Government of the Netherlands
Ministry of Foreign Affairs
Directorate-General for
International Cooperation

GUJARAT - INDIA

EVALUATION AND APPRAISAL

INDO-DUTCH RURAL WATER SUPPLY AND SANITATION PROGRAMME

DRAFT

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Rates of exchange

1 US$ = Rs 31
1 US$ = Dfl 1.85
1 Dfl = Rs 16.7

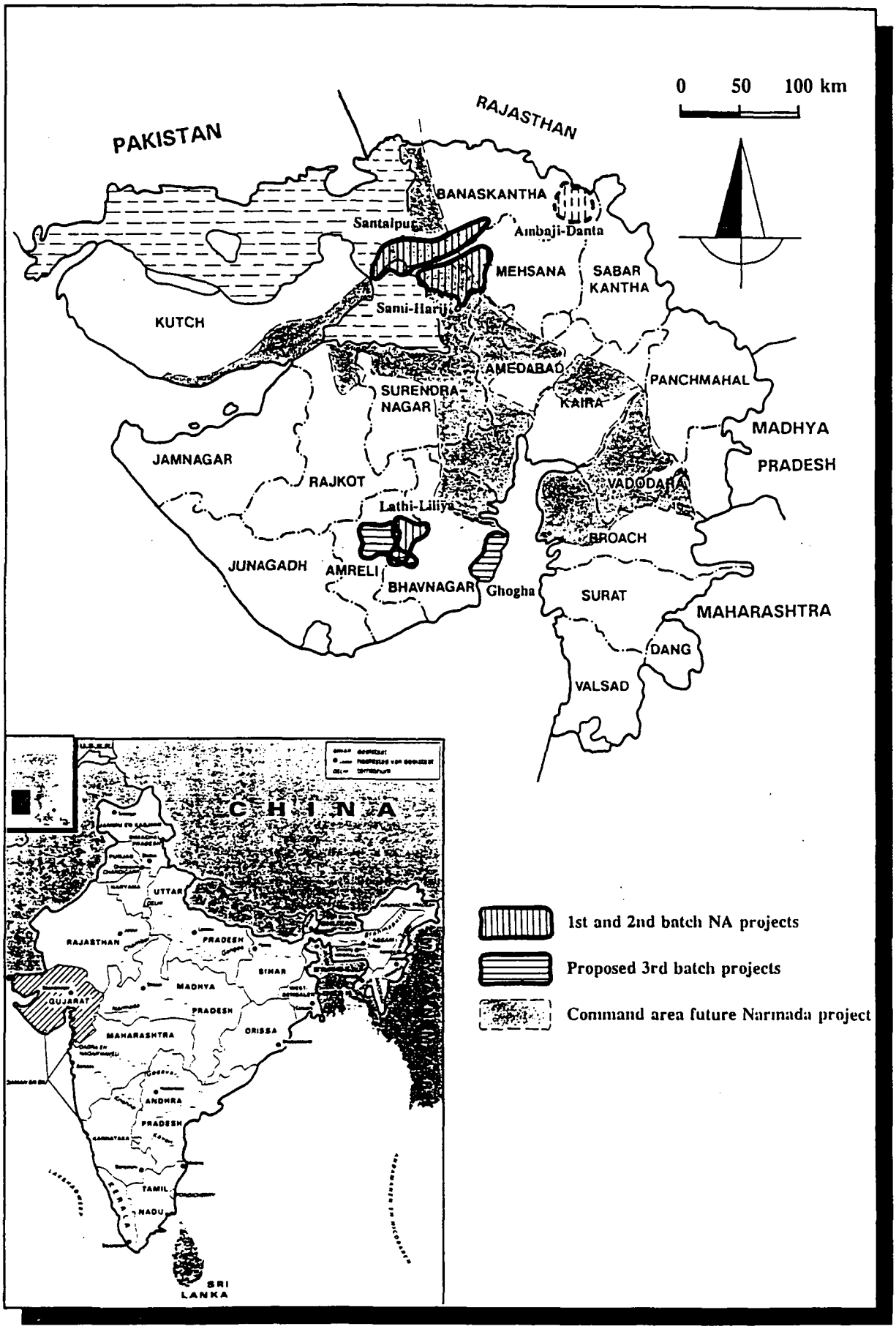

FIGURE 1 Situation

0 EXECUTIVE SUMMARY

0.1 The programme

Since 1981 the Government of the Netherlands (GON) provides financial support to a rural drinking water supply and sanitation programme in Gujarat. The present objective of the programme is to create drinking water supply and sanitation facilities in order to improve the health, quality of life and productive capacity of rural people, especially the poor.

Implementation of the first project started in 1979. The immediate objective of this Santalpur Project was to supply 72 villages in the Banaskantha District with reliable water through a regional piped scheme. The project was set up as a purely technical water supply project. It was commissioned in 1987.

Three new regional water supply schemes were taken up simultaneously in 1987, initially with again only a technical approach:

- Santalpur-Extension scheme to provide 48 villages and 1 town in the same area as the original scheme;
- Sami-Harij scheme in Mahesana District for 111 villages and 1 town;
- Lathi-Liliya scheme in Amreli District for 36 villages and 1 town.

It is expected that these schemes will be completed by the end of 1993.

The total amount allocated by GON was Dfl 82 million for the water supply to 267 villages and 3 rural towns. The total design population is 710,000. The Gujarat Water Supply and Sewerage Board (GWSSB) is the implementing organization for these works and the main counterpart for GON.

Soon after the start of the first project, the need for an integrated approach was recognized. Eventually this led to:

- the start in 1988 of establishing village water committees by GWSSB;
- in 1990 the start of health education activities in 95 villages. The Centre for Health Education, Training and Nutrition Awareness (CHETNA) is the implementing NGO, working under a 3-year contract with the Royal Netherlands Embassy (RNE);
- since 1992 a 5-year income generating project for women, contracted by the RNE to the Self Employed Women's Association (SEWA);
- the implementation of a pilot sanitation project for 140 latrines in 2 villages. The project was implemented in 1992 by the Environmental Sanitation Institute (ESI) under a contract with the GWSSB.

All these activities are limited to the Santalpur project area. Furthermore, in 1992 formal approval was given to the establishment of a socio-economic unit in GWSSB for the coordination of Netherlands assisted (NA) projects.

Total Dutch allocations for the sanitation and socio-economic activities amount to Dfl 4.7 million.

Recently, five new projects were proposed by the Government of India for financial assistance by GON. It concerns regional water supply schemes with sizeable sanitation and socio-economic components.

0.2 Evaluation and appraisal

In the course of 1992 GON decided, in accordance with routine procedures, to evaluate the programme. At the same time, the two projects with highest priority of the proposed new schemes were to be appraised: Lathi-Liliya-2 and Ghogha.

The main objectives of the evaluation-cum-appraisal were:

- to evaluate, in broad terms, whether the development from a purely technical approach into an integrated one, increases effectiveness;
- to evaluate in general terms, whether the present organizational set-up is effective and sustainable;
- to give a summary assessment of the sustainability and replicability of the projects;
- to evaluate, in general terms, the roles of the various parties involved;
- to draw lessons and formulate concrete recommendations for future projects;
- to appraise two new projects with the highest priority.

In March 1993 a team of 6 experts in various disciplines was fielded to carry out the evaluation and appraisal. After preparatory activities in the Netherlands and India, the field work in India took 3 weeks. The team studied all relevant documents, met representatives of all parties involved and made extensive visits to the project sites.

