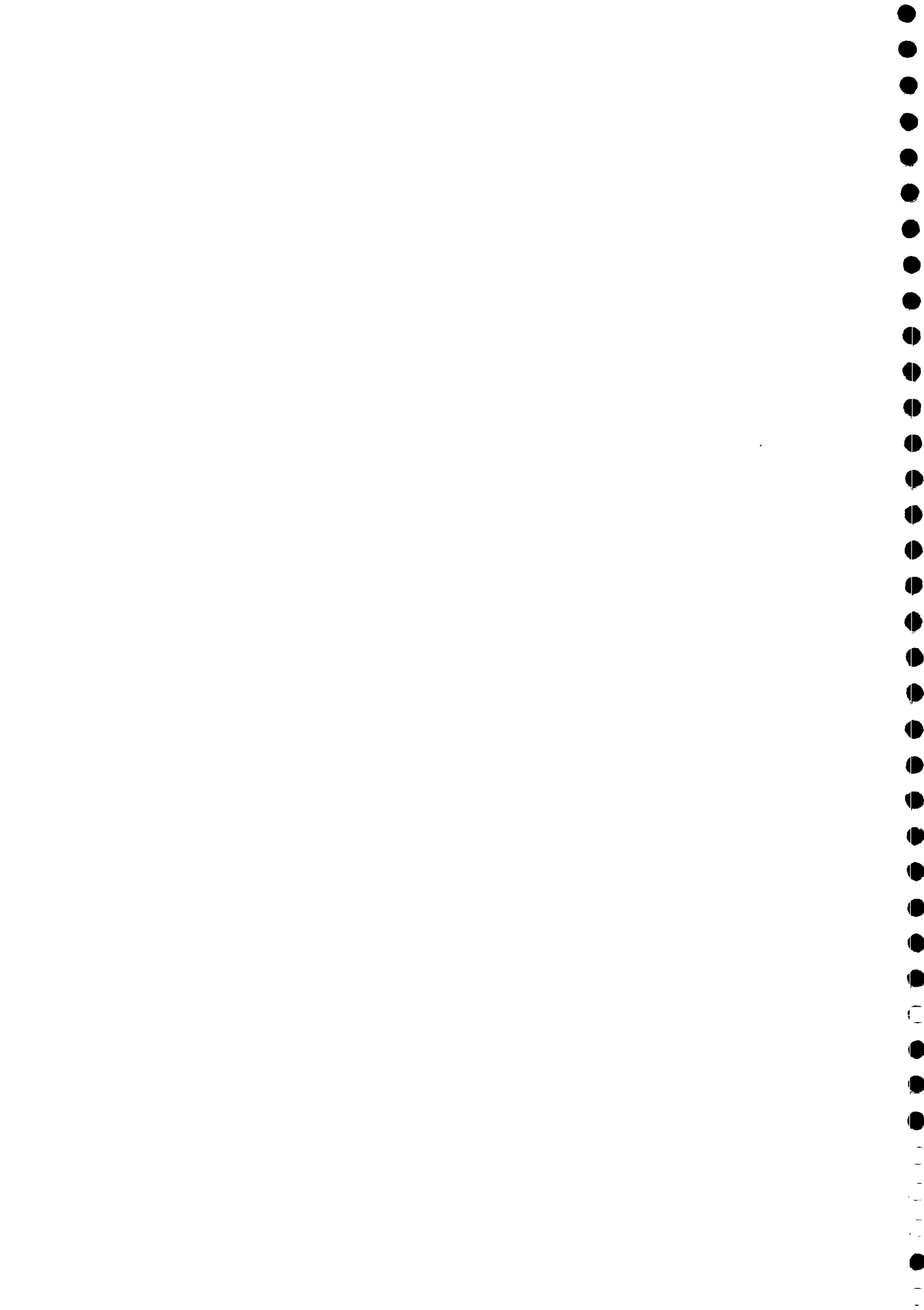
Government of Gujarat, (1997), Socio-Economic Review: Gujarat State 1996-97, Directorate of Economic and Statistics, Gandhinagar.

Ecotech Services, (1996), The Policy Review of Land and Water Sector in Gujarat.

Centre for Media Studies, (1996), Socio-Economic Development Status in Different States



Annexures



Annexure 2.1

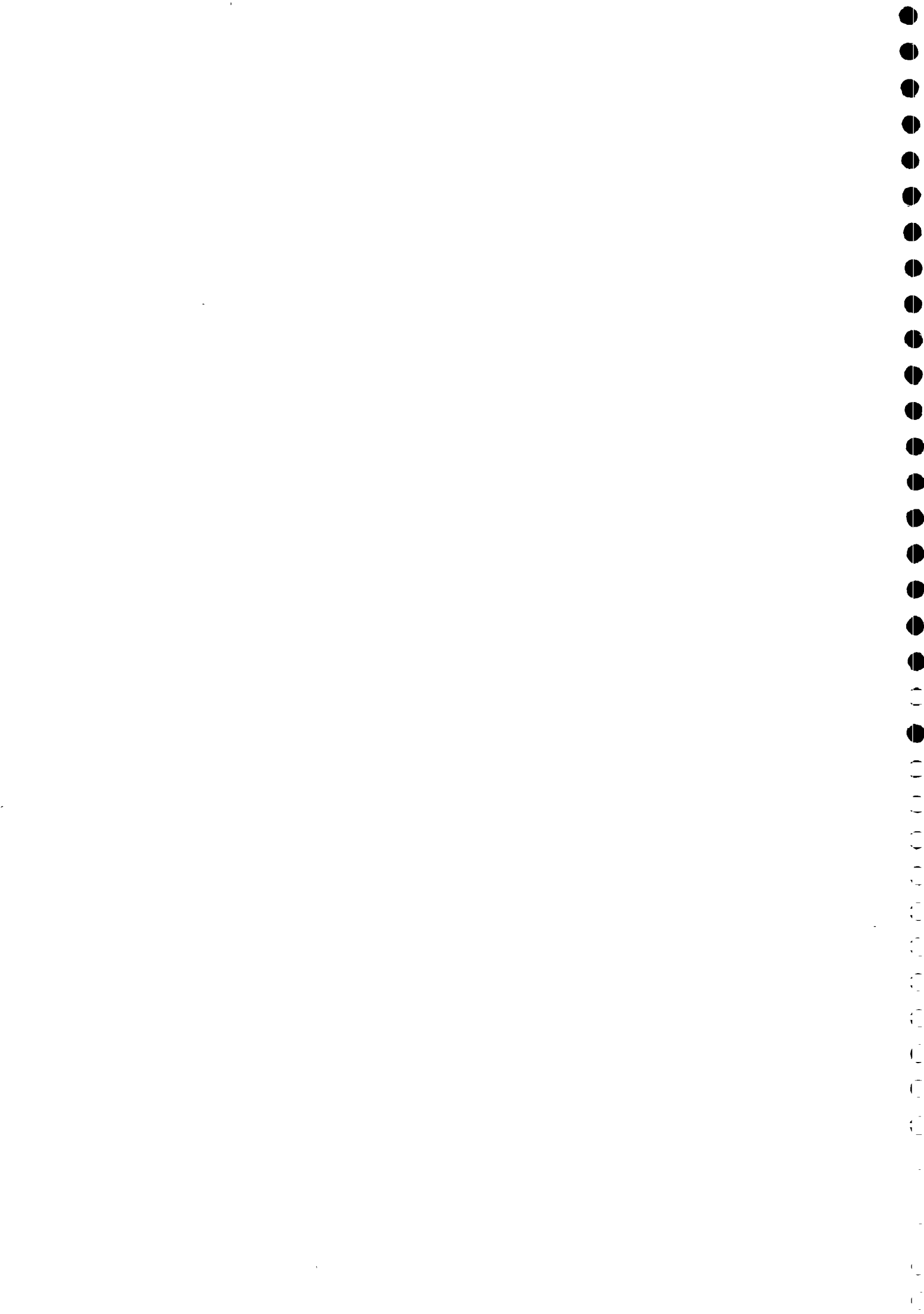
List of Information or Documents Requested for at the State and District Level

State Level

- Annual reports
- Organisational set-up
- Monitoring and evaluation reports
- List, information and appraisal reports of externally aided projects
- Any other sector specific studies undertaken
- Information indicating outlays on operation and maintenance with respect to new investment
- Area coverage and budgetary allocation for different supply systems
- Information pertaining to mini missions
- Capacity building / HRD programmes at the state level
- Specific areas of relevance in the Draft Ninth Plan
- Letter of introduction

District / Circle Level

- Coverage under NC, PC and FC categories
- Area coverage and budgetary allocations under different water supply and sanitation systems
- Special problem areas concerning water quality
- Information, if any, on traditional sources and systems
- Monitoring and evaluation reports
- Information on externally aided projects and studies conducted
- Work plan and financial outlays
- Capacity building / HRD programme at the circle level



Annexure 2.2

Village panchayat members (PRIs) Questionnaire

Respondent identification

Name of respondent

male/female

panchayat position held

Village profile

geographical and administrative

total population

total no of households

major castes

no of phalas/ mohallas

total no of drinking water sources under each type

no of traditional drinking water sources

no of operational drinking water sources

1..What are the main problems pertaining to drinking water in your area:
in order of response.

Checklist

Quality

Quantity

Seasonality

Distance

others

2..What is the ground water level in your area (time line)

3..Ranking of institutions for O&M of DW sources (1-3)

Current practise and assessment

Alternatives suggested ...

Checklist

User groups(with Panchayat participation pani panchavat mode)

User groups (without Panchayat participation)

Govt managed

Voluntary Org

Others

4..Are you willing to undertake the O&M of drinking water sources in your area Y/N

If yes then in your perception these are the problems faced :

Ranking of problems faced by the PRIs pertaining to (1-5)

(Use placards)

Checklist

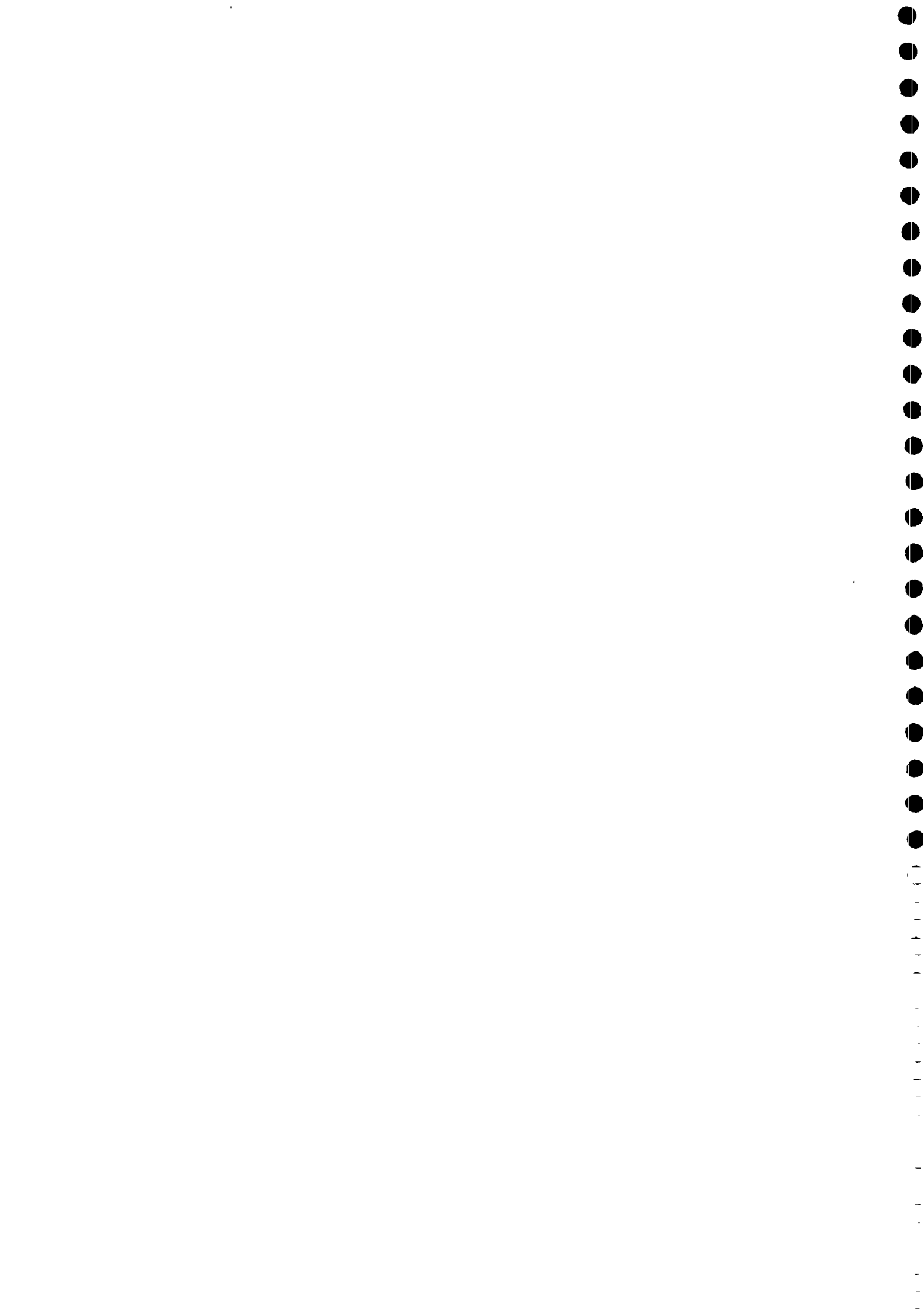
Insufficient funds

No trained manpower at community level

No felt need for community participation due to supply driven approach

Lack of general awareness issue

User's unwillingness to pay



5..Are you consulted for drinking water interventions in the area Y/N... . if yes
for what
by whom
significance of your suggestions for the implementers/ planners in your opinion

6..Who is the most reliable government functionary, in terms of handling of drinking water and sanitation services for your area

7..Panchayats contribution towards improvement in status pertaining to drinking water and sanitation in the panchayat area

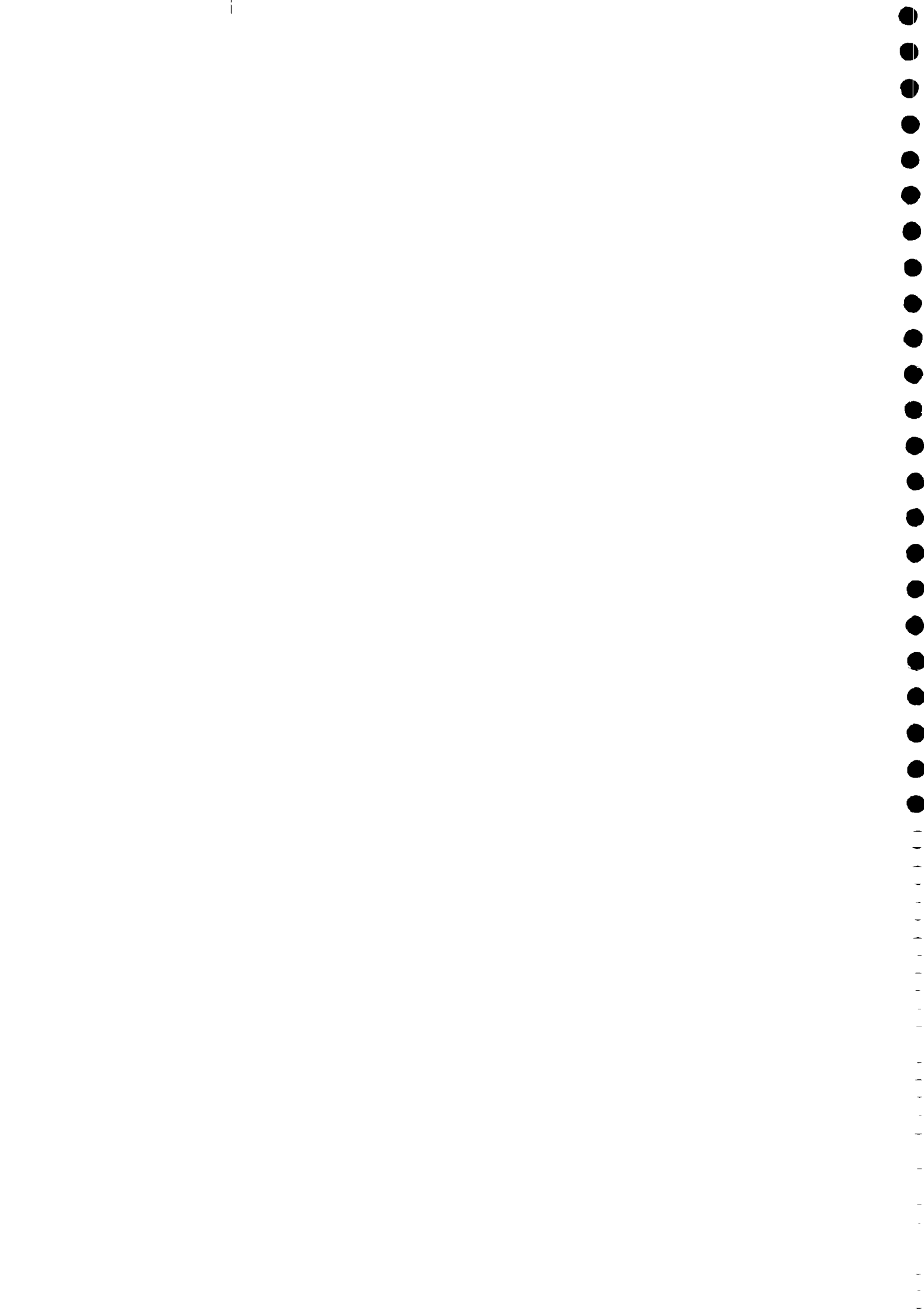
8.. Major lacunas (apart from income) which act as impediments towards motivation for contribution.. .. .

Checklist ·

Transparency regarding use of generated funds

General awareness

In-operational mechanisms



Annexure 2.3

Village level non-panchayat (Community Individuals) Questionnaire

Household identification :

Name of respondent

Sex

Village.

Block

Total no Of family members

Main Occupation

Whether SC/ST

No. Of earning members

Total income (all sources) per month (avg)

peak months of income & months when income is low

No Of Animals

Drinking Water consumption for household needs per day(matka/bucket in litre terms)

Water consumption for animals(drinking)

1.. Detail of main drinking water sources used (ranking if applicable :as per use frequency)

Community well

Own Well

Tank Water (community tap)

Tank Water (house hold tap)

River /Canal/ Pond

Others

2.. Distance of Primary DW source:

<50mts

51-100mts

101-200mts

201-500mts

501<mts

3..Nature of Water from the main DW source being used

Potable-sweet

Potable-normal

Non Potable-normal

Non Potable-saline

Non Potable

Others

4.. Frequency of water releases if piped

Every day / no Of days in a week. . .

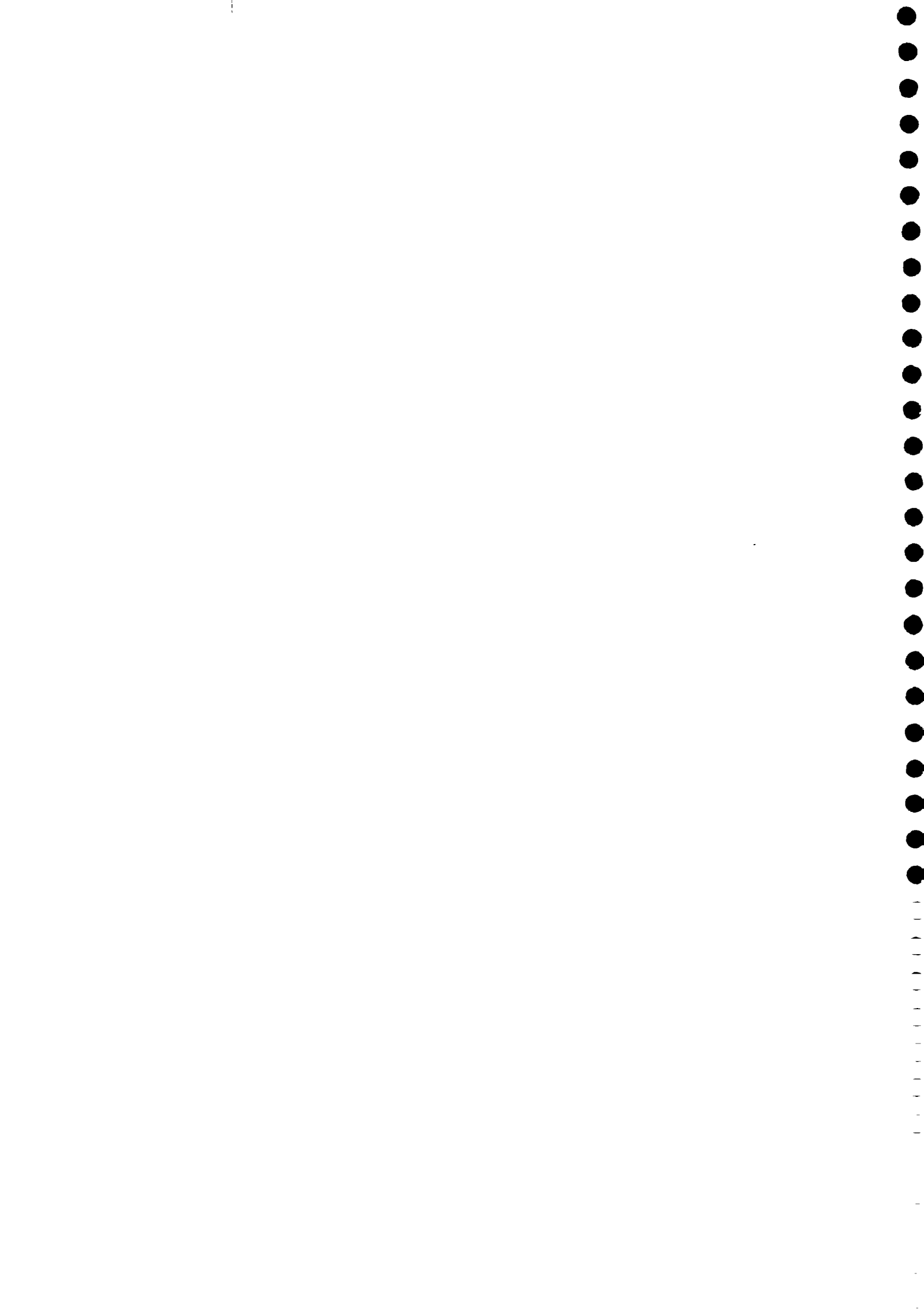
No Of Hours

Non Scarcity

Scarcity months

Morning

Evening



5.. Collection

a

Where do you get your water for drinking

1 wells 1 private 1 inside house 1 inside village
2 HP 2 govt 2 outside house 2 outside village
3 tap
any others ..please specify.

b

Is this the nearest source of water Y/N

if N then why don't you use the nearest source:

caste problem
quality problem
in sufficient quantity
family conflict
any others

c

How long does it take to reach your main drinking water source: .. .minutes .. . Km

d

How many trips do you make daily.

e

What is the quantity that you collect daily from this source..... ..litres

f

If you use other sources also, What is the quantity that you collect daily from other sources. ...
litres

g

For summer months do you go to the same place to collect water Y/N

if N. then where do you go to collect water

1 wells 1 private 1 inside house 1 inside village
2 HP 2 govt. 2 outside house 2 outside village
3 tap
any others. ..please specify

6..Purposes for which the main drinking water source is being used

collection
drinking on site
drinking by cattle on site
washing on site
bathing on site
bathing animals on site

7..Problems perceived in the main source being used

a

List of problems in order of response.....

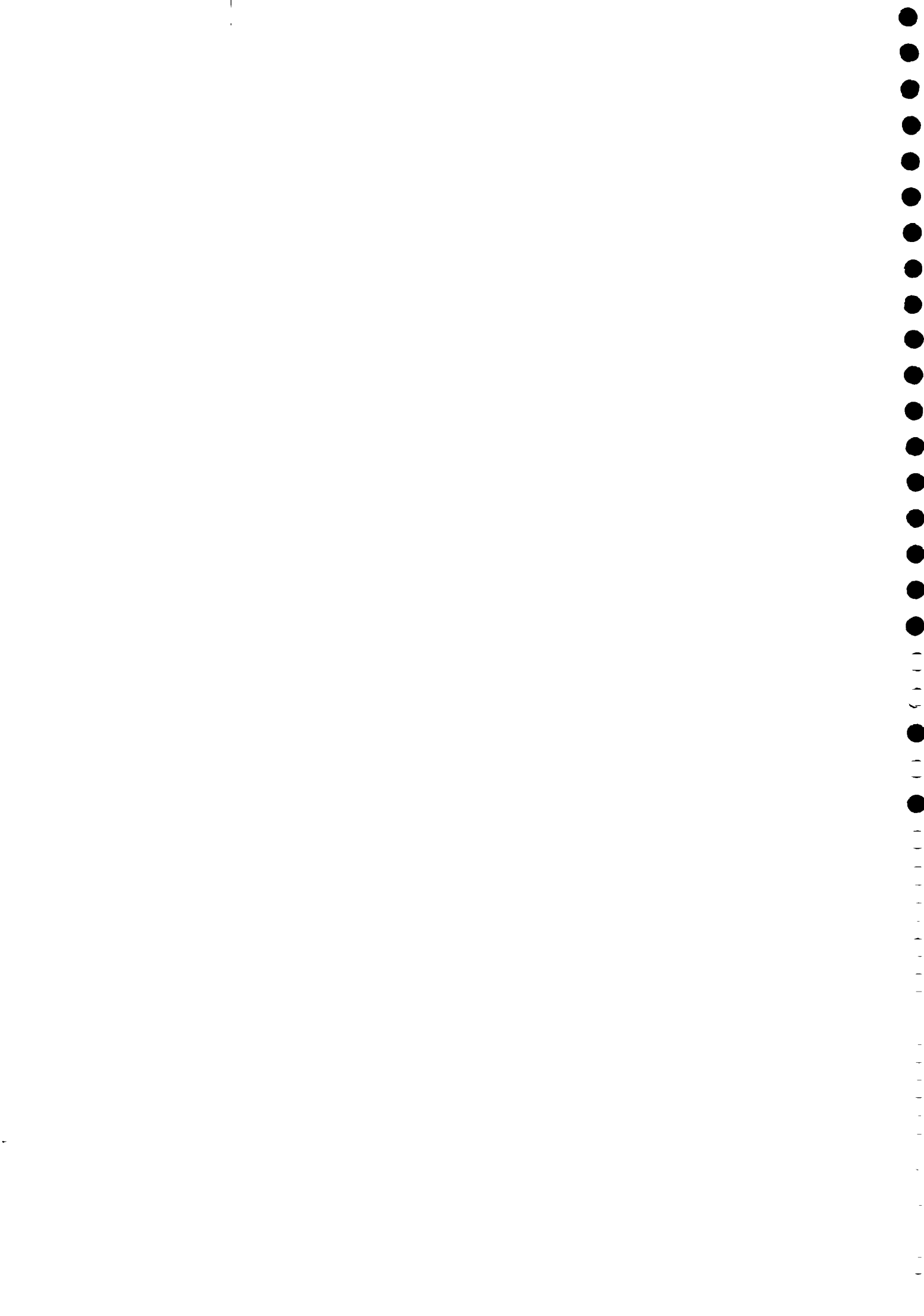
Checklist

Distance

Seasonality

Quality

Quantity



b

Main reasons for source going out of order:

Improper use

Damage due to natural calamities

Damage by miscreants

Theft of Parts

Lack of maintenance

Others

8..Hygiene conditions around the DW source: (poor, satisfactory, good)

If poor, response statement on why considered poor.. . . .

9..Purchase of water

Months

nō Days in the month

amount spend in the month on purchase

amount bought per day of purchase

10..Demand assessment / Willingness to pay:

a What the household currently pays for DW & S services

b. Have you contributed for capital investment towards a community DW source if yes. the amount. type of source.....

<Rs100

Rs100-Rs300

Rs300-Rs500

Rs500-Rs1000

Rs1000<

c. Have you contributed towards O&M of a community DW source, if yes. . amount.

Type of source.

d Do you need more water for domestic purposes? N

Y How much more per day? _____ litres

e Suppose your village people got together in a small group(samiti) to build a new source for this additional water, and you all had to collect money to do this work How much would you becontribute?

Rs _____ or _____ days of labour time or
_____ amount of material.

f Now the group would also need money to do repairs and maintain and to clean this new source If this money was collected as a monthly fee, how much would you pay?

i Rs _____ per month/per litre

ii **Nothing**
Why? _____



g. What sort of system would you prefer for making additional water available?

11..Under what mechanism ...

Would you contribute more easily (separately for O&M and capital costs) :

A Collection system exclusively by Panchayats

B Collection by district / block level government functionaries

C Local user association collection units

Present Contribution mechanism if any.....

12..Perceptions about safe drinking water for humans..and for animals.(One statement each)
checklist: sweet, clear, source based judgement

13..Ranking of practices considered as most important to hygiene (1-7):

(Use of placards)

Washing of hands after defecating with water

Washing of hands before meals

Preventing water stagnation near drinking water sources.

Use of community latrines

Use of in house/ private latrines.

Use of fields/ running water for latrine

Collection storage and use practices

14..Do you have a house hold latrine Y/ N

If yes type of house hold latrine.....

If no: defecating practices.....

Utility of Household latrine (None, indifferent, useful, acute need felt)

15..Measures suggested for making provisions for HH latrine

Most preferred measure

What kind of contribution would you provide to make this possible

16..Problems of accumulated waste water--list of problems generated in order of response ...

17..Drainage Route check:(draw as per the response)

Waste water generated

*Water thrown into drain
within house*

*Water collected
temporarily*

Thrown outside house

*Open Space /road
within sett*

Field/farm

Open space

Stagnates

Drain outside house

Goes a little distance , disposal outside

house












Joins common village drain

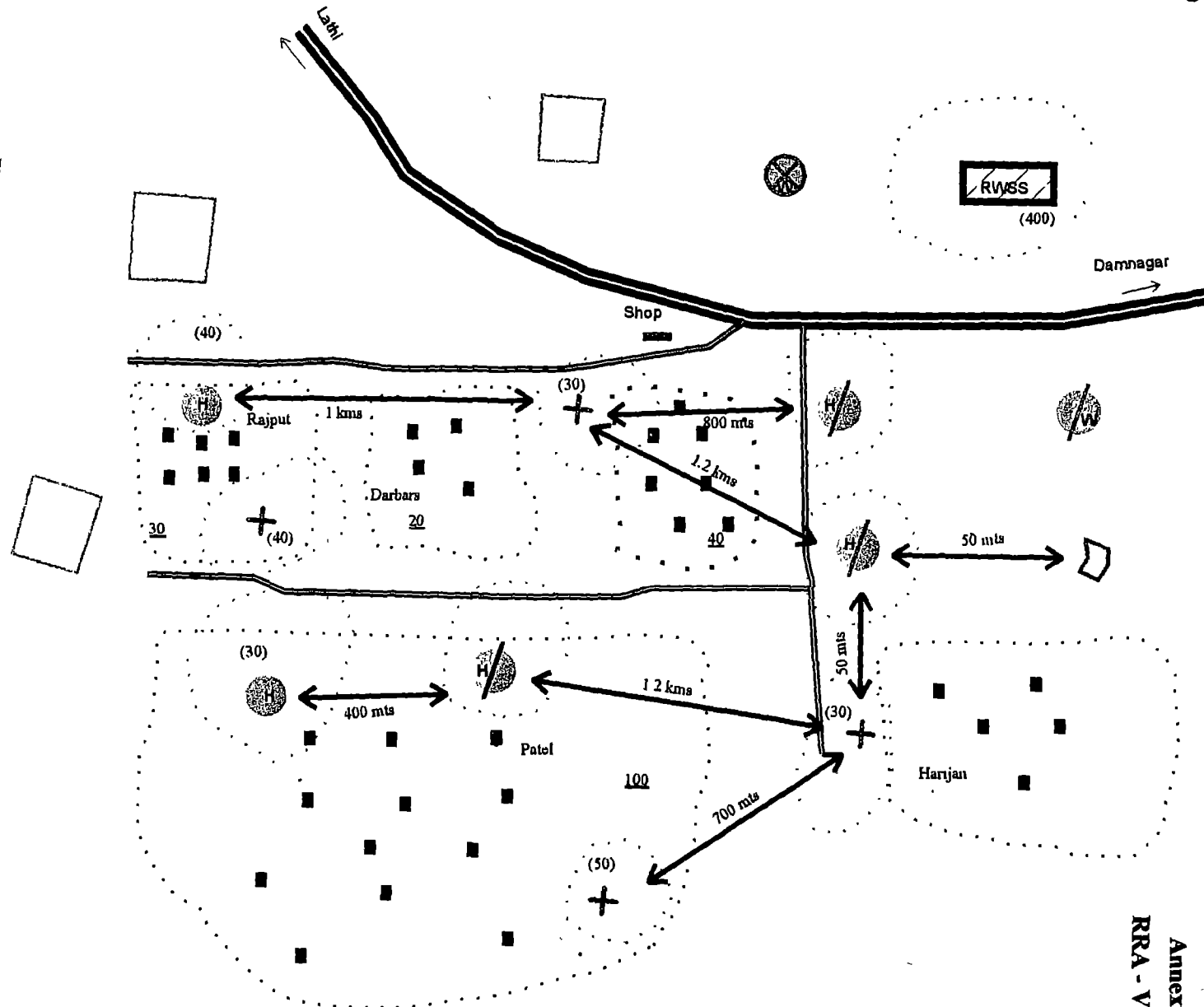
Pit

Water Source

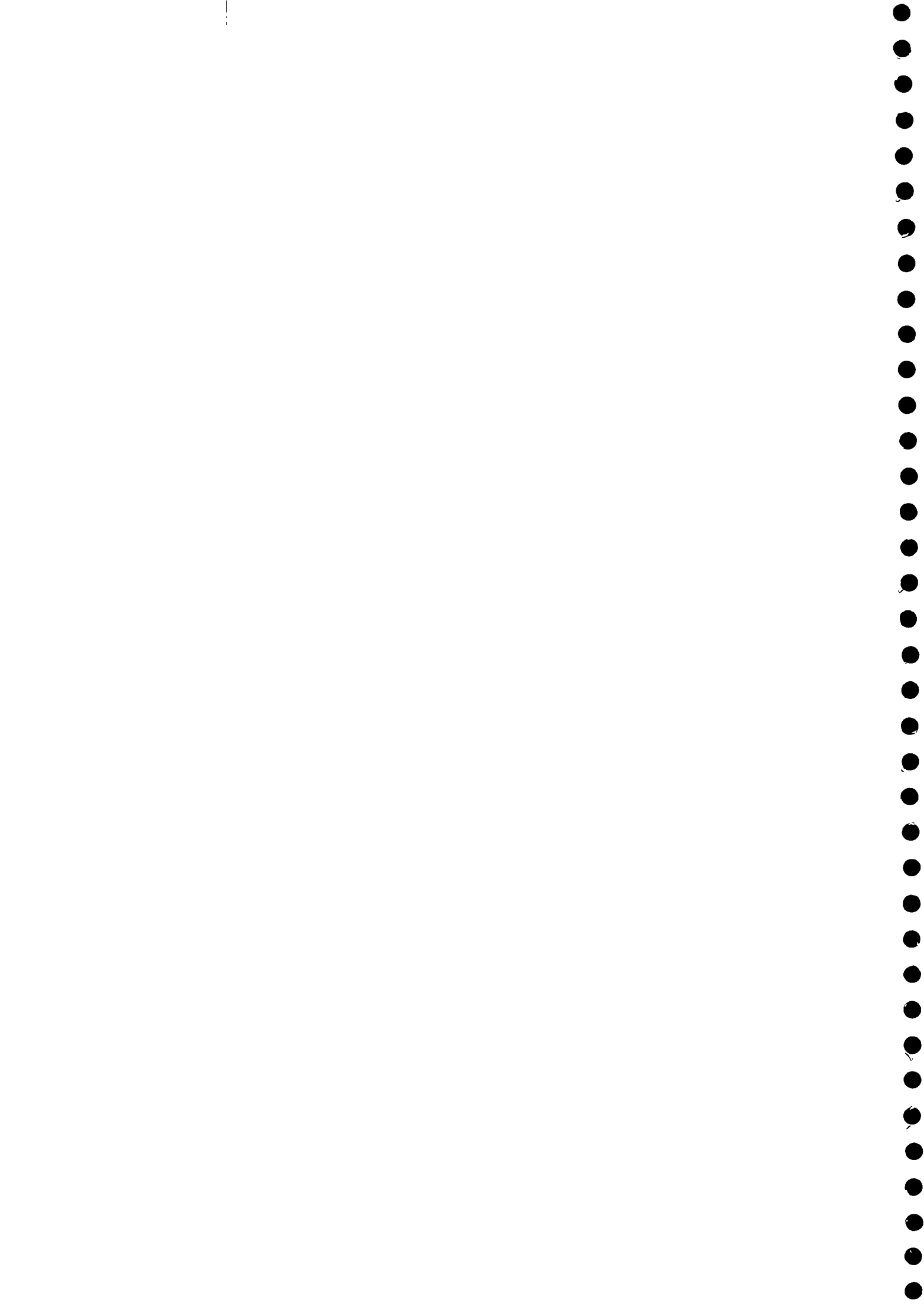


Village: Lajpar
 Taluka: Lathi
 District: Amreli
 State: Gujarat

-  Road
-  Village Boundary
-  Extent of influence of water source
-  Hamlet Boundary
- (40) Number of households served by the source
- 30 Number of households in the hamlet
- W Well
- H Handpump- Government
-  Private source for both drinking water & irrigation
-  Low yield Source
-  In-operational Source
- Houses
-  Public Drinking Water Tap
-  Tank
-  Primary School
-  Fields outside the village belonging to people of the village



Annexure 2.4
 RRA - Village Map



Annexure 2.5

List of People Met for Secondary Information

Mr Sanjay Mitra, Director (CRSP), Rajiv Gandhi National drinking water Mission , *N Delhi*

Mr Vijay Kumar, Deputy Director (CRSP), Rajiv Gandhi National drinking water Mission , *N Delhi*

Mr Carl .D L. Brands, First Secretary, Water and Sanitation, Royal Netherlands Embassy, *N.Delhi*

Mr R.K Tripathi Secretary (WS), Narmada Water Resources and Water Supply Department, *Gandhinagar.*

Ms Swatantra . K Sekhon, Ex- Secretary (WS), Narmada Water Resources and Water Supply Department, *Gandhinagar*

Mr Shah, Superintending Engineer, Narmada Cell, GWSSB, *Gandhinagar.*

Mr Vashist, Asst. to Superintending Engineer, GWSSB, *Panchmahal.*

Mr M.H Barot, Executive Engineer, GWSSB, Palanpur, *Banaskantha*

Mr D Patel, Executive Engineer, Mechanical division, GWSSB, Godhara, *Panchmahal.*