0.3 Conclusions

The NA programme has shown commendable developments and has achieved substantial results. Therefore, we strongly recommend to continue the Indo-Dutch collaboration in the rural water supply and sanitation sector in Gujarat. The recommendations that follow the conclusions in this chapter are suggestions for further improvements.

We have drawn the following main conclusions:

a. The new regional water schemes are being appreciated and utilized by the majority of the people. However, the reliability of supply is still low in several places. Protection or rehabilitation of local water sources is not part of the NA programme. At times of non-supply from the new systems, the population thus depends often on bacteriologically unsafe local sources. Therefore, it is doubted that the main objective of the NA programme, improving health, is fully achieved.

b. The well fields of the Santalpur and Sami-Harij schemes are threatened by rapidly declining water tables and increasing fluoride content of the water. The situation may well become untenable before new sources can be developed.

c. Implementation of the Santalpur-1 regional water supply scheme took more than 8 years. The 3 schemes of the 2nd batch may be completed in 6 years. These implementation periods are far too long.

d. In designing the 1st and 2nd batch schemes, a "blanket" approach was adopted. Village level sources were not taken into account and full new supplies were provided. This is an inefficient and ineffective approach.

e. No house connections are provided under the NA programme. We doubt that providing house connections can be avoided for a long time in the future, particularly in the Lathi-Liliya scheme.

f. The need for an integrated approach was recognized early in the programme, but realization started only in 1988 with community participation. The changes that took place in the past few years towards an integrated approach are noteworthy. They definitely enhance the hygienic use of facilities and the position of women. Nevertheless, real integration is not achieved yet; the new activities remain "add-ons" to the technical programme and still have a limited reach.

g. Till present community participation is mainly limited to participation in the siting of the standposts. The institutional sustainability at grass root level will not be realized with the present approach.

h. CHETNA has created health awareness at the village level through women's camps and school camps for children. Emphasis on awareness raising is not

sufficient as a take-off for sustained behaviour change at household and community level. The project implementation is behind schedule.

i. The SEWA project aims at the involvement of the local communities, especially the women, through their local organizations in generating and strengthening their economic activities. The SEWA concept is clear and will ultimately strengthen the grass root level management capabilities.

j. The latrines in the two pilot villages are generally being used. However, the effort required to install 140 latrines in two small communities with 100% coverage is beyond a reasonable input and is therefore not replicable. Given the expertise already gathered in other projects, this small pilot programme was superfluous.

k. Gender related issues get more and more attention during the last few years. This is a positive development.

l. Environmental problems caused by the programme are not serious. The most important environmental problem affecting the programme is the rapid depletion of the ground water sources caused by irrigation.

m. GWSSB is responsible for all operation & maintenance activities of regional schemes, including the village facilities. This is an inefficient approach. Although GWSSB is reasonably well organized for this task, persistent under-staffing threatens the effectiveness. Financing of recurrent costs depends for nearly 100% on subsidies from the State. This situation is not sustainable.

n. The information on the problems with present water supplies in the areas for the proposed new 3rd batch of projects is not yet complete. The sanitation and socio-economic components are only qualitatively indicated; operationalization is still lacking. Consequently, we were not in a position to arrive at an opinion on these projects. Nevertheless, we feel that the tribal areas in the Ambaji-Danta scheme may merit a high priority in addition to the 2 schemes proposed.

0.4 Recommendations

Our main recommendations are summarized as under:

a. The main objective of NA programme can only be attained with projects that are sustainable and reliable. This, in turn, will only be the case if (eventually) full cost recovery is achieved. Thus, a community based, demand driven

approach is required in which the villages participate in all phases of the project cycle. Special reference should be made to the crucial role of women in the programme. Such approach will ensure that (i) real needs of the population are addressed, (ii) use of existing local water sources is made where possible, (iii) operation & maintenance of village level facilities is undertaken by the communities and (iv) cost recovery is optimized.

b. A community based approach requires (i) strengthening of the management capabilities at village level through various types of training by NGOs, (ii) decentralization of tasks to the lowest possible levels, (iii) the different parties each concentrating on their core business and (iv) effective coordinating and monitoring mechanisms at a "neutral level" above the various implementing parties.

c. During the planning phase this would mean:
   * that the village Panchayat is responsible to take decisions on facilities to be developed and activities to be undertaken at village level. This includes (i) upgrading and protecting of local water sources and (ii) negotiating with GWSSB the conditions for a connection to the regional scheme;
   * that a planning group draws up a plan for all activities required for the realization of the project. A well qualified, international consulting firm should head this planning group;
   * that Steering Committees at District level monitor the progress of the planning activities;
   * that the District Steering Committees are supported by Project Supervisory Units;
   * that a Steering Committee at State level coordinates the activities of implementing parties at State level;
   * that the State Steering Committee is supported by a Programme Management Unit. The latter would be directly related to the Royal Netherlands Embassy.

d. During the implementation and operation phases the structure would be the same with the exception that the planning group will no longer be required.

e. The above mentioned approach would apply to schemes newly to be adopted in the NA programme. A comprehensive 5-year plan for the period 1993-1997 based on this approach is proposed in section 0.5 below.

f. At short notice decisions should be taken how to ensure adequate water sources for the Santalpur and Sami-Harij schemes. Waiting for the World Bank project in Mahesana District to materialize may cause unacceptable delays. Water conservation and possibilities for integrated water resources management should continue to be actively pursued.

g. Cost recovery from water supply schemes should receive much attention in any new scheme. For this purpose, the ability and willingness to pay of consumers in different categories and different situations should be assessed.

0.5 Proposed 5-year programme

For the period 1993-1997 a comprehensive programme is proposed consisting of the following 4 main components:

- continued activities in the areas of the 1st and 2nd batch schemes;
- implementation of an integrated, community based, water supply and sanitation project in the Ghogha area;
- assessing and, if appropriate, implementing similar projects in the Lathi-Liliya-2 and Ambaji-Danta areas;
- further developing and implementing the organizational framework for the NA programme.

The proposed activities are worked out in some detail below.

1st and 2nd batch areas:

- completion of the 2nd batch regional water supply schemes before the end of 1993;
- preparing and implementing plans for improving local village sources to serve as back-up water supplies in all villages in the NA project areas;
- implementing a full scale sanitation programme in accordance with the guidelines drafted by IRC;
- external evaluation of the water supply schemes about 1 year after completion.

Ghogha area:

- the water problems in the villages in the proposed areas should be assessed on a village by village basis;
- investigation of the geohydrological situation in the supply area;
- preparing an integrated plan in cooperation with all parties involved. This would take about 1 one year;
- implementation would take about 2 years.

The population to be covered under the project would be about 400,000.

Further project areas

For the purpose of this plan it is assumed that the proposed areas of the Lathi-Liliya-2 and Ambaji-Danta schemes will retain their high priority status and can be taken up in the NA programme. The activities would be:

- the design for the Thebi dam and reservoir for the Lathi-Liliya-2 scheme has to be critically reviewed prior to any further action;
- after the needs assessment and reformulation of the projects the latter should be appraised;
- further activities are identical to those for the Ghogha area.

The total population to be covered under these two schemes would be approx. 500,000.

Institutional development

The steering committees should be made functional in the proposed composition. The services of internationally experienced consulting firms should be contracted for (i) the preparation of integrated plans and (ii) the programme management unit and the project supervisory units.