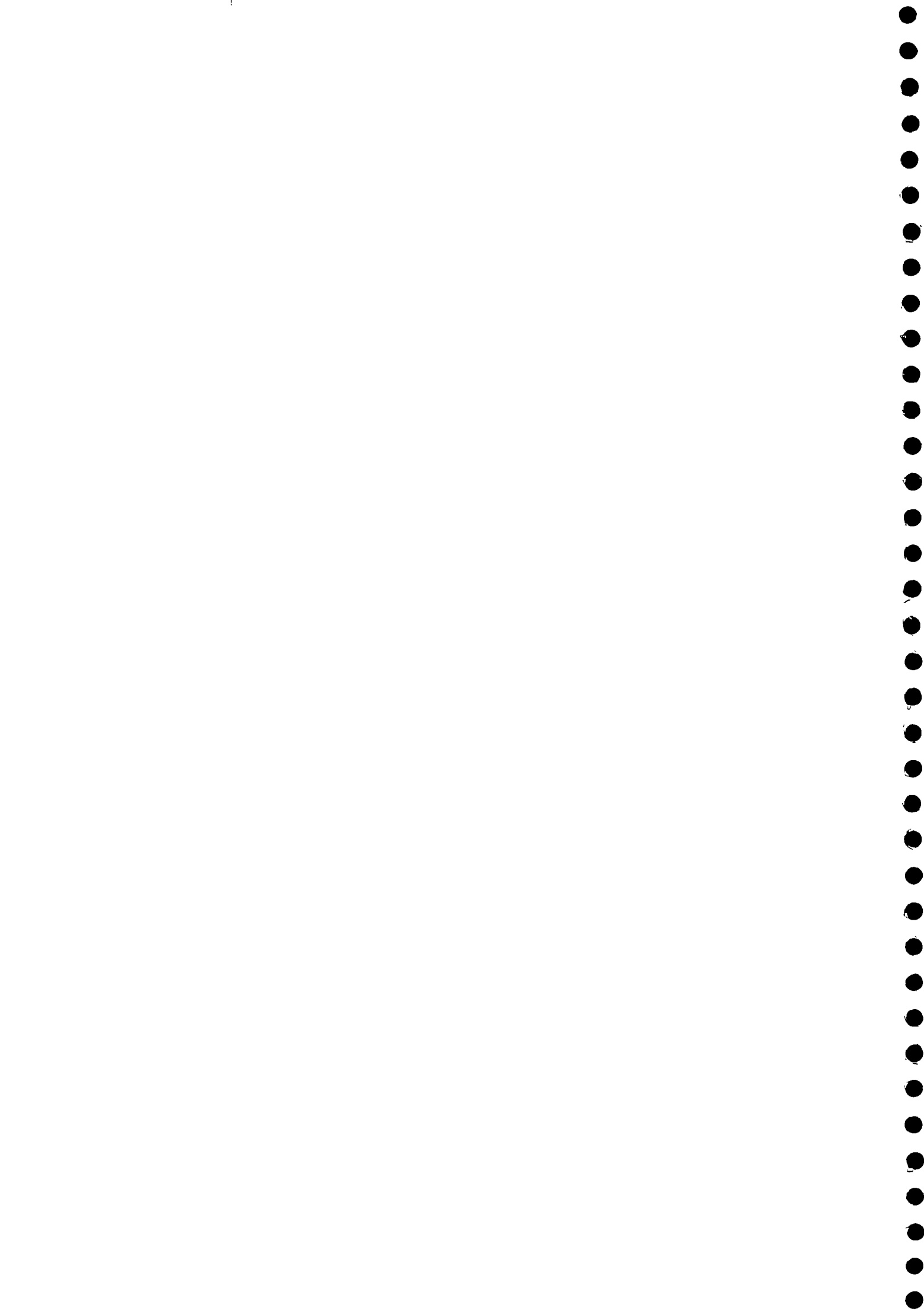
Mr K.P. Patel, Deputy Engineer, GWSSB, Circle office, Palanpur, *Banaskantha.*

Mr D K. Acharaya, Deputy Engineer, GWSSB, Palanpur, *Banaskantha*

Mr N K. Patel, Junior Engineer, GWSSB, Division (II), Palanpur, *Banaskantha*

Mr Prajapati, Hydrologist, Division office, Godhara, *Panchmahal.*

Mr. Sharma, district co-ordinator, Nehru Yuva Kendra, Godhra, *Panchmahal*

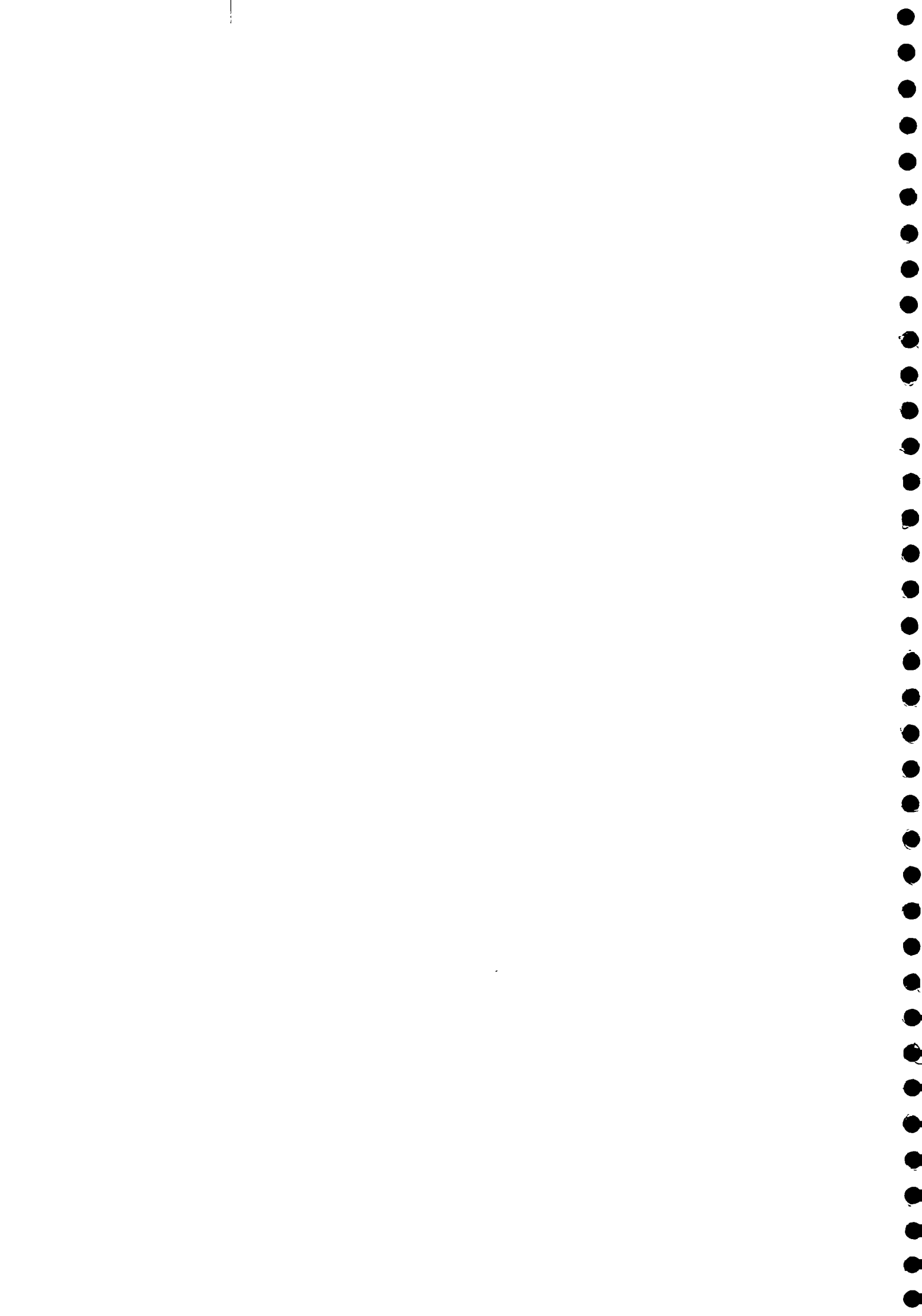


Annexure 4.1

Percentage of Rural Households Having Access to Safe Drinking Water and Sanitation

State / District	Safe Drinking Water	Rural Sanitation
Gujarat	60	11.2
Ahmedabad	61	10.3
Amreli	74.5	7.9
Banaskantha	70.5	6.1
Bharuch	65.7	22.1
Bhavnagar	59	6.5
Gandhinagar	90.5	15.1
Jamnagar	53.6	6.8
Junagarh	64.7	8
Kachchh	73.9	15.4
Kheda	62.8	17.2
Mahesana	81.2	11.2
Panchmahals	35.6	4.8
Rajkot	67.4	7.8
Sabarkantha	63.4	10.5
Surat	45	16.8
Surendranagar	39.8	4
The Dangs	9	3.11
Vadodara	63.4	15.5
Valsad	41.6	11.6

Source: Centre for Media Studies (1996), Socio-Economic Development Status in Different States

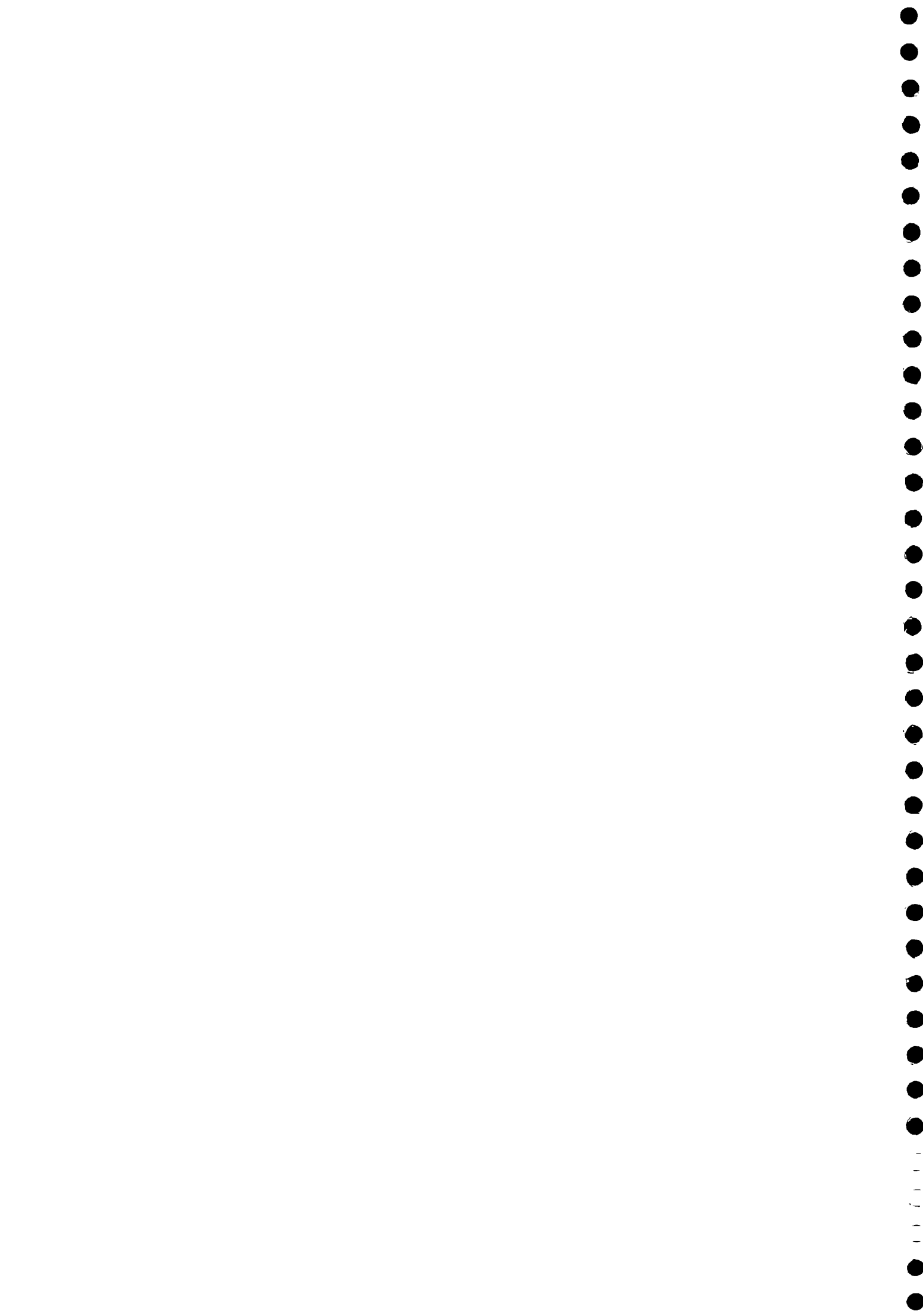


Annexure 4.2

Outlay and Expenditure under Water Supply and Sanitation Sector in Various Annual Plans (in Lakhs)

Year	Outlay	Sectoral outlay as percentage of total outlay	Expenditure	Expenditure as percentage of outlay
1992-93	8071	4.3	7709.63	95.5
1993-94	19353	9.1	7396.72	38.2
1994-95	19556	8.7	6578.74	33.6
1995-96	17820	6.8	8489.94	47.6
1996-97	13000	3.8		
1997-98	60000	13.3		

Source: Development Programme 1997-98, Government of Gujarat.



Annexure 4.3

Various Schemes and Programmes Running under Water Supply Sector in the State of Gujarat

i) Regional Water Supply Schemes

a) Accelerated Rural Programme (Regional Schemes)

50 schemes covering 1356 habitations with an estimated cost of Rs.15,000 lakhs are in programme. Expenditure upto March, 97 was Rs 9500 lakhs, leaving a balance requirement of Rs 5500 lakhs. Expenditure proposed during 1997-98 was Rs 2000 lakhs, of which 50% is the share of Government of Gujarat

b) MNP Regional Water Supply Schemes

44 schemes covering 1260 habitations at an estimated cost of Rs.17000 lakhs are in the programme. Expenditure upto March'97 was Rs.7700 lakhs, leaving a balance of Rs.9300 lakhs. The proposed expenditure during 1997-98 was Rs.1000 lakhs to be borne entirely by the State.

c) Desert Development Programme

5 regional schemes are in progress under this programme, of which 3 schemes are almost complete and 2 are being taken up at an estimated cost of Rs 1050 lakhs to be made available by the Government of India

d) Regional Schemes awaiting approval

About 67 regional schemes, having an estimated cost of Rs.13,500 lakhs for 1093 habitations are under the process of approval. A token provision of Rs 500 lakhs has been proposed for such schemes.

ii) Border Area Development Programme

To address the need of water supply for the two border districts of Kachchh and Banaskantha, an outlay of Rs. 500 lakhs was provided under this programme

iii) Poverty Alleviation Programme

It is proposed to take up a programme of providing water to slum dwellers in urban areas and hamlets of Indira Awas Yojna in rural areas (minimum 50 persons). Under this programme, suitable extension scheme such as extension of pipeline, construction of stand-post etc or construction of low cost hand-pumps, source simple wells may be taken up. On completion, the scheme will be handed over to village panchayats or concerned local bodies for maintenance and repair. Rs 200 lakhs (Rs 100 lakh for rural areas and 100 lakh for urban areas) had been provided under this programme for the year 1997-98

iv) Recharging Programme

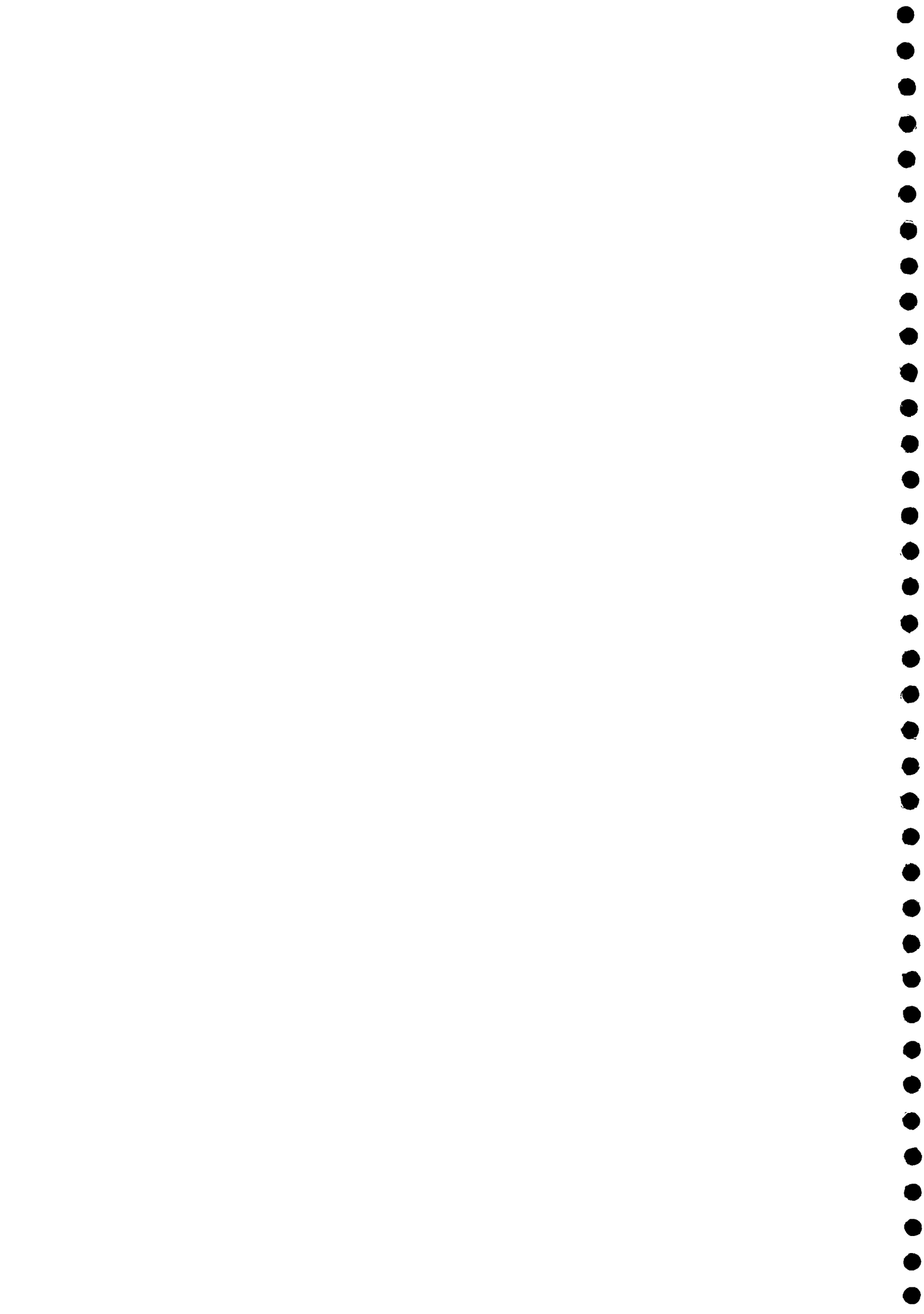
Recharging of existing sources is found necessary in view of the scanty and erratic rainfall pattern. A provision of Rs 900 lakhs was made in the year 1997-98 under the programme.

v) Construction of Rain Water Storage Tanks

Traditionally rainwater storage tanks were constructed by the households to cater to the need of drinking water during the summer/scarcity period. It has been felt that there is need to motivate the construction of such tanks in the State. The households will be paid a subsidy (rate not yet decided) under this programme for construction of such tanks. Rs 100 lakhs had been allocated under this programme in the year 1997-98.

vi) Purchase of Small Reservoirs

Owing to the falling availability of groundwater in the State, the focus is now on making use of surface water available in reservoirs for drinking water supply. In the first instance the focus is on numerous surface water reservoirs in Saurashtra and Kachchh areas. In the year 1997-98 an allocation of Rs. 500



lakhs had been made for this purpose

vii) Canal Lining

It has been found necessary to cut down on the seepage losses from canals by lining them and using the water saved for drinking purpose. The water resources department would be required to be paid the amount for this by Government of Gujarat in Health and Family Welfare Department. A provision of Rs 700 lakhs has been provided for this

viii) Implementation of Scheme for Saurashtra, Kachchh, North Gujarat and Panchmahals based on Sardar Sarovar Canal

Narmada tribunal has allocated 3582 MLD of water for domestic and industrial use. Out of this 2921 MLD has been allocated for the drinking water needs of 8215 villages and 135 urban centres, as detailed below

District	Villages	Towns
Saurashtra & Kachchh	5825	100
Ahmedabad	377	12
Mehsana	542	13
Banaskantha	490	3
Sabarkantha	568	-
Panchmahal	413	-
Total	8215	135

Source Eighth Five Year Plan 1992-97, Government of Gujarat

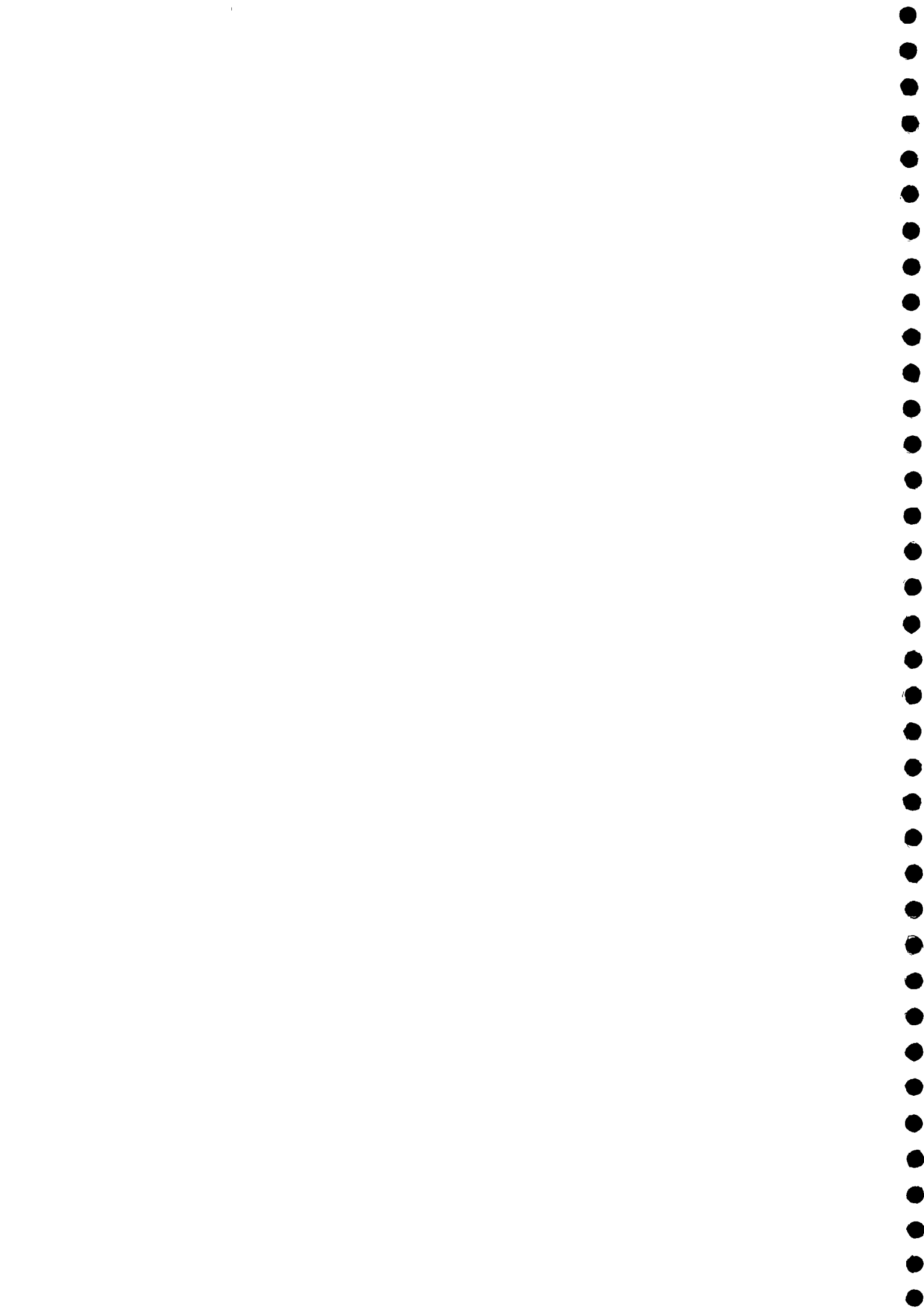
Scarcity Relief

During drought years, the government spends large amounts of money in transporting water from long distances to different affected areas. Supply of water through tankers is a major arrangement for supply of water in Saurashtra and Kachchh. The State Government has to prepare special Master Plans to meet with the acute drinking water scarcity and has spent huge amounts on drinking water supply in addition to normal water supply programmes. There have been years when the total allocation under scarcity master plan has overshoot the allocation under the regular plan

Funds Allocated for drinking water Supply (Rs. In Lakhs)

Year	Funds Provided in Normal Plan				Scarcity Master Plan		
	MNP	Rural ARP	Urban	Total	Rural	Urban	Total
1985-86	1500	846	867	3213	5886	2191	8077
1986-87	1590	1737	1137	4464	3075	1280	4355
1987-88	2660	2249	1833	6742	6739	3185	9924
1988-89	2589	1611	1747	5947	-	-	-
1989-90	4700	1464	375	6539	-	-	-
1990-91	4400	1464	400	6264	2100	-	2100
1991-92	4700	2000	550	7250	5680	1810	7490

Source Eighth Five Year Plan 1992-97, Government of Gujarat

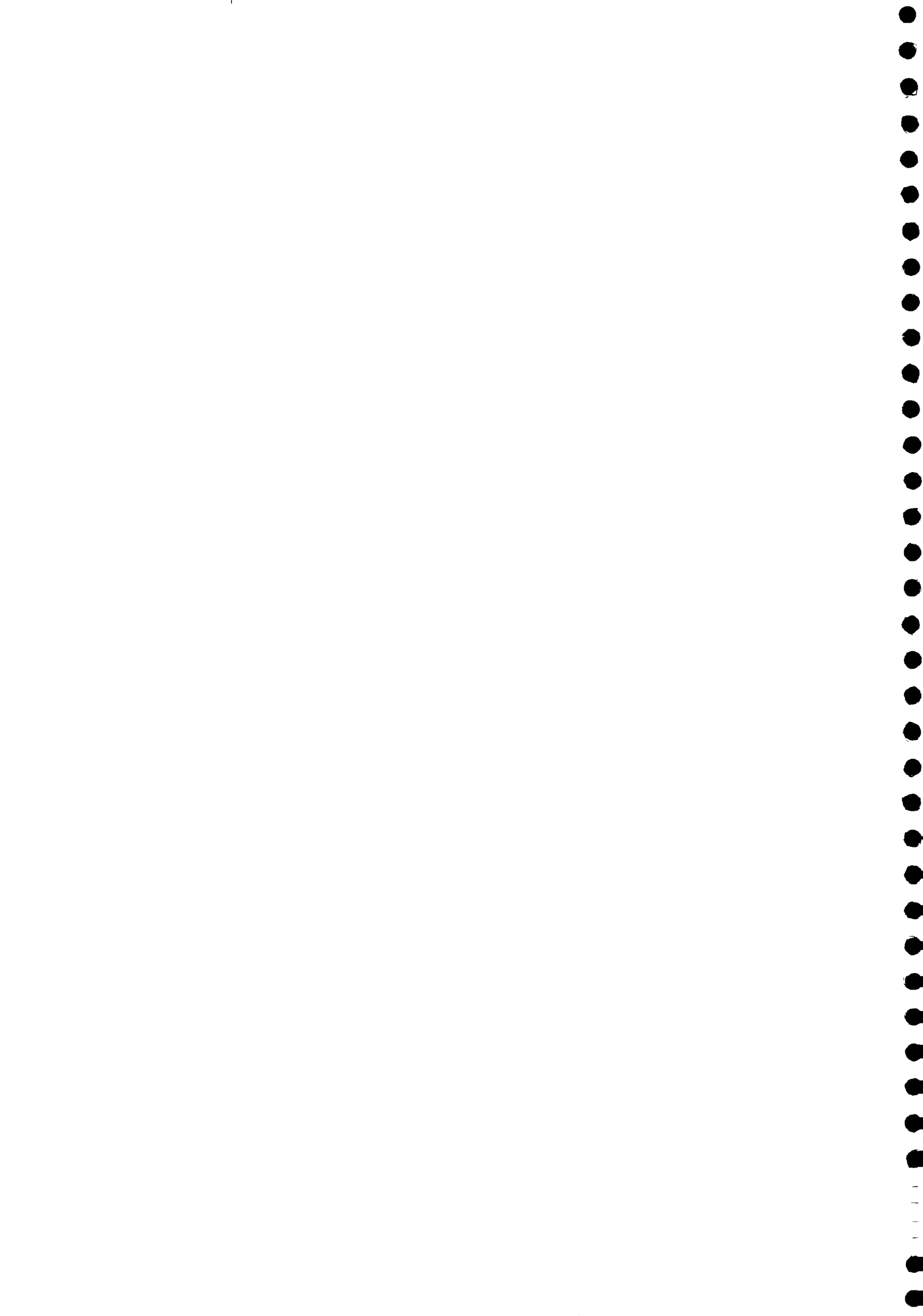


Annexure 4.4

Outlay Under Various Water Supply and Sewerage Scheme, 1997-98 (in lakhs)

Head of Development	Outlay	Capital Content
Survey and Investigation	20	
Research and Development	100	
Rural Sanitation	1000	
Urban Sanitation	600	
Urban Water Supply	550	150
Rural Water Supply (MNP)	10400	8400
Cost of Off Bldg & Staff Quart	200	200
Border Area Dev Programme	500	500
Poverty Alleviation Prog	200	200
Recharging Schemes	900	
Fluoride Schemes	900	900
Purchase of Reservoirs	500	500
Cost of Rain water Storage Tanks	100	
IEC & HRD Tanks	30	
Implementation of Water Supply Scheme for Saurashtra, Kachchh, North Gujarat & Panchmahals based on Sardar Sarovar Canal	44000	43500
Total	60000	54350

Source: Development Programme 1997-98, Government of Gujarat



Annexure 6.1

Pani Panchayat / Samiti

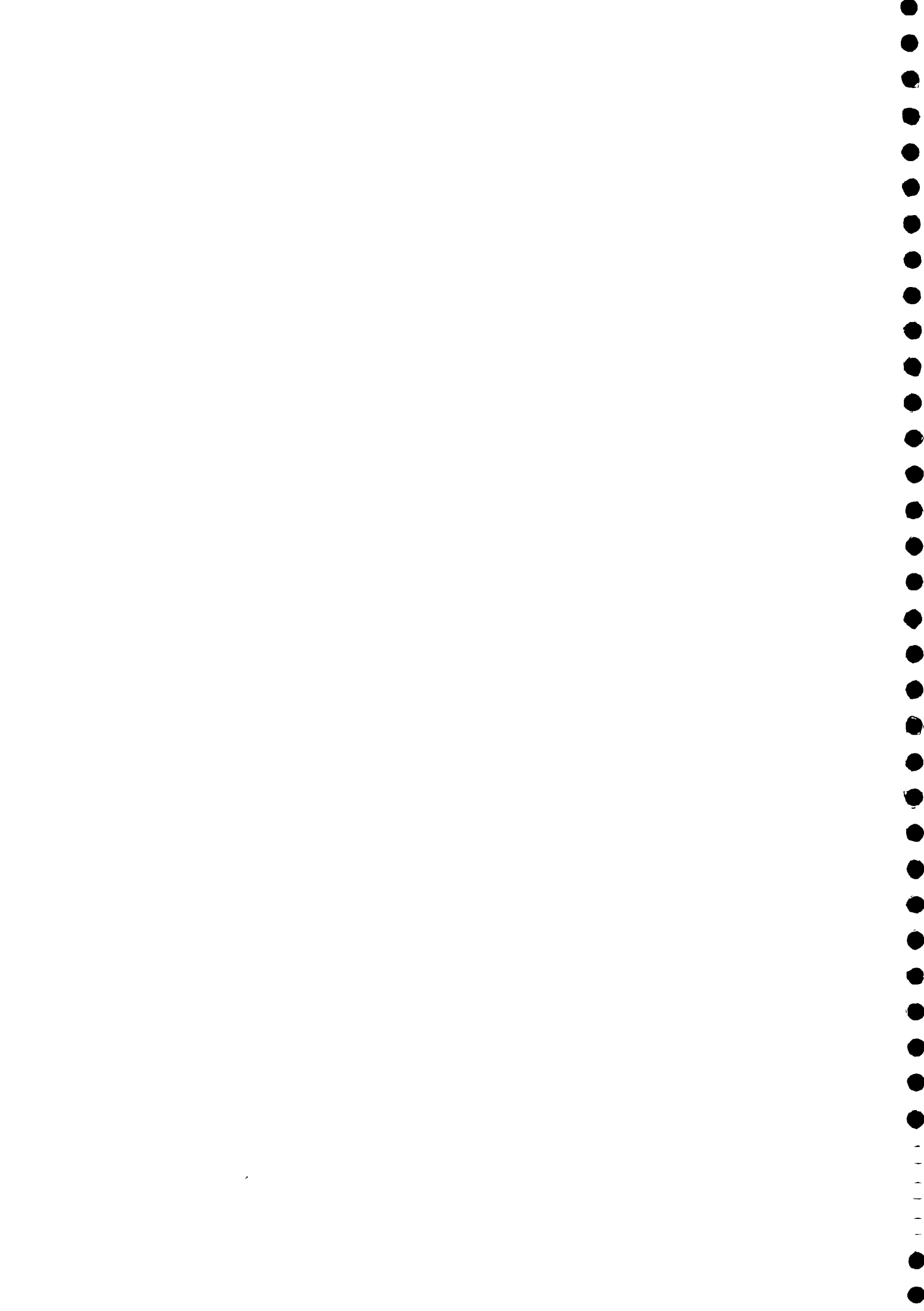
Pani Panchayat is a voluntary board, without a legal status, and consists of the Sarpanch, the linesman (technician for the pipeline), two men and two women from each village. The members of the Pani Panchayat are not elected but nominated by the GWSSB. The purpose of the committee is to monitor water supply, collect water tariffs and promote water conservation amongst the people in their communities. They were not allowed to operate a bank account and had very little authority to ensure the basic mandate of localised maintenance of water supply schemes and initiating a cost recovery mechanism among others.

As per a proposal to the Government of Gujarat (GOG), a resolution was passed in April 1995, about Pani samitis (the new name for what was previously pani panchayat), whereby they were given a legal status. According to the resolution the pani samiti of the concerned village Panchayat should consist of following members:

- | | |
|--|-----------|
| • Sarpanch of Village Panchayat | President |
| • A female member of Village Panchayat | Member |
| • One other member of Village Panchayat | Member |
| • A local habitant from among female health worker/lady teacher/anganwadi worker | Member |
| • Representative of Local Voluntary Organisation | Member |
| • Representative from among the people residing near the outskirts of Public Stand and who can voluntarily take interest in water supply works | Member |
| • Representative (village level) of GWSSB | Member |
| • Talati cum secretary of Village Panchayat | Member |

A number of Pani samiti members are from the village Panchayat (as in the pani panchayat so that the orientation efforts are not lost) and the term of the samiti thus, linked with the term of the panchayat.

As per the resolution, the pani samitis are empowered to collect annual water charges @ Rs 14.00 per capita and retain Rs 5 of the same for maintenance of the public facilities. The guideline regarding the retention of a certain amount is still pending approval.

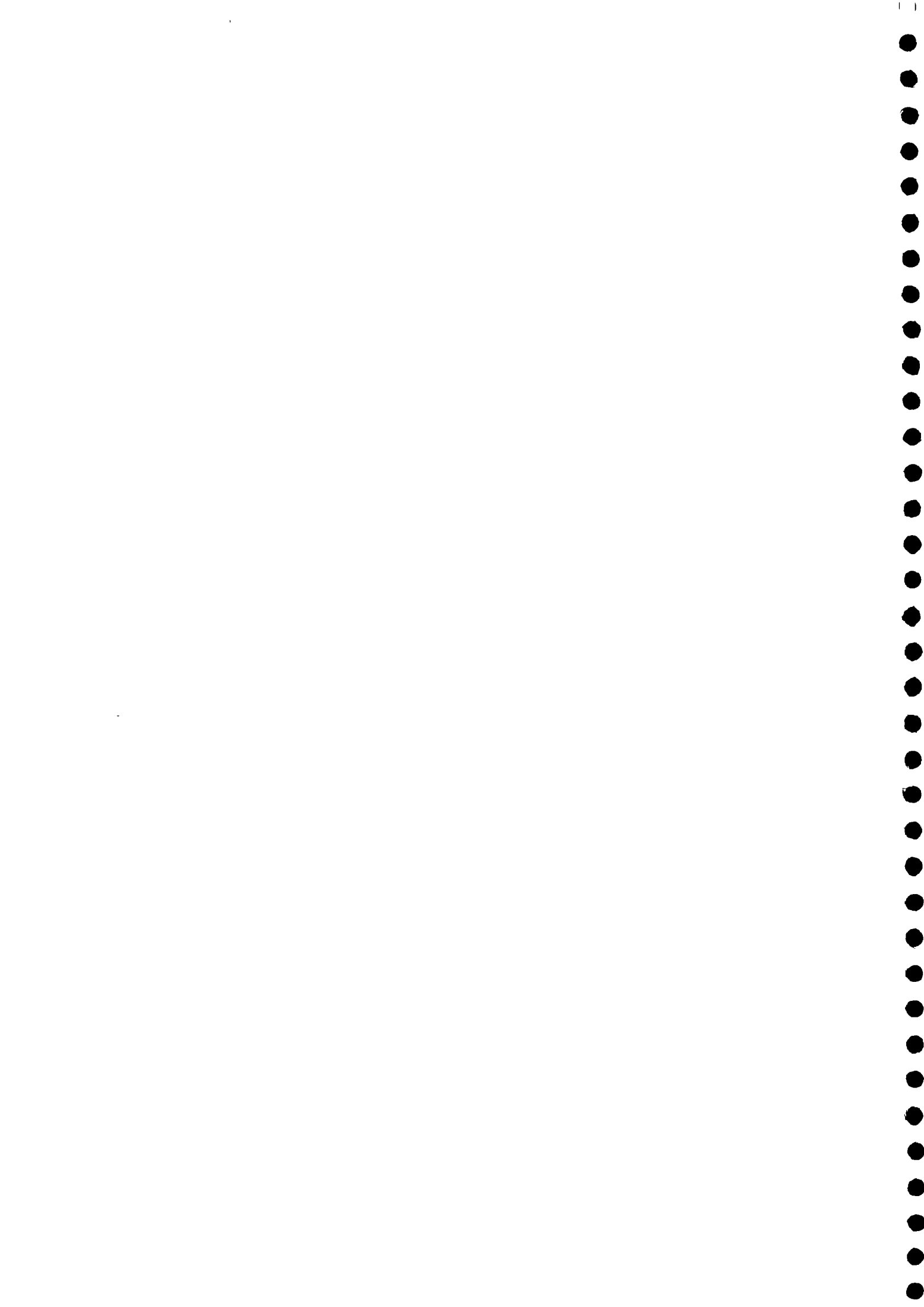


Annexure 11.1

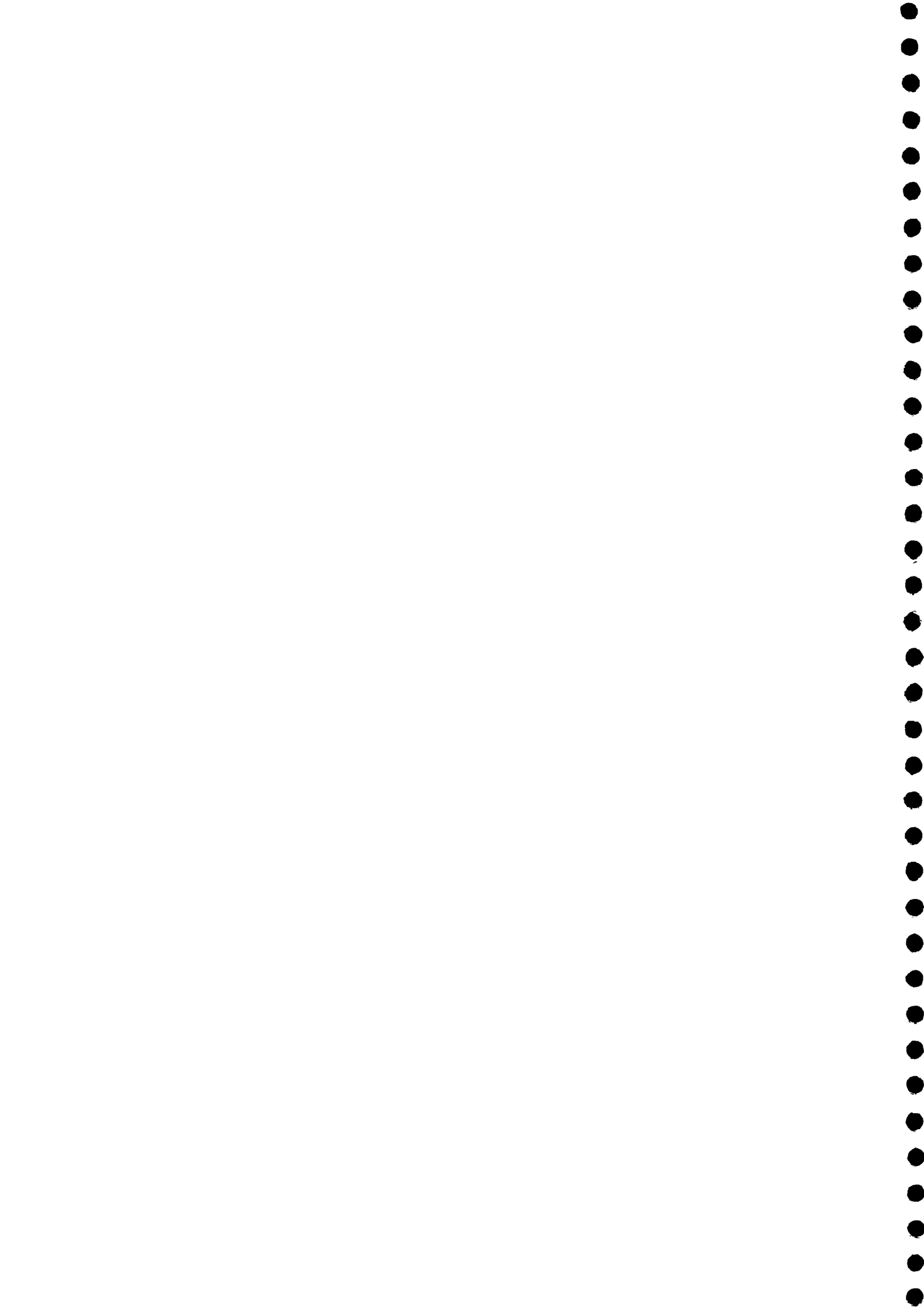
Water Quality Standards as Prescribed by ISO

Water Class	Designated Best Use	Criteria
A	Drinking water source without conventional treatment but after disinfection	Total coliform organism = <50 MNP/100 ml pH 6.5 to 8.5 DO => 6mg/l BOD 5 days 20 degC =<2mg/l
B	Outdoor bathing (organised)	Total coliform organism = <500 MNP/100 ml pH 6.5 to 8.5 DO => 5mg/l BOD 5 days 20 degC =<3mg/l
C	Drinking water source with conventional treatment followed by disinfection	Total coliform organism = <5000 MNP/100 ml pH 6.0 to 9.0 DO => 4mg/l BOD 5 days 20 degC =<3mg/l
D	Propagation of wildlife and/or fisheries	pH 6.5 to 8.5 DO => 4mg/l Free Ammonia (as N) =< 1.2mg/l
E	Irrigation, industrial cooling, controlled waste disposal	pH 6.0 to 8.5 Maximum electrical conductivity at 25 deg C = 2250 us/cm Maximum Sodium Absorption Ratio 26 Maximum Boron =< 2mg/l

Source: Indian Standards Organisation



Reference Document



District Panchmahals

1. Introduction

Panchmahal district, located in the North-eastern part of Gujarat between 22deg 15' and 23 deg 30' North Latitude and 73 deg 22' and 74 deg 30' East latitude, is bordered by the state of Madhya Pradesh on its East, state of Rajasthan on North East, district Sabarkantha in north west, district Kheda on West and district Baroda on South. The total population of the district, which primarily consists of tribals (50.86% of the total population), is about 29.56 lacs, spread over an area of 8870 sq.km. According to the 1991 Census the district had 1889 inhabited villages and 9 towns, with average population density of 333 persons/sq km

The work force participation rate in the district is 33.3, with 81% of the total workers engaged in agriculture.

For administrative purposes the district has been recently reorganised into separate districts - Panchmahals and Dahod. Panchmahals district has nine talukas namely, Godhra, Morwa, Kalol, Halol, Jambughoda, Shahera, Lunawada, Khanpur, Dhondhab. The newly constituted Dahod districts also has nine talukas namely, Kadana, Fatepura, Zalod, Dahod, Garbada, Limkheda, Dhanpur and Devgarh Baria.

2. Water Resource: an overview

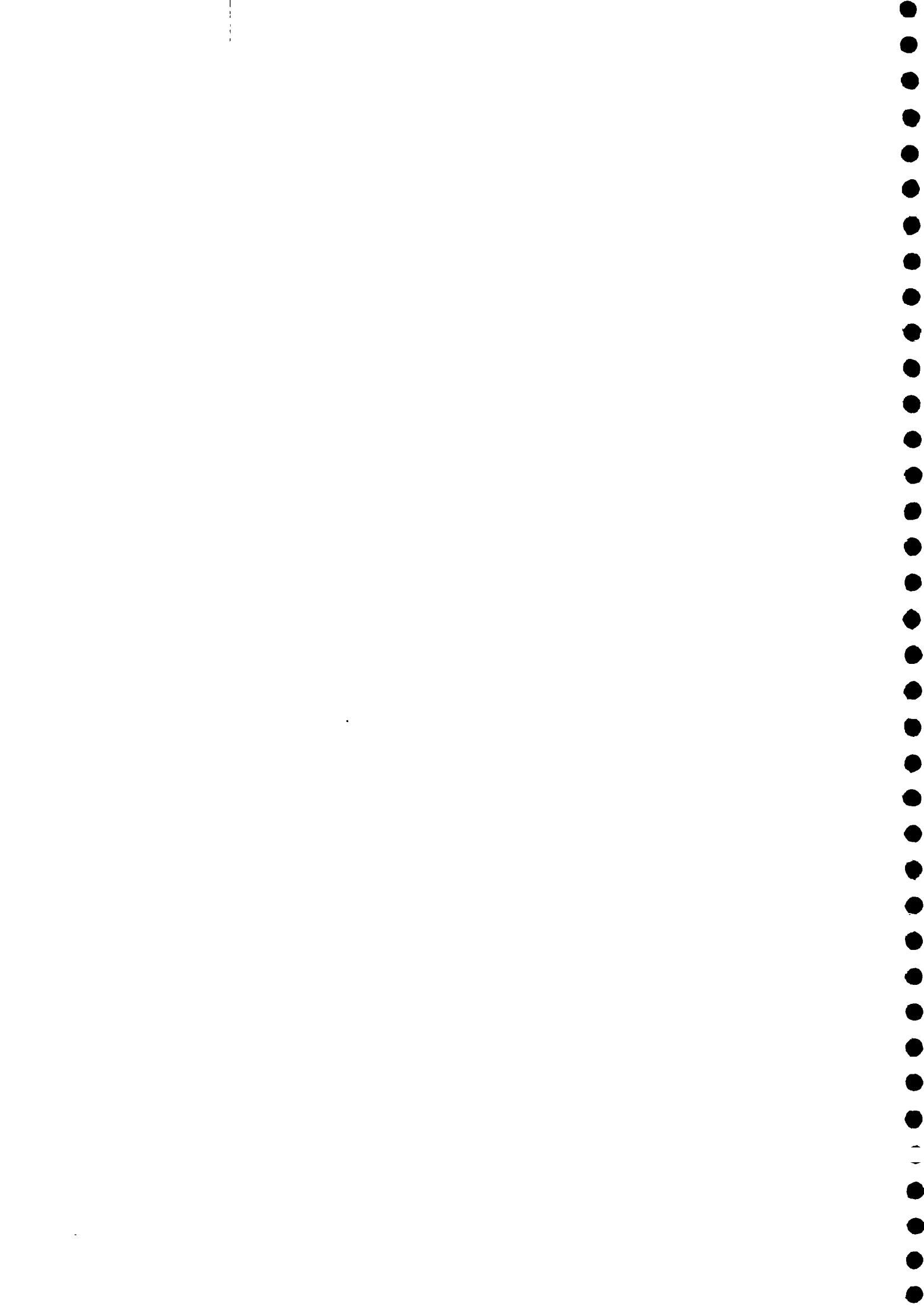
As one moves from the northern tip of the district towards the east and south east, a significant variation in the water availability status is observed in the district. One of the major reasons for this could be the existence of a number of dams across the Central North Western region and the resultant improvement in the water tables

Although 94% of the population have reported a fall in the water table both over the years as well as seasonal, but as per the government records non of the talukas of the district have been classified as over-exploited, where the net groundwater draft exceeds the utilisable groundwater recharge

Groundwater in the area between the Mahi and Goma rivers, covering parts of Kadana, Lunavada, Jhalod and Rampur talukas, occurs under unconfined conditions and is mostly tapped through dug wells and dug cum bore wells and 100mm dia bore wells (hand pumps) The Static Water Level in the area varies from 6.0 m to 18.0 m bgl In the granite formation, covering the talukas of DevagarhBaria, Godhara, kalol and halol, the water level ranges from 6 to 13 mts. In this formation the ground water is confined to joints, cracks and weathered zones Tube wells are not feasible in this region, shallow open wells and bore wells (100mm) are possible The areas covered by sand stone formation in the district are poor with respect to ground water availability owing to the low water yielding capacity of the sandstone formations.

3. Coverage under Drinking Water Sources

In Panchmahals, of the total 783 villages, there were 611 villages in the 'no source' category, which have been covered under various water supply schemes, while work was under progress



in 5 other villages, as on 30th April, 1997. In Dahod district, till April 1997, of the total 1050 villages, there were 869 villages in the 'no source' category, which have been covered under various water supply schemes in Dahod district As on 30th April, 1997. work was under progress in 20 other villages¹.

Table 3.1 presents the status of coverage in the villages surveyed The table lists the various parameters that define FC, PC or NC status of a habitation As per the primary survey results, there is a good coverage of the households under drinking water schemes, with a drinking water source for 80 households and a functional drinking water source for 116 households

Table 3.1: Drinking Water Supply Status as per Primary Survey

Coverage (Avg. No of households per drinking water source)	80
Coverage (Avg No of households per functional drinking water source)	116
Water Consumption (lpcd) as a percentage of responding households	
<40	57
40-80	12
80-120	5
> 120	26

Source Primary Survey, 1998

From the table it is evident that 57% of the households are partially covered². There also seem to be large inequities observed in water availability, with over 30% of the households consuming more than 80 lpcd of water These are the households who are taking domestic water from the private wells on their farms / wadis.

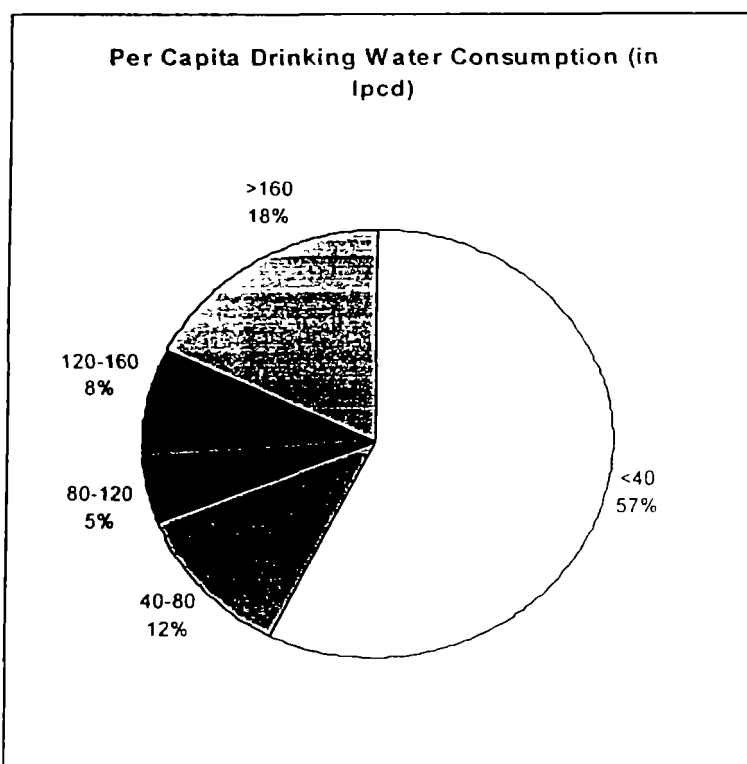
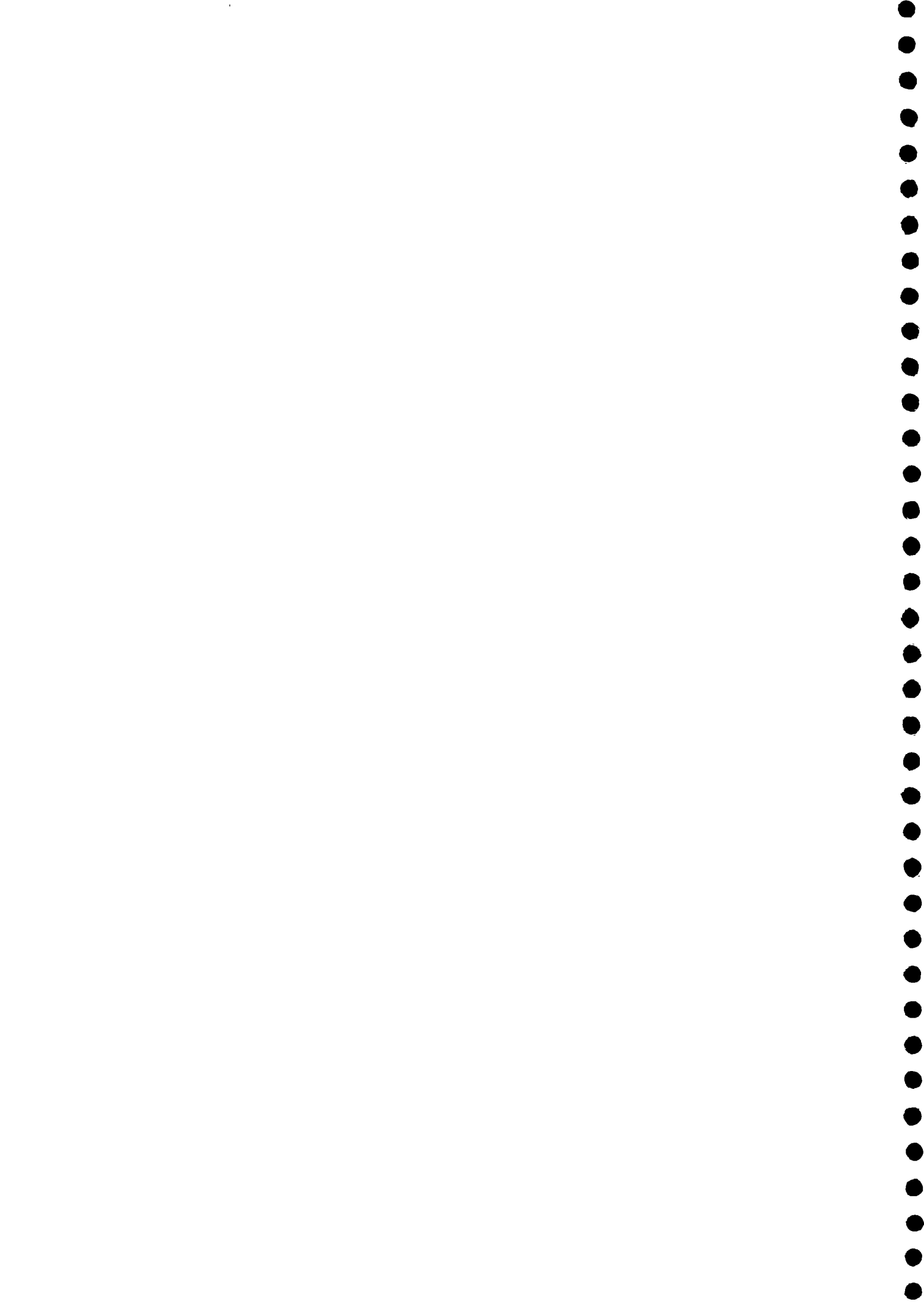


Figure 1
Source: Primary Survey

¹ Statistics regarding FC, PC, NC status of various habitations were reported to be not available by the department

² The departmental statistics have not distinguished between FC and PC status and it is assumed that all areas are fully covered. Also, it is unclear whether the calculations of supply are based on the discharge capacity of the water extraction mechanism or on actual discharge It appears that it is done on the basis of capacity, which would led to erroneous coverage status



This implies that although most of the villages have a number of drinking water sources, the water supply from them is not sufficient to adequately serve the village population who does not have access to private sources.

4. Water Availability and Supply Sources

The districts are predominantly covered under hand-pumps with about 87.3% and 68.6% of the total villages supplied water through handpumps in Dahod and Panchmahals, respectively. The average density of hand pumps is around 1 hand-pump per 125-160 persons. While only 7.1% of the villages are served by pipeline schemes in Dahod district, 21.9% of villages in Panchmahals district are covered under such schemes. Even the primary survey revealed that of the total number of sources, 61.5% were handpumps and 35.1% were community wells

Table 4.1: No. of Villages Covered Under Different Water Supply Schemes

Type of Scheme	Dahod	Panchmahals
Pipe-Line	62	134
Hand-pump	759	420
Dug well	48	57
Total villages covered	869	611
Total villages	1050	783

Source: GWSSB Circle Office, 1998

There is a wide variation in the status of development of drinking water infrastructure in the districts. The reasons for this can be broadly put across as the concentration of tribal settlements towards the east (scattered) and the lack of infrastructure. There is also a concentration of regional schemes in the north-western part of the district.

Most of the area of Dahod district is comprised of hard-rock, owing to which it is not possible to dig very deep bores for hand-pumps. As a result of which, less water is available in these bores. In summers, the water level falls considerably and as a result of which the hand-pumps dry up. In the granite formation covering Godhara, Kalol and Halol talukas of Panchmahals district, tube-wells are not feasible in this region. shallow open wells and bore wells (100mm) are possible.

80% of the surveyed households are dependent upon government water sources for their domestic water requirements. 15% of the households are primarily drawing water from private wells, while 5% of the households are dependent upon unsafe sources like streams and ponds

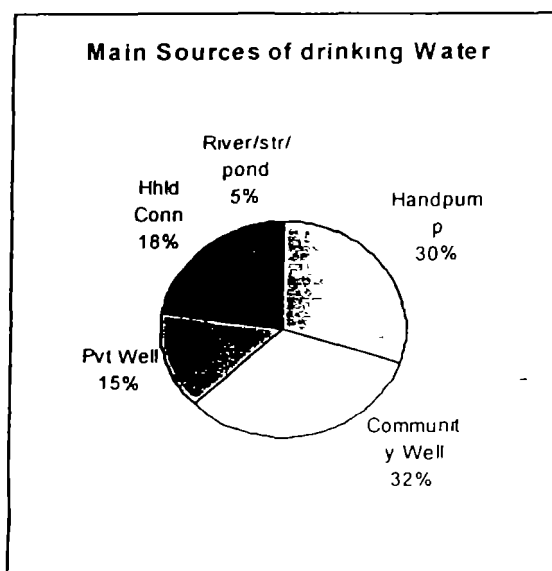
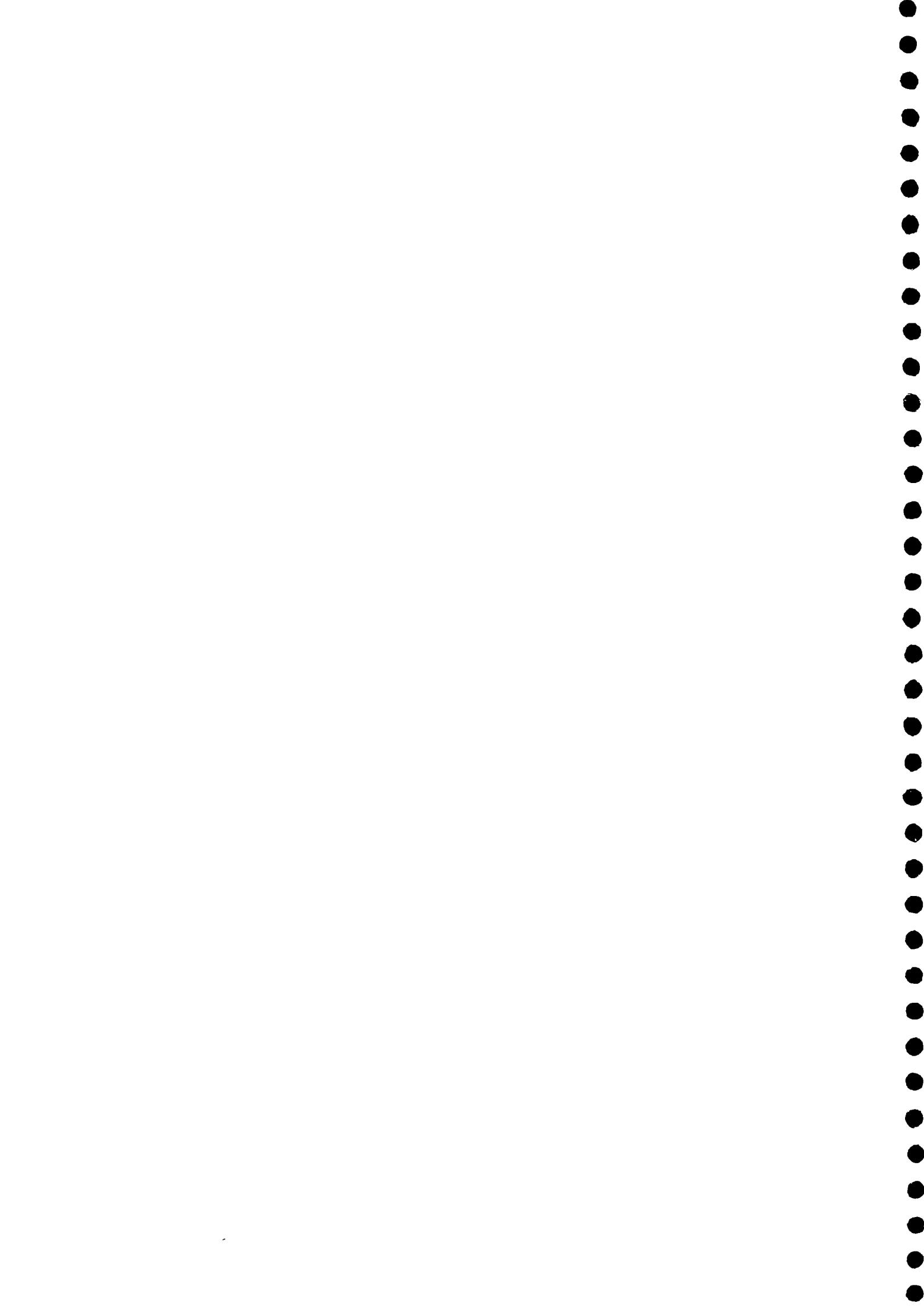


Figure 2

Source: Primary Survey



5. Defunct and Inoperational Sources

According to the primary survey 80% of the surveyed villages reported the presence of one or more defunct sources of drinking water. 33.3% of the total number of government drinking water sources in the district have been lying defunct for a long time, as per the surveyed respondents. Handpumps top the list of defunct sources with 36% of the total number of handpumps lying defunct, followed by 25% of the total number of community wells. It has also been reported that a number of sources have been lying defunct for some time. No efforts for their repair have been made either by the department or by the panchayats. (refer Case Studies)

As per the departmental records, 22.4% of the total pipeline schemes in the district are lying inoperational, primarily owing to defunct pump-sets. The figures are extremely high for Lunawada and Shahera Circles where 37%, 29% respectively, of total schemes are inoperational.

Table 5.1: Statement Showing No. of Existing Pipeline Schemes in the District (25th March, 1998)

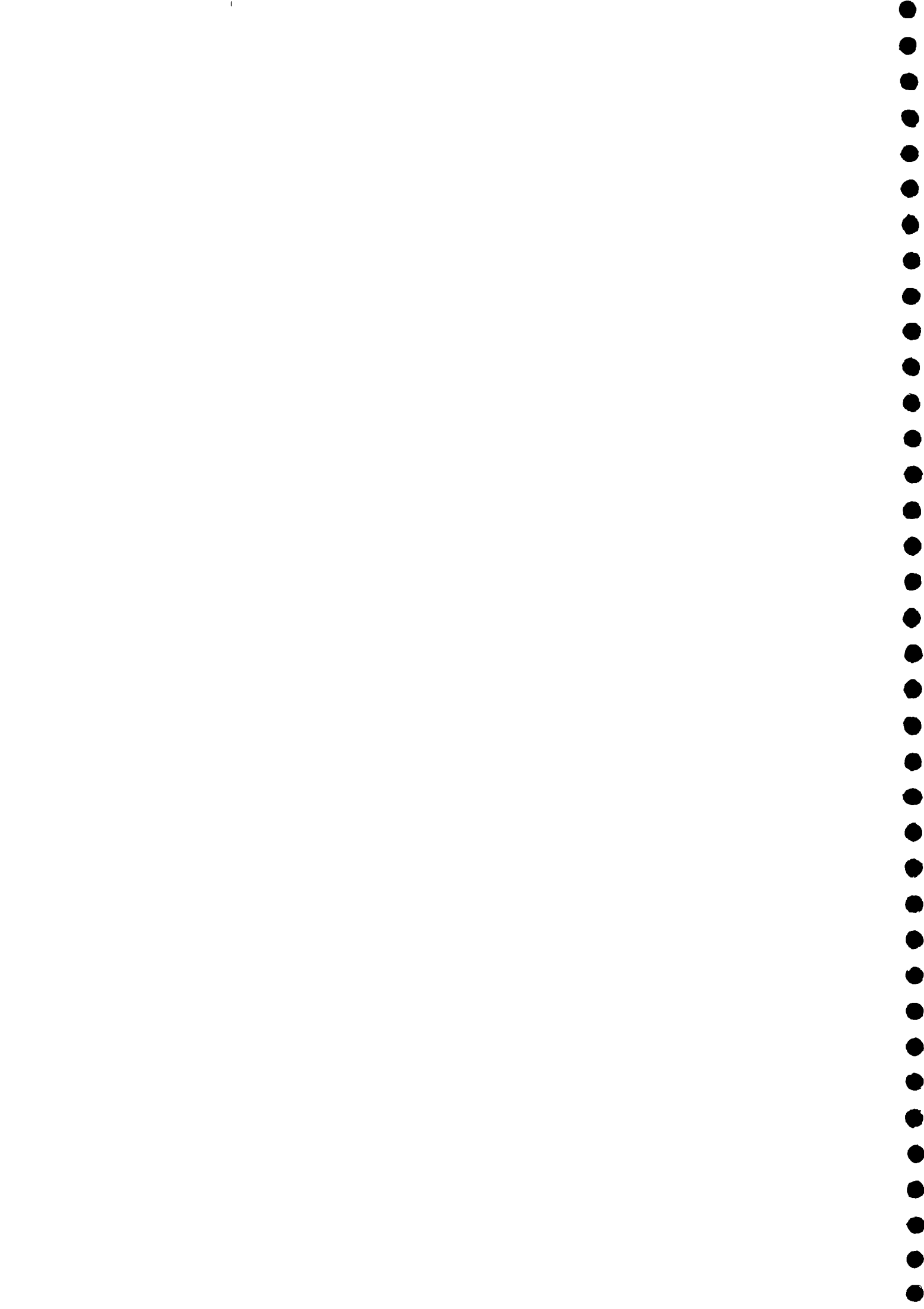
S no	Taluka	Circle	No. of Pipeline schemes			Reasons for Non-functionality		
			Total	Functional	Non-functional	Drying of Source	Defunct Pump	Others
1	Godhra	Godhra	23	18	5	1	2	2
2	Morwa							
3	Kalol	Kalol	39	37	2	-	1	1
4	Halol	Halol	10	9	1	-	1	-
5	J'Ghoda	J'Ghoda	1	1	-	-	-	-
6	Shahera	Shahera	7	5	2	-	-	2
7	L'Wada	L'Wada	54	34	20	2	12	6
8	Khanpur							
9	Dhondhab							
	Total		134	104	30	3	16	11

Source: GWSSB

6. Quality of drinking water

Rural areas of Panchmahals district have reported high levels of nitrate pollution exceeding the WHO maximum of 45 mg/l³.

³Matzer, H. and Moench, M. (1994), Ground Water Availability for Drinking Water in Gujarat Quantity, Quality and Health Dimensions, Economic and Political Weekly, XXIX (13), March 26



Of the total number of households enumerated during the primary survey, 63% reported that the quality of drinking water available was potable and sweet to taste, while 21% reported that the water was just potable but not very palatable. 84% of the respondents found the water to be potable while the remaining 16% of the households found the water non-potable.

7. Various Programmes and Schemes

Under various programmes / schemes, as on 11th May, 1998, 8556 hand-pumps were functional in 783 villages of the Panchmahals District, while 9981 hand-pumps were functional in 1050 villages of the Dahod District. (Annexure 1).

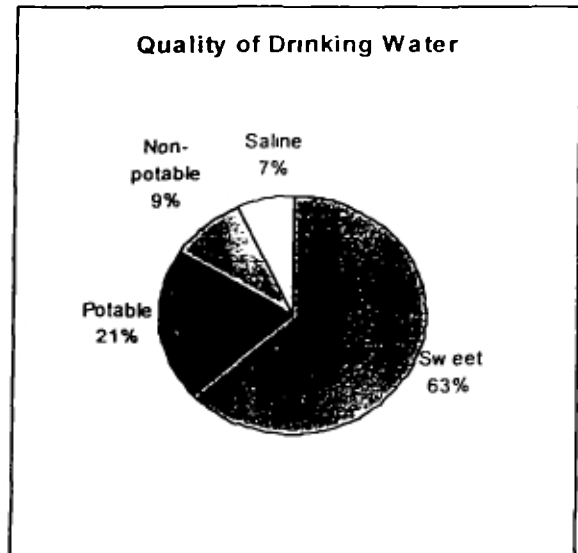


Figure 3
Source: Primary Survey

In Panchmahals, there are a few large reservoirs from which assured supply of water is possible by through laying piped water schemes. Three such schemes, Vanakbori reservoir Water Supply Scheme (Shahera, Godhara), Panam reservoir Water Supply Scheme (Shahera, Godhara) and Pavagadh (Manchi) Water Supply Scheme (Halol) are presently underway and are expected to serve 166 villages on completion.

Apart from above mentioned schemes, few schemes have been proposed on river systems in the Lunawada and Khanpur talukas. These are as follows:

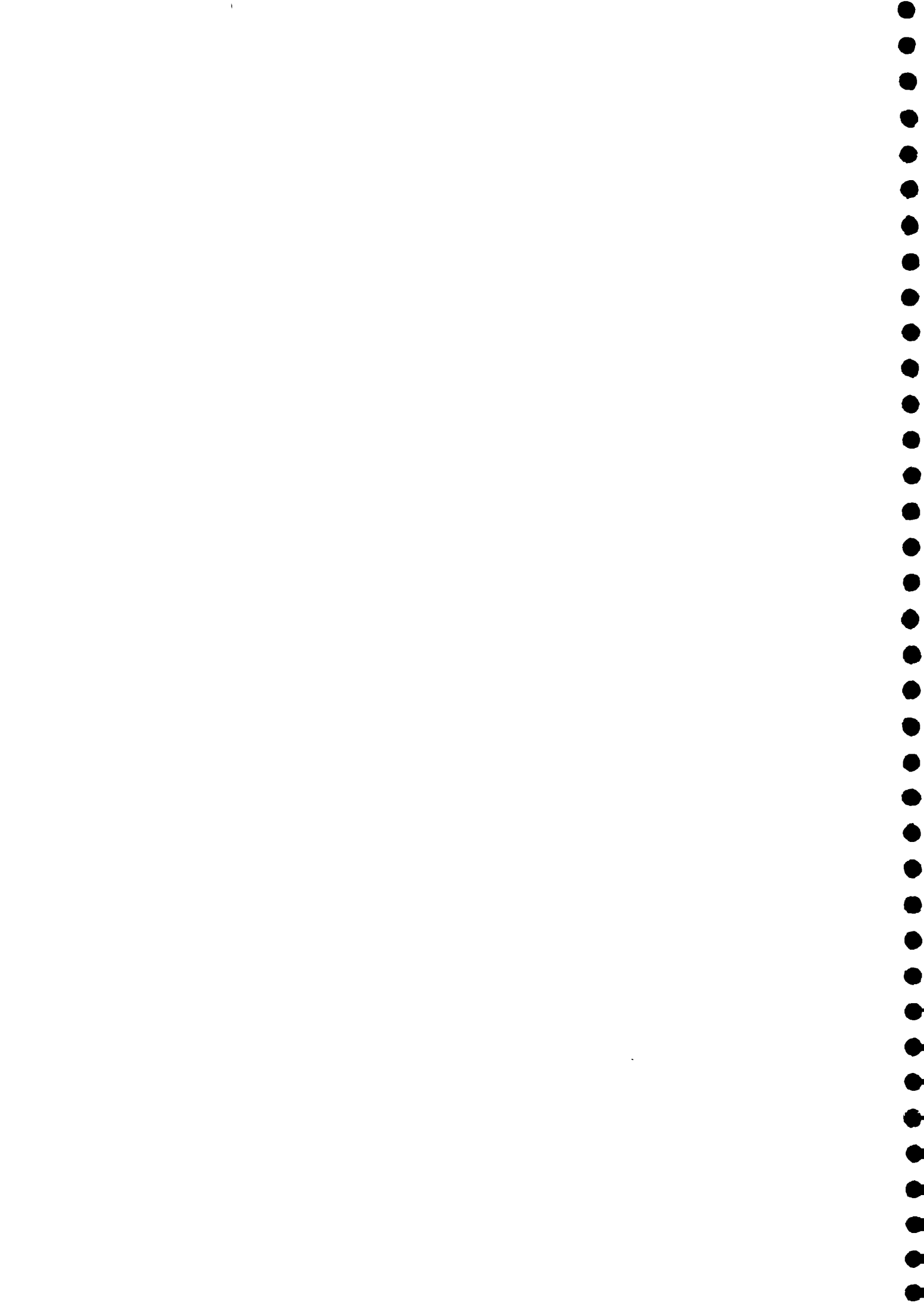
i) Charangam Nathnar Water Supply Scheme	- 43 villages
ii) Karanta, Mudawadeb Water Supply Scheme	- 76 villages
iii) Hindoliya Water Supply Scheme	- 86 villages
Total	- 202 villages

In Dahod there are a few large reservoirs namely, Kadana, Vankeshwar, Kand. Kali Dam, Macharana, from which assured supply of water is possible by laying piped water schemes. Two such schemes, Kadana reservoir Water Supply Scheme (Santrampur, Godhara) and Macharana reservoir Water Supply Scheme (Santrampur, Zalod), are presently underway and are expected to serve 150 villages on completion.

In the Action Plan for Panchmahals district for the year 98-99, under various schemes Rs. 21.485 crores has been allocated for 144 bores. Under the scarcity programme also Rs. 21.3 lakh has been allocated for drilling 110 bores in 87 villages. In the 1998-99 Action Plan for District Dahod, an allocation of Rs. 21.840 crores has been approved for 2541 bores under various programmes. Under the scarcity master-plan also, for the year 1998-99, Rs. 21.45 lakhs has been allocated for drilling 150 bores in 109 villages.

8. Maintenance and Repair

The life of a hand-pump in the region is around 10 years and the hand pumps are maintained by departmental service teams. Every year the department (mechanical division of the GWSSB)



receives Rs.400 per hand-pump for repair and maintenance. Last year 21,000 repair works were carried out in the district . Whenever there is a complaint lodged for the repair of the hand-pump, measures are taken to get them repaired. There are 16 servicing teams active in Panchmahals, while as per the departmental norms 17 teams are required in the district. 18 repairing teams are active in Dahod district, while 20 teams are required.

Most of the works regarding drinking water were undertaken by the village panchayat Although 57% of the respondents said that their opinions are solicited for works related to drinking water schemes, but rarely is the work carried out according to their needs and demands

9. Peoples' Perception of Issues Pertaining to drinking Water

47% of the surveyed villages reported a scarcity of drinking water, whereby adequate quantity of water was not available to the village population through the existing infrastructure. The falling ground water table has been identified as the major reason for the scarcity of water in the area.