Budget estimate

The required budget is estimated as under:

- 1st and 2nd batch areas:	Dfl 13.3 million
- Ghogha area:	Dfl 22.1 million
- Lathi-Liliya-2 and Ambaji-Danta areas:	Dfl 28.1 million
- institutional development:	Dfl 4.5 million
	---------- +
Total for 5 years:	Dfl 68.0 million

1 INTRODUCTION

1.1 Background of evaluation and appraisal

Since 1981 the Government of the Netherlands (GON) provides financial support for the implementation of a rural drinking water supply programme in Gujarat. Implementation of the first project started in 1979. The objective of this Santalpur Project was to supply 72 villages in 3 Talukas in the Banaskantha District in the north of Gujarat with reliable water. This regional piped scheme uses ground water from tubewells as source. The project was set up as a purely technical water supply project, without sanitation and socio-economic aspects. It was commissioned in 1987.

Soon after the start of this project, the need for an integrated approach was recognized. Only towards the end of the 1980s, this led to (i) health awareness and health education activities, (ii) income generating activities for women and (iii) the implementation of a pilot project for latrines in 2 villages. All in the Santalpur project area.

Three new water supply projects were taken up simultaneously in 1987. Again it concerned regional piped water supply projects, with, initially a merely technical approach. The main characteristics are as follows:

- Santalpur-Extension scheme to provide an additional 48 villages and 1 town in the same area as the original scheme. Again ground water is the source, from a radial well tapping the phreatic water table near the Banas river;
- Sami-Harij scheme in Mahesana District for 111 villages and 1 town. Ground water from tubewells is used as source;
- Lathi-Liliya scheme in Amreli District for 36 villages and 1 town. The scheme uses surface water from the Kalubhar dam.

It is expected that these schemes will be completed by the end of 1993.

Recently, five new projects were proposed by the Government of India (GOI) for financial assistance by GON.

In the course of 1992 it was decided by GON, in accordance with routine procedures, to field a team of external experts to evaluate the completed and ongoing projects. At the same time, the two projects with highest priority of the proposed new schemes were to be appraised: Lathi-Liliya-2 and Ghogha.

According to the Terms of Reference (Appendix 1) the main objectives of the evaluation-cum-appraisal were:

- To evaluate, in broad terms, whether the development from a purely technical and construction oriented approach into one which also includes community participation, hygiene education, sanitation, women's income generation and maintenance, increases effectiveness. This, especially with regard to:
  * continued functioning and hygienic use of facilities;
  * service to the poorer section of the population;
  * sustainability of maintenance and sanitary improvements;
  * financing of recurrent costs;
  * development capacities within communities (empowerment);
- To evaluate in general terms, whether the present organizational set-up is effective and sustainable.
- To give a summary assessment of the sustainability and replicability of the reviewed water supply, sanitation and hygiene education projects at State, District and village level.
- To evaluate, in general terms, the roles of the various parties involved in the planning and implementation of the integrated projects;
- To draw lessons from the present project activities and organization and formulate concrete recommendations for future projects;
- To appraise two new projects with the highest priority (Ghogha and Lathi-Liliya extension).

The Terms of Reference were mutually agreed upon by GOI, the Government of Gujarat (GOG) and GON.

1.2 Evaluation and appraisal procedure

The evaluation and appraisal activities consisted of four phases:

- Preparatory phase, including study of documents, interviews with resource persons and the preparation of brief field studies;
- Execution of two field studies concerning water utilization and socio-economic activities in February and March 1993. The results were available prior to the field visit of the team;
- Field visit of the evaluation and appraisal team from 15 March till 2 April 1993;
- Preparation of the draft report and final report in the Netherlands.

The list of documents perused is given in Appendix 2. Appendix 3 lists the persons met, while Appendix 4 gives the itinerary.

The team consisted of the following members:

- Mr. B.K. Dadlani, civil engineer, Senior Consultant of JPS Associates Management Consultants, New Delhi;
- Mrs. B. Kakkar, communication and health specialist, of CMCD, Calcutta;
- Mr. A.R. Manuel, sanitary engineer and team leader, of M-CONSULT, Woerden;
- Mr. A.K. Singh, chartered accountant, Senior Consultant of JPS Associates Management Consultants, New Delhi;
- Mr. B.L.M. van Woersem, rural development specialist, of BVW Rural Development Consultancy, Breukelen.

Mr. J.H. de Goede, team leader of the Review and Support Mission (RSM) for the programme in Gujarat, participated as resource person during the second week of the field visit.

The draft conclusions and main recommendations were discussed in Ahmedabad on 1 April 1993 with representatives of all implementing parties. The meeting was chaired by Mr. P.M. Flik, First Secretary and water coordinator of the Royal Netherlands Embassy (RNE). A debriefing took place in New Delhi on 2 April 1993 with the Joint Secretary of the Ministry of Rural Development and with Mr. P.M. Flik. The comprehensive draft report was prepared in the Netherlands in the course of April 1993.

We wish to express our sincere appreciation to the authorities, organizations and persons met during our field visit for their untiring efforts to accommodate all our wishes. Their contribution to the results of the evaluation & appraisal are invaluable. Nevertheless, only the team can be held responsible for the views expressed in this document.

2 MAIN LINES OF PROGRAMME CONCEPT AND DESIGN

2.1 Background

A growth rate of 2.1% per year over the period 1980-1991 resulted in a total population in India of 844 million in 1991. India now has more than 15% of the world's population. With a Gross National Product of US$ 330 per capita in 1991, India places itself in the middle of the group of 43 countries with the lowest per capita incomes in the world [104]. Real growth during the 1980s was 3.2% per capita per year, but at the same time macro-economic imbalances developed that threaten the sustainability of the economic growth. The policy is now to move away from the mixed economy that was characteristic for India during many years. This implies that market forces will play a greater role in the future than the protected environment and government controls [99].

Gujarat's 1991 population of 41.2 million constitutes 4.9% of the population of the country as whole. With an area of 196,000 km^2 its share in India's total territory is slightly higher at 6.0%. With 65.6% of the population living in rural areas (India 74.3%) and 56.4% of the workforce employed in agriculture, the State is still predominantly rural. However, these fractions are steadily declining. The Gujarat economy has accelerated its growth in each of the last three decades. The secondary and tertiary sectors have grown faster than the primary sector. The share of agriculture in the Net State Domestic Product has dropped from 45.2% in 1964/65 to 23.1% in 1989/90. The State economy has grown at the rate of 6.2% per year for the period 1974/75 to 1984/85 against an all India average of 4.0%. Per capita income at current prices (1989/90) is Rs 5,400; this is significantly higher than the national average of Rs 4,250.

Although the overall development of Gujarat thus shows a relatively healthy profile, serious problems are recognized. Of the cultivated area of 90,000 km^2, about 33,000 km^2 is now under irrigation. It is assumed that the latter figure could be doubled by further developing surface water sources. Most of this would have to be provided by the prestigious Narmada project[1], which is meeting with increasing resistance (see Figure 1). Moreover, ground water that would have to provide about 40% of the total quantity of water required, is already overexploited to the point of ecological degradation in many areas. To reach sustainability, abstractions should be drastically curtailed.

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1 The Narmada project is planned to provide irrigation for 18,000 km^2. This would be 28% of the envisaged total irrigated area.

Rapid urbanization and industrialization cause serious environmental problems that may eventually impede development. Gujarat is one of the fastest developing states in India, especially in the field of chemicals and petrochemical industries. This growth is continuing rapidly, further enhanced by the recent discovery of oil and gas at Gandhar.