Although only 16% of the surveyed households found the water to be non-potable, 29% of the surveyed villages identified poor quality of water as the major problem being faced with respect to drinking water. This implies that sarpanch or village panchayat members are relatively more aware of the water quality problems in the village, as compared to the general population, who tend to associate quality issue primarily with the taste of water. 18% of the villages enumerated both quality and distance of the drinking water source from the households as the main problems being faced in their village

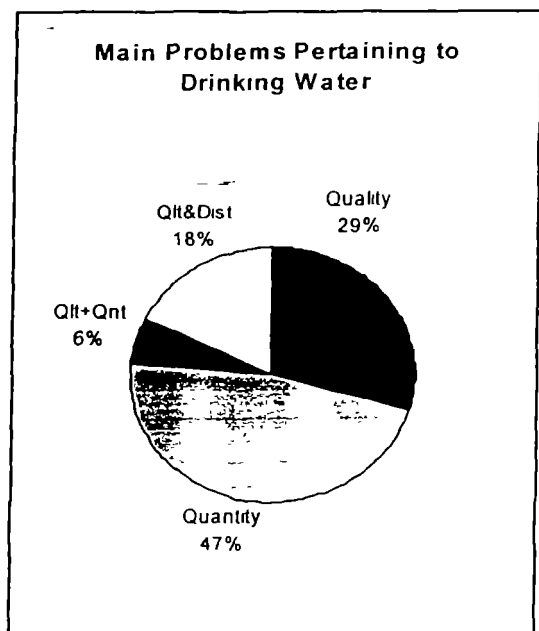
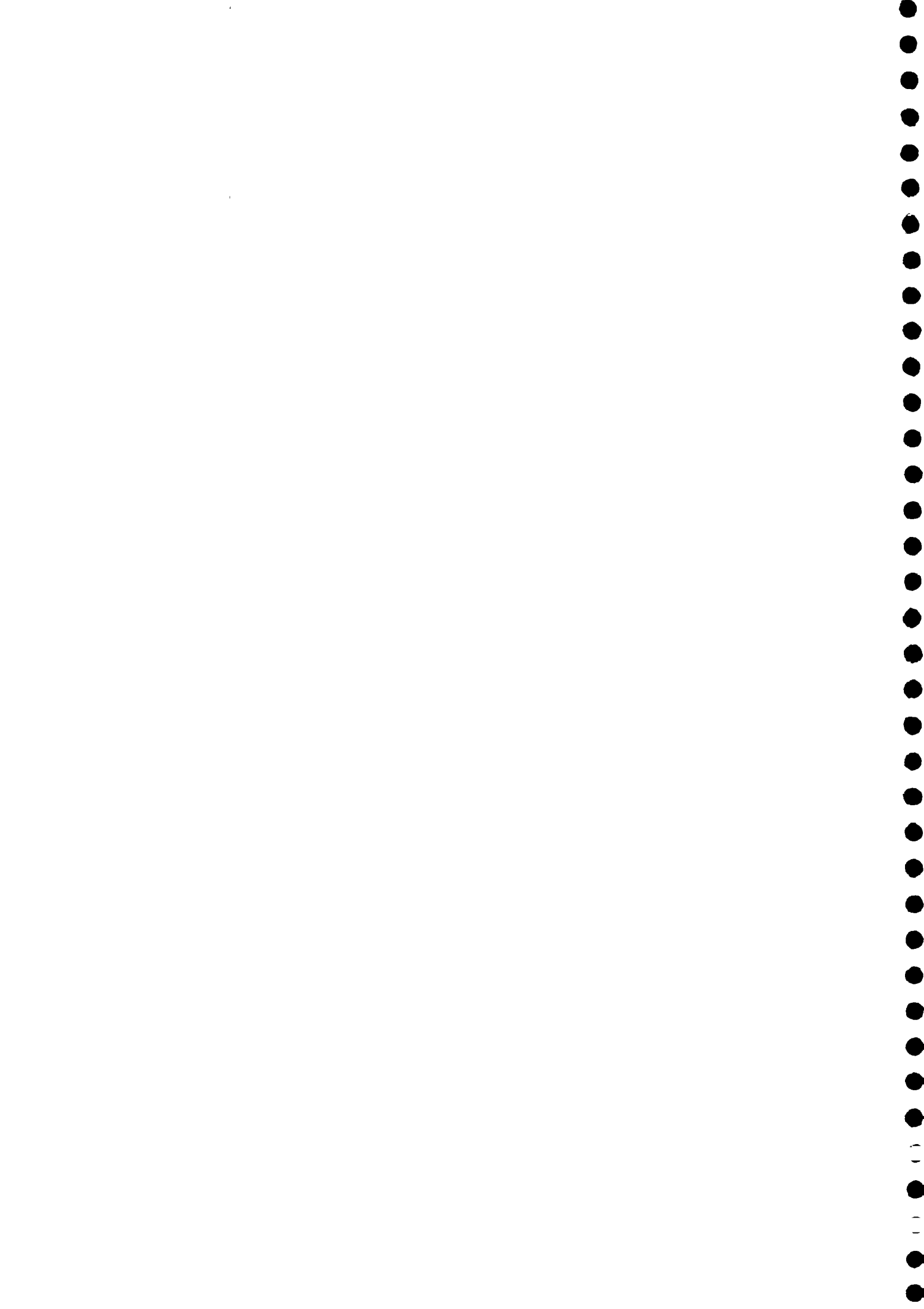


Figure 4
Source. Primary Survey

Although more than 74% of the villages have acknowledged the visits of some official from the GWSSB, they are not very satisfied by the services rendered by them As per the local community, the maintenance of the drinking water sources is not adequately undertaken by the department. This is substantiated by the presence of atleast one defunct source in 80% of the surveyed villages Even the departmental statistics reveal that about 22% of the pipeline schemes in the district are lying inoperational.

10. Community Participation

Although the Government is primarily responsible for the maintenance of drinking water sources, but there are lacunas existing in it. The community at present is not participating in any way for the upkeep and maintenance of the various drinking water source. Figure 5 presents the various reasons for non-participation of the community in the upkeep of drinking water sources. One fourth of the respondents expressed inability in contributing for the upkeep of the drinking water sources because of financial constraints. The other major reasons include inability in mobilising



community effort for the upkeep of drinking water sources, lack of information and lack of training as the main impediments in the upkeep of water sources.

65% of the surveyed respondents felt that the involvement of Government was necessary in the operation and maintenance of drinking water sources (whether independently or in collaboration with some NGOs or User Groups). 35% of respondents felt that User Groups would be the best institution for the operation and

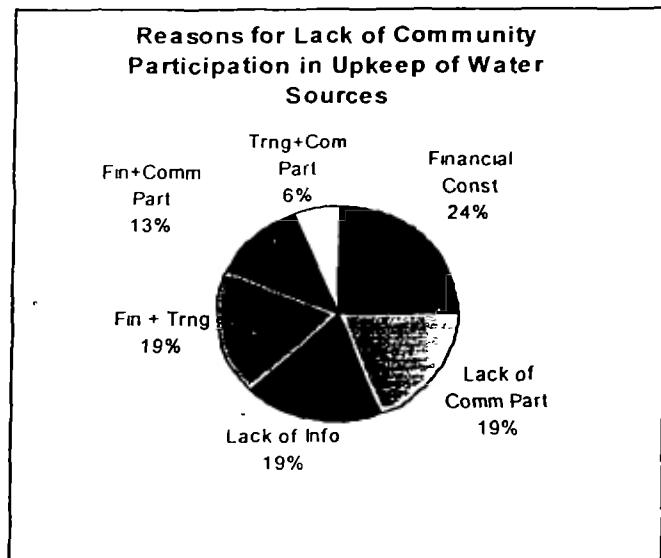


Figure 5
Source. Primary Survey

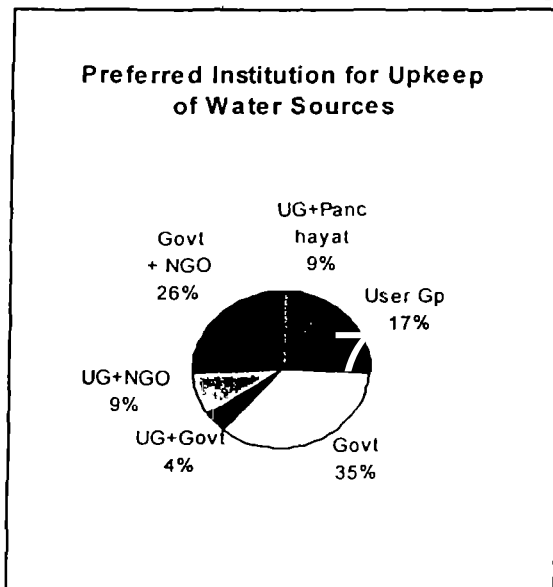


Figure 6
Source: Primary Survey

maintenance of drinking water sources, either individually or in collaboration with the panchayat or NGOs

These people identified a need for defining an appropriate contribution mechanism and disseminating information about it as important prerequisites for the successful working of the User Groups for the operation and maintenance of the drinking water schemes. They also felt that there should be transparency in the management and use of the collected funds for promoting the community to contribute towards the construction and maintenance of the drinking water schemes

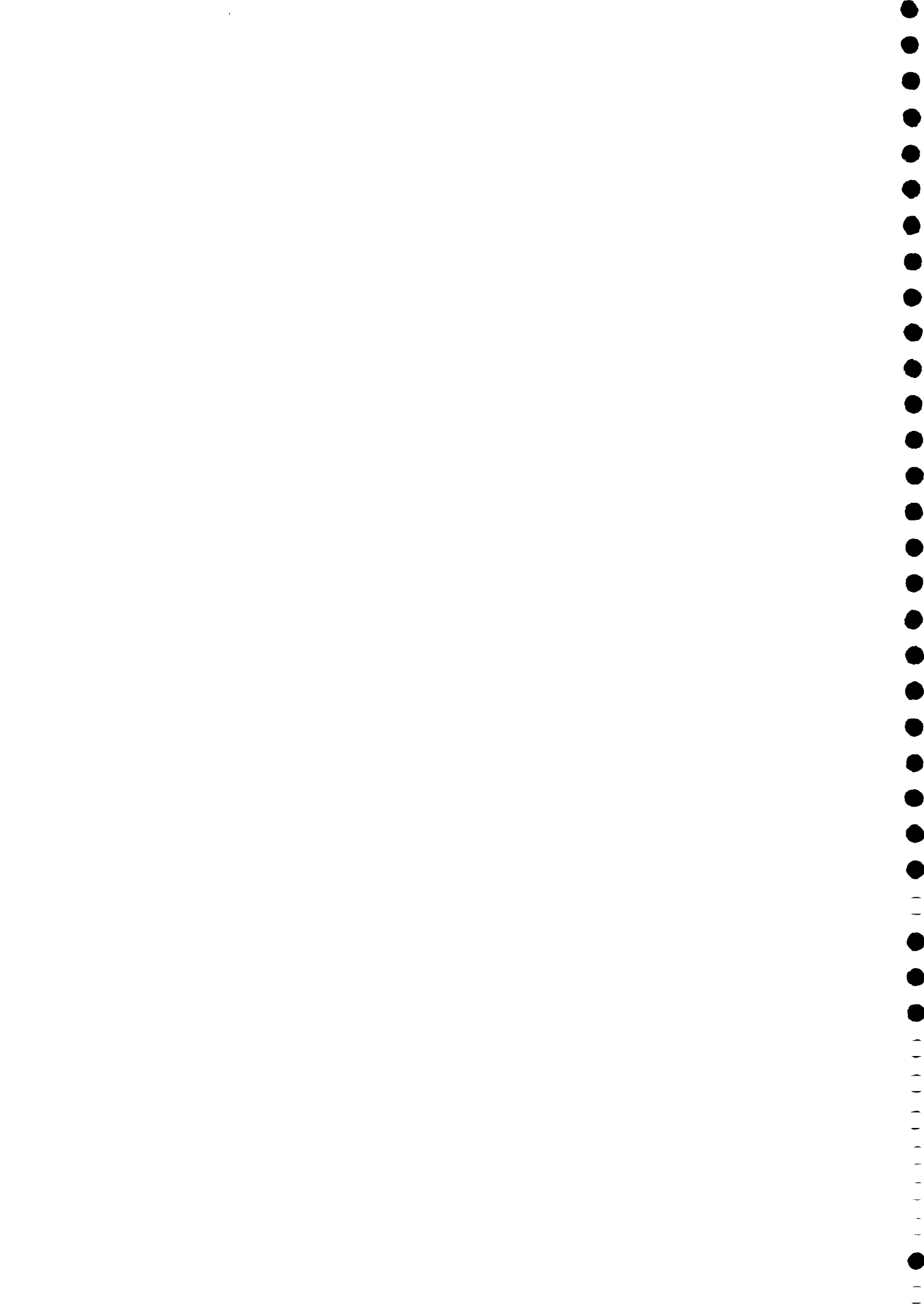
As far as willingness to pay is concerned, the average contribution forthcoming for the construction of a new drinking water source is around 225 rupees per household, while average contribution for maintenance of a source is rupees 14 only.

11. Sanitation

11.1 Status

As per 1991 census, about 11% of the total rural households in the State had an access to sanitation facility. The situation vis-a-vis rural sanitation, as compared to the state average is extremely poor in Panchmahal district, where only 4.8% of rural households are reported to have access to sanitation facility.

But contrary to this, 21% of the surveyed households have reported the ownership and usage of private latrines during the primary survey, while 71% of the households have regarded the



provision and use of latrines as highly important for the maintenance of sanitary conditions around them. The provision of toilets was considered to be important especially for the women of the household as they faced greater problems due to the lack of such a facility in the village.

Only 31% of the surveyed households said that there was high level of cleanliness maintained around the sources of drinking water, while 26% were of the opinion that the conditions around the drinking water sources were less than satisfactory.

87% of the population regards washing hands as an important practice for maintenance of health and hygiene.

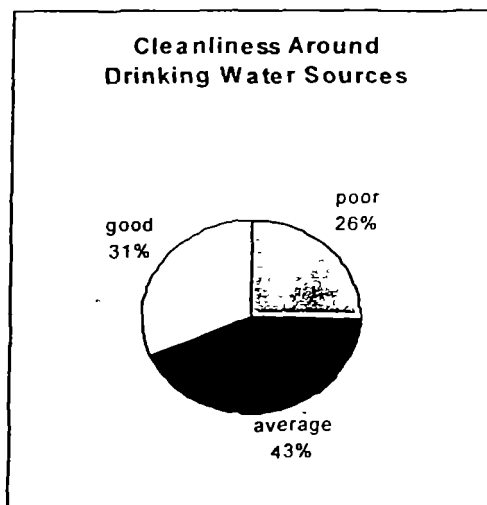


Figure 7
Source: Primary Survey

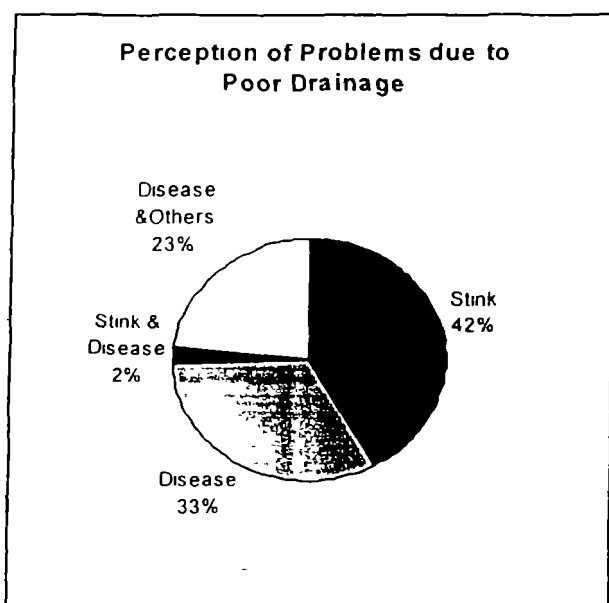


Figure 8
Source: Primary Survey

As far as the drainage of the wastewater in the village is concerned, 24% of the households said that the wastewater stagnates within the village. The situation gets worse during the monsoon months when there are heavy spells of rain

Disease and bad smell are the main problems perceived by the people because of improper drainage of wastewater. Although the main concern of the people is the spread of disease because of the stagnation of wastewater in the village, people feel that it also causes inconvenience in the general movement of the people about the village.

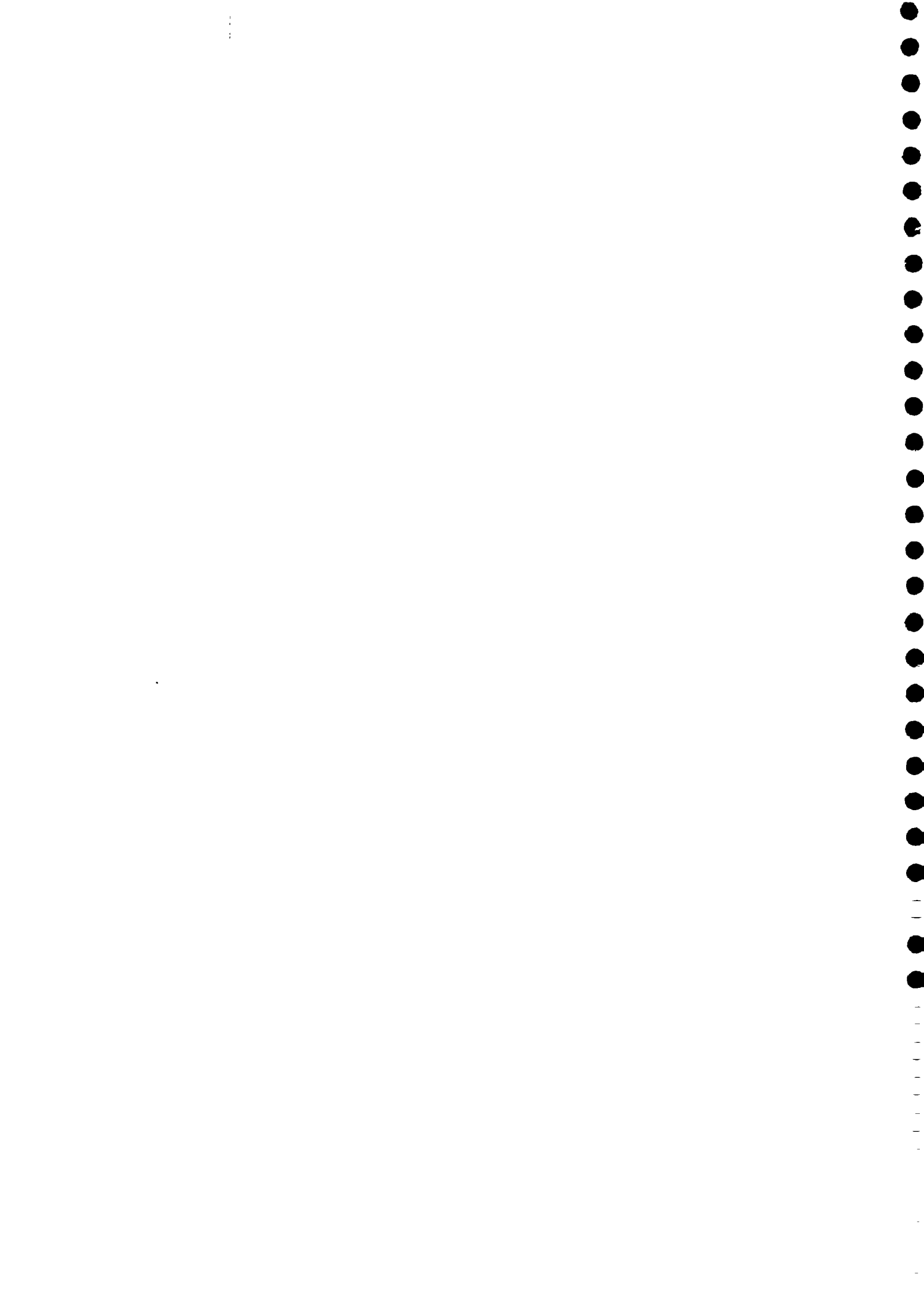
11.2 Peoples' Contribution

Acceptance for community latrines was not very high among the surveyed villages. Even those who did find them acceptable refused contribution in any form for their construction

Even in the case of household latrines in the village 59% of the households felt that it was the sole responsibility of the government to make provisions for them. While 39% of the respondents agreed to provide labour contribution, only 2% agreed to give monetary and labour contribution

12. Conclusions

The departmental statistics and the primary survey report a high degree of coverage under drinking water schemes. However, according to the primary survey, 57% of the households have



a consumption level of less than 40 lpcd and thus, fall in the category of partially covered

80% of the households are dependent on government drinking water sources, while 5% of the households are drawing water from ponds and streams, the remaining depending on private sources. Although handpumps are the most prevalent source of drinking water, forming 61.5% of the total sources in the surveyed villages, but only 30% of the households draw water from them, while a 32% are primarily dependent on community wells.

80% of the surveyed villages reported the presence of one or more defunct drinking water sources with handpumps topping the list of defunct sources, followed by community wells. 22% of pipeline schemes in the district are also presently inoperational. All this points towards poor management and low repair and maintenance of drinking water sources

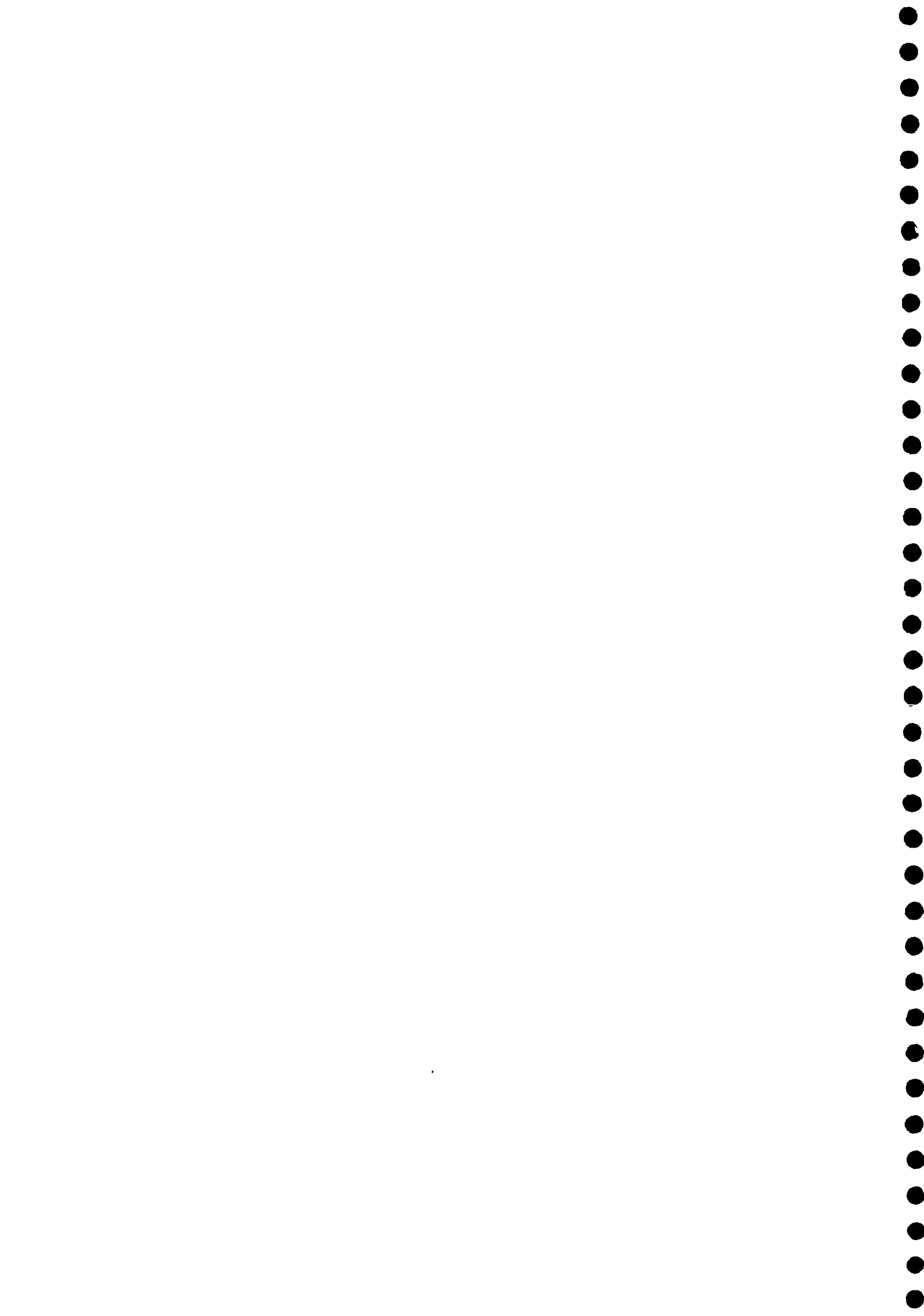
The quality of drinking water was not perceived as a major problem since the inadequate quantum of water was a much larger issue in the area, with 61% of the villages citing it as a major problem being faced by them.

The community at present is not participating in any way for the upkeep and maintenance of the various drinking water sources, owing to inability in contributing because of financial constraints, inability in mobilising community effort, lack of information and lack of training. 65% of the surveyed respondents felt that the involvement of Government was necessary in the operation and maintenance of drinking water sources. 35% of respondents felt that User Groups would be the best institution for the operation and maintenance of drinking water sources, provided an appropriate contribution mechanism is defined and there is transparency in the management and use of the collected fund

21% of the surveyed households have reported the ownership and usage of private latrines during the primary survey, while 71% of the households have regarded the provision and use of latrines as highly important, especially for the women of the household. But acceptance for community latrines was not very high among the surveyed villages. Even in the case of household latrines in the village 59% of the households felt that it was the sole responsibility of the government to make provisions for them. While 39% of the respondents agreed to provide labour contribution, only 2% agreed to give monetary and labour contribution

As far as the drainage of the wastewater in the village is concerned. 24% of the households reported that the wastewater stagnates within the village, the situation getting worse during the monsoons. Disease and bad smell are the main problems perceived by the people because of improper drainage of wastewater.

In conclusion it can be said that while government statistics indicate a high coverage, in reality there is partial coverage. A situation of water crisis, hence exists, especially during the summer months. This situation only partly exists because of the lack of infrastructure, but primarily because of inadequate and unfunctional infrastructure. Judicious management and maintenance of existing infrastructure, both new and traditional could have helped ease the crisis in many places. However, neither has any community effort, which appears to be almost indispensable for an initiative of this kind, been made by the government nor have such attempts been forthcoming from the people themselves. However, discussions at the village have revealed a willingness among the local community to participate in such efforts provided an appropriate contribution mechanism is devised with a transparency in the management of community funds.



Annexure I

Statement Showing No. of Existing Source Facilities of 100 mm dia bore hand-pumps in district Dahod

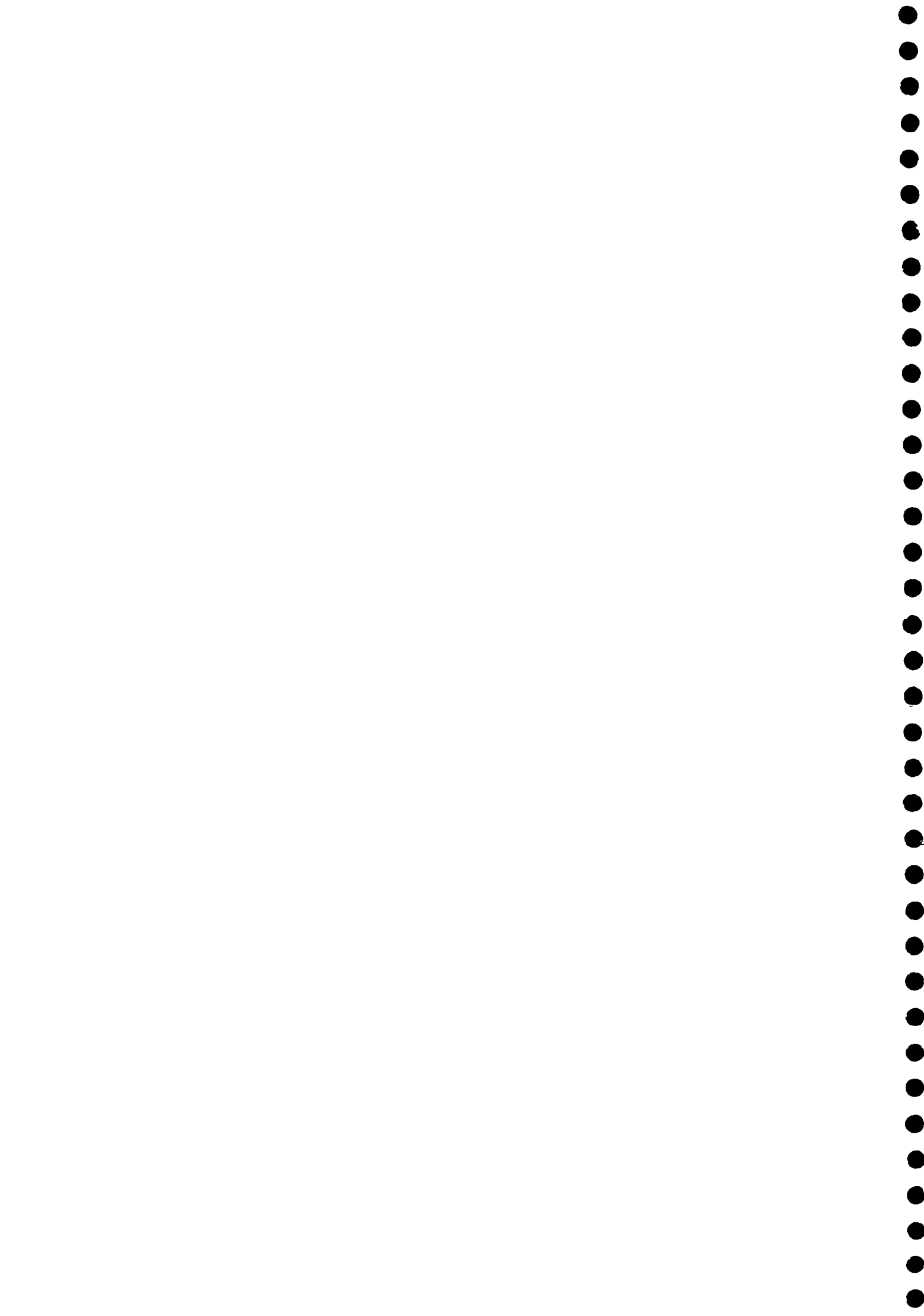
S.no	Taluka	Circle	Population size	No of villages	No of Hand-pumps	No. of repairing teams		No of Persons served by 1 hand-pump
						Reqd	Present	
1	Santrampur	Santrampur	403744	371	2766	6	6	137
2	Kadana							
3	Fatehpura							
4	Zalod	Zalod	275857	144	1659	3	3	162
5	Dahod	Dahod	304757	117	1957	4	4	152
6	Garbada							
7	Limkheda	Limkheda	287204	237	1976	4	3	140
8	Dhanpur							
9	D.Baria	D.Baria	190000	181	2591	3	2	125
Total			1431522	1050	9981	20	18	143

Source GWSSB, 11th May, 1998

Statement Showing No. Of Existing Source Facilities of 100 mm dia bore handpumps in Panchmahals

S no	Taluka	Circle	Population size	No of villages	No of Hand-pumps	No of repairing teams		No of Persons served by 1 hand-pump
						Reqd	Present	
1	Godhra	Godhra	321242	158	2537	5	5	117
2	Morwa							
3	Kalol	Kalol	145404	64	541	1	2	257
4	Halol	Halol	125998	116	926	2	2	132
5	J'Ghoda	J'Ghoda	32488	52	282	1	-	114
6	Shahera	Shahera	179069	81	1473	3	2	120
7	L'Wada	L'Wada	244013	312	2797	5	5	87
8	Khanpur							
9	Dhondhab							
Total			1211394	783	8556	17	16	142

Source: GWSSB, 11th May, 1998



Annexure II

Village Case Studies

Village: Ankalva

Taluka : Lunawada

District: Panchmahals

Village Profile

Village Ankalva, located 8 kms away from the Lunawada town, which is the taluka headquarter, falls in the Panchmahals district of Gujarat. The village is located 6 kms east of National Highway no.8. The village is inhabited by 600 households belonging to a number of communities like Patel, Chauhan, Suthar, Lohar, Vankar, Bariya, Brahman etc. There are 10 bastis in the village namely, main Ankalva village, Nada, Patel wadi, Pagini wadi, kidipani wadi, lohar wadi, navi basti I & II, vankar basti, etc. The village has a highschool, primary schools, angan wadi. The village has a panchayat with 10 members of which 3 are women. The village also has an active mahila mandal and a yuva mandal. There is a voluntary organisation active in the village which is undertaking some development works in the village.

Drinking Water Sources and their Status

There are a number of drinking water sources in the village comprising of twelve hand-pumps, two village tanks, four community wells. Piped drinking water supply is there in the main village whereby water is available to each and every household of the village. This scheme has been functional for last ten years. Some of the bastis also have piped drinking water supply scheme. The village also has a pipe-line scheme for the scheduled caste and the scheduled tribe households.

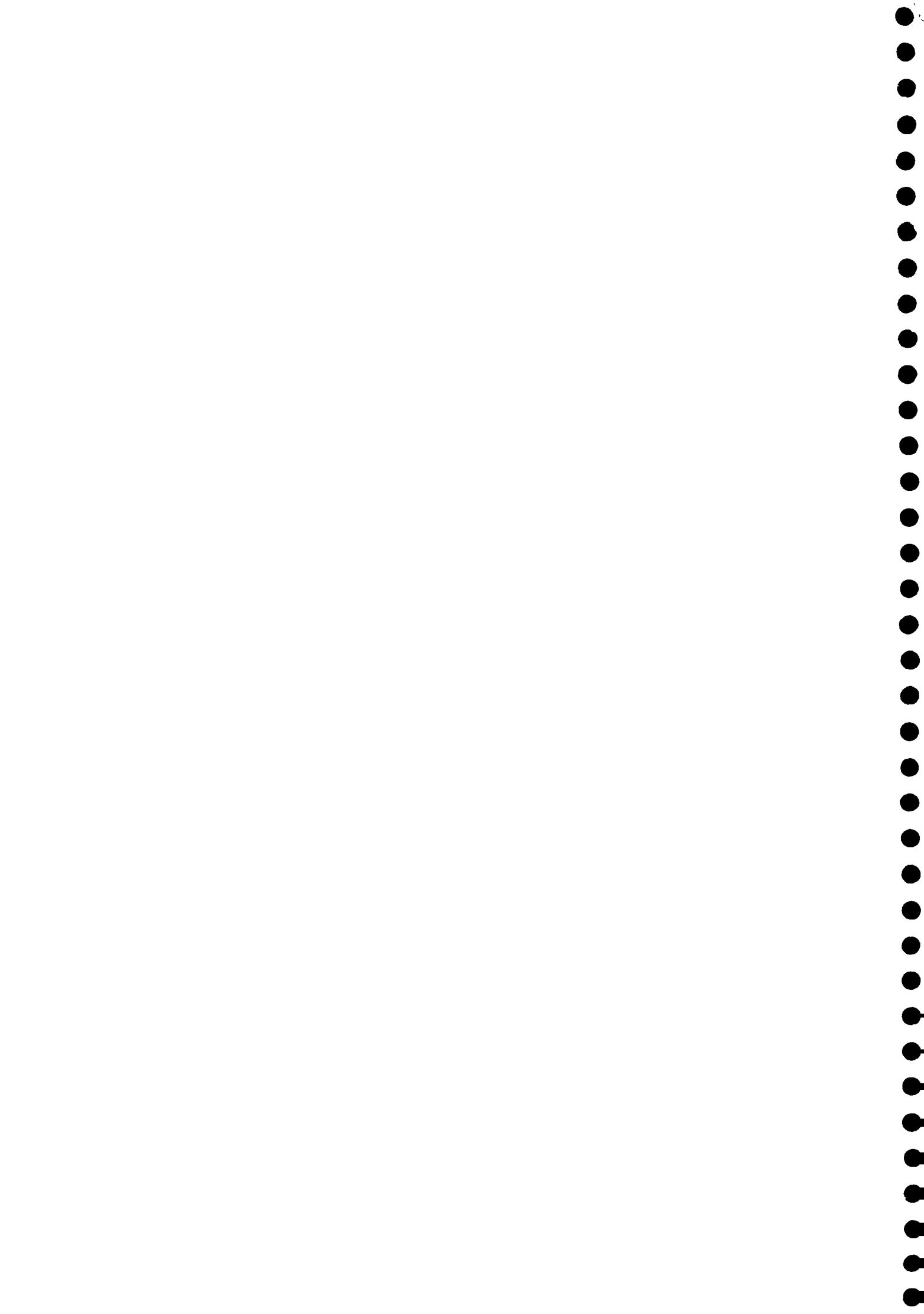
Source of Drinking Water	Number	Dependability
Hand-pumps	12	Medium
Pipeline Water Supply		Medium
Community Wells	4	Medium

Of the twelve hand-pumps in the village, ten are functional while two are lying defunct for two years. Next to the village there is a taal / tank in which water is available throughout the year. Water is available throughout the year in the village community wells. Almost the whole village is benefitted by the pipe-line water supply scheme, except parts of some bastis.

The water is potable and good to taste (sweet). The water available through the hand pumps in nada, kidipani wadi and lohar wadi is of poor quality and contaminated. The villagers are of the opinion that drinking water from these hand pumps can cause diseases among the people.

Sanitation

A proper drainage facility is not there in the village which leads to the stagnation of water in the village especially during the monsoon months. This stagnant water can lead to a number of



diseases like malaria. The village does not have community latrines and a garbage removal system for the maintenance of sanitary conditions.

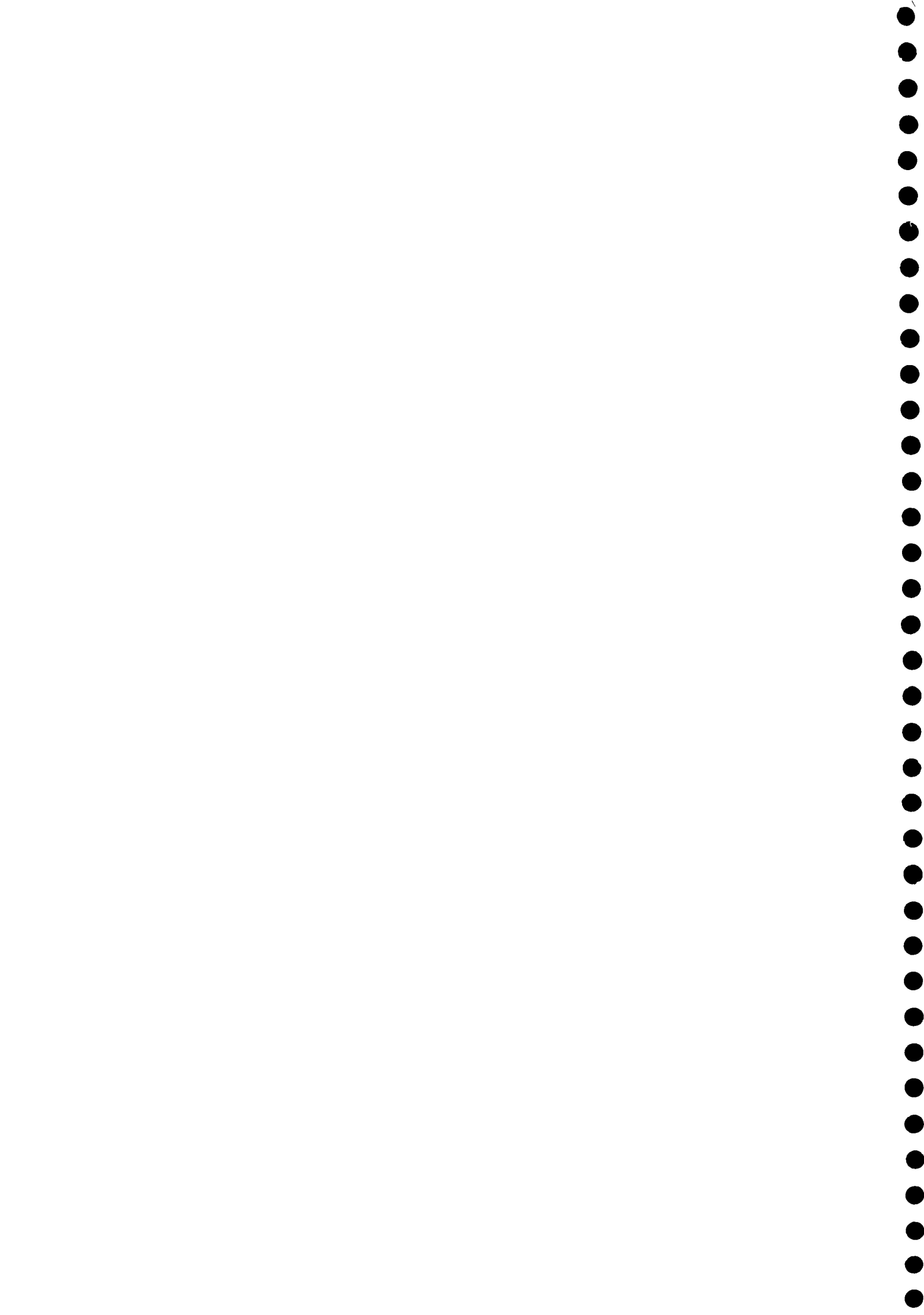
The poor sanitary conditions in the village are of a concern to the villagers and there is need felt for community or individual latrines. The villagers have also identified a need for improved drainage facilities and measures for garbage removal in the village.

Issues Pertaining to Drinking Water

There is a drinking water scarcity in the lohar wadi, nada and the vankar wadi, which are essentially inhabited by the families belonging to the lower castes. The quality of ground water in these wadis is also very poor.

The villagers have expressed a need for improved availability of good quality drinking water in the village. Efforts should be made for the repair and maintenance of the hand-pumps that are not functioning. It is felt that community efforts are required for this. There is need for improvement in the irrigation facilities in the area. It is important to have a vision for the development of all the settlements in the village.

The village population also feels that there is a mismanagement in the Panchayat and there is no unity in the village. There is a lot of groupism and internal politics in the village. Cooperation under the leadership of enlightened people, which is extremely important for community effort for any work, is not there.



Village : Limbdi

Taluka : Zalod

District : Dahod

Village Profile

The village is located at a distance of 8 kms from Mahi river. The village is bound in the East by Khanpur village, Modasa highway in the North, Godhara - Vadodara highway in the South and is located 2 km west of the Limbdi chowk on the Virpur road. The village has a total of 6000 inhabitants, with about 200 people belonging to the scheduled caste and scheduled tribe category. The village is cohabited by a number of communities, prominent among them are Baniya, Brahman, Darbar, Muslim, Jain, Vankar, Harijan, Bariya and Chamar. The village is divided into 5 bastis / settlements, namely Narangarh wadi, Hanseri, Ranjitpura, Maliya and Limdiya. The households belonging to a particular caste / community live together in a basti. The villagers are primarily engaged in agriculture and animal husbandry. The total livestock population of the village is about 500. The village is well endowed with social and physical infrastructure and has a high school, 3 primary schools, a balwadi, a health centre, a post office, a bank, a panchayat ghar, a fair price shop, a motorable road, electricity supply etc. It has a village panchayat with twelve members, of which four are women. Other community organisations active in the village area are a mahila mandal and a yuva mandal.

Drinking Water Sources and Status

The ground water is the main source of drinking water in the village. The village is endowed with a number of drinking water sources comprising of 10 hand-pumps, 3 community wells and a piped water supply scheme in one basti which supplies water to about 30 households. The village also has two ponds for the cattle and irrigation purpose.

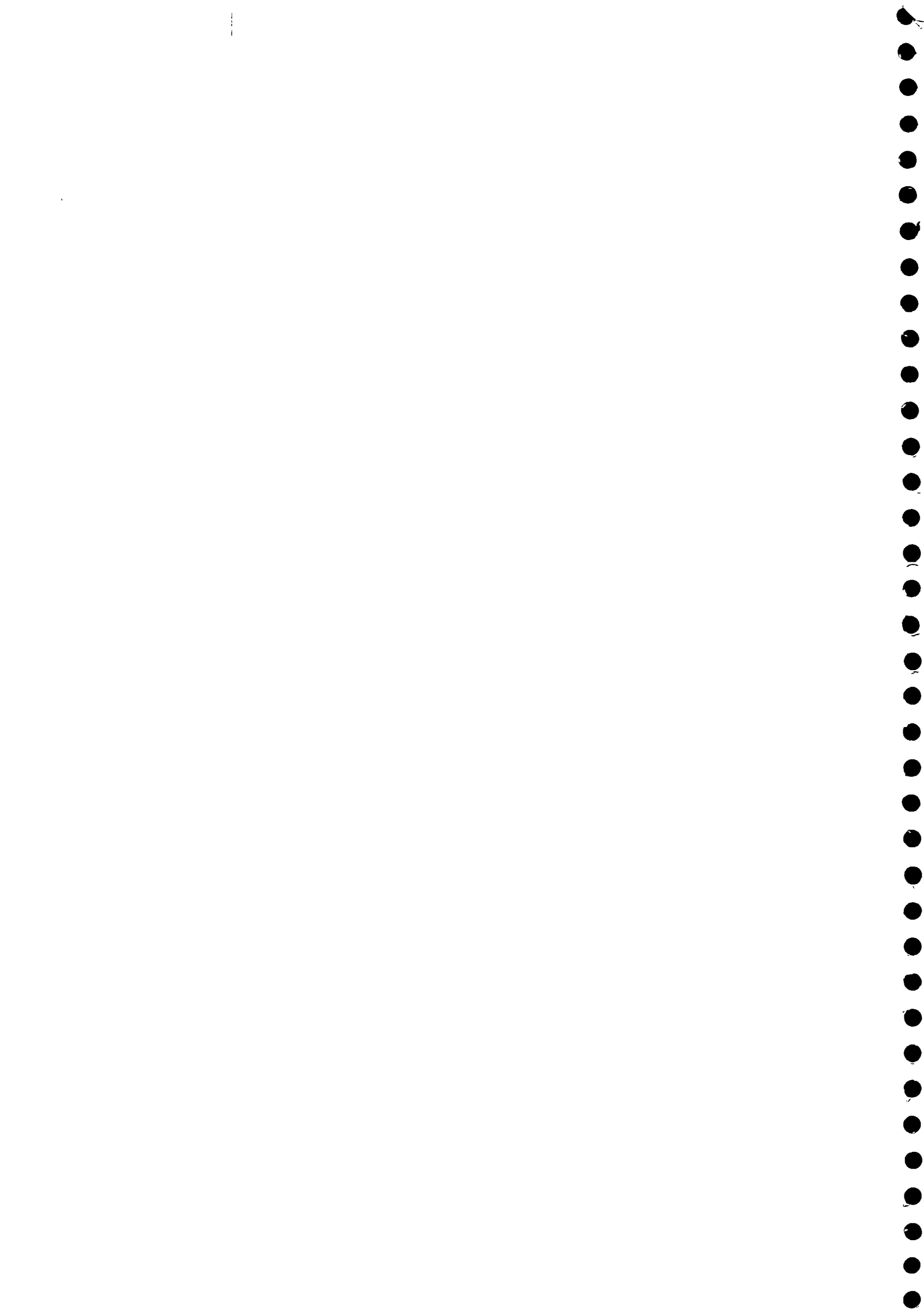
Source of Drinking Water	Number	Dependability
Hand-pumps	10	Medium
Pipeline Water Supply	30 House-holds	Low
Community Wells	3	Medium

Of the ten hand-pumps only 5 are functional and the rest are lying defunct for some time now. The pipeline scheme has been functional in the village for last 20 years. It supplies water to only about 60% of the total households of a basti of 50 households. Also the supply of water is extremely irregular, with water being supplied for only about 8-10 days in a month. Villagers do not get adequate quantity of potable drinking water. The problem becomes more acute during the summer months when the ground-water level falls drastically.

The ground water in the village is of poor quality with high salinity content. This makes the water unpalatable.

Sanitation

The village lacks a proper drainage system and community toilets for the population. The hand-pumps in the village do not have soak-pits. The women of the village wash their clothes at the



community wells and hand-pumps and also people water their cattle at these places. As a result the area around the drinking water points is not well maintained. Also as all the hand-pumps and community wells are located along the pathways, all the waste water flows along these tracks, making it difficult to traverse them.

The animals defecate and urinate on the pathways making the place filthy. In summer and winter months the area around the water points is clean and dry but during monsoons it is full of grime, making it a hot-bed of mosquitoes. All this leads to spread of diseases in the whole village.

Operation and Maintenance

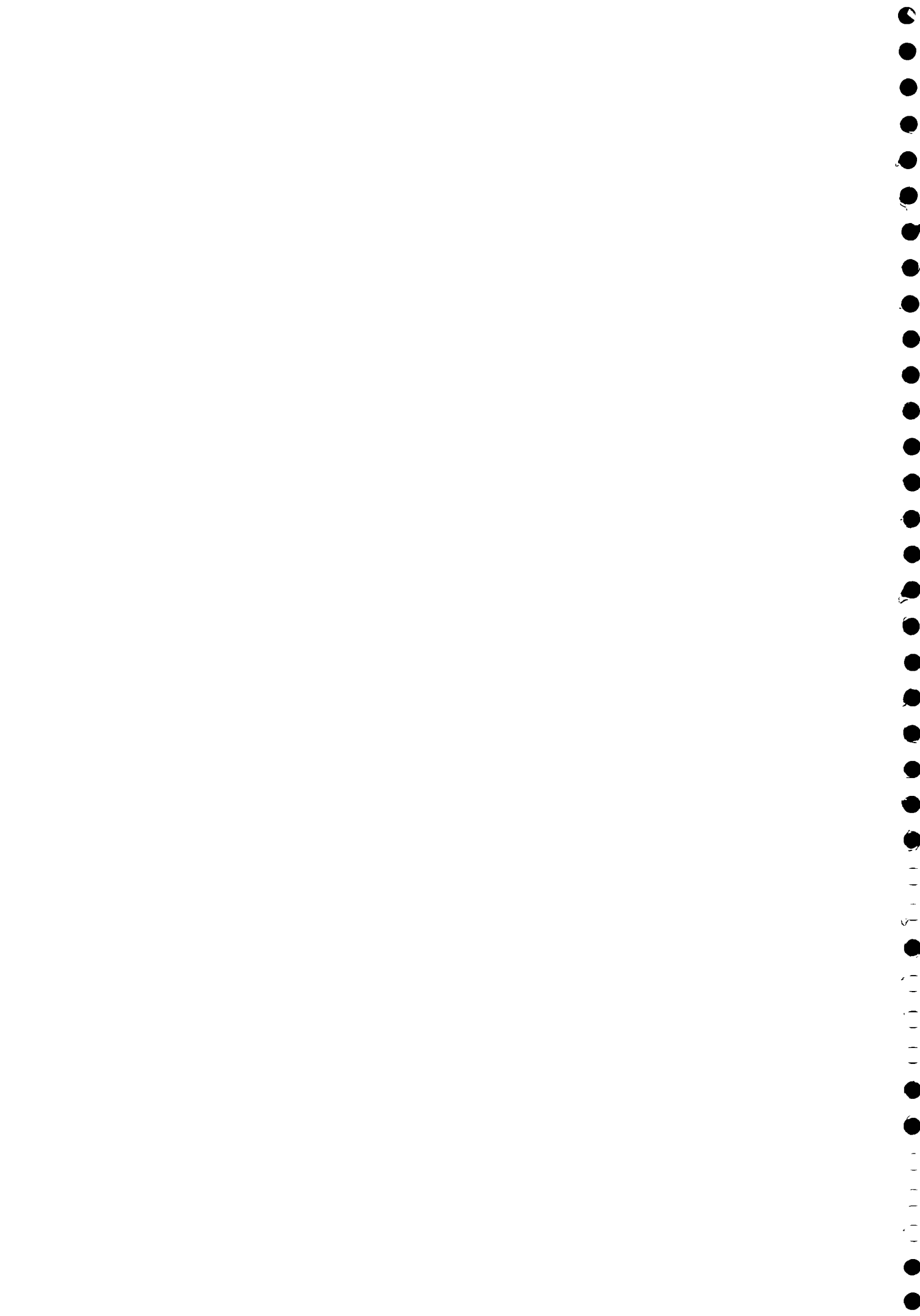
The village panchayat is the main body responsible for the maintenance of drinking water sources and sanitation in the village. But it is not able to undertake this task effectively. The villagers have expressed a need for a voluntary organisation to hold awareness campaigns in the village to educate the village population about the need for maintaining sanitary conditions in the village. The voluntary organisation should also be made responsible for the maintenance of drinking water and sanitation facilities in the village.

Problems / Issues Related to Drinking Water

There is a shortage of water during summer months and the years of drought. The villagers also feel that the present number of hand-pumps are not adequate to serve the entire village population and there is a need for the government to dig new bores so that everyone in the village gets adequate quantity of potable water.

The tank for piped water supply is not cleaned regularly which can cause diseases among the households being served by the scheme. There is no cleanliness around the stand-posts and hand-pumps, making them prone to contamination. There is need felt among the villagers for the provision of soak pits near the hand-pumps and regular cleaning of the water tank.

A place should be provided for the women to wash clothes and a proper cattle trough should be made to water the cattle. A proper drainage system should be put in place for effective sewage disposal and measures should be taken for the removal of garbage from the village premises. Provision of community latrines is considered essential for maintaining sanitary conditions in the village.



District Banaskantha

1. Introduction

Banaskantha district, located in the Northern part of Gujarat, is bordered by the Rann of Kachchh to the West, Pakistan to the North and the state of Rajasthan to the East. The district has a total population of about 21.63 lakhs spread over an area of 12700 sq.km., having a density of 170 persons per sq. Km. About 17.7% of the total population belongs to the Scheduled Caste /Scheduled tribe category. Banaskantha District has 9 talukas namely, Palanpur, Vadgaon, Dante, Deesa, Dhanera, Tharad, Vav, Deodar and Kankrej. Earlier Radhanpur and Santalpur talukas were also under Banaskantha district, but during the recent reorganisation of the districts the two talukas have been transferred under the jurisdiction of the Patan district¹.

The rainfall in this region usually follows a cyclical pattern, with two to three years of plentiful rainfall, followed by one or two years of sparse rainfall. This pattern makes the district prone to regular droughts.

Agriculture is the main economic activity of the district. Even though only a small proportion of the total cultivated land is being irrigated, the overall usage of water for irrigation is very high and accounts for 90-95% of the total water consumption in the area. The demand for irrigation water has put pressure on the groundwater sources of Banaskantha and has caused problems for the supply of drinking water at places.

2. Water Resource: an overview

Ground water conditions are diverse in all the talukas of the district. Radhanpur, Santalpur and Vav have a lot of water but in most places it is brackish; Palanpur and Vadgam have plenty of good quality water but have hard rock at 60-70 meters depth; half of the Tharda block has good quality water but the other half has salinity; Deesa, Dhanera, Kankarej and Dodhar have plentiful water resources. Both Water quality as well as water quantity tend to decline as one moves from north-east to south-west.

During the primary survey, most of the households have reported a considerable fall in the ground water levels over the years. The phenomenon is also evident during the summer months when the water level declines rather rapidly, starving a number of villages of the required quantity of domestic water.

3. Coverage Under Drinking Water Sources

The district has 7 towns and 1241 villages of which 1157 (93.2%) have been identified as 'no source' villages. 84 of the 'no-source' villages are still to be covered under different schemes. Presently (in the year 1998) work on drinking water supply is underway in 21 villages. Of the total number of villages in the district, 84.1% fall in "fully covered" category, while 9.2% fall in the "not covered" category.

¹ However, for the purpose of this study, they have been included as part of Banaskantha district

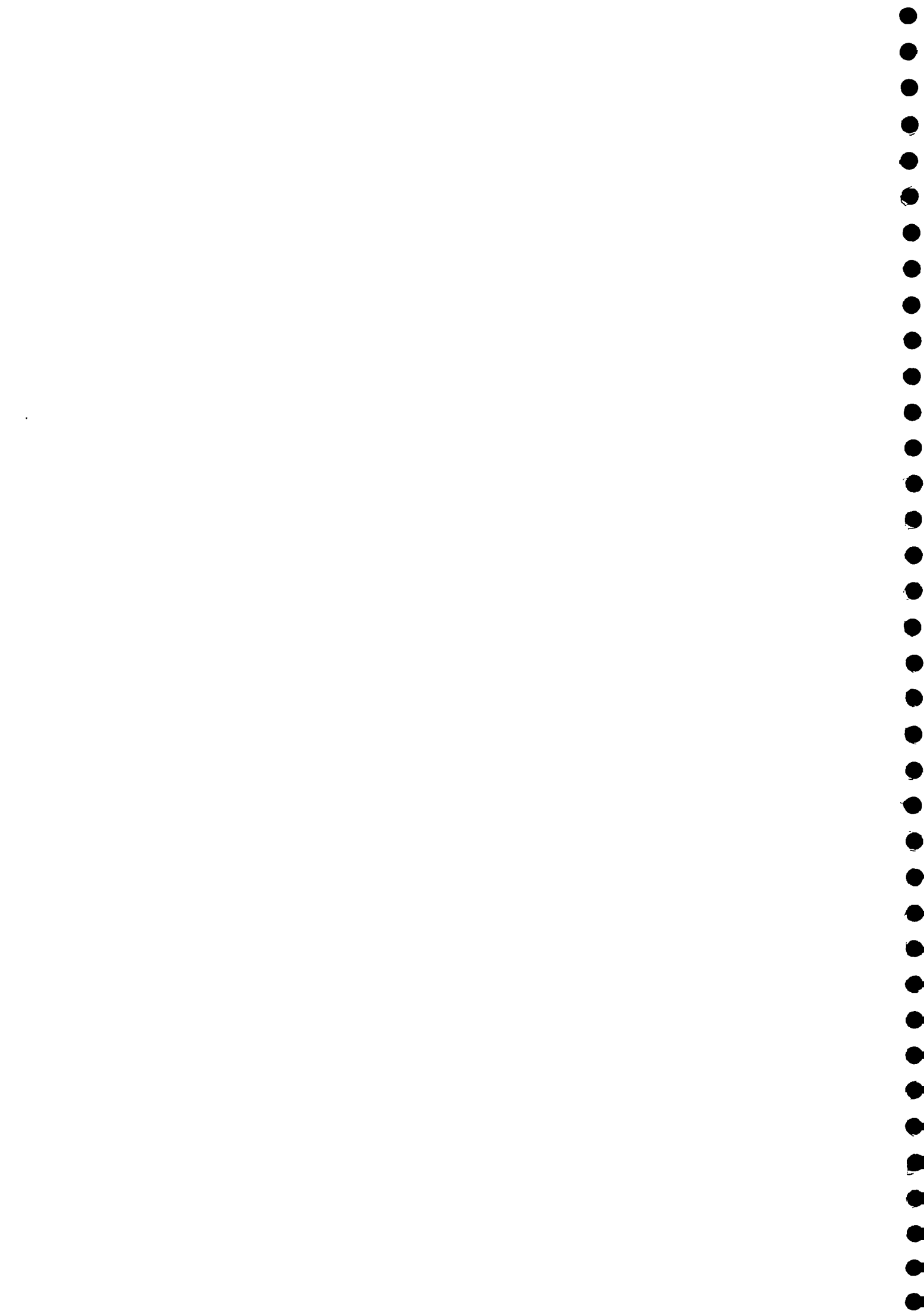


Table 3.1: Coverage Status in the District

Category	No of Villages	%
Not Covered	114	9.2
Fully Covered	1043	84.1
Partially Covered (0-10 lpcd)	9	0.7
Partially Covered (10-20 lpcd)	7	0.6
Partially Covered (20-30 lpcd)	49	3.9
Partially Covered (30-40 lpcd)	19	1.5
Total	1241	100.0

Source: GWSSB, 1997

As per the primary survey results also, there is a good coverage of the households under drinking water schemes, with a drinking water source for 66 households and a functional drinking water source for 116 households, which compares favourably with the norm of a drinking water source for every 250 households.

But all the surveyed households had an average domestic water consumption of less than 40 lpcd and the average consumption per cattle is less than 30 lpcd. This implies that although most of the villages have atleast one drinking water source, the water supply from these is not sufficient to adequately serve the entire village population.

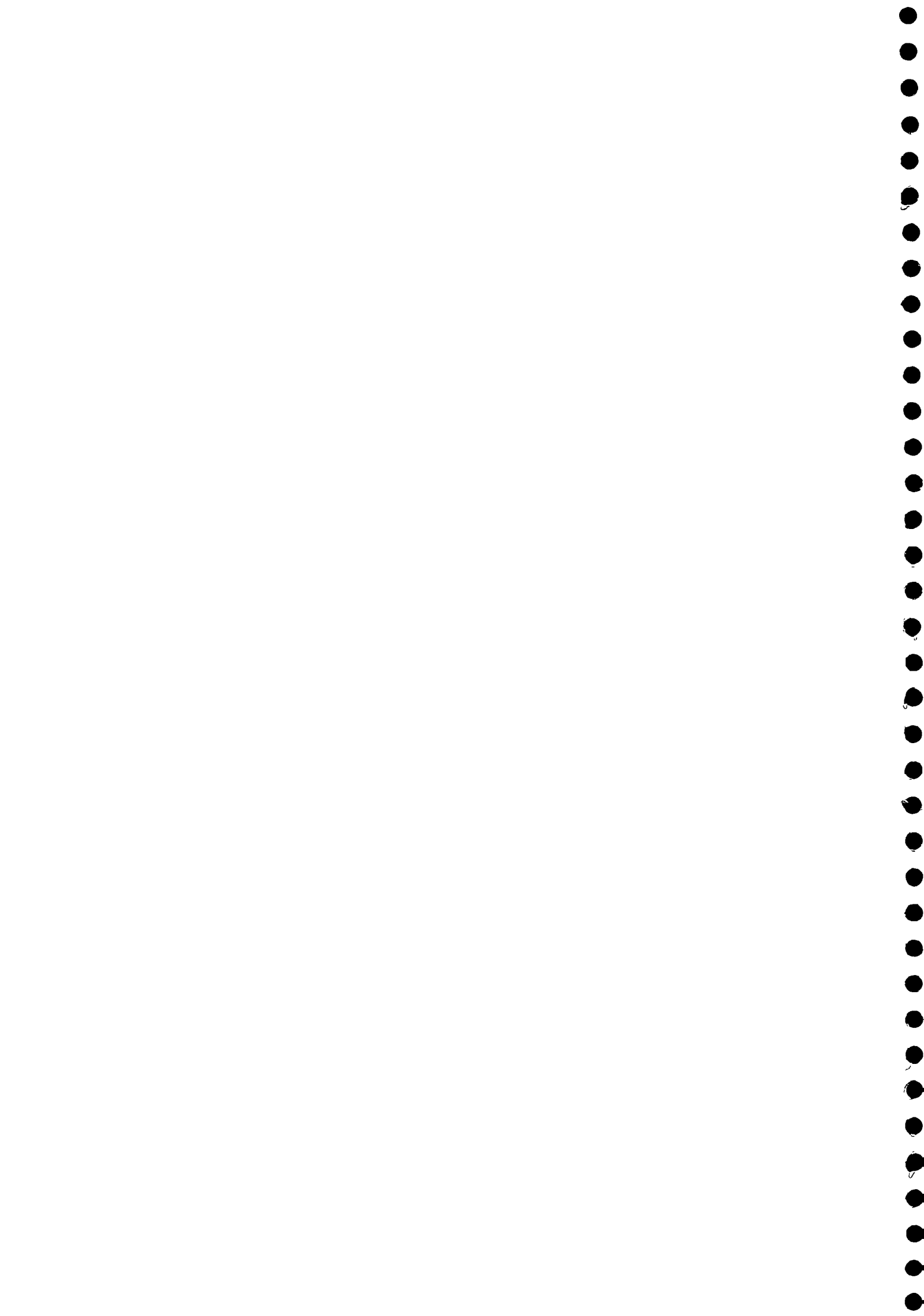
4. Water Availability and Supply Sources

Drinking Water is supplied through a number of sources with 47.5% of the total villages covered under the pipe-line water supply schemes. 28% of the total villages are being supplied water through regional water supply schemes while 21.2% of the villages are covered under handpumps. Water tables are declining at an annual rate of 5m, converting source villages into 'no source' villages over time.

Table 4.1: Various Types of Water Supply Schemes in the District

Type of scheme	No of Schemes	No. of villages covered	As a percentage of total villages covered
Piped Water Supply	540	540	47.5
Regional Water Supply Scheme	13	318	28.0
Hand-pump	241	241	21.2
Dug-well	37	37	3.3
Total		1136	100.0

Source: GWSSB, 1997



Eastern part of the district is comprised of rocky formations of granite, marble and basalt and is dotted by approximately 1200-1300 hand-pumps of shallow depth. Water flows into these hand-pumps through horizontal flow from shallow aquifers. Only at some specific locations, where the strata permits, deep bore wells have been drilled.

Banaskantha has a number of regional drinking water schemes which meet the drinking water needs of over 300 villages in the western talukas by transporting groundwater over long distances, often exceeding several hundred kilometers. Villages in Santalpur, Radhanpur, Kankarej, Tharad and Deesa talukas are covered mostly under regional schemes, whereas villages of Vadgam, Palanpur and Danta taluka are covered under individual schemes.

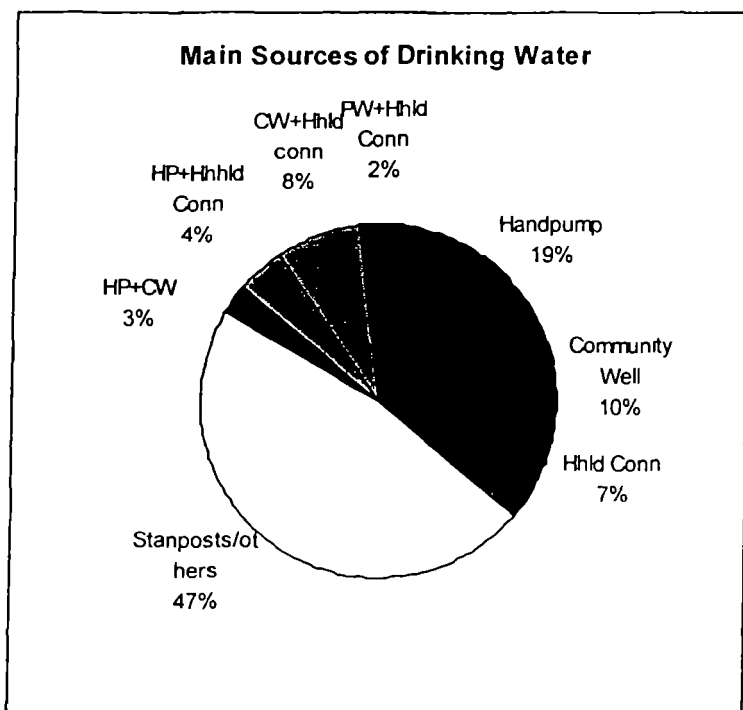


Figure 1
Source Primary Survey

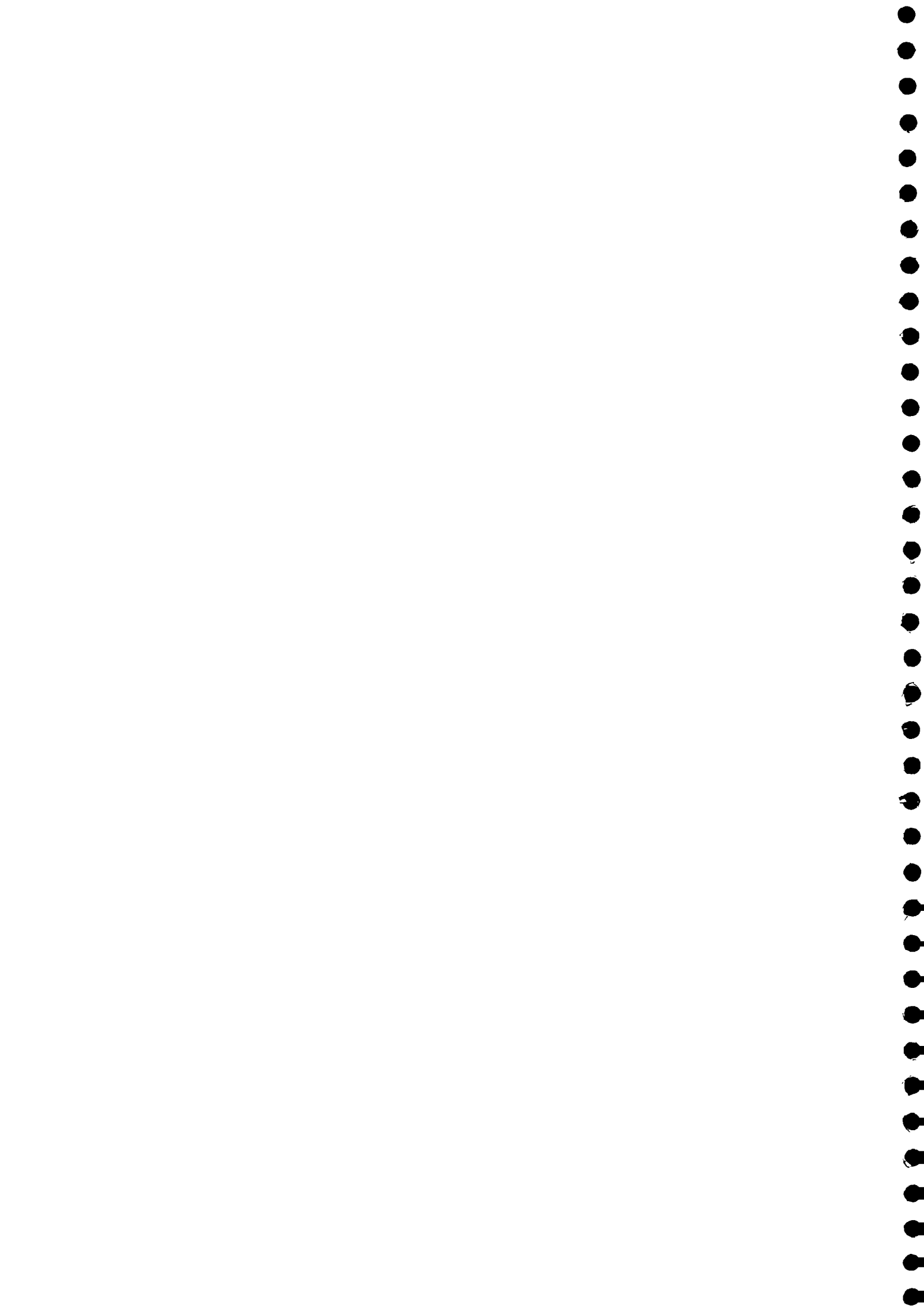
As per the primary survey, the main source of water supply are stand-posts(RWSS) and handpumps, with 47% and 19% of households dependent on them, respectively. Most of the families are dependent on more than one source for satisfying their drinking water needs. More than 90% of the households are drawing water from a government water supply source

75% of the surveyed villages reported non-existence of a household pipeline scheme. Even in those villages where such a scheme was reported, it was found during the survey that of the 21% of the households served by such a scheme, 14% depended on another source to satisfy the

domestic water demand. This implies that the water from the pipeline schemes was not adequate to serve the entire population.

Along the regional water supply schemes also, the villages near the source receive adequate water while villages at the tail-end of the scheme are afflicted by erratic water supply, restricted to a short period of time. Although, contrary to the local peoples opinion, the department officials feel that the level of reliability is highest in the regional water supply schemes and piped water supply schemes and medium in the hand pump and dug-well schemes

For 41% of the households the choice of the drinking water source changed during summer season because of drying up of the source of water that they use during the rest of the year. But none of the households reported buying of water during the summer season as no tanker facility was available in their village.



77% of the households have a drinking water source between 50-200m away from their residence. Only 3% of the surveyed households have reported the presence of a drinking water source at a distance of more than 16 kms. On an average it took most of the households 30-45 minutes to collect the requisite quantity of domestic water for their family. Most of the households have to make more than ten trips per day for collecting the domestic water.

5. Defunct and Inoperational Sources

According to the primary survey 66% of the surveyed villages reported the presence of one or more defunct sources of drinking water. 31.4% of the total number of drinking water sources in the surveyed villages have been lying defunct for a long time. Handpumps top the list of defunct sources with 32% of the total number of handpumps lying defunct for a long time, followed by 19% of the total number of community wells.

6. Traditional Water Supply Sources

Tanks have traditionally been a dominant source of water for domestic as well as protective irrigation needs in many parts of the district. Each village has access to traditional water sources, for example at least one tank/pond and usually several wells. Occasionally, a village will auction off the pond to raise funds for a community activity, such as construction of a temple.

The traditional sources like tanks and ponds get silted over time and as a result go out of use. The communities rarely show interest in desilting these structures on their own, reportedly owing to the paucity of funds. The department officials are of the view that such sources are generally contaminated or unsafe and hence, show little interest in their rejuvenation or revival.

7. Water Quality

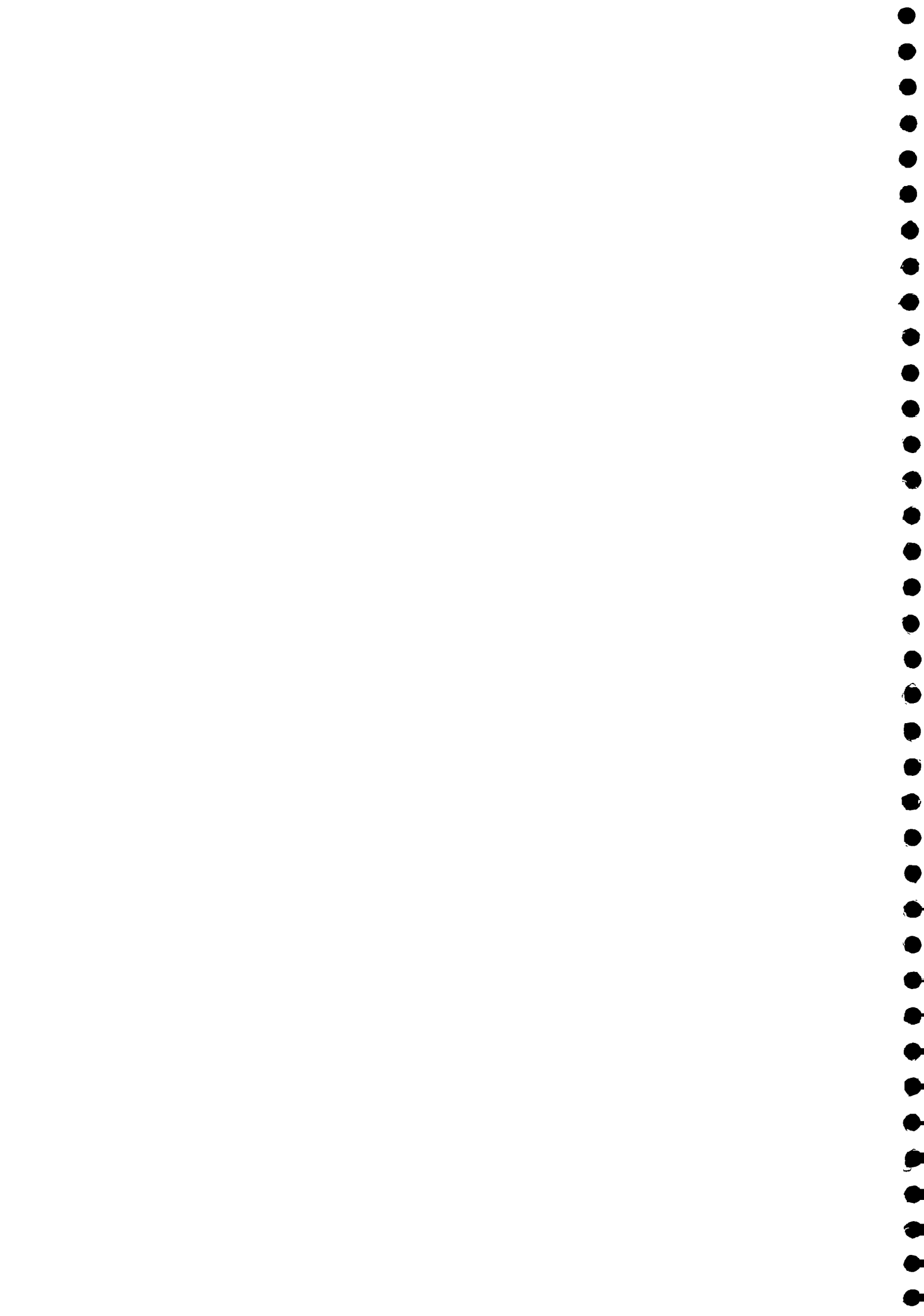
As per the departmental records, 27.2% of the total villages in the district are afflicted with a water quality problem. 293 villages of the district have been identified as affected by high fluoride content in the ground water, while 12 have a high salinity problem¹, 32 have high nitrate content in ground water. The problem is rather acute in Danta taluka of the district, where it has been planned to supply drinking water from Dharai dam.

Table 7.1: No. of Villages having Water Quality Problem

Category	No. of Villages
Fluoride Affected	293
Salinity Affected	12
Nitrate Affected	32
Total	337

Source: GWSSB

¹ Salinity in the district has appeared after 4-5 years of the operation of regional water supply schemes



During the village survey, only 12% of the surveyed villages reported of poor quality water.

8. Various Programme and Schemes in the District

A large water supply scheme, comprising of 8 regional water supply schemes serving 197 villages, is existing in the district on river Banas, near Deesa (refer Annexure I). It is the biggest scheme of its kind in the whole of Gujarat state, consisting of 18 tubewell with heavy pumping machinery and 1250 k.m of pipelines of various diameters. This scheme also supplies water to the border areas of Kachchh.

It is proposed to provide water to Radhanpur, Vav, Santhalpur and Tharad talukas from Narmada canal, which is expected to be available in next 4-5 years. The area is predominantly inhabited by tribals.