The State is mostly semi-arid, except for South Gujarat which is humid to sub-humid. Rainfall is on average around 500 mm per year in the Santalpur and Sami-Harij project areas and around 650 mm per year in the Lathi-Liliya project area. Fluctuations in rainfall are relatively large. This makes about 27% of the geographical area of the State, including the NA project areas, so called "drought prone"[2]. Particularly during the years 1985 through 1987, Gujarat was hit by a severe drought. Annual rainfall in the State dropped to less than 50% of the long term average in 1987. The situation is further aggravated by the fact that high fluoride levels in the ground water are found in many places in the State. In this respect, the Mahesana District and Amreli District belong to the most affected in the State.

2.2 Gujarat objectives and targets for RWS/S

2.2.1 General objectives

In the **National** Eighth Five Year Plan 1992-1997 [90] India lists drinking water among the priority areas of development. It is considered an important tool for poverty alleviation.

This policy is reflected in the **State**'s plan for 1992-1997. "Social transformation" figures prominently in the approach to development. The main elements for achieving this transformation include provision of safe drinking water to every citizen in the State. The State has accepted the responsibility for creating drinking water supply sources in rural areas and for meeting the entire expenditure for maintenance of regional schemes.

2 Drought areas are defined as having a 20% probability of having less than 75% of average rainfall. Chronically drought prone is defined as having a 40% probability of receiving less than 75% of normal precipitation.

For the preservation of health and hygiene, stress is given to the programme of construction of low cost latrines in urban and rural areas[3]. The objective is rather vaguely worded as:

"to provide door to door facility of disposal of human waste in rural areas."

2.2.2 Targets and realizations

There are 18,114 villages in the State. With respect to the drinking water situation, 14,503 of these are declared "no source" villages, of which 14,087 were covered by March 1992. This would leave a balance of only 416 villages to be covered during the 8th plan. However, the real picture is somewhat less favourable. Many systems, although recently built, do either not yield sufficient water or the water quality is not (any longer) acceptable. Various names are used for proposed new activities in such villages: augmentation, "upgradation", rejuvenation, conversion etc.

The physical targets for rural water supply in the 8th plan are:

-	No source villages (first time):	416
-	Upgradation villages (bringing supply level at 40 lcd):	500
-	Rejuvenation villages:	2,500
		----- +
	Total number of villages for water supply	3,416

Until the start of the 8th plan, 45,500 low cost latrines have been constructed in rural areas. Rural sanitation will continue to receive relatively low priority. The target for the 8th plan is to construct 75,000 low cost latrines.

2.2.3 Major RWS/S programmes in Gujarat

The main programmes for RWS/S in Gujarat are summarized below.

a. The Accelerated Rural Water Supply Programme. This programme is 100% financed from Central Government funds. Criteria for this programme include: (i) per capita consumption of 45 litres per day, (ii) piped systems with stand-posts only and (iii) 250 to 300 people per water point.

b. The Minimum Needs Programme, that includes rural water supply and rural sanitation, funded from the State budget.

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3 Apparently this is meant to replace the former policy of providing piped sewer systems. It does not indicate a high priority for sanitation as such.

c. The Scarcity Programme. During the 7th plan and the period 1990-1992, the State mobilized substantial additional sources to meet the serious crisis of drinking water due to failure of the monsoon in 3 successive years.

d. The World Bank has financed the construction of water supply schemes for a total of 411 villages and 4 rural towns under two credits. They became effective in February 1983 and November 1986. A new credit is being negotiated.

e. The Netherlands Assisted Rural Water Supply Programme.

Funding of these various programmes is discussed in detail in Chapter 6.

2.2.4 Institutions involved

The Gujarat Water Supply and Sewerage Board (GWSSB) is the principal organization for developing rural water supply and sanitation systems. This includes small towns or "rural centres". In larger towns the municipal corporations are responsible for water supply and sewerage. The GWSSB has been the main "counterpart" in the NA programme. In addition, a growing number of NGOs is involved.

2.3 The Netherlands Assisted programme in Gujarat

2.3.1 Objectives

According to the GON policy plan 1992-1995 for bilateral aid to India, rural water supply is one of five "entry points" for rural development. The two objectives are (i) improving the living conditions and (ii) improving health [77].

The main guideline for the Netherlands assisted (NA) water supply and sanitation programme in Gujarat is the draft document "Framework for collaboration for the period 1990 - 1995" [1]. According to this document the overall objective is:

> *"to create sustainable and effectively used drinking water supply and sanitation facilities, through strategies and methods which are replicable, in order to improve the health, quality of life and productive capacity of rural people, especially the poor."*

Furthermore, this document states that the strategy of the programme will be characterized by an integrated approach including (i) community participation in all aspects of the project cycle, (ii) hygiene education and (iii) institutional development.

As stated before, the first project, Santalpur-1, was set up as a purely technical water supply project, without the objective of integration. The sideletters of 1987 for the second batch of projects formulate the overall objective as follows:

> *"to provide the entire population of the project area with safe and sufficient drinking water at a reasonable distance from their housing unit. In order to arrive at the full benefits of the improved drinking water supply, socio-economic aspects will be integrated in the preparation and implementation of the projects."*

Although not explicitly stated, the objective goes beyond the mere provision of drinking water. Presumably the "benefits" would include improved health and, subsequently, improved living conditions.

For the newly proposed third batch of projects, the overall objective as mentioned in the project documents is:

> *"to improve the quality of life for the population living in marginal rural areas in Gujarat."*

The immediate objectives include: (i) sustainable water supply, (ii) provision of sanitary facilities, (iii) improving environmental conditions in the villages focused on improvement of health and (iv) exploring possibilities for alternative income generating activities.

2.3.2 Targets

The physical targets mentioned in the various project documents for the water supply schemes are summarized in Table 1.

For the other components in the programme the targets and budgets were as follows:

- Socio-economic action research in the Banaskantha Districts carried out by FPI and SEWA in 1990 and 1991. An amount of Dfl 170,300 was allocated in 1989 for these activities of which the duration was estimated at 5 years. Three further allocations totalling Dfl 460,000 were made under the same heading, but actually meant for income generating activities by SEWA in the period 1990 and 1991;
- A five-year programme for income generation by SEWA started mid 1992. An amount of Dfl 3,682,550 was allocated;
- Health education in 95 villages in Santalpur project area is carried out by CHETNA. The allocation is Dfl 319,000;
- 140 households and 2 schools in 2 villages in the area of the Santalpur scheme were covered under the pilot sanitation project. Funding was from the Santalpur-Extension budget;

- As a contribution during 3 years in the cost of the Socio-Economic Unit in the GWSSB an amount of Dfl 78,080 was allocated in 1992.

TABLE 1 **Targets NA water supply projects**

Scheme	Allocation in million Dfl	Number of villages	Number of towns	Design population (x1000)			Design year
				Rural	Urban	Total	
Commissioned:							
- Santalpur-1[4]	24.00	72	0	120.0	0	120.0	2008
In progress:							
- Santalpur-Ext.	14.21	48	1	115.4	39.4	154.8	2018
- Sami-Harij	33.75	111	1	294.0	38.8	332.8	2018
- Lathi-Liliya	9.90	36	1	78.5	23.7	102.2	2018
Total	81.86	267	3	607.9	101.9	709.8	
Proposed:							
- Ghogha	-	79	1	451.4	33.1	484.5	2026
- Lathi-Liliya-2	-	51	0	200.5	0	200.5	2026

The total amount allocated from Dutch funds is approx. Dfl 87 million. The realization of the project targets is indicated in the respective sections.

Under active consideration is at present the proposal by CEE for a 3 year programme for awareness and training in the Lathi-Liliya project area. The total cost would be Dfl 330,000.