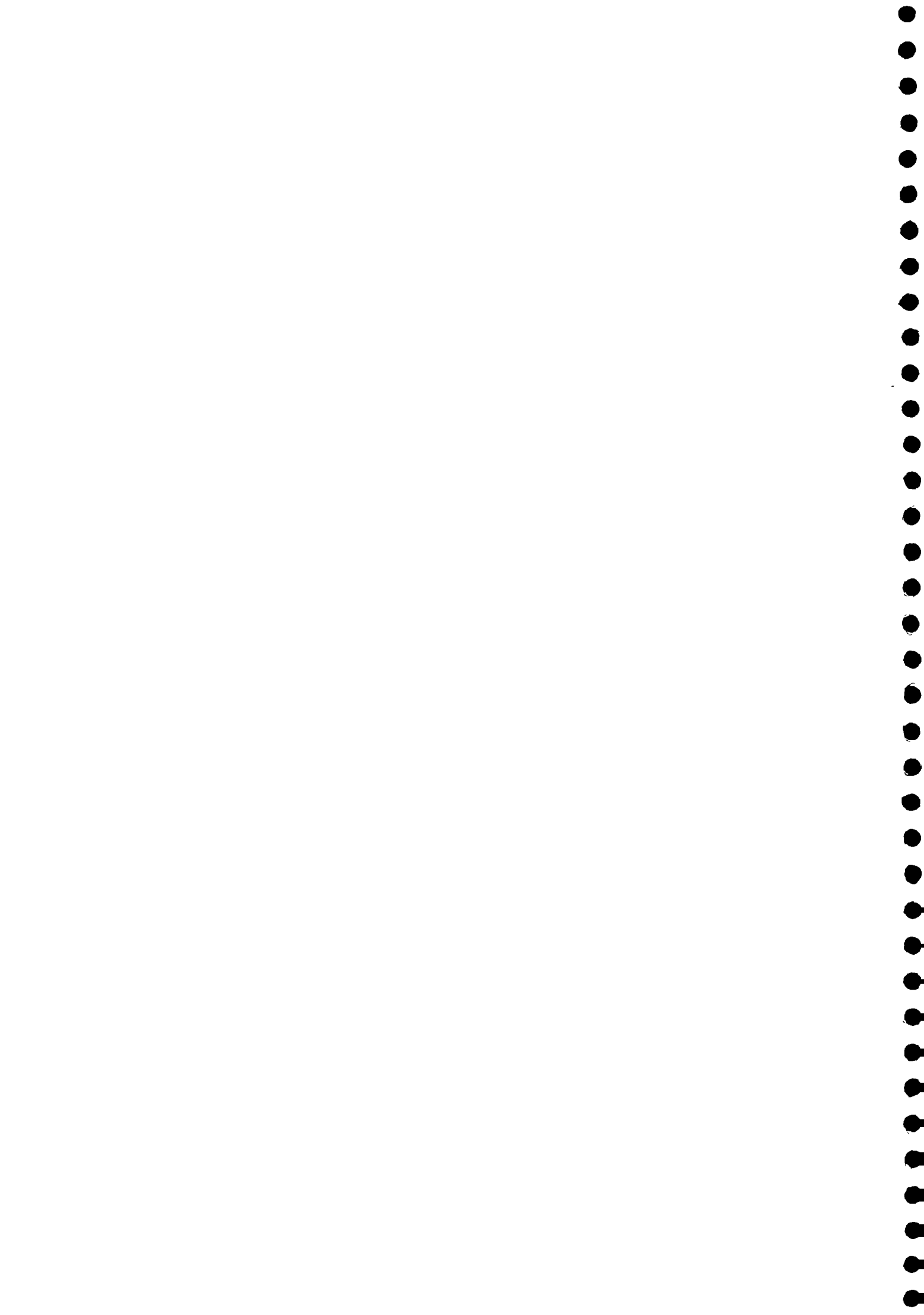
Table 8.1: Physical Progress under Various Schemes and Programmes in Banaskantha District (Upto March,1998)

Programme	Total No Of Habitation	Targeted Habitation	Coverage
NC Category	114	65	65
PC-1 Category habitations (0-10lpcd)	9	5	5
PC-2 Category habitations (10-20lpcd)	7	5	6
Quality Problem- Fluoride		8	12
NC/PC Hab Accelerated Rural Water Supply Programme RWSS		20	0
Ongoing MNP RRWS		10	9
NC/PC hab Approval Awaited		4	0
DDP RWSS		80	72
Fluoride RRWS (Ongoing and Awaited)		81	3
Bilateral RRWS		48	44
Tribal Area H P	200	45	45
Anganvadi Programme	140	37	37
Rejuvenation Programme		35	12
Special Component Plan		10	33

Source: GWSSB, 1998

Of the total allocation of 1734 lakhs for water supply and sanitation sector in the district. 13.0% is directed towards addressing the quality problems in the area, 45.8% is allocated for repair and maintenance of RWS Schemes and only 41.2% is for enhancing the availability of drinking water in the district (Annexure II)

Targets under most of the schemes have been achieved barring works under the rejuvenation



programme, Accelerated Rural Water Supply Programme (RWSS) and regional water supply schemes for fluoride affected areas. The targets under these programmes are lagging to a large extent. The department is more keen in constructing new water supply schemes rather than rejuvenating the defunct ones as they can show increased coverage by doing so. The regional water supply schemes too are rather delayed for a number of reasons. One of them is a rather large size of these schemes and a longer duration required for their approval and execution.

But it is interesting to note that although the physical targets in a few schemes, like RWSS for fluoride affected areas, NC/PC habitations under Accelerated Rural Water Supply Programme (RRWS), construction of defluoridation plants, have not been achieved, the financial expenditure under those schemes has been more than the allocation under the 1997-98 annual plan.

There are 27 defluoridation plants in the district, out of which 7 are under construction.

9. Operation and Maintenance

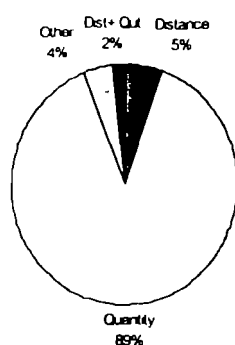
The hand pumps are maintained by service teams of the mechanical division of the department. The State Government has the responsibility for the maintenance of Regional Rural Water Supply Schemes. Contract arrangements are resorted to for increasing departmental capacity pertaining to installation of new works in the summer months. During the primary survey, all the villages reported of visits by an employee of GWSSB in their village for water supply related works.

According to the present policy, the villages covered by Group Water Supply Schemes are supposed to pay a nominal water charge at Rs.5/- per capita per annum to the State Government through Village Panchayats. But none of the households reported any revenue collection mechanism prevalent in their village. They also acknowledged that they had never contributed in any manner for either the construction of the water supply source or its maintenance.

10. Peoples' Perception of Problems Pertaining to Drinking Water Supply

With respect to the domestic water, the most prevalent problem that the villages face is of inadequate quantity of water. This is also evident from the fact that all the surveyed households have reported the average drinking water consumption of less than 40 lpcd (refer case studies).

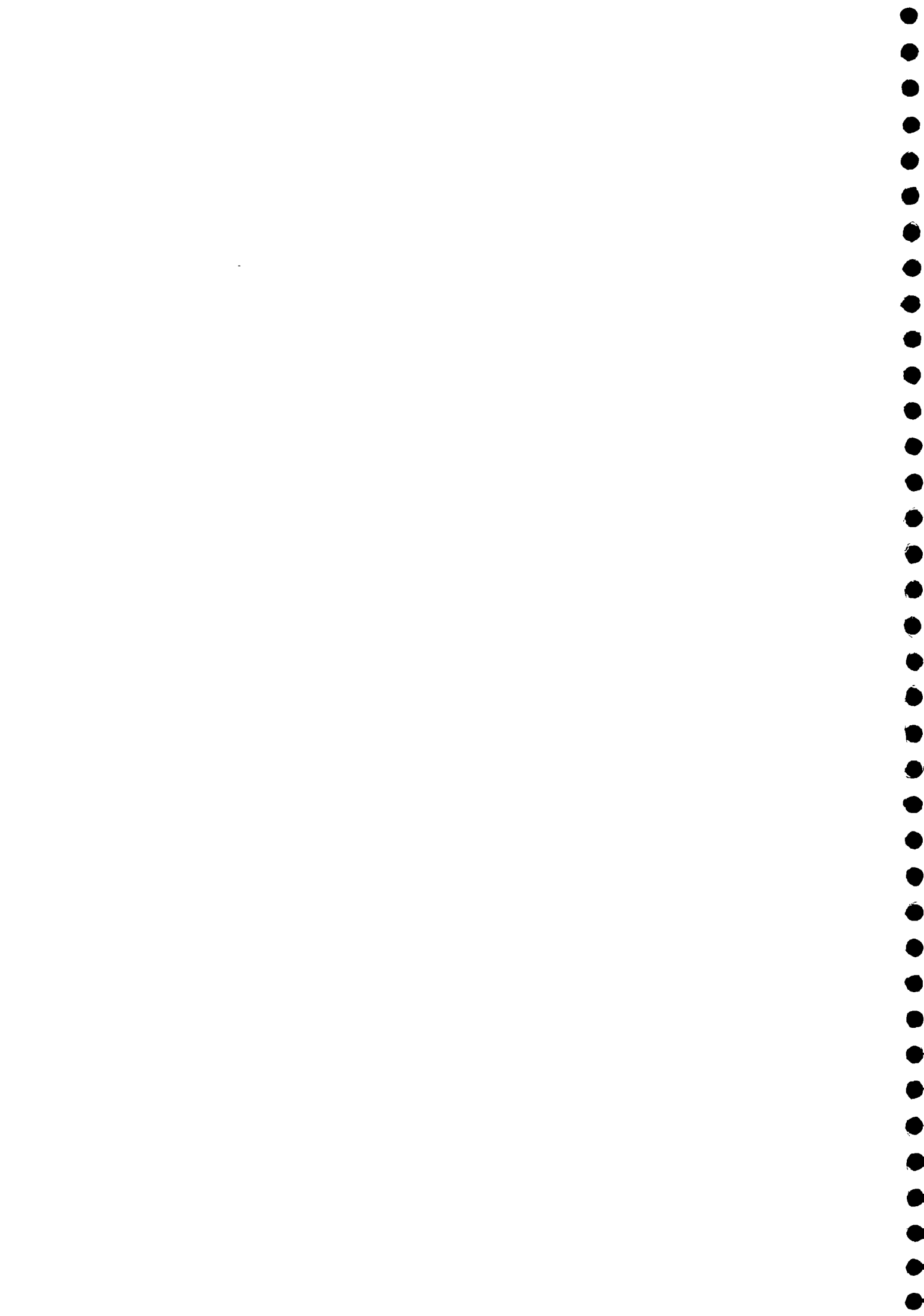
Problems Pertaining to drinking water



None of the surveyed households report poor quality of water as a problem. This complete ignorance of the local community regarding the water quality problem could be owing to their lack of knowledge of the quality related problems in their village.

7% of the surveyed households have identified distance as a major problem as far as access to drinking water facilities is concerned. Covering large distances for collecting water leads to the

Figure 2
Source: Primary Survey



women spending a long time in collecting water, this inadvertently leads to a household consuming a lesser quantity of drinking water

Although all the village panchayat members have acknowledged that they are consulted regarding interventions related to drinking water supply schemes, but they accept that it is usually only the sarpanch's opinion that is regarded as important and the community at large is not really consulted in these matters

11. Community Participation

The main constraints expressed by the villagers in the operation and maintenance of drinking water sources are the lack of training and financial constraints. The other problems envisaged in the upkeep of the drinking water sources are the inability in mobilising community effort

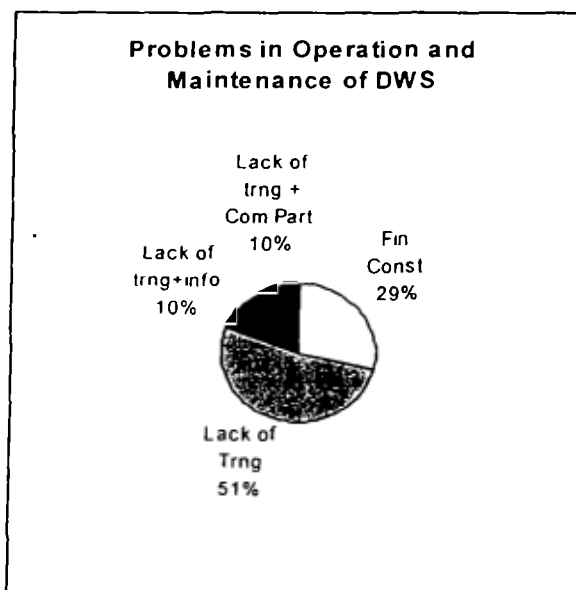


Figure 3
Source: Primary Survey

The local people feel that the panchayat does not really do anything substantial for the drinking water supply in the village. But despite this, most of the households view panchayats as the best institution for the overall management of the drinking water supply systems in the village and also collect the contribution from the households. User groups (UGs) with the participation of either the panchayat or government are considered to be the next best option for this purpose

Only 53% of the surveyed villages have expressed willingness to undertake the operation and maintenance of the drinking water sources in the village through formation of User Groups. Apart from lack of information

regarding the functioning of the user groups and the mechanism for contribution and management of community funds, people also express apprehensions about the prevalent contribution mechanisms which are generally not appropriate and lack transparency in the utilisation of the collected funds. This hinders the participation of the community in the management of the drinking water sources

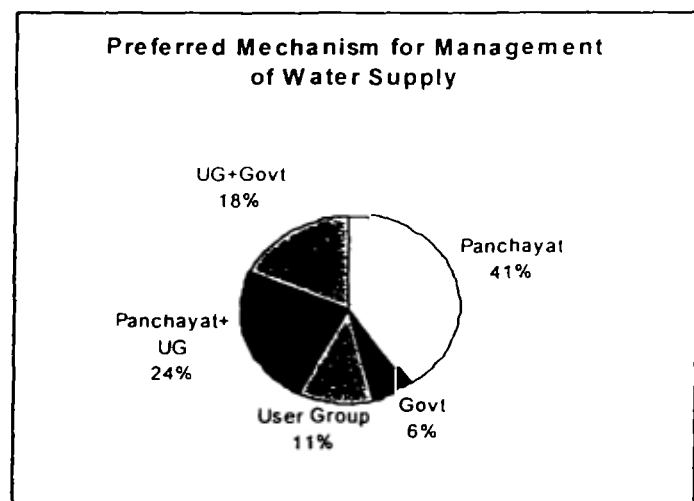
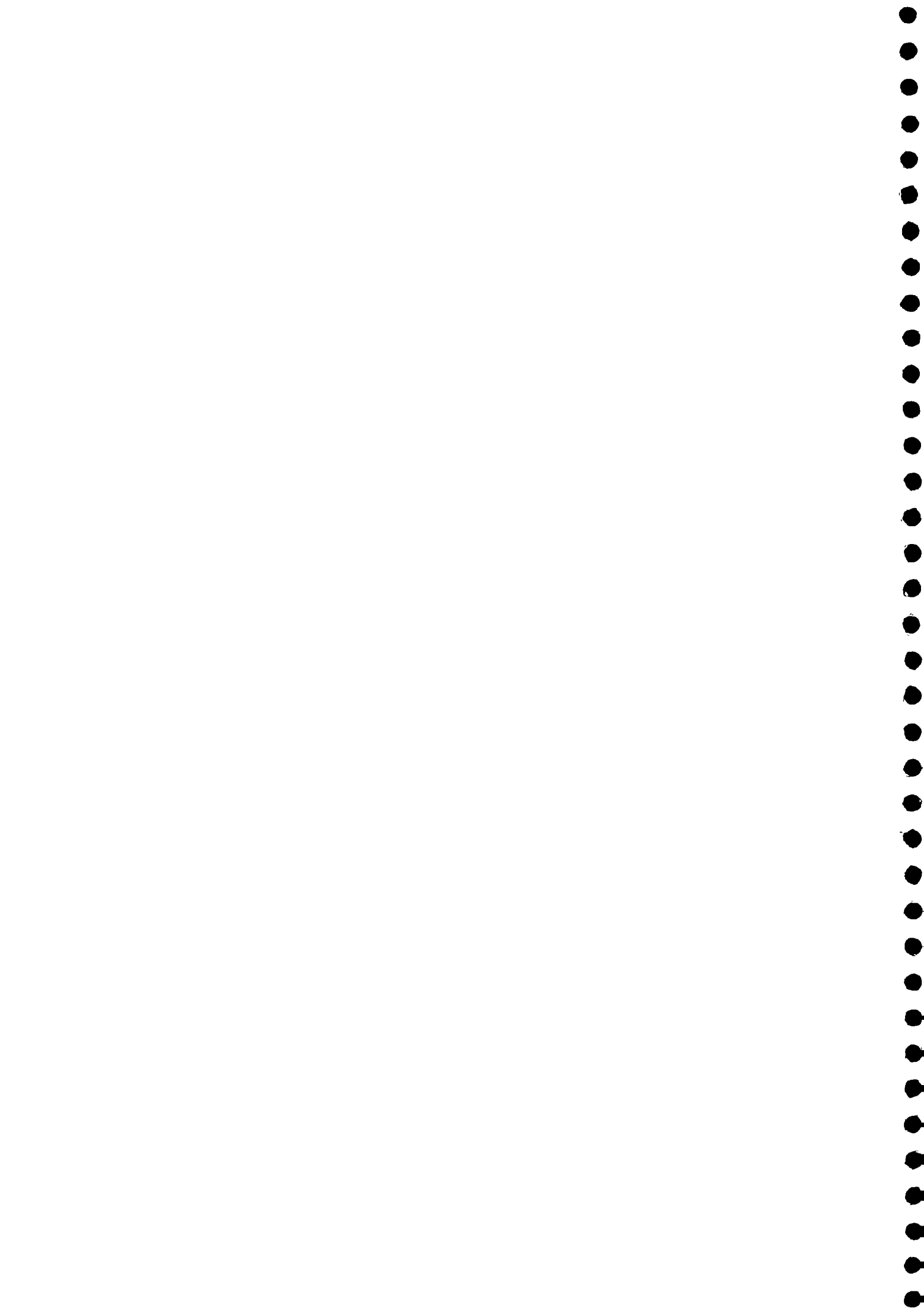


Figure 4
Source: Primary Survey



As far as willingness to pay is concerned, the average contribution forthcoming for the construction of a new drinking water source is around 250 rupees per household, while average contribution for maintenance of a source is rupees 16 only

12. Sanitation

Most of the households feel that the cleanliness around the drinking water sources is of an acceptable level and they are satisfied with the current situation.

All the households view washing hands after defecation and washing hands before meals as the most important practices relating to health and hygiene of the community. None of the households regarded the use of community or individual latrines for defecation as an essential practice for the general health and hygiene of the community.

Only about 10% of the households reported the utilisation of household/private latrines while 50% of the surveyed households regarded the household latrines as highly useful. All the surveyed household considered it the sole duty of the government to provide latrines for the improvement of the sanitary conditions in the village. They were not willing to contribute either in the monetary form or in the form of labour for such facilities.

As far as the drainage of wastewater was concerned non of the households reported the presence of soak pits or proper drainage channels in the village. But the drainage of wastewater was not really perceived as a problem by any of the enumerated households.

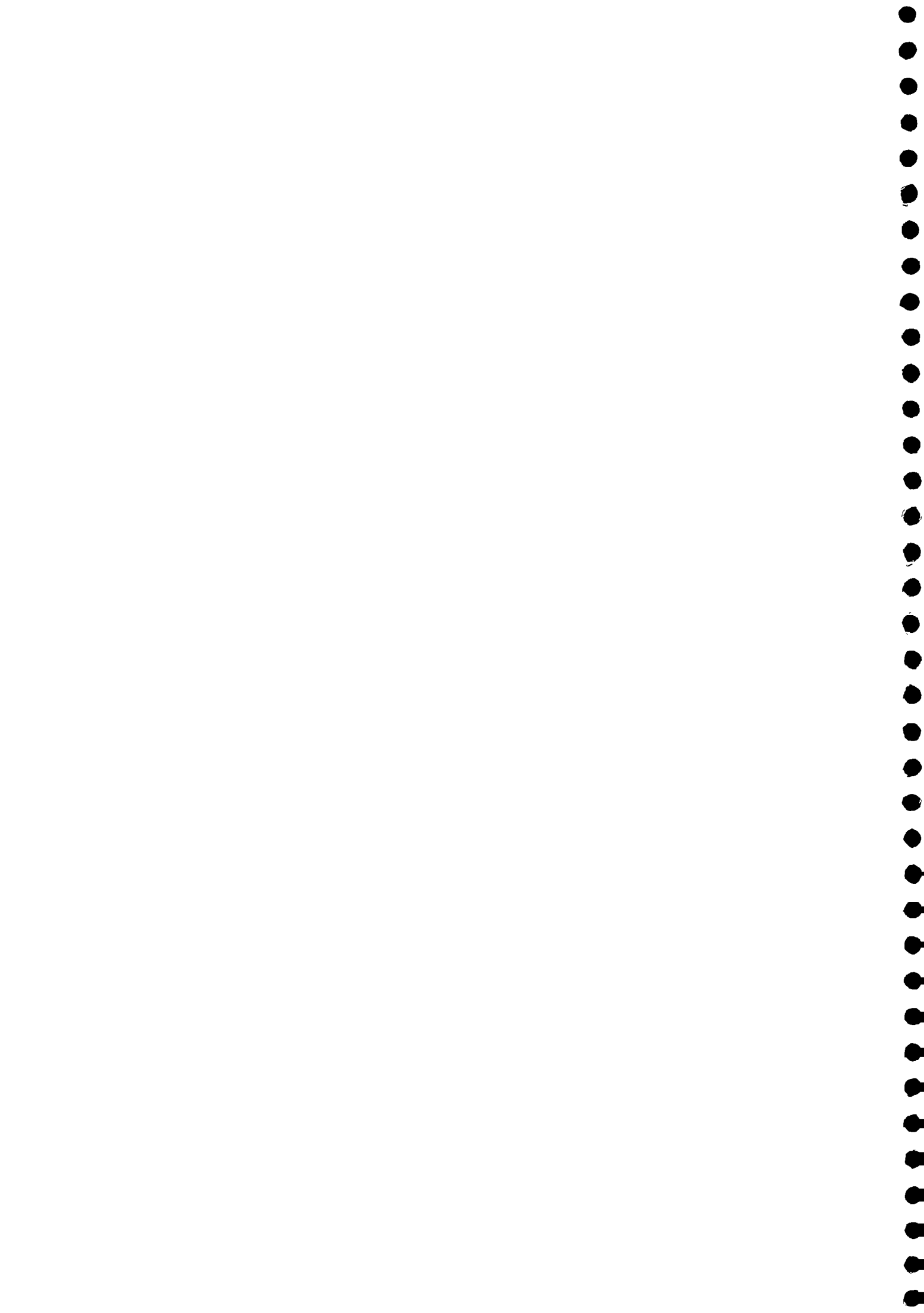
13. Conclusions

The drought prone district of Banaskantha is plagued by both a water quantity and water quality problems. Ground water conditions are also diverse in all the talukas of the district, with both water quality as well as quantity declining as one moves from north-east to south-west

84.1% of the total number of villages in the district fall in "fully covered" category, while 9.2% fall in the "not covered" category. The primary survey results though show a good coverage of households under drinking water schemes, however all of them mentioned an average domestic water consumption of less than 40 lpcd bringing them to partially covered category implying that the water supply from the drinking water sources is not sufficient to adequately serve the entire village population

According to the primary survey 66% of the surveyed villages reported the presence of one or more defunct sources of drinking water. 31.4% of the total number of drinking water sources in the surveyed villages have been lying defunct for a long time with handpumps topping the list of defunct sources followed by community wells. Looked at in conjunction with the fact that most of the surveyed villages have reported a fall in the ground water levels (at an average annual rate of 5m), it is clear that over-extraction of ground water is resulting in many sources going defunct

Tanks and ponds have traditionally been a dominant source of water for domestic as well as



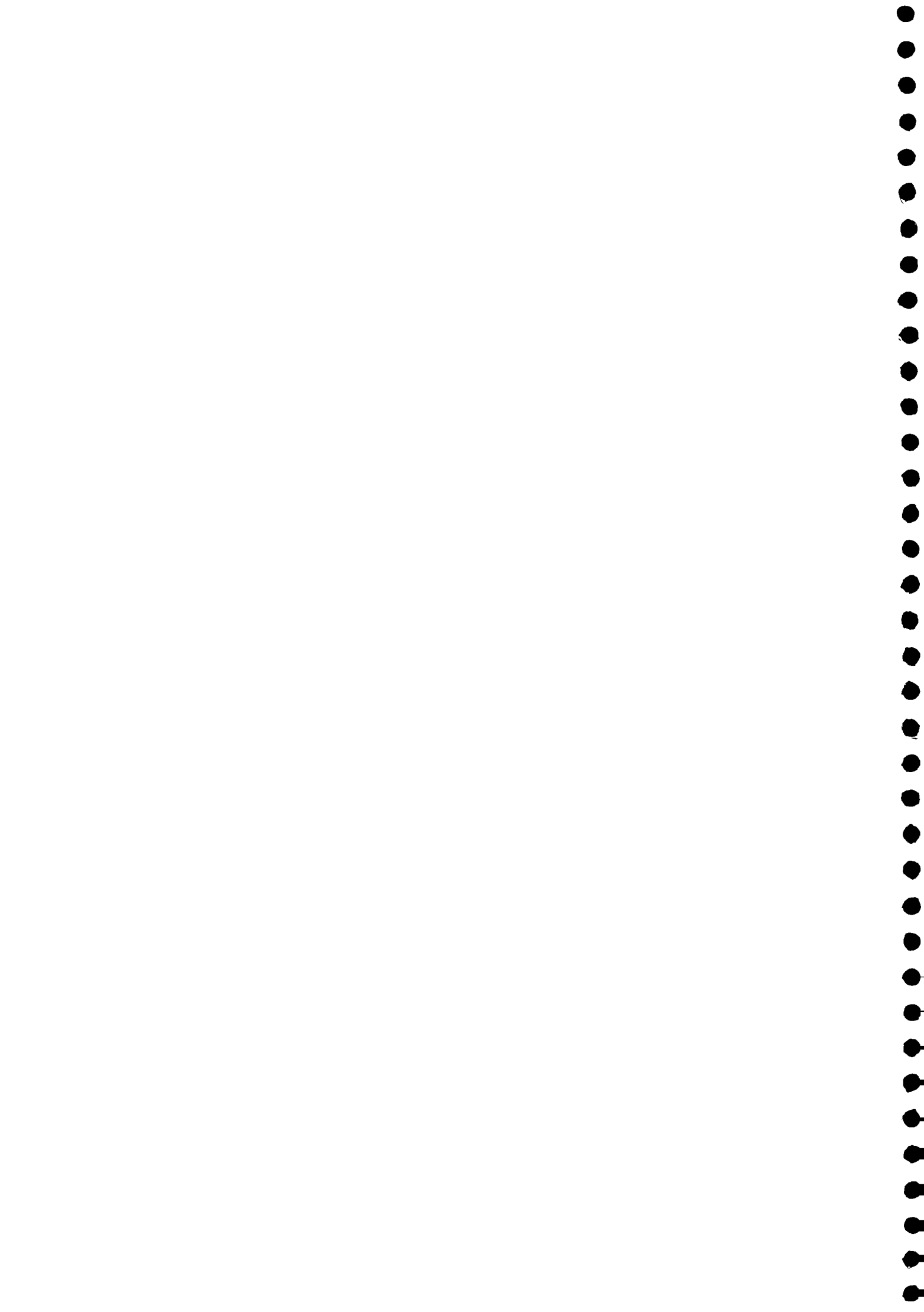
protective irrigation needs in many parts of the district. However, with establishment of new water sources like handpumps wells etc., these traditional sources have become silted over time and as a result gone out of use. Attempts of maintenance or rejuvenation have neither been made by the community nor the department. The department officials are of the view that such sources are generally contaminated or unsafe and hence, show little interest in their rejuvenation or revival.

27.2% of the surveyed villages in the district are reported to be afflicted with a water quality problem but the local community does not perceive the poor quality of drinking water as an important problem since the inadequate quantity of available water is a more immediate problem and over-rides the quality issue.

The community at present is not participating in any way for the upkeep and maintenance of the various drinking water sources owing to lack of training, financial constraints and inability in mobilising the community effort. 53% of the surveyed villages have expressed willingness to undertake the operation and maintenance of the drinking water sources in the village through formation of User Groups, provided they are informed regarding the functioning of the user groups and the mechanism for contribution and management of community funds. There are also apprehensions about the prevalent contribution mechanisms which are generally not appropriate and lack transparency in the utilisation of the collected funds.

Although 50% of the surveyed households regard the household latrines as highly useful, they consider it the sole duty of the government to provide latrines for the improvement of the sanitary conditions in the village and were not willing to contribute in any form for such facilities.

In conclusion, it can be said that while the departmental figures report a high full coverage, actually most of the settlements are only partially covered. This situation exists primarily because of unfunctional and low yielding water extraction mechanisms. The inadequacy of water is so pronounced that it completely over-rides the quality issue. The situation takes on a more serious dimension during the summer months, with the area facing a widespread water crisis. Judicious management and maintenance of existing infrastructure coupled with efforts directed towards rejuvenation of localised traditional water harvesting systems would go a long way in easing the crisis in many places. At present neither the local community nor the department are actively undertaking such measures. However, discussions with the people at the village level have revealed a willingness to participate and contribute towards the upkeep and maintenance of drinking water sources. Both the local community and the department need to work in tandem to mitigate the drinking water problem in the district.



Annexure I

Regional Water Supply Schemes in Banaskantha District

Scheme	Taluka	No. of villages covered	No. of villages supplied with water	Capital cost of scheme (in lacs)
Samadhi - Ranajivas	Palanpur	3	3	8.32
Velavpur - Saviyana	Deesa	2	2	5.32
Agdal	Deesa	5	5	15.75
Garnel-Nani-Moti	Deesa	2	2	4.82
Katarva	Deesa	5	5	19.67
Tharad	Tharad	36	29	476.56
Deh-Odhra	Dhanera	10	8	41.6
Khimat-Vithodar	Dhanera	26	2	327.13
Eight RWSS	Vav/Tharad/Deesa	197	197	505.95

Source: GWSSB, 1997

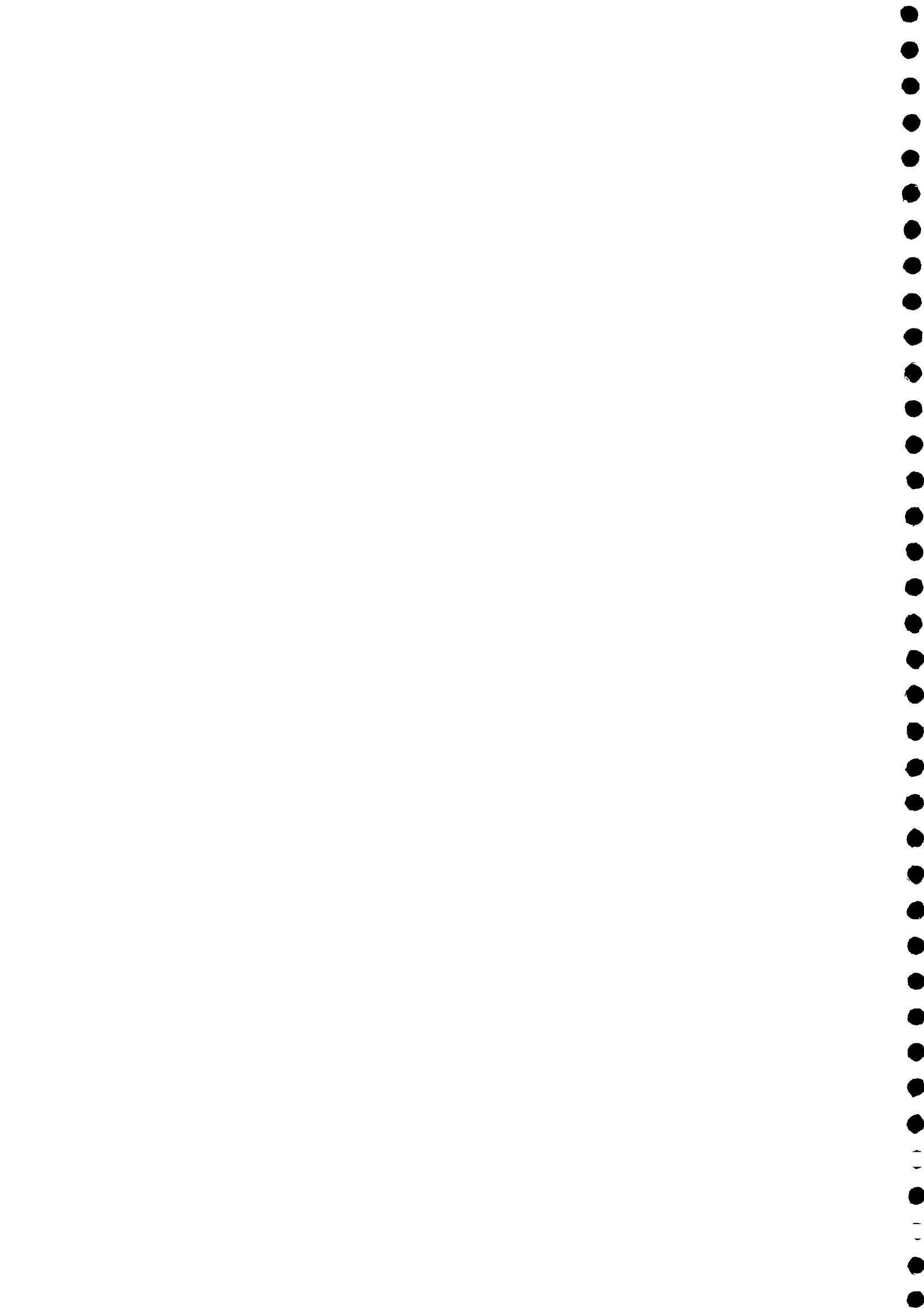


Annexure II

Annual Budget/Programme & Progress of Expenditure upto March, 1998 (Rs. in Lacs)

Programme	Plan Provision 1997-98	Expenditure
N C Category habitations	110	130.82
P C 1 Category habitations (0-10lpcd)	10	1.91
P C 2 Category habitations (10-20lpcd)	6	6.98
Quality problem Cat.		
D/F Plants	80.00	166.54
Salinity Problem	0.00	0.00
Nitrate Problem	0.00	0.00
NC/PC Hab. ARP (RRWS)	62	115.28
Ongoing MNP RRWS	5	17.65
NC/PC Hab. RRWS (AA Awaited)	5	0
D D.P. RRWS - on going	35.00	45.64
D D.P. RRWS - To be appr	35.00	0.00
Fluoride RRWS - on going	145.00	195.77
Fluoride RRWS - AA Awaited	0.00	0.00
Bilateral RRWS	117	26.64
Tribal area Sub-plan (Rural)	30.00	10.33
Tribal area Sub-plan (Urban)	15.00	0.00
Anganwadi Programme	35	18.89
Rejuvenation Programme	87	101.69
Special Component (Rural)	30.00	46.07
Special Component (Urban)	5.00	0.00
Sch Comp Fund Required	3.00	3.06
Rural WSS As & When	0.00	0.00
BADP Prog - State	100.00	108.04
BADP Prog - Central	20.00	18.62
Saltcess Programme	0	0
Poverty Eleviation Prog	7	0
Total	942	1013.93
M &R to Regional WSS	792	534.14

Source GWSSB 1998



Annexure III

Village Case Studies

Village : Moriba

Taluka : Vav

Village Profile

Village Moriba falls in the Vav Taluka of the Banskantha District. The village has a gram panchayat, anganwadi kendra. Moriba is a large village with a number of communities co-habiting in it. The main communities inhabiting the village belong to the scheduled caste and economically backward and include Patel, Chaudhari, Harijan, Rabari, Panchal, Suthar, Pandya, Nai, Rathod, Jain. The households of the village are distributed in about 7 bastis. Cultivation and agricultural labour are main occupations of the villagers. Most of the cultivation in the village is carried out during the monsoon months. Hardly any area is brought under plough during winter and summer because of scarcity of water for irrigating the crops. The literacy levels among the village population are extremely low.

Sector Status and Knowledge Attitude and Practices

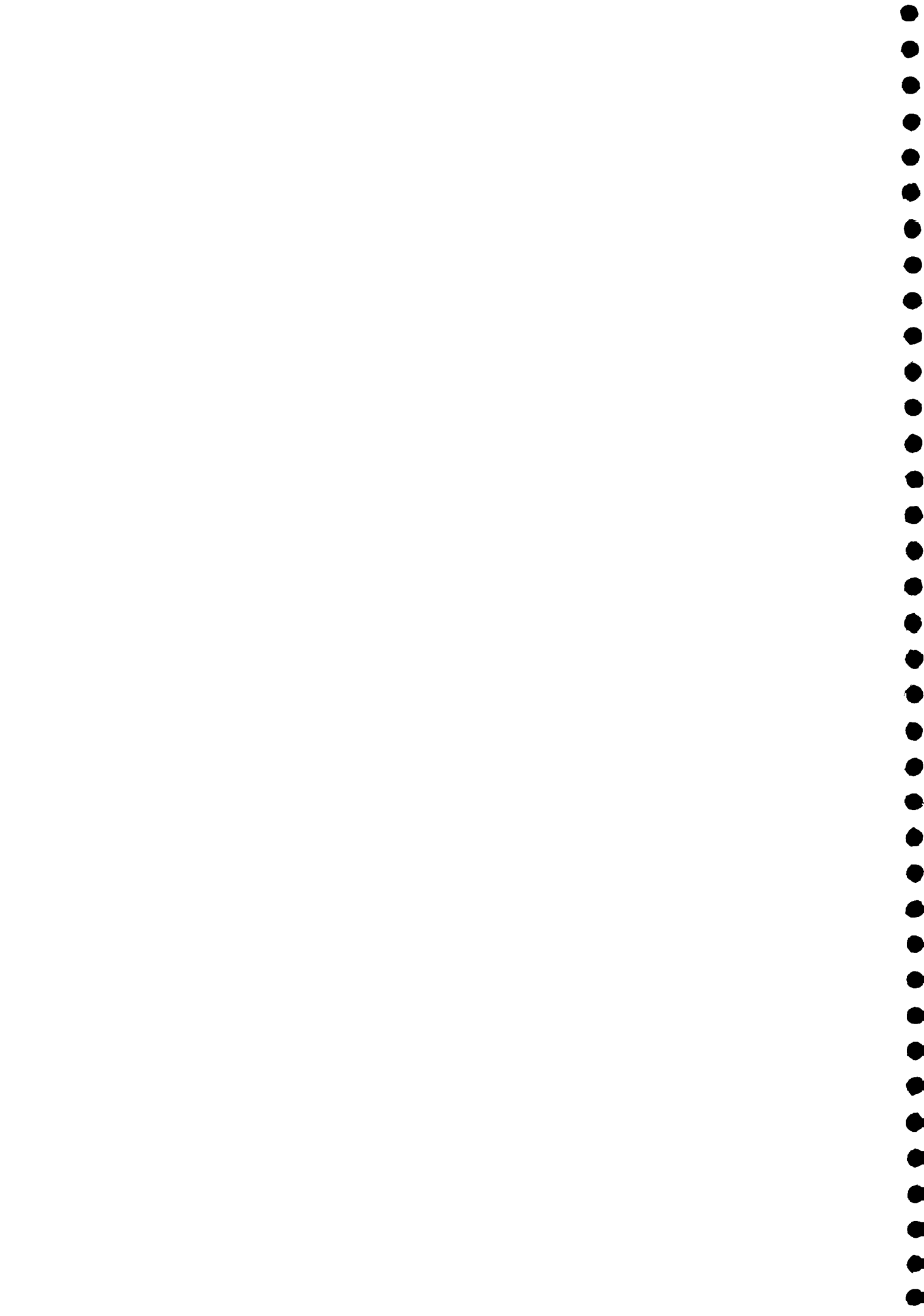
Although Moriba is a large village, there is only one stand-post for the supply of drinking water in the whole village which supplies water during morning and evening. The whole village has to come to this stand-post to collect drinking water. As a result there is an acute problem of shortage of drinking water in the village throughout the year. This also results in a wastage of a lot of time in collecting drinking water and on an average about 30 minutes are spent in collecting the water. There is a lot of rush and urgency among people while filling water which regularly results in the breaking of a number of earthen water pitchers.

At times water has to be collected from long distances (from bore wells in the farms), which is very inconvenient for the village women. Also water for the livestock has to be brought from long distances / they have to be taken there, but there is nobody in the village who is willing to do this work.

On an average, a household of four people consumes about 30 litres of water for drinking purposes everyday, which rises to about 60 litres in the summer months. The scarcity of drinking water becomes more acute during the summer months and the years of drought, when the ground water tables fall considerably. Despite the scarcity of water in the summer months none of the households are buying any water.

The water in the village has high salinity content, making it unpalatable. People also believe that this water also causes various diseases, especially related to skin infections and stone problem.

People view sanitation as an important part of life. It is extremely important to maintain sanitary conditions in areas around the drinking water facilities in the village. Removal of garbage and sewage is also extremely important to keep the village clean and protect the village from spread



of various diseases / epidemics. Villagers consider it essential to wash hands after defecating and also washing hands before eating food as essential practices for cleanliness and health. Provision of toilets is also necessary for the maintaining sanitary conditions in the village. People consider it the duty of the government to construct community toilets in the village.

Issues Related to Drinking Water

There is a shortage of water during summer months and the years of drought. The villagers feel that the one hand-pump is not adequate to serve the entire village population and there is a need for the government to dig new bores so that everyone in the village gets adequate quantity of potable water

People want the government to undertake new drinking water schemes in the village. People are ready to carry out all labour work for the scheme but have expressed inability in monetary contribution for the scheme owing to poor economic conditions prevalent in the area.

Once the scheme starts operating people are willing to pay some water charges (each according to his financial capability) but are not ready to contribute in lump-sum for the construction and maintenance of the scheme



Village : Dadegam
Taluka : Tharad

Village Profile

The village falls in the Tharad Taluka of Banaskantha district and is adjoining the boundary of Vav taluka. The village is bound on the sides by Moriba, Khanpur and Nagla villages. The village has a large number of households residing in nine bastis / settlements. A number of communities co-habit the village. The most prominent communities in the village are Patel, Thakur, Rajput, Harijan, Bhangi, Jain, Brahman, Lohar, Suthar and Pandya. The households belonging to a particular community reside in one basti/ settlement. The main economic activity for the village population is cultivation and agriculture labour. Most of the cultivation in the village is carried out during the monsoon months. Hardly any area is brought under plough during winter and summer because of scarcity of water for irrigating the crops. The general literacy levels in the village are poorer than the state average. The village is linked by a pucca road and has a primary and a middle school, anganwadi kendra, a big temple and a Panchayat ghar.

Sector Status and Knowledge Attitude and Practice

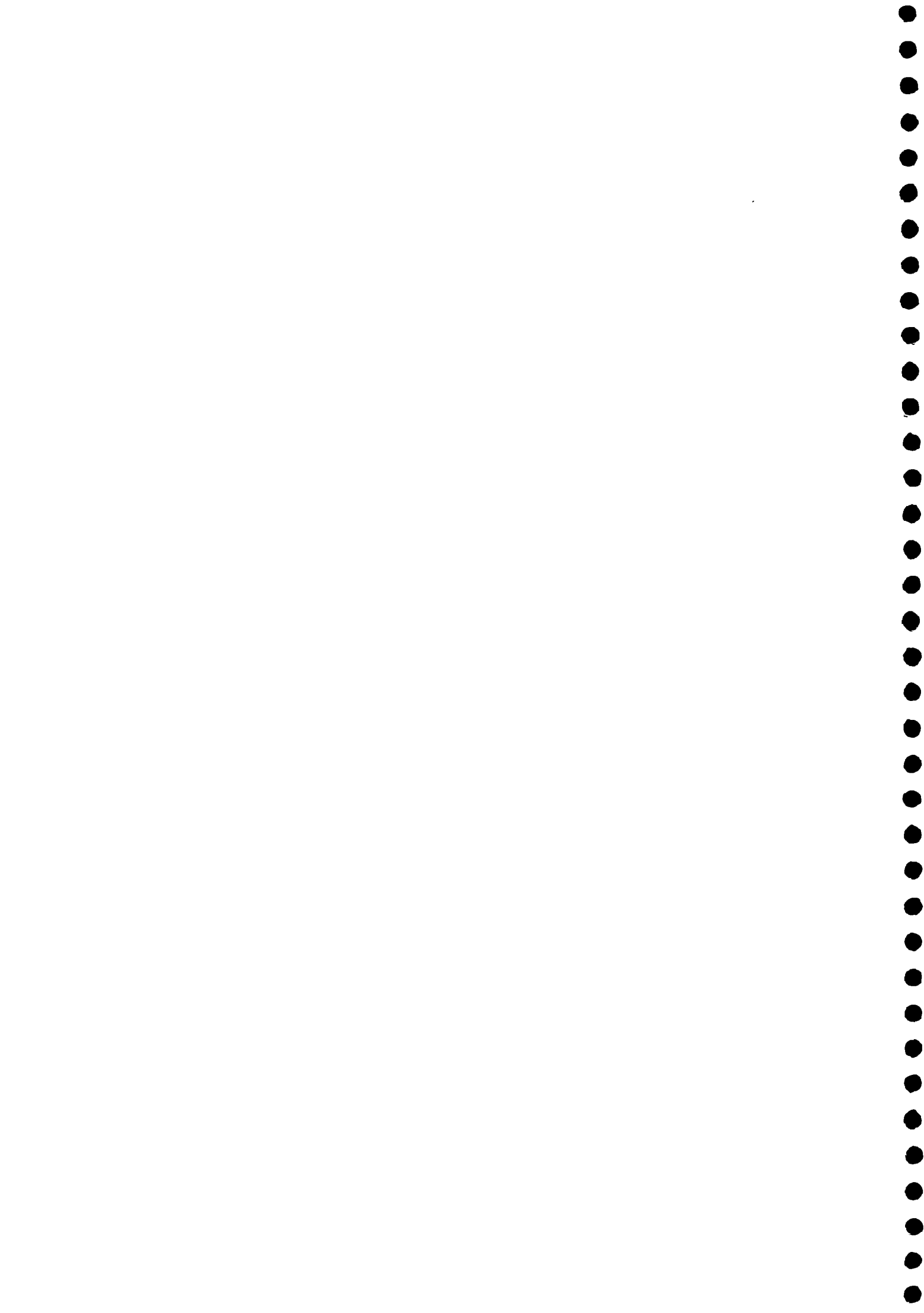
The village has four stand posts and a piped drinking water supply scheme operational in one basti of the village which supplies water for about 5 days a week. As the village population is very large these facilities are not adequate to serve the entire village.

Source of Drinking Water	Number	Dependability
Hand-pumps	4	Medium
Pipeline Water Supply		Low

Whenever there is a scarcity of drinking water, the villagers go to the fields to collect drinking water from the irrigation bore-wells. But when both the quantity and the quality of water from the bore-wells deteriorates, village women have to walk long distances outside the village to get water. Water supply from the village stand-posts is very low. Same is the case with household taps provided under the pipeline scheme.

On an average a household of four people consume about 30 litres of water for drinking purposes everyday, which rises to about 60 litres in the summer months. On an average it takes about 30-45 minutes per day to collect water for drinking purposes. Despite the scarcity of water in the summer months none of the households are buying any water.

The quality of water supplied through the piped water supply scheme is good and potable. But the water collected from the field bores is of poor quality with high salinity content. The groundwater level falls drastically during the summer months and also the quality of water deteriorates considerably making it unpalatable. The local people believe that the consumption of this water can cause stones in the body and also lead to other diseases.

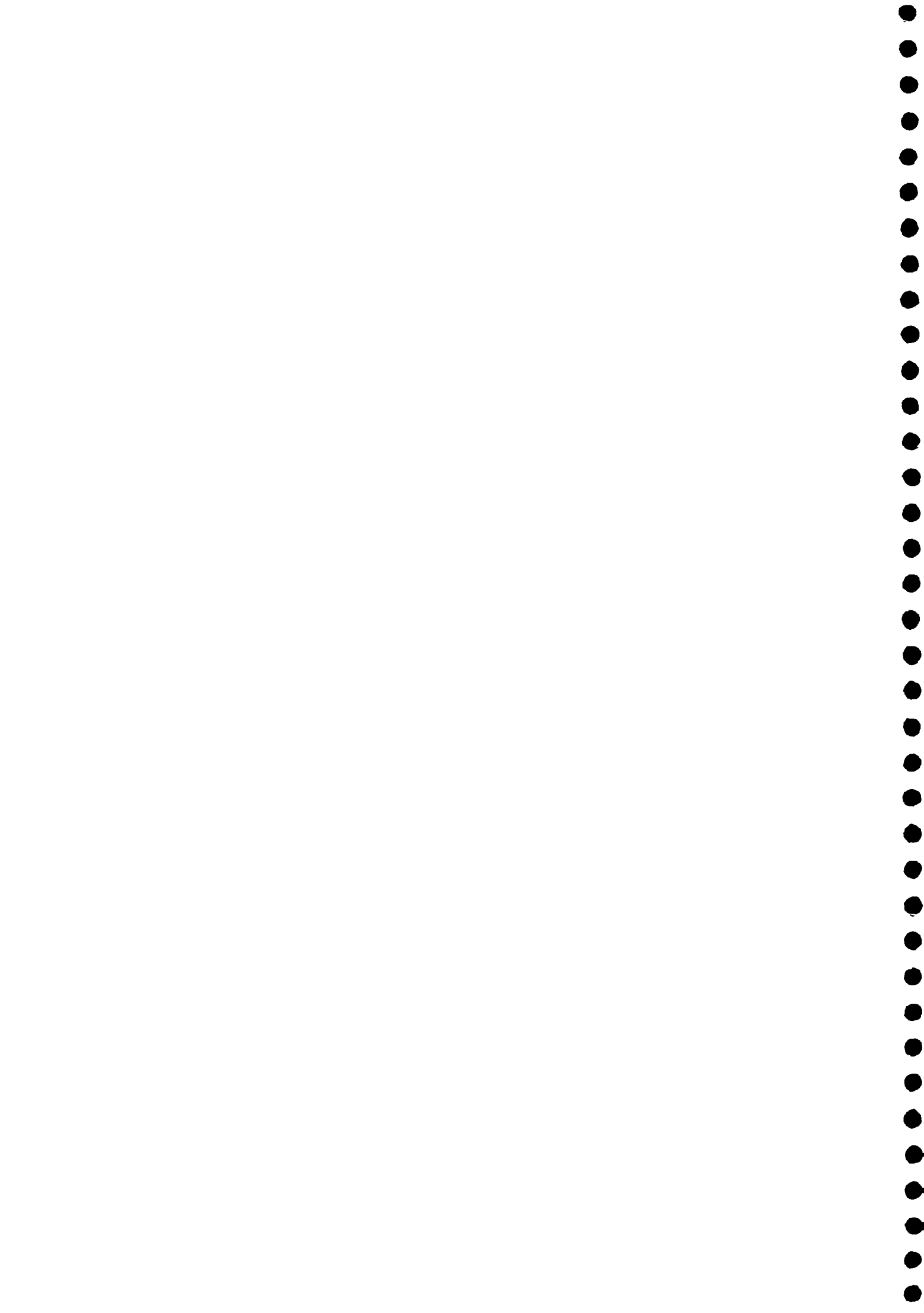


Panchayat is the main organisation active in the village which is working for the provision of more drinking water.

As the literacy levels among the population are extremely low, the general cleanliness and sanitary conditions in the village are poor. But people do consider it important to maintain sanitary conditions in the village through the removal of garbage and sewage disposal. They consider it important to maintain sanitary conditions around the sources of drinking water supply. Villagers consider it essential to wash hands after defecating and also washing hands before eating food as essential practices for cleanliness and health. People consider it the duty of the government to construct community toilets in the village.

Issues Pertaining to Drinking Water

The acute scarcity of good quality drinking water was one of the prominent issues that emerged during a meeting held in the village. One of the main concerns of the village community was the reliable supply of drinking water throughout the year. The villagers wanted the government to bring in some new scheme for drinking water in the village. The local people expressed willingness to participate by contributing free labour if such a scheme was brought into the village. The villagers are also willing to give monetary contribution for the scheme according to the individual's financial status and capability. People consider the user-groups to be the best set-up for the operation and maintenance of the drinking water supply schemes in the village.



District Amreli

1. Introduction

Amreli district, located in the Saurashtra region of Gujarat along the Arabian Sea Coast, is bounded by District Junagarh on the West, District Bhavnagar on the East and District Rajkot towards the North. The district, having a population of 12.53 lakh spread over an area of 6800 sq.km., has a population density of 185 persons per sq.km. Amreli district consists of two divisions viz. Amreli division comprising of Amreli, Babra, Lathi, Lilia and Kunkavav Vadia talukas and Rajula division comprising of Rajula, Dhari, Jafrabad, Khamba and Kodinar talukas. The district has 595 inhabited villages and 12 towns. 9.3% of the total population belongs to SC/ST category. The district has a work force participation rate of 33.6, with 67.5% of the total workers engaged in primary sector.

The district has a semi-arid climate with average annual rainfall of 545.5 mm. The rainfall in the district usually follows a cyclical pattern, with two to three years of plentiful rainfall, followed by one or two years of sparse rainfall.

2. Water Resource: an overview

Over the years, a fall in the drinking water level in the area (average rate of 0.3-0.5 m every year) has been reported both by the government officials and the local populations. The erratic rainfall pattern and frequent occurrence of droughts further compounds the problem. There is also a drastic change in the groundwater table between post monsoon to pre-monsoon season.

High salinity and high fluoride content in the ground water are the major problems faced by the villages in the district.

3. Coverage under Water Supply

Of the total number of habitations, about 62% of the habitations are fully covered under the drinking water supply scheme as reported by the Department. Only two habitations are not covered by any water supply scheme (0.3%), while 37.9% fall in Partially Covered category. Table 3.1 presents a break up of coverage in the district.

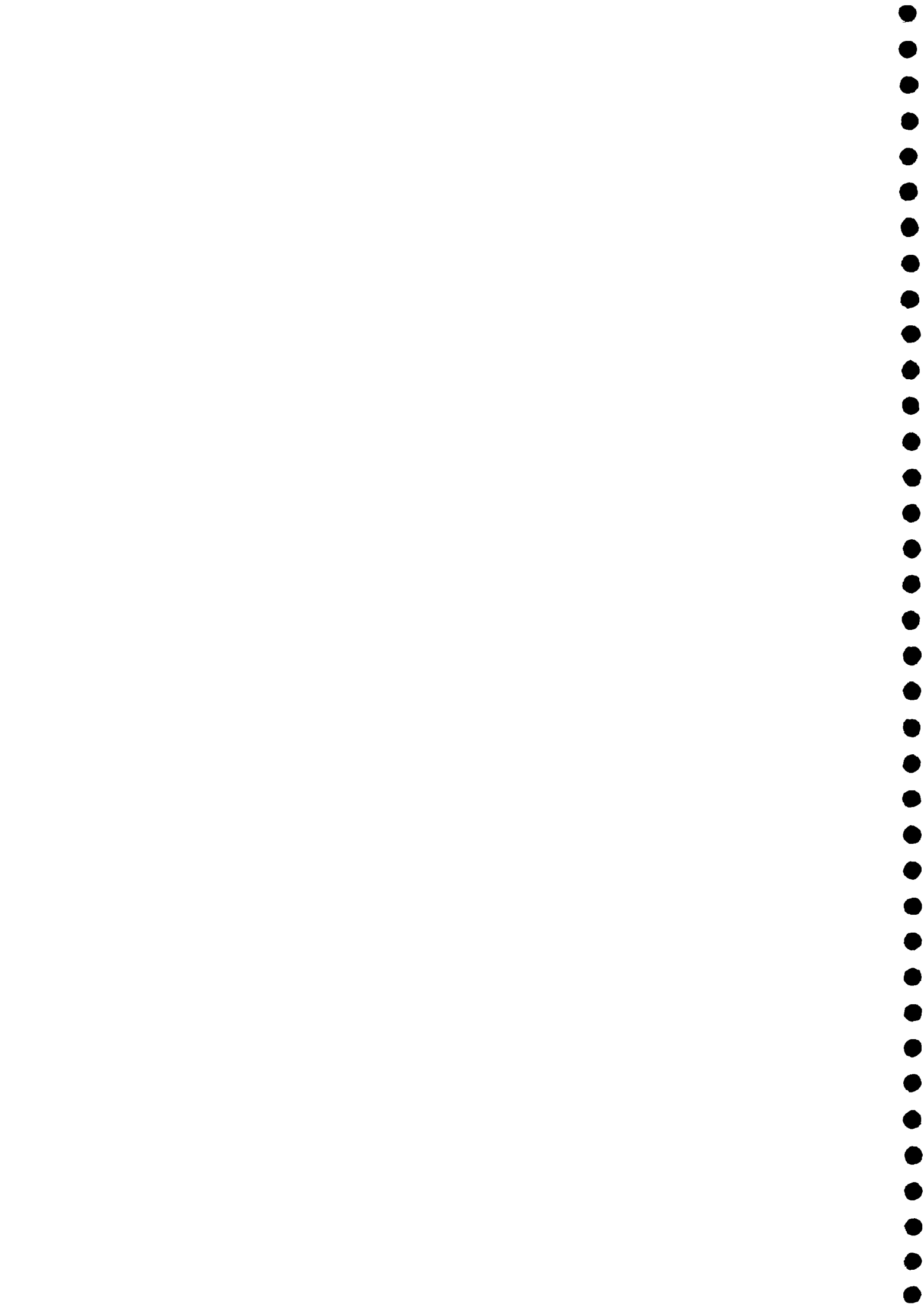


Table 3.1: Status of Coverage Under Drinking Water Supply Schemes

Category	No. of habitations	Percentage
Fully Covered 'FC'	615	61.8
Not Covered 'NC'	2	0.3
Partially Covered (0-10 lpcd)	68	6.8
Partially Covered (10-20 lpcd)	176	17.7
Partially Covered (20-30 lpcd)	102	10.3
Partially Covered (30-40 lpcd)	31	3.1
Total	994	100

Source: GWSSB, (as on 31st March'97)

Table 3.2 presents the status of coverage in the villages surveyed. The table lists the various parameters that define FC, PC or NC status of a habitation. As per the primary survey results, there is a good coverage of the households under drinking water schemes, with a drinking water source for 67 households and a functional drinking water source for 94 households.

Table 3.2: Drinking Water Supply Status as per Primary Survey

Coverage (Avg. No of households per drinking water source)	67
Coverage (Avg No of households per functional drinking water source)	94
Water Consumption (lpcd) as a % of responding households	
<40	4
40-80	50
80-120	41
> 120	5

Source: Primary Survey, 1998

Most of the households (67%) have a drinking water source less than 100m away from their residence and take less than 5 minutes to reach it. On an average a family makes about 10 trips per day to collect drinking water and spends about 30-40 minutes for collecting it.

Only 4% of the surveyed households had a consumption level of less than 40 lpcd, while rest of the enumerated households consume >40 lpcd of water for domestic purposes.

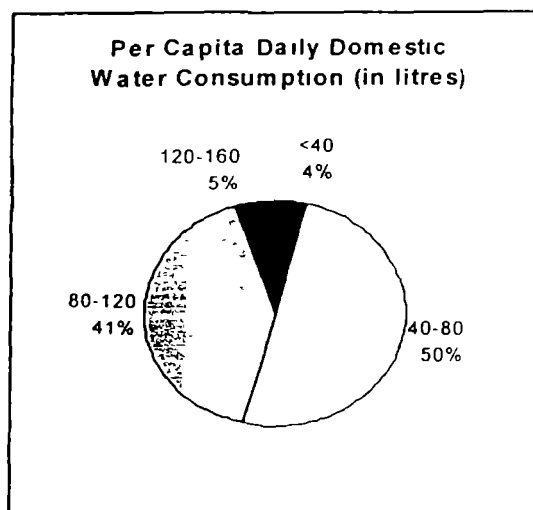
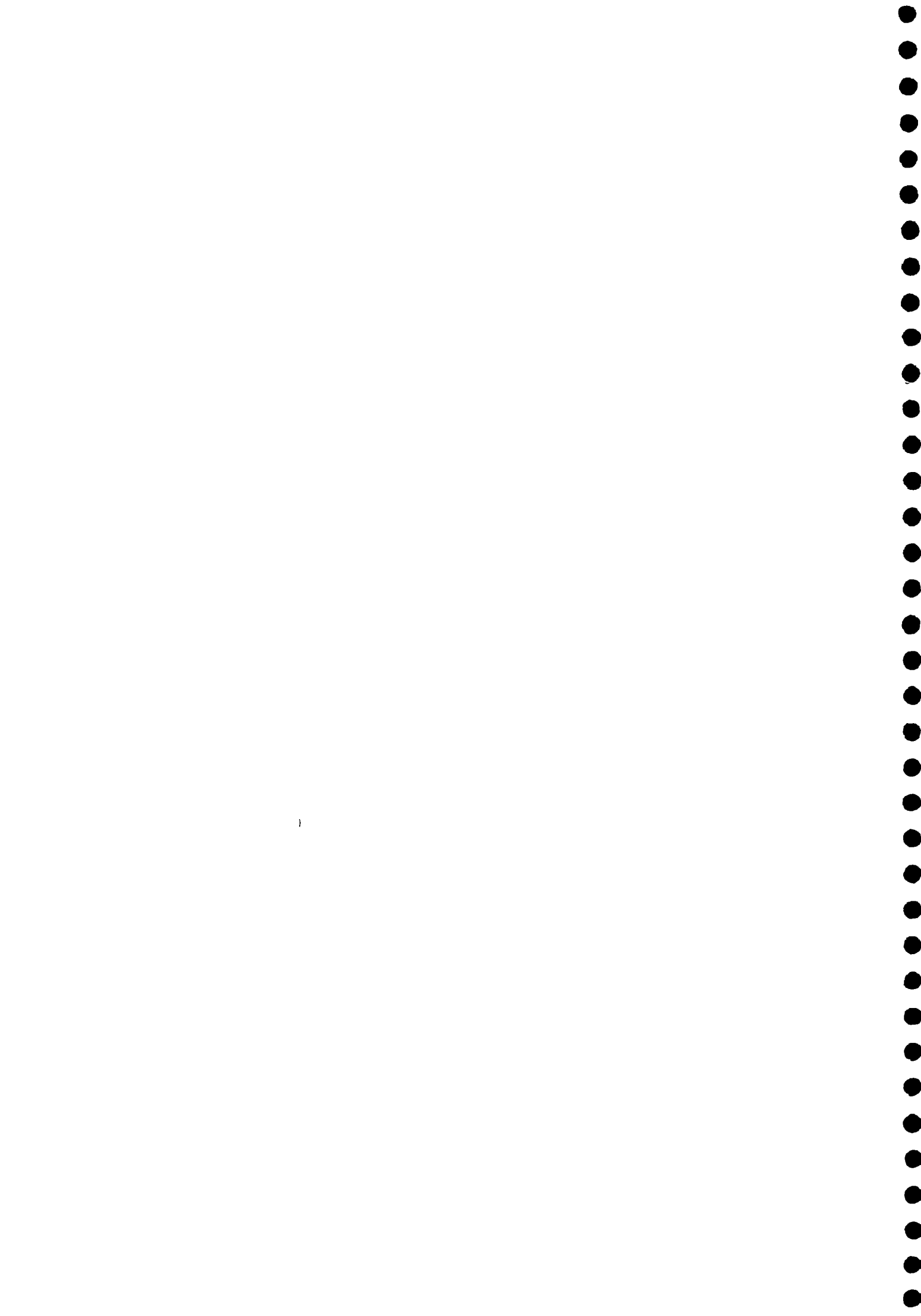


Figure 1

Source: Primary survey



4. Drinking Water Sources and Water Availability

As per the official records, 52.4% of the total villages in the district are covered under a piped drinking water supply scheme.

Table 4.1: No. of Villages Covered Under Different Types of Schemes

Type of scheme	No of Villages	Percentage
Piped Water Supply	312	52.4
Regional Water Supply Scheme	36	6.1
Hand-pump	Not Available	Not Available
Dug-well	Not Available	Not Available
Total	595	100

Source: GWSSB, 1998

As per the primary survey, 67% of the surveyed households depended primarily on government drinking water sources (Fig.2). In these handpumps are the most important source with 37% of the total households dependent on them, followed by stand posts and community wells. The relatively high dependence of households on private sources in Amreli is owing to the higher ownership of irrigation wells in the district. Generally, with the approach of summers, as the sources of water dry up, more and more people get drinking water from farm wells.

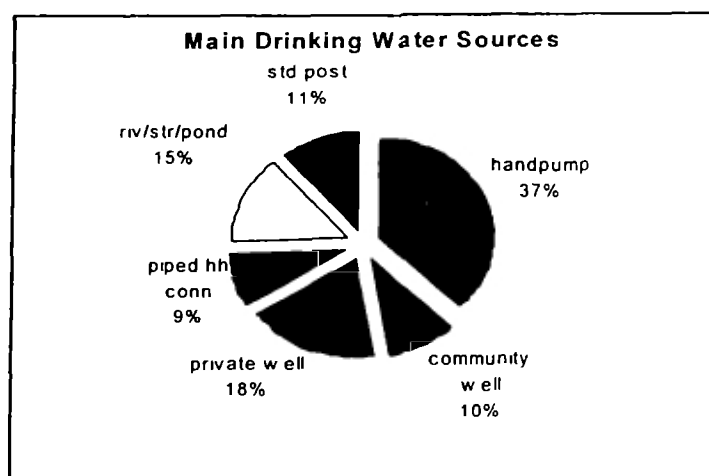


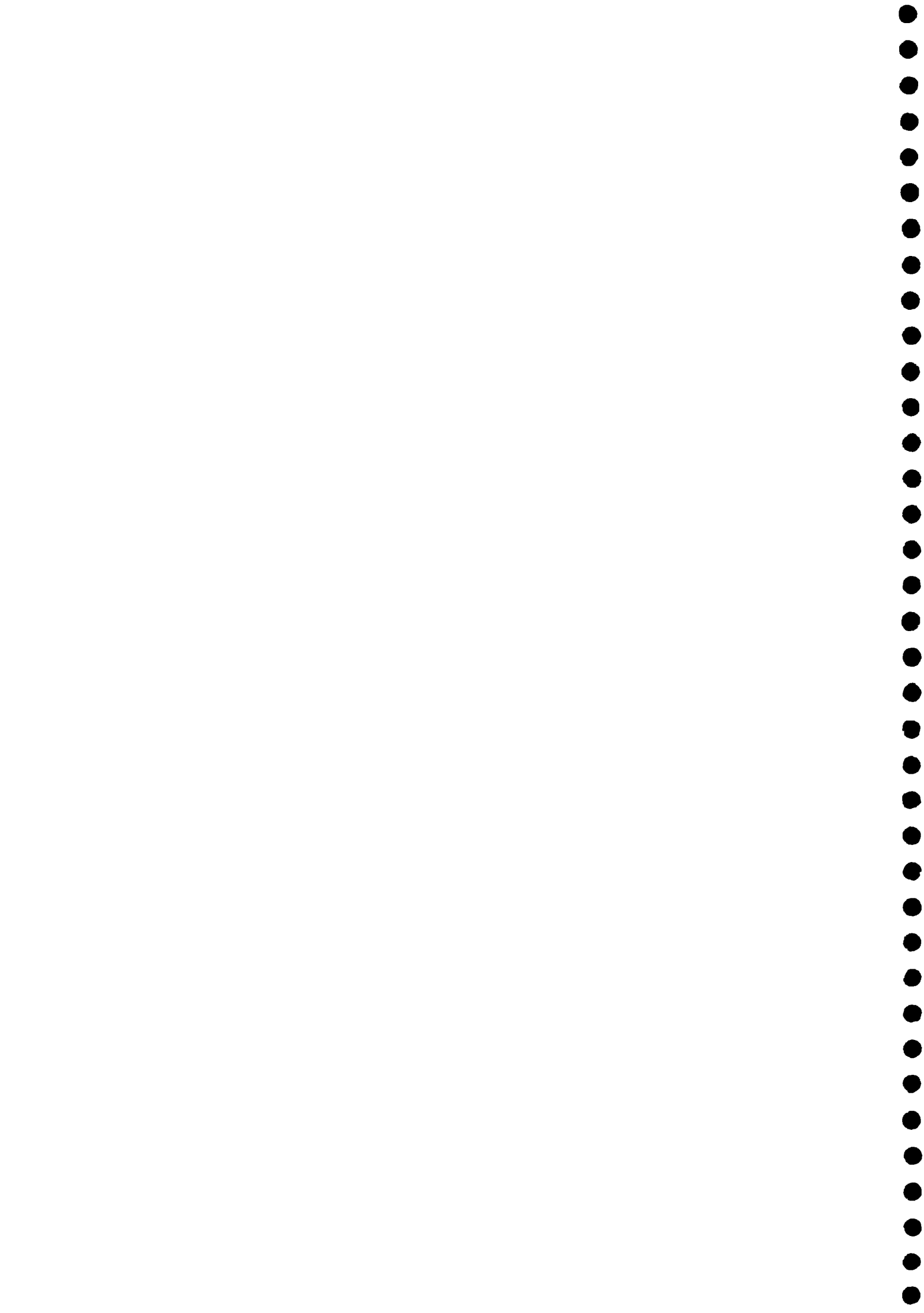
Figure 2

Source: Primary survey

Although 75% of the households in Amreli District reported the existence of a pipe-line water supply scheme, only 9% of the total households depended on it for domestic water. This was owing to the irregular water supply timings and less quantity of water supplied by the system.

5. Defunct and Inoperational Sources

According to the primary survey 80% of the surveyed villages reported the presence of one or more defunct sources of drinking water. 27.0% of the total number of drinking water sources in the district have been lying defunct for a long time, as per the surveyed respondents. Handpumps top the list of defunct sources with 29% of the total number of handpumps lying defunct, followed by 18% of the total number of community wells.



According to the official records, on 11th May, 1998 of the total villages covered under a pipeline scheme, in 17.6% of villages these schemes are not functional (Table 5.1). As per the departmental records a much higher percentage of schemes are lying inoperational in Savarkundla, Khamba, Rajula, Dhari and Amreli Talukas of the district with 41.5%, 31.8%, 26.3%, 24.4% and 19% respectively, of total schemes lying inoperational.

Table 5.1: Status of Individual Pipeline Schemes in the District

Taluka	No of Villages Covered Under			No of Villages with Defunct Schemes			No Of Schemes under Progress		
	MNP	ARP	Total	MNP	ARP	Total	MNP	ARP	Total
Amreli	23	19	42	3	5	8	1		1
Babra	23	25	48		3	3			
Dhari	17	24	41	2	8	10	1		1
Jafrabad	6	4	10	2		2			
Khamba	12	10	22	3	4	7	1	1	2
Savarkundla	20	21	41	11	6	17	3	1	4
Kunkvav	36	21	57	1	1	2			
Lathi	14	12	26				1		1
Lila	2	4	6	1		1	1		1
Rajula	13	6	19	2	3	5	4	5	9
Total	173	146	312	23	32	55	11	8	19

Source: GWSSB, (as on 11th May'1998)

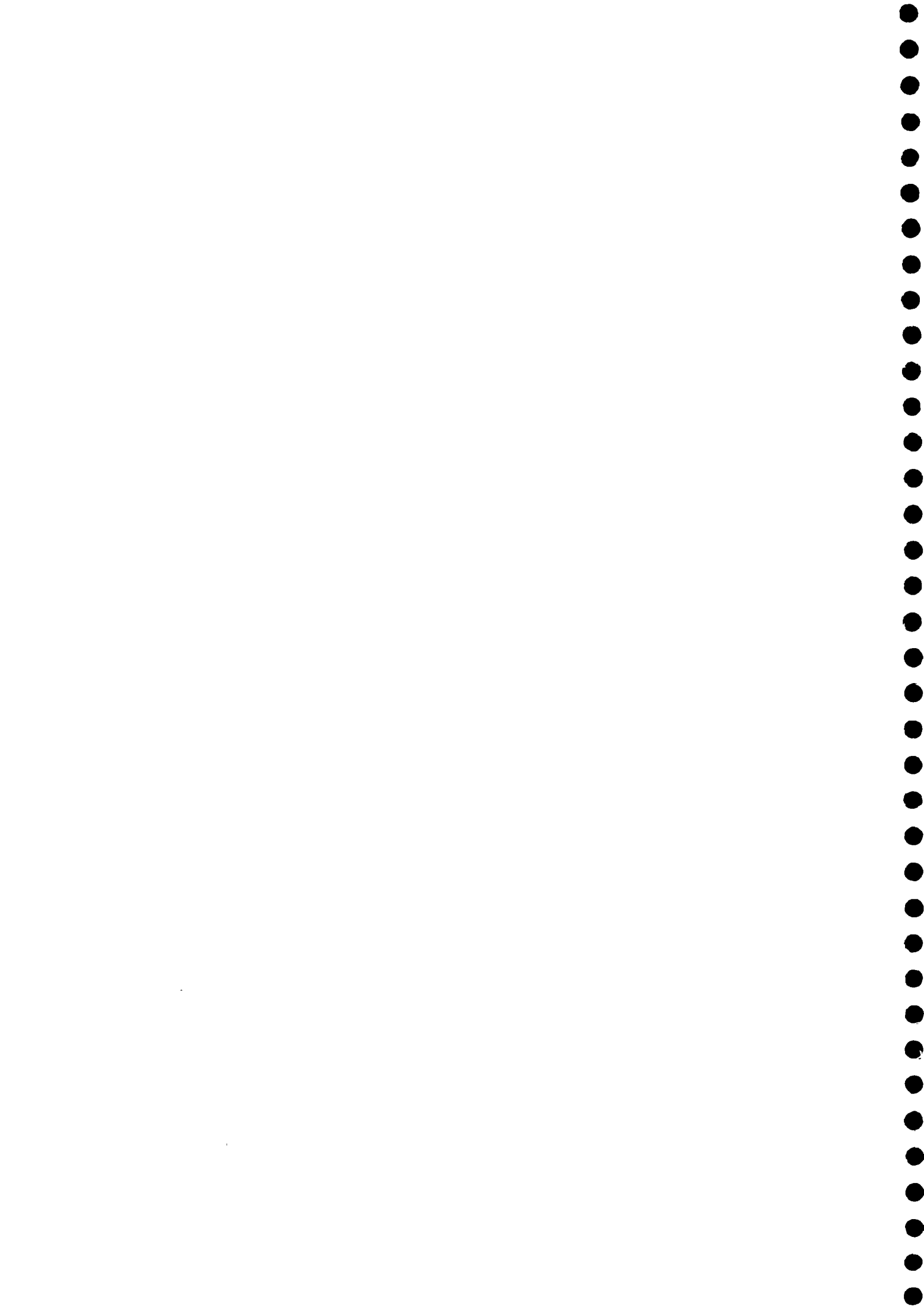
Also in those villages where these schemes are functional, there the quantity of available water is not adequate, as the water is supplied only for a limited number of hours (varying between 1-2 hrs per day) in a day and also the timing of water supply is not regular.

6. Quality of Water

A major problem faced by the villages along the coast is the high salinity in the ground water which may be attributed to the ingress of sea water into the freshwater aquifers. Some inland areas are also facing this problem which can be attributed to the underlying geology (Gaj series), which causes inherent salinity in the ground water.

Another major problem in the area is high fluoride content in the ground water in the area. Amreli district has villages with fluoride content as high as 11 ppm with an average of 4.4 ppm (the WHO prescribed standards are 1.5 ppm).

Of the total number of households enumerated during the primary survey, 37% reported that the quality of drinking water available was potable and sweet to taste, while 62% reported that the water was just potable but not very palatable. 99% of the respondents found the water to be potable while only 1% of the households found the water non-potable (Fig 3)



7. Various Schemes and Programmes in the District

Implementation of a regional water supply projects had been taken up in the Lathi-Lihiya talukas, covering 36 villages and a town, with the bilateral aid of Government of Netherlands

As on March'98, two regional water supply schemes, Govindpura-Kubda scheme and Kodinar scheme, were ongoing in the district funded under the Minimum Needs Programme. These schemes are expected to supply water to 9 villages in the district. Apart from the on-going schemes, two other schemes namely Lathi-lihya extension scheme based on Thebi dam serving 51 villages and Survo RWSS based on Survo dam supplying water to 28 villages, have already been approved for the district.

During the ninth five year plan (1997-2002), it has been proposed to cover 379 villages under various schemes at the total cost of 1214 lakhs (Annexure I)

8. Operation and Maintenance

Although more than fifty percent of villages have acknowledged the visits of some official from the Water Supply and Sanitation Board, they are not very satisfied by the services rendered by them.

Although sometimes the peoples' opinion is solicited for works related to related water schemes, but rarely is the work carried out according to peoples' needs or demands. The officials primarily come to take water samples from the drinking water sources to test the quality of water but rarely are the results shared with the people.

9. Problems Pertaining to Drinking Water Supply

With respect to the drinking water the most acute problem that the villages in the area face is inadequate quantity of drinking water. The major concern of the local population is regarding the falling groundwater table over time. The problem becomes more acute in summer season, when the ground water table falls to an extent where it is not feasible to pump out the water even through the bore wells.