2.3.3 Approach and strategy

As stated before, the NA programme started with purely technical activities. There are two main reasons that justified this approach at that time:

- it was still generally assumed that the (technical) provision of safe water would by itself lead to better health and better living conditions;
- until 1976 development aid to India consisted nearly completely of programme aid (soft loans). Only after this time, a gradual shift to project aid and grant funds allowed more leverage of the donor in the development programme.

[4] The design population included 13% for "future additional population". The reason for adding this number was probably to arrive at a certain water demand. By the time these population estimates were made, the design was already completed, pipes ordered and construction work advancing.

Rather soon after the start of the programme, the first suggestions for socio-economic activities were voiced. The Review and Support Mission (RSM) suggests in 1981 that a special evaluation team should assess the possibilities for supplementary development activities [GU-3]. Gradually ideas develop for an integrated approach in which water supply, sanitation and socio-economic activities are to be taken up in a synergistic manner. The coordination of the various parties to be involved in such approach would be done by a small socio-economic unit within the GWSSB.

Activities by CHETNA on health education started in 1990. After action research was carried out in 1990 and 1991, SEWA started with a full-fledged programme for income generation and strengthening of local management capabilities for women in 1992. The pilot sanitation project in 2 villages was implemented in 1992. All these "additional" activities take place in the Santalpur project area. The socio-economic unit in the GWSSB is not yet operational.

According to our findings the approach and strategy until present in the NA programme can be described as follows:

a. **Integration** is not really achieved yet. Modest activities in the field of sanitation and health education are undertaken. Community participation is (not very successfully) undertaken by the GWSSB by setting up village level water committees (Pani Panchayats). A rather substantial income generation programme is under way, but still only loosely related to the water supply activities. All activities are in the Santalpur project area only.

b. **Coordination** between the various organizations in the NA programme is still weak. The District Level Steering Committee, the NGO panel meetings and the GWSSB are the instruments available. Although approved already a long time ago, the socio-economic unit in the GWSSB has not yet materialized. Although a State Level Coordination Committee of government representatives has been approved [GU-26], this committee is not yet functioning.

c. The number of **organizations involved** has gradually increased, mostly through promotion by the RSM and Gujarat based NGOs. The strategy to work through a number of Governmental and Non-Governmental organizations is sound. Particularly since strong and well qualified NGOs are based in Gujarat and because GO-NGO collaboration is a known phenomenon in the State.

d. **Project selection** is based on a number of criteria with associated weighing factors. The four most important of the 10 criteria are: (i) scarcity, (ii) qual-

ity/health benefits, (iii) reliability of sources and (iv) policy of GON [GU-13]. Criteria do not include geographic concentration in the State. In principle only no-source or problem villages are taken up. It has not become clear to us why until now only regional piped schemes are brought forward by GWSSB for the NA programme. A considerable number of handpump and single village piped schemes is also implemented in the State. Such schemes have never been proposed for adoption in the NA programme.

e. **Target groups** are the rural poor in general and women for the income generating activities. Scheduled castes and scheduled tribes get special attention.

f. **Service level and cost recovery.** Drinking water is supplied through public standposts only, as is the policy of GOG for regional piped water supplies. At the start of the NA programme in 1978, house connections were eventually foreseen. At present this possibility is no longer part of the approach. Water rates are low. Partly because of the low service level, recovery of even this modest amount is a problem. The pilot project for sanitation aimed at relatively high service levels with twin pit pour-flush latrines and private bathrooms.

g. The NA programme has no comprehensive (annual and multi-year) operational **planning**. The various activities each have their own time schedule. The two visits per year of the RSM are an important **monitoring** instrument.

3 EVALUATION OF TECHNICAL ACTIVITIES

3.1 Objectives and targets

As appears from Table 1 in section 2.3.2, the 4 water supply projects taken up so far aim at providing safe water to a total design population of 710,000 in 267 villages and 3 towns. The pilot project for sanitation aimed at 100% coverage of 2 small villages in the Santalpur project area. The design populations are shown in Figure 2. The objectives of the various schemes are listed in section 2.3.1.

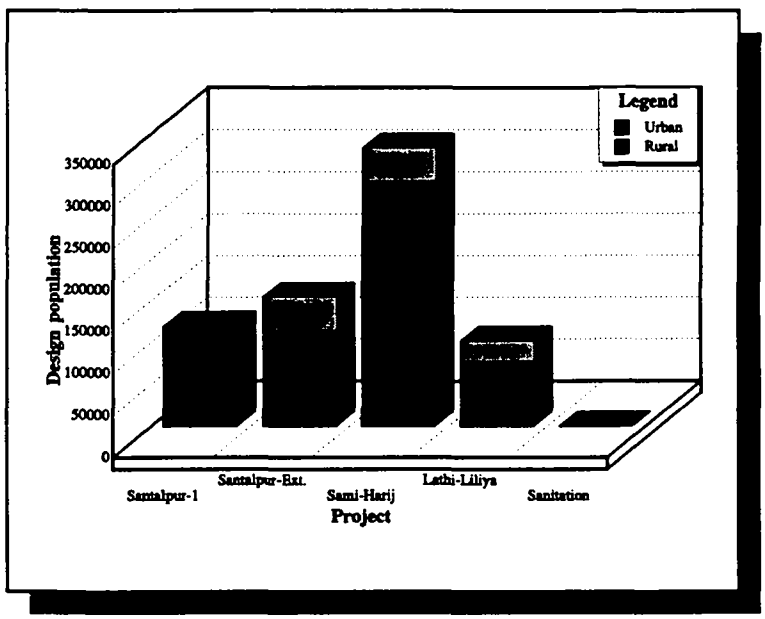

FIGURE 2 **Design population NA schemes**

3.2 Water supply

3.2.1 General

The Santalpur-1 scheme was commissioned in November 1987. An evaluation by ORG took place in 1989 [47].

The second batch of 3 schemes was not yet completed at the time of our field visit in March 1993. Physical completion was about 85%, while approx. 60% of the villages to be included were receiving water on a more or less regular basis already. Evaluation of the completed systems was thus not possible. This should still be done, preferable about 1 year after commissioning.

As stated before, until now only regional schemes were proposed for and included in the NA programme. Such regional schemes include many villages that are already provided with a single village piped scheme. The reason for inclusion is mostly the fact that the source has become insufficient or un-drinkable. But sometimes such villages just happen to lay in the supply area of an envisaged regional scheme ("en route" villages). For the same reasons small towns or rural centres are included in the NA programme.

Selection of the villages to be included in a particular scheme is not based on a master plan for larger areas or optimization. Neither are optimization techniques explicitly used in any of the designs of the 1st and 2nd batch schemes.

3.2.2 Design criteria and design

Design criteria for the **Santalpur-1** scheme included:

- Originally the system was designed for 70 lcd total production. Upon request of the RSM this was revised before the project was approved into:

*	human consumption	20 lcd
*	20% additional on peak day	5 lcd
*	cattle consumption 0.5x30 lcd	15 lcd
*	losses in the system approx. 25%	10 lcd
		----- +
	Total production requirement	55 lcd

  The consumption for cattle was based on the fact the number of cattle in the area was 50% of the number of human beings;
- Population growth rate was assumed at 2% per year, starting from 1978. For "additional future population" 13% was added to the figures thus derived (see footnote in section 2.3.2). The 1978 population was based on the 1971 census data and a yearly increase of about 1.37% until 1978;
- Design period: 30 years (design horizon 2008), except for components that should be replaced at shorter intervals or can be extended easily. For such first phase works the design period was 15 years (design horizon at 1993);
- Pumping at source: 20 hours per day;
- Hydraulic design of the distribution network based on a peak factor of 1.2 as included in the 55 lcd. Hydraulic calculations were based on Hazen-Williams with C-values of 130 for concrete, 120 for asbestos cement and 110 for PVC and HDPE pipes;
- Storage at village level 50% of daily requirement in ground level cisterns;
- Water for human consumption to be provided through public standposts only. No house connections are allowed in regional piped schemes in Gujarat. The reason was primarily to reduce investment costs (ground level storage in the villages, low pressure pipelines etc.), but also because the capacity of the water sources is limited. However in the earlier reports [GU-1] it was mentioned that in "a second phase" house connections might be provided, for which then elevated storage reservoirs in the villages would be required;
- Maximum walking distance to public standposts 150 m. Maximum 100 consumers per tap;
- One cattle trough per village;

- Mid-1981 prices were used; no price escalations were included. Contingencies were not taken into account. It is remarked, however, that by the time the final project document was approved (June 1981) the tubewells were completed and most of the pipes had been procured. Establishment charges GWSSB: 17.85%.

Design criteria as used in the **2nd batch** of schemes were mostly identical, with some exceptions:

- For urban centres the total demand on the system is 100 lcd;
- Population projections (mostly) based on the average of linear and exponential extrapolation of the 1971 and 1981 census figures;
- Water quality: WHO standards;
- Storage at scheme level: 30% of daily demand;
- Maximum walking distance to public standposts 250 m.

For the proposed **new projects** (3rd batch) the criteria are the same. The only exception is the walking distance, which will be 200 m.

With respect to the design criteria we make the following remarks:

a. The 55 lcd production figure was based on sound reasoning for the Santalpur-1 scheme. However, this figure has gradually become a standard. This results in a "blanket approach" of providing 55 lcd for all consumers in all villages, which is not realistic and efficient.

b. System losses are usually expressed as a percentage of total production. The assumption of 10 lcd for system losses represents 18% of the total production. This is a low figure for piped rural water supply systems. With the long transport distances involved in the NA schemes, at least 25% would be more realistic. With average human consumption at a relatively low 25 lcd, the total demand figure of 55 lcd is thus on the low side.

c. The criterion not allowing house connections is in sharp contrast with the policy for single village piped schemes. In these single village schemes private connections are a very common feature. When local sources deteriorate or dry up, in many cases single village systems are replaced by regional schemes. Private connections would then no longer be allowed. One wonders whether villagers consider this an improvement. The original intention, as mentioned before, to consider house connections once the systems were completed, seems forgotten or has been quietly discarded.

d. No reasons could be found for changing the criterion for the maximum walking distance from 150 to 250 and then to 200 m. Anyhow, this limit is not strictly adhered to. In the few cases that we checked the maximum walking distance, we found substantial excesses. In one case we measured about 500 m. This is detrimental to the use of safe water, particularly when unsafe water is found at a shorter distance.

e. There is some conflict with the design criteria that are usually applied by the GWSSB [105]. These require 40 lcd for domestic **consumption**, presumably on average. This would be substantially more than the 25 lcd provided in the NA programme. Furthermore, for villages with more than 3000 inhabitants, elevated storage is to be provided. No such criterion exists in the NA programme.

f. We noted that several communities in the schemes are called villages, but are actually hamlets. This distinction may eventually be relevant when Pani Panchayats would get a formal status in the villages.

g. Designs of the systems are prepared by GWSSB with the exception of treatment plants. It is obvious that this organization has considerable experience with the design of regional schemes. We noticed that the flow velocity in the twin 450 mm diameter mains for the Santalpur-1 project from Shihori headworks into the supply area is only 0.24 m/s at the final design capacity of 6.65 Mld. This is far below the optimum flow velocity. Possibly the system has been heavily over-dimensioned. It is also noted that designs tend to be rather traditional.

h. The Santalpur-1 scheme was designed to have only one pumping stage: the submersible pumps in the tubewells. Only for 3 villages in the tail-end a small booster was required. In a later stage, boosting at the mid-way point in Varahi would have to be added. The Sami-Harij scheme is designed with 2 pumping stages for most of the villages. In the Lathi-Liliya scheme a number of villages depend on 3 pumping stages according to the design. We understood that temporarily an additional booster pump had to be installed. Multiple pumping stages negatively affect the reliability of the schemes.

i. It is the intention that the schemes continuously supply 24 hours per day water to the cisterns in the villages. The storage in the cisterns of 50% would allow the consumers to draw the required quantities during 2 short periods of the day.

The policy of providing water through standposts only is a major issue. Considering that:

- in many cases local sources are still in use;
- in many places people already have private connections;
- a limited number of house connections would increase the total demand on the system with only 10 to 20% as a maximum;
- well to do people will always find ways to obtain the convenience of a private connection[5],

we feel that the policy of not allowing house connections in regional schemes is not sustainable in the long run. It is remarked that the approach of providing ground level cisterns stands in the way of eventually providing house connections. For the latter considerably more pressure is required for which elevated storage would have to be provided.

3.2.3 Population projected and covered

GWSSB undertook to add 21 villages to the Santalpur scheme under the Santalpur-Augmentation project from its own budget. For the villages in the Santalpur area, 1991 population census data could be obtained and the annual growth rates over the past 20 years (Santalpur-1) or 10 years (Santalpur-Extension and Santalpur-Augmentation) could be calculated. Extrapolating the 1991 figures with the growth rates thus found would result in the rural population figures by the end of the design period as shown in Table 2. It appears that the design population may not be reached.

TABLE 2 **Rural population in Santalpur area (x1,000)**

Project	1991 census	Growth rate (% per year)	Extrapolated	Design	Difference (%)
Santalpur-1	84.0	2.31	123.7	107.0	16
Santalpur-Extension	59.3	1.37	75.0	115.4	-35
Santalpur-Augmentation	20.5	1.46	26.0	37.8	-31
Total			224.7	260.2	-14

Remarkable are the low growth figures over the period 1981-1991 for the villages in the Santalpur-Extension and Santalpur-Augmentation projects. In the design 2% per

5 Many houses in the Amreli and Bhavnagar Districts were seen to have electricity connections and television sets. The cost of an electricity connection is about Rs 50 per month.

year was used. For the Santalpur-1 scheme for the same period 1.86% per year is found.

The situation with respect to the population actually supplied in the Santalpur area per March is given in Table 3. In this table also the 6 "Extra villages" that were connected to the system by GWSSB are included.

TABLE 3 **Population covered in Santalpur area (1991 census figures x1,000)**

Project	Total in supply area	Covered (March 1993)	
		population	% of total
Santalpur-1	84.0	81.6	97
Santalpur-Ext.	59.3	36.5	62
Santalpur-Augm.	20.5	8.5	41
Extra villages	2.9	2.9	100
Total	166.7	129.5	78

The total rural population now supplied in the Santalpur area is about 130,000. In addition, water is supplied to Radhanpur town and to some large private consumers.

3.2.4 Water sources

In general water resources are scarce in Gujarat. Over-exploitation of ground water is common and well documented. The demand on the limited surface water sources is ever increasing. In many cases the use of water from reservoirs is shifting more and more to drinking water to the detriment of irrigation. In several instances, reservoirs do not supply irrigation water any longer and have become "dedicated" drinking water sources.