Apart from the falling availability of ground water, some of the villages in the district are also facing problems concerned with the quality of water. These quality problems also indirectly add to the quantity problem being faced in the area, as some of the sources of water become non-usable because of extremely poor quality

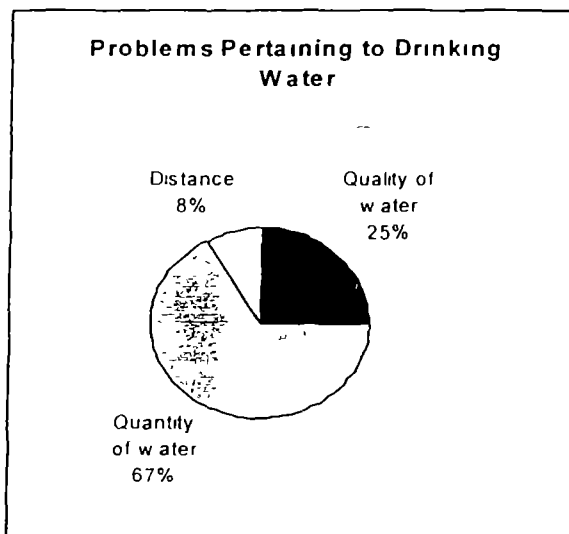
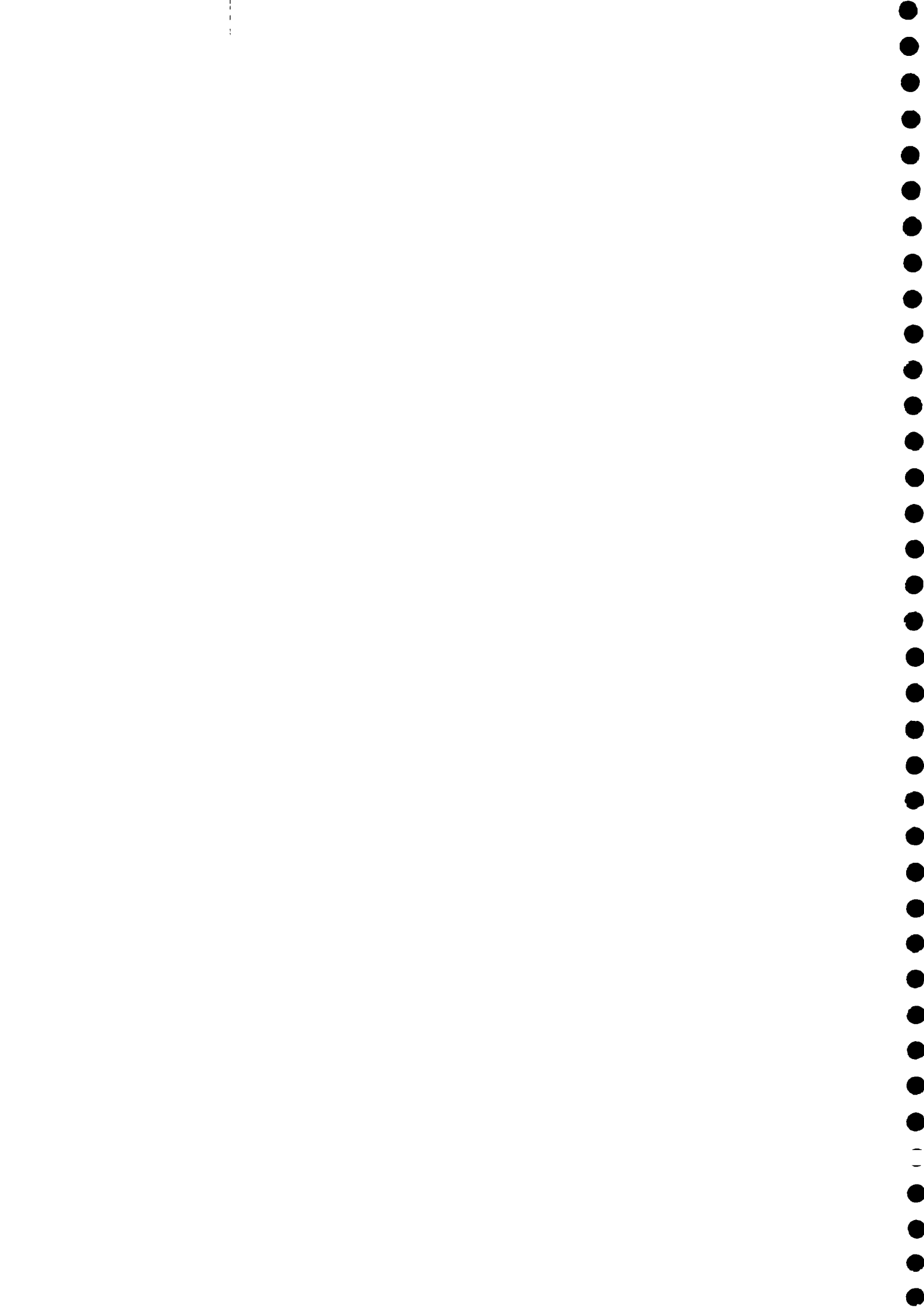


Figure 4
Source: Primary Survey

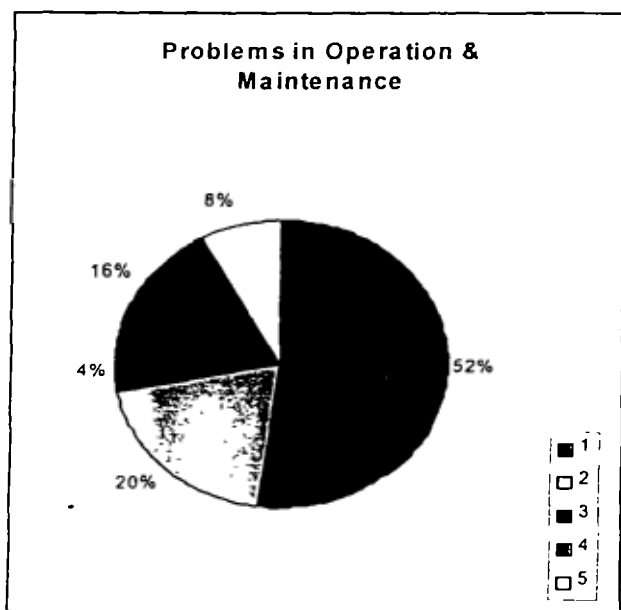


of water which is not potable.

Although only 1% of the surveyed households found the water to be non-potable, 25% of the surveyed villages identified poor quality of water as the major problem being faced with respect to drinking water. This implies that sarpanch or village panchayat members are relatively more aware of the water quality problems in the village, as compared to the general population, who tend to associate quality issue primarily with the taste of water.

People also feel that the operation & maintenance of the drinking water sources is not adequately undertaken by the department and some of the sources have been lying defunct for years.

10. Community Participation



1- Financial Constraint, 2-Lack of Training, 3-Lack of Participation, 4- Lack of Information, 5-Unwillingness to Pay

Figure 4

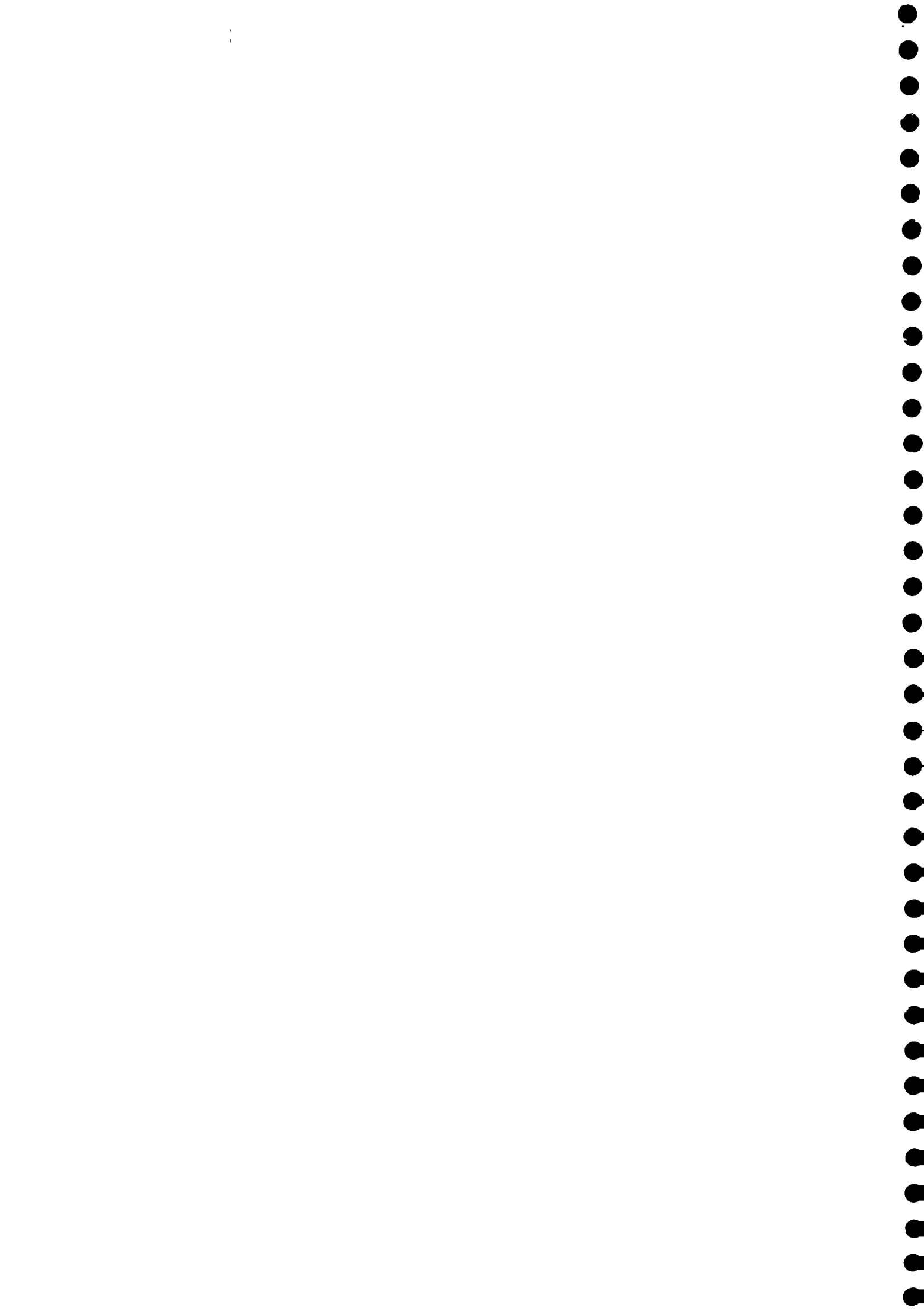
The village panchayat plays an important role in the provision of drinking water in the villages. The panchayats are especially active during the years of drought and make arrangements for bringing drinking water in to village by making arrangements for the water tankers etc. The panchayats also work towards maintaining cleanliness and sanitary conditions around the sources of drinking water and also overall maintenance of drinking water system.

More than 90% of the households reported non-existence of any revenue collection mechanism prevalent in the village. They also accepted that they had never contributed in any manner for the construction or the maintenance of the drinking water sources in the village.

A large section of the population has expressed an inability in contributing towards the operation and maintenance of the schemes owing to their poor economic condition. Other problems that have been highlighted with respect to the operation and maintenance of the drinking water sources are the lack of information and also lack of training for carrying out the necessary works at the community level.

The local people have expressed a willingness to take up the responsibility for the upkeep of drinking water services. User groups with panchayat participation are perceived as the best option by 75% of the respondents for the operation and maintenance of the drinking water sources in a village.

The necessary conditions for such a setup to work effectively are provision of information regarding the functioning of user groups and mechanism of contribution etc., and need for



transparency in management of the collected funds and their use for motivating the local community to contribute towards the operation and maintenance of drinking water sources

11. Sanitation

11.1 Status

As per 1991 census, about 11% of the total rural households in the State had an access to sanitation facility. The situation vis-a-vis rural sanitation, as compared to the state average is relatively poor in Amreli district, where only 7.9% of rural households are reported to have access to sanitation facility. But contrary to this, 24% of the surveyed households have reported ownership of household / private latrines, while more than 80% of the household regard latrines as highly useful

80% of the total households consider washing hands after defecation as the most important hygienic practices, while 10% of the households consider washing hands before eating meals also as an essential practice for the maintenance of healthy and hygienic conditions

75% of the surveyed households have reported maintenance of high level of cleanliness around the drinking water sources, while only 2% have reported poor cleanliness around the sources of drinking water. Maintaining cleanliness around drinking water sources has also been regarded as important, by the local community.

With respect to the drainage facilities in the village, only 1% of the households reported the existence of soak-pits for draining out the waste water, while 37% of the households reported the stagnation of the wastewater in the village.

Stink and diseases are the main problems as perceived by the local households because of stagnating wastewater in the village. 72% of the surveyed households feel that the improper disposal of the wastewater can lead to diseases, while 10% of the households feel that it also causes stench in the village.

11.2 Peoples' Contribution

About 46% of the surveyed households consider

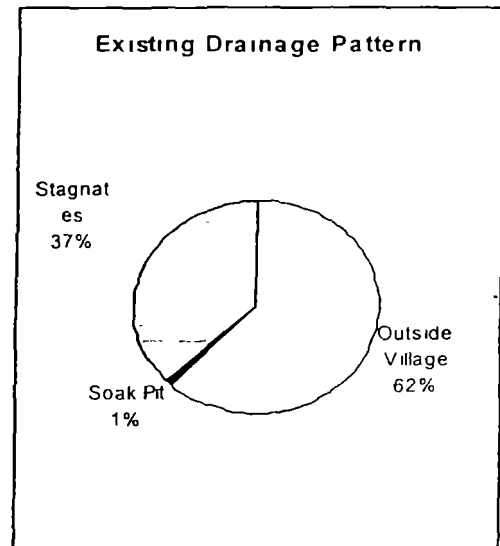


Figure 5
Source Primary Survey

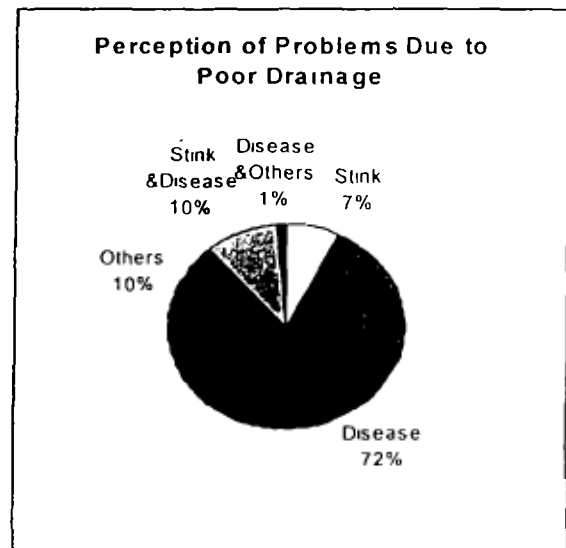
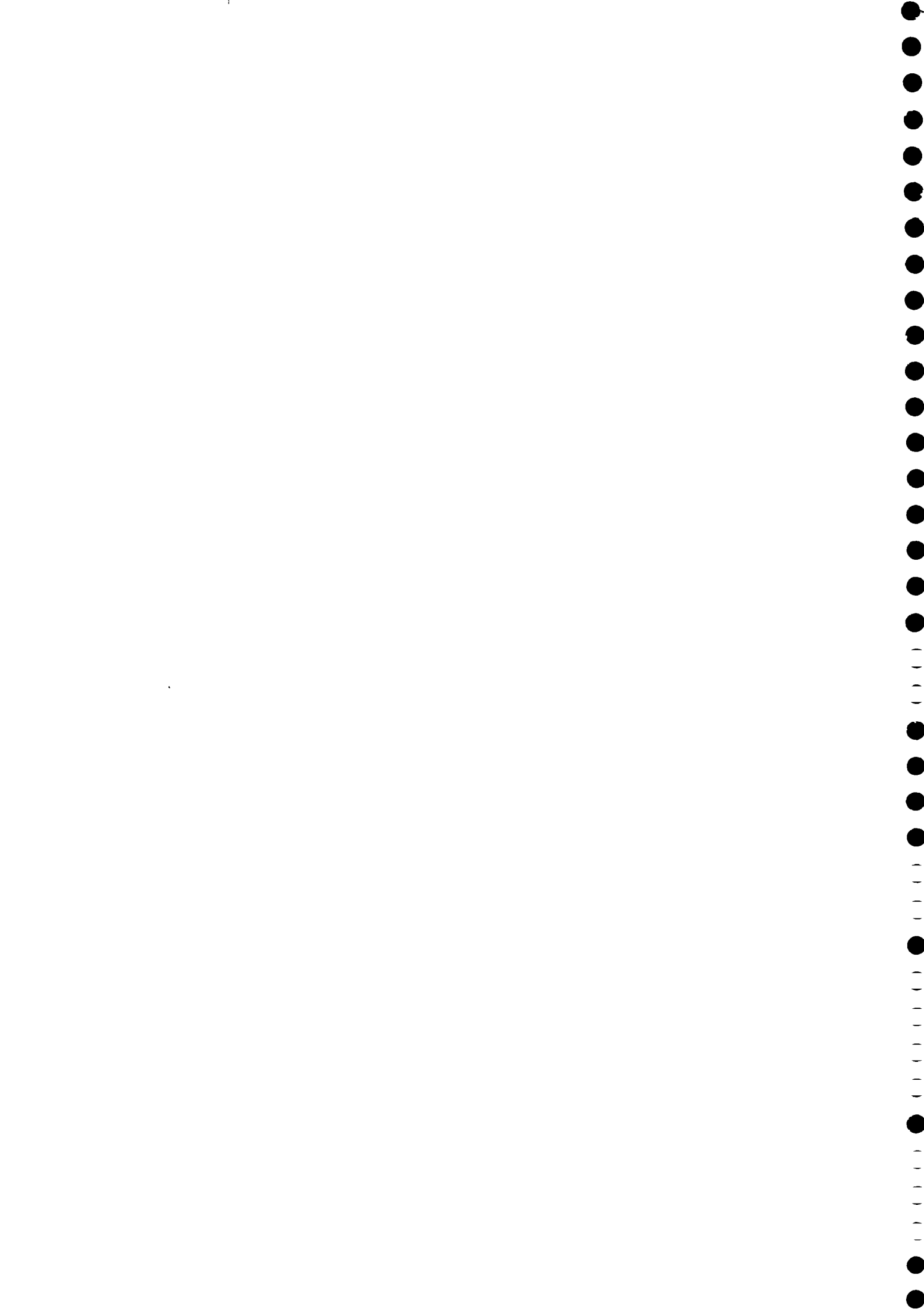


Figure 6
Source Primary Survey



it the sole duty of the government to provide private latrines in the villages 51% of the households have expressed a willingness to provide labour for the construction of private latrines in the village, provided all the other costs are borne by the government Only 3% of the total households agreed to give some monetary contribution for the construction of such facilities in the village. But as far as the construction of community latrines is concerned no form of contribution is forthcoming from the village population.

12. Conclusions

Over the years, a fall in the drinking water level in the area (average rate of 0.3-0.5 m every year) has been reported both by the government officials and the local populations. The erratic rainfall pattern and frequent occurrence of droughts further compounds the problem. There is also a drastic change in the groundwater table between post monsoon to pre-monsoon season. High salinity and high fluoride content in the ground water are the major problems afflicting the villages in the district.

Of the total number of habitations, about 62% of the habitations are fully covered under the drinking water supply scheme as reported by the Department. As per the primary survey results, there is a good coverage of the households under drinking water schemes, with a functional drinking water source for every 94 households. Only 4% of the surveyed households had a consumption level of less than 40 lpcd, bringing them to a category of partially covered.

As per the primary survey, 67% of the surveyed households depended primarily on government drinking water sources, with handpumps emerging as the most important source with 37% of the total households dependent on them. There is a relatively high dependence of households on private sources in Amreli owing to the higher ownership of irrigation wells in the district.

According to the primary survey 80% of the surveyed villages reported the presence of one or more defunct sources of drinking water. 27% of the total number of drinking water sources in the district have been lying defunct for a long time with handpumps topping the list of defunct sources followed by community wells. Also, according to the official records, in 17.6% of the total villages pipeline schemes are not operational.

Although hardly any of the surveyed households found the water to be non-potable, 25% of the surveyed villages identified poor quality of water as the major problem being faced with respect to drinking water. This implies that sarpanch or village panchayat members are relatively more aware of the water quality problems in the village, as compared to the general population, who tend to associate quality issue primarily with the taste of water. The GWSSB staff visits the villages for collecting water samples to test the quality of water but people complained that the results were rarely shared with them

The village panchayat plays an important role in the provision of drinking water, especially during the years of drought in making arrangements for bringing drinking water in to village through water tankers etc. The panchayats also work towards maintaining cleanliness and sanitary conditions around the sources of drinking water and also overall maintenance of drinking water system

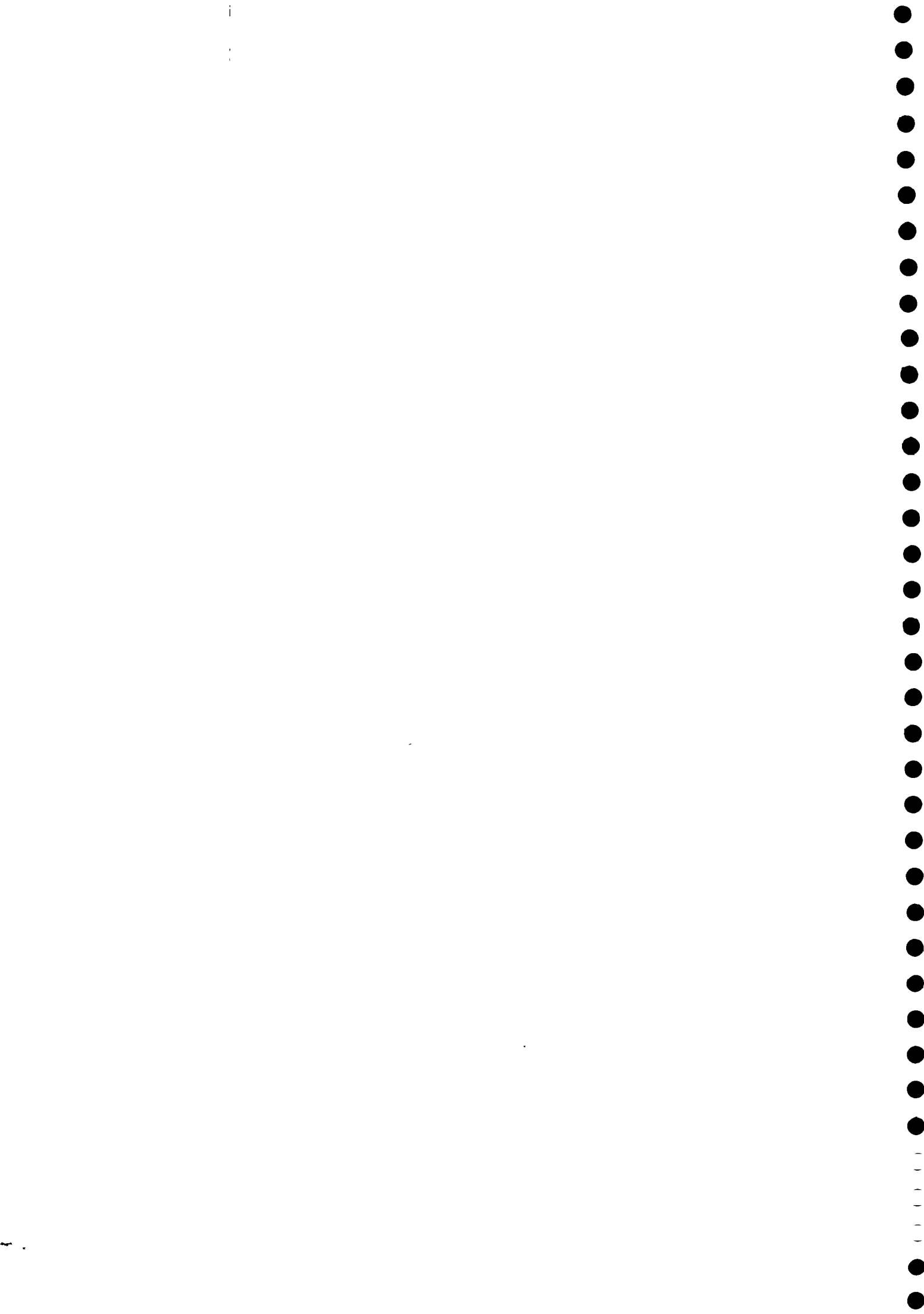
User groups with panchayat participation are perceived as the best option for the operation and maintenance of the drinking water sources in a village. The necessary conditions for such a setup to work effectively are provision of information regarding the functioning of user groups and mechanism of contribution and need for transparency in management of the collected funds

24% of the surveyed households have reported ownership of household / private latrines, while most of the household regard latrines as highly useful. About 46% of the surveyed households consider it the sole duty of the government to provide private latrines in the villages. 51% of the households have expressed a willingness to provide labour for the construction of private latrines in the village, provided all the other costs are borne by the government

Washing hands after defecation and before eating meals are considered to be the most important hygienic practices. Maintaining cleanliness around drinking water sources has also been regarded as important, by the local community.

With respect to the drainage facilities in the village 37% of the households reported the stagnation of the wastewater in the village. Stink and diseases are the main problems as perceived by the local households because of stagnating wastewater in the village

In conclusion, it may be stated that while there is a good coverage under drinking water schemes, a situation of water shortage does exist during the summer months and the years of drought which is mitigated by increased dependence on private sources and bringing in of water through tankers etc. This situation exists primarily because of the defunct and inoperational infrastructure. Judicious management and maintenance of existing infrastructure, both new and traditional, can play a role in easing the crisis in many places. Although panchayats are playing an important role with respect to drinking water sources, still there is a need for an initiative for community effort, which appears to be almost indispensable for an initiative of this kind, to be made by the government. Discussions at the village have revealed a willingness among the local community to participate in such efforts provided an appropriate contribution mechanism is devised with a transparency in the management of community funds.

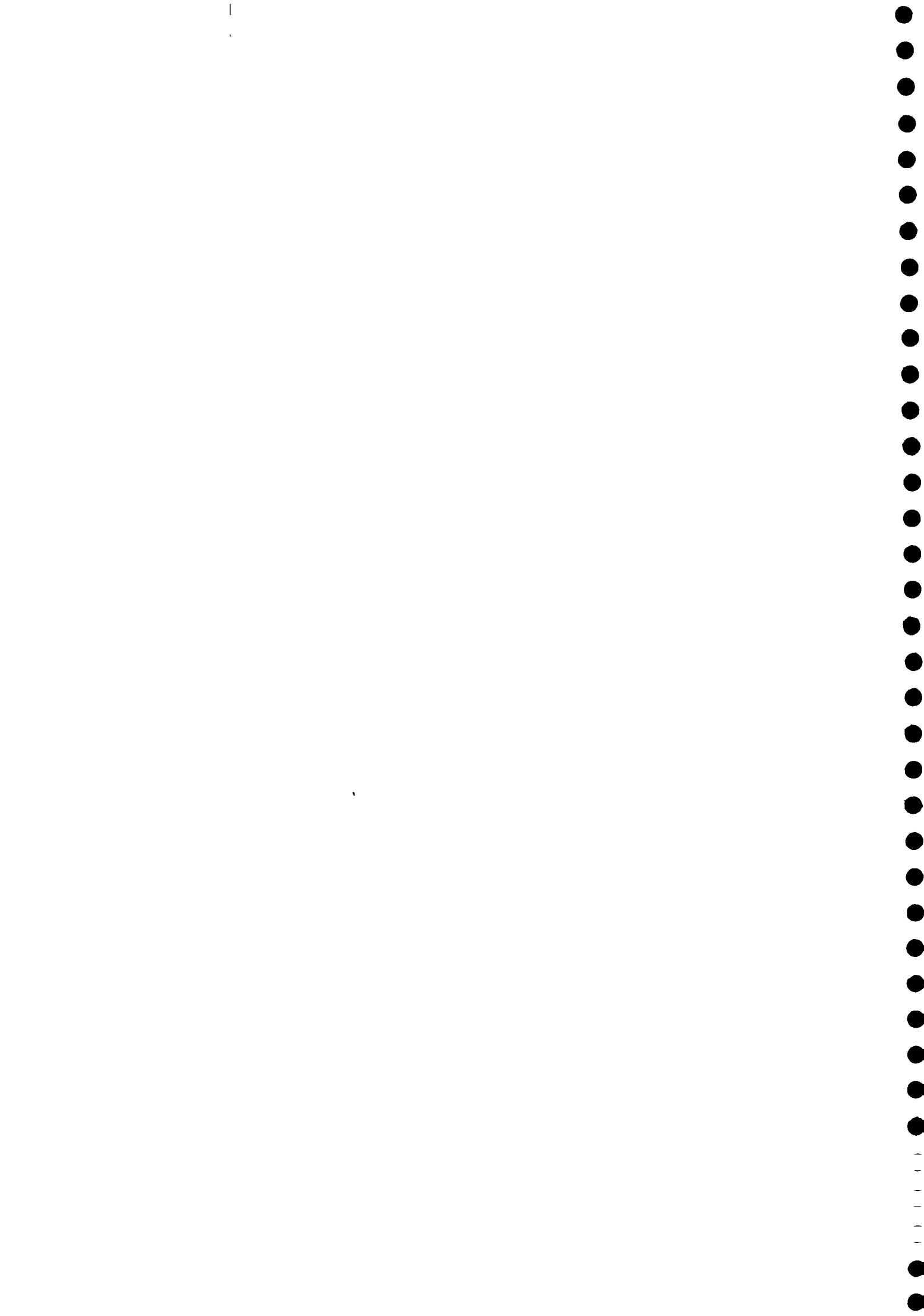


Annexure I

No. of Villages to be Covered with Drinking Water Facilities During 1997-98 to 2001-02

Taluka	No. of Villages to be Covered Under Proposed Schemes					Cost (in lakhs)
	Tube Well	Handpump	Pipeline	Regional WSS	Total	
Amreli	13	1	6	17	37	134.90
Babra	9	2	-	13	24	100.80
Dhari	17	13	39	5	74	164.20
Jafrabad	3	2	21	12	38	133.45
Khamba	5	2	26	-	33	112.00
Kondinar	-	1	9	-	10	35.50
Kunkvav	24	4	8	14	50	103.10
Lathi	7	1	7	12	27	152.30
Lilia	-	-	1	4	5	33.90
Rajula	13	5	55	8	81	244.20
Total	91	31	172	85	379	1214.35

Source: GWSSB



Annexure II

Village Case Studies

Village : Lajpar

Taluka : Lathi

Village Profile

The village of Lajpar, falling in the Lathi taluka of Amreli district, is located 7 kms away from Lathi village on the Lathi-Damnagar road. The village has about 200 households, with a population of 750 persons. The village is multinucleate, having 5 habitations. The main communities residing in the village are: Darbar, Rajput, Bawaji, Bharwad, Vagher and Harijan.

Drinking Water Sources & Status

The village is primarily dependent on the ground water for its drinking water requirements. All the nine drinking water sources in the village, seven hand-pumps, one dug well and one bore-well, are ground water based. Traditionally also, ground water has been the source of drinking water for the village. The hand-pumps and dug-well are less frequented for drinking water collection because of high dependence of population on stand-posts.

Regarding the reliability / dependability of the sources of drinking water in the village, the following inferences have been drawn from the village discussions:

Scheme	Year of Construction	Dependability
Well	1982	Low
Hand-pump (7)	1990-98	Medium
Tank	1990	Medium
Stand-post		High (1 hour in the morning and evening throughout the year)

Problems Pertaining to Drinking Water

During summers the groundwater level falls drastically from 150 ft in monsoons to reach around 400 ft. During summers, the handpump and the dug-well dry up and there is no water available in these sources. During monsoons, the villagers take water from a well just outside the village, however during the summer months this well also dries up and the water is not available. Thus, the village faces an acute scarcity of water in the summer months.

The fluoride content in the ground water in the area is very high, making the water not fit for drinking purposes. The villagers feel that the frequent droughts are the main cause of falling quality and quantity of drinking water in the area.



Operation and Maintenance

The supply of drinking water is the responsibility of GWSSB. The officers from the water supply department visit the village once in every two months. Water testing is done by taluka level officers. No intervention has been undertaken by the department towards the maintenance and repair of the drinking water sources. A hand pump has been lying defunct for many years, but no efforts have been made by the government to repair it. Also, in the last one year no construction related to establishment of new sources has taken place

During drought the village panchayat is primarily responsible for the management and availability of drinking water, apart from some individual efforts made by the villagers. Besides the gram panchayat there is no other institution at the village level which is functioning for the provision of drinking water in the village. Although water charges for drinking water are there, but the contribution towards it is non-existent.

Peoples' Participation

Although the people say that their opinions are sought for the various measures related to drinking water supply, but rarely is any work done by the department according to the popular opinion or demands

The villagers feel that the quantity of water available is not adequate and it is important to undertake measures to promote the availability of adequate quantity of potable water in the village. There is a felt need for some kind of a new management system in the village which can function along with the panchayat for the management of drinking water. But the villagers have expressed their inability to contribute for drinking water facilities. The contribution is also not forthcoming towards establishment of any new sources/ upkeep of existing or new sources. This is largely owing to the economic condition of the villagers, as found during the village discussions and observed from the response to the questionnaires administered



Village Gughrana
Taluka - Babra

Village Profile

The village Gughrana, falling in the Babra taluka of Amreli district, is located at a distance of 17 kms from Babra village. There are about 700 households residing in the village (a total population of 3200). The village is multinucleate with 25 bastis or settlements. The main communities are Patels, Darbar, Ahir, Koli and harijan.

Drinking Water Sources & their Status

There are six sources of drinking water, including hand-pumps, a dug-well and a bore well. Dug-well is less utilised for drinking water, as there is very little quantity of water available. The hand-pumps and the bore well have become the main source of drinking water since 1997. Traditionally also the village has been dependent on the ground-water for its drinking water requirements.

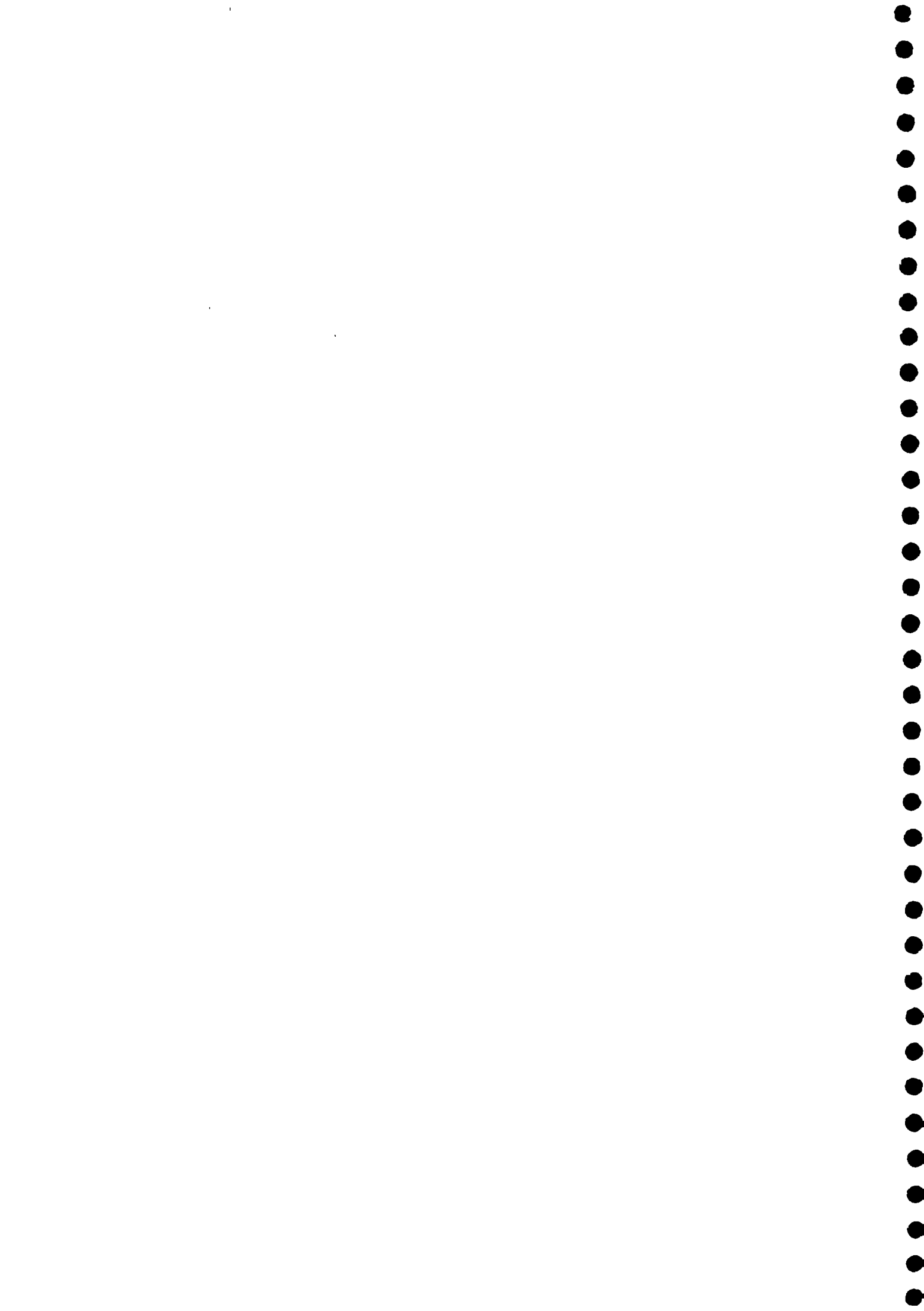
The quality of drinking water in the village is poor. Within the settlement no sweet water, which is considered to be potable, is not available. The groundwater level is very low as a result of, which the accessing the water is rather difficult. The groundwater level falls drastically from 150 ft in the monsoon to 600 ft in the summers.

Regarding the reliability / dependability of the sources of drinking water in the village, the following inferences have been drawn from the village discussions.

Scheme	Year	Dependability
Well	1987	Low
Hand-pump	1997	Low
Bore-well	1998	Low

During monsoon, people get water from the wells and from the hand pumps. During summer the water is supplied in the village by a tanker. The village does not have a piped water supply or taps. In past one year one bore-well has been constructed by the GWSSB but it does not have any water. According to the people no special effort has been made for the protection and maintenance of the sources of drinking water.

During drought neither the government nor the panchayat hand-pump, bore-well or dug-well function. In fact, according to the local population these drinking water sources have been defunct for a long time now. Drinking water is filled in to village tank from a bore well but the quantity of the available is not adequate. At that time the government wells and hand pumps also be defunct or dry-up and drinking water is brought from wells outside the village by government water tankers, and by individuals having vehicles that can carry water tanks / cans etc.



During drought management of water, availability drinking water, extra tanker, repairs of hand pump etc are all done by the village panchayat. No other organisation or department is active in the area for the provision of drinking water. For water testing, an officer from water supply department in Babra visits the area once a month but no laboratory test has ever been conducted.

Issues Related to Drinking Water

People feel there is a need for the government to lay down a pipe line for drinking water so that water is available in each and every household. There is also a need for a check-dam. No contribution from the peoples' end.

Important works for Drinking water are: construction of a storage tank, laying down of pipeline for household level connections and maintaining the quality of water. There is need for an able organisation that can improve the availability of water and undertake its management, and thus resolve the drinking water related problems. And also bring a pipeline scheme or any other scheme to the village.

The local people are ready to take the responsibility of the management of water but the main constraints are the lack of finances and know-how. The economic state of the population is poor, thus contributing they express an inability in contributing for a new drinking water scheme. Also, in their opinion individuals capable of undertaking community works are not there.