The water sources for the schemes in the NA programme give reason for grave concern. In the Santalpur scheme static water level in the tubewells is dropping at a rate of 3 to 4 metres per year. Moreover, the drawdown in the tubewells increases. The water quality has so far remained within permissible limits but only due to limitation of the abstraction. The radial well that was meant to provide water for the Santalpur-Extension requirements, is practically a failure. The construction of 2 new tubewells has been agreed upon by the RSM. The possibilities to drill several new tubewells are being studied. These tubewells were not foreseen in the original budget. GWSSB estimates that ground water sources might be sufficient for only

another 5 to 10 years. If this proves true, major new investments will be necessary not even half way the design period.

In the Sami-Harij scheme the quality of water from the tubewells at the Kamlivada well field has recently deteriorated to the point that the permissible limit for fluoride is surpassed: 2.26 mg per litre (1.5 max. permissible). Static water levels are declining here too. Not enough data are available yet to firmly establish the rate of decline. The alarming situation is described by the RSM as follows:

> *"In the worst case scenario the ground water resources for the Santalpur scheme will be depleted in five years if pumping continues at the same rate. Very few data are available in for the well field of the Sami-Harij scheme but the situation may be worse here."*

Given these dramatic deteriorations of the existing sources, and considering the fact that realizing substantial new works would take at least 5 years, it is urgently required that a long term source development plan is made. This needs to be done for both the Santalpur scheme and the Sami-Harij scheme.

The Lathi-Liliya scheme depends on water from the Kalubhar dam. Every year a trade off has to be found between the requirements for irrigation and for drinking water. In 1992 no water was available at all during 15 days just before the monsoon. Reportedly this was due to a communication problem. This year (1993) is foreseen that drinking water needs can be met until the date that the rains usually start. In case the rains are late, again the drinking water supply would have to be stopped. In the Lathi-Liliya case the situation is seriously complicated by the fact that the supply area for drinking water is in Amreli District, while the command area for irrigation is in Bhavnagar District. Not only the consumers are thus different, but also the District level authorities.

Particularly in the case of the use of surface water for drinking purposes it is obvious that this can only be realized at the cost of water for irrigation[6]. In existing irrigation systems, this raises the question whether it is fair to use water for drinking purposes that until now was available for irrigation. The justification for such action could be:

- That by law priority should be given to drinking water;
- That drinking water is a primary necessity;
- That drinking water is provided to every one, also the poor people. Irrigation mostly serves the more well to do section of the population;

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6 Of course, also in cases of ground water abstractions the trade-off is there, but in such cases it is less obvious.

- That farmers do pay for irrigation water. If they receive less, they save money. Although there is justification to give priority to use for drinking water, at the same time it is clear that conservation is important.

In general we found little interest with the authorities to improve water management in the State. Existing legislation could be enacted or enforced, new legislation could be drafted and instruments to stimulate efficient water use and conservation could be introduced. There are no such intentions. Apparently it is expected that the future Narmada project will solve the water problems in the State. The 8th plan considers this project the "life line of Gujarat". From the total outlay of the 8th plan a full 25% is set aside for this project alone! It expected that before the end of the plan period (1997) some water will start flowing through the irrigation canals.

3.2.5 Technical aspects

The drawdown of the tubewells in the Shihori well field of the Santalpur scheme increases with an average of about 3 m per year. Possibly this is due to the deterioration of the mild steel screens used in these tubewells. This material is usually not suitable for screens. In the future non-corrosive materials (plastic or stainless steel) should be considered.

The design of the treatment plant in the Lathi-Liliya scheme was provided by a contractor. This contractor was selected because of the low investment cost for the plant. The design is traditional with mechanical mixing and flocculation and a circular sludge blanket clarifier. We feel that this does not represent the optimum design when also other considerations are taken into account, such as reliability, durability and running cost.

In the Santalpur scheme many of the solvent cement joints in the PVC pipes reportedly come loose. The cause of this problem is not clear, but should be investigated to prevent similar problems in the future. Also the possibility to use rubber ring joints in PVC should be considered for future projects.

The design of standposts is purely functional. Although it is thus appropriate for its intended use to dispense water, it has nothing friendly or inviting.

3.2.6 Water use

It is obvious that the water supply in the NA programme addresses a felt need of the population. In the Santalpur and Sami-Harij project areas water is very scarce or even unavailable during substantial periods every year. In such case it may be

expected that improved supply is appreciated, which it is. At the same time it is crucial that the supply is reliable.

In the Santalpur area a total population of about 130,000 is presently supplied by the new system. From the total production of 8.5 Mld about 0.8 Mld is used for non-rural purposes. The present per capita production for rural water supply can thus be calculated as about 60 lcd. A similar figure was found by the RSM in 1992 [GU-26]. This per capita production is close to the design figure. However, it should be noted that supply is curtailed as much as possible to avoid over-exploitation of sources. Furthermore, several tail-end villages do not receive sufficient water due to problems with the transport system.

In the Lathi-Liliya area not the water quantity but the high fluoride content of the water was the main problem. Health authorities have done a remarkable job in making the consumers aware of the difference between the new "Kalubhar water" and traditional sources. In all places that we visited, people did obtain water for drinking and cooking from the standposts, while often they had a traditional source in or near their house. It should thus be expected that demand on the new system for domestic purposes will be substantially below the 55 lcd. The first impressions on the actual consumption seem to confirm this. In the Lathi-Liliya area the reliability of the new source is less critical, since local sources in the villages are usually giving sufficient water around the year. Occasionally using this water with a high fluoride content is acceptable, provided that is made safe from a bacteriological point of view.

Cattle are important water consumers. It is assumed in the projects that the quantity consumed per cow is about 30 litres per day. Although this figure is not substantiated with empirical data yet, it seems reasonable. However, apparently buffalos need to wallow in water during several hours per day. The quantity of water required for this purpose is not mentioned in any document, but could well be very substantial. We have the impression that much water is (illegally) tapped for the latter purpose. We observed that water was intentionally spilled from standposts and cistern to supply ditches and small ponds in which buffalos wallowed. The same was observed several times by the RSM in addition to tampering of the distribution system with the same purpose.

Possibly better than trying to control this phenomena through regulations and technical means, it may be regulated through economic mechanisms. Farmers may be free to use as much water for their cattle as long as they pay the full price for the service. The same approach for regulating water use would apply for house

connections. There is little future in prohibiting such services. Rather, the consumers should pay the full price, and if possible even more than that.

A further question that need to be addressed is whether cattle may or may not drink water with high fluoride levels. Both the health of the animal of its products (milk and meat) should be considered.

3.3 Sanitation

The sanitation pilot project had a long time in coming. The idea was first brought forward in 1985 to start sanitation education and implementation in some "demonstration villages" [GU-13]. Much discussion ensued [e.g. GU-16 and 28]. In November 1991 contractual arrangements were completed between the GWSSB and the Environmental Sanitation Institute (ESI). The latter had the work contracted to the Sahyog Foundation, an NGO with experience in the area.

The project is implemented in the villages Kalyanpura (Santalpur Taluka, population 476) and Tembi (Kankrej Taluka, population 352). Twin pit pour-flush latrines were adopted as is more or less the standard in India. No choice of technology was offered to the users. During the first half of 1992 a total of 140 household sanitary units, consisting of a latrine and bathroom were constructed covering all houses in the two villages. Additionally, a school sanitary unit was constructed in each of the villages.

Subsequently CHETNA carried out a study cum evaluation of the use of the facilities [GU-27]. For Kalyanpura usage of latrines was 40% and of bathrooms 75%. In Tembi, were cash contributions for the construction were required, usage was 73% and 93% respectively.

wording clear?

We are of the opinion that there was no need for the NA programme to experiment in this way on such a small scale. Much experience has already been obtained in other large scale programmes under similar conditions.

3.4 Implementation of water supply schemes

Implementation periods of the projects are excessive. Santalpur-1 took more than 8 years to complete. But even when it was finally commissioned in 1987, it was only because some remaining works were carried over to the Santalpur-Extension project. The projects of the 2nd batch will have taken more than 6 years, assuming

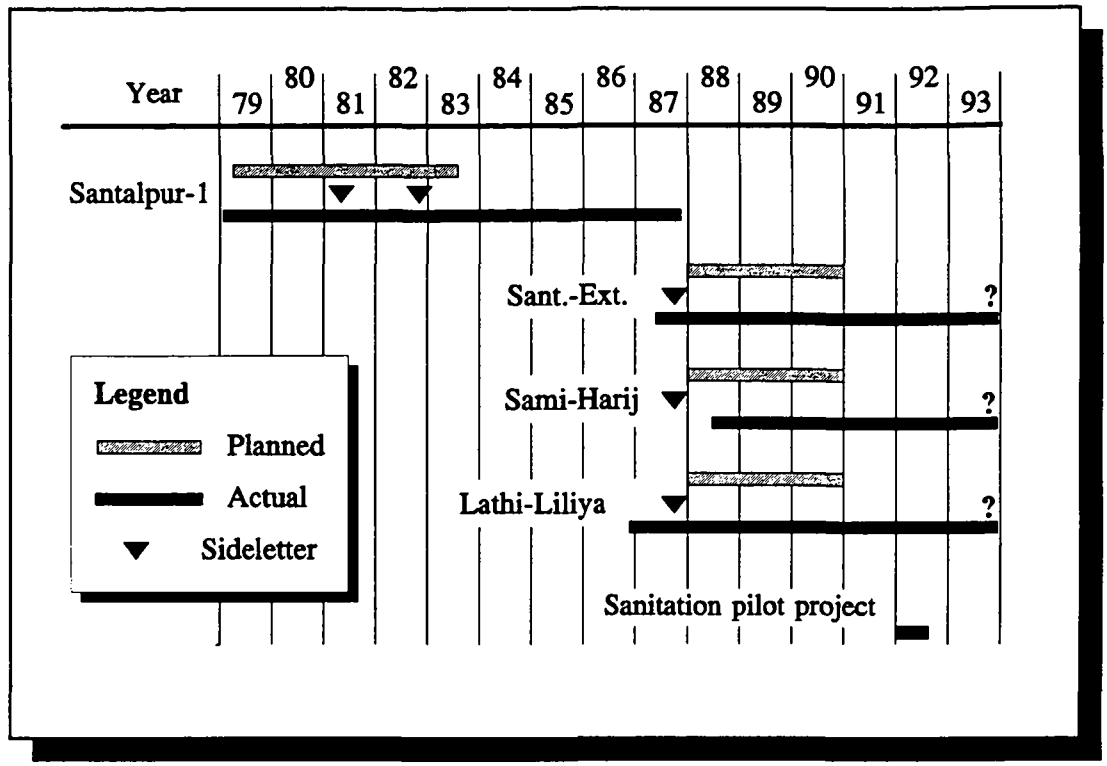

FIGURE 3 **Time schedule water supply and sanitation projects**

they will be completed by the end of 1993. Construction periods were estimated at 4 years for Santalpur-1 and 3 years for the 2nd batch. Figure 3 shows the time schedules of planned and actual implementation.

Each and every visit the RSM was confronted with new delays and new promises of early completion by the GWSSB. Many times unforeseen circumstances occurred like drought, flood, strikes, problems with land acquisition or right of way, non-availability of materials etc. However, over-optimistic scheduling, poor planning and inadequate project management are the main causes of these delays. For example the number of contracts and tenders for the projects is unnecessarily large as is shown below:

- Santalpur-1: 102 contracts (situation March 1987);
- Santalpur-Extension: 68 contracts (situation June 1991);
- Sami-Harij: 130 contracts (situation June 1991);
- Lathi-Liliya: 66 contracts (situation June 1991).

Optimism is reflected in the discussion in 1979 [GU-2] when Indian authorities and RSM agreed that an implementation period of 3 years would be feasible. Possibly as the result of earlier comments by the RSM [GU-13], it was assumed by the GWSSB in 1986 that 7 contracts per scheme would be sufficient [GU-15]. The time overruns are shown in Figure 4.

Village level works proved the most difficult part of all physical works:

- timing was critical: facilities should be made shortly before water is available;
- proper siting of cistern, standpost and cattle trough was not always easy due to many conflicting interests;
- maintaining a sufficient level of quality of the physical work was difficult due to weakness of contractors and supervision.

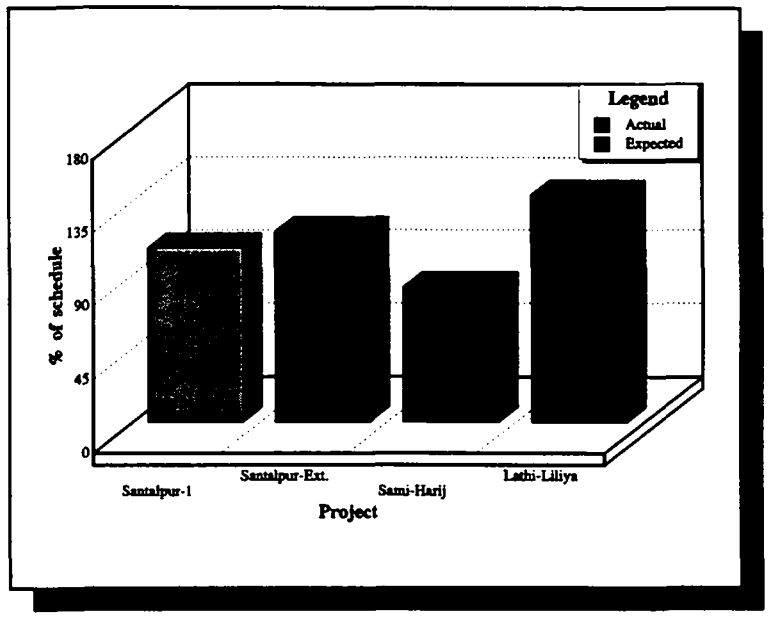

FIGURE 4 **Time overruns**

It should be noted that it are these elements of the system that are the visible parts for the villagers and form the "interface" between consumers and the main system. The main parts of the system are either buried underground or located in far off places.

Connection of villages to the Santalpur-1 system went in a rather uncontrolled way. During commissioning in November 1987 the RSM found that 22 additional villages (partly of the then proposed Santalpur-Extension scheme) had already been connected. Even the city of Radhanpur was supplied from the scheme at that time [GU-17]. On the other hand, out of the 72 villages of the scheme only 66 received regular water.

In Table 4 the total number of villages and the number connected according to information provided by the GWSSB at the time of our field visit is listed.

TABLE 4	Numbers of villages (situation March 1993)		
Scheme	Total	Connected	Remarks
Santalpur-1	72	69	1 village deserted
Santalpur-Extension	48	27	
Santalpur-Augmentation	21	10	
Santalpur-"Extra"	6	6	Added without RSM consent.
Sami-Harij	111	72	60 have regular supply
Lathi-Liliya	36	35	

3.5 Operation & maintenance

Operation and maintenance of all works is the responsibility of the GWSSB. This goes down to the smallest items in the most remote villages. Clearly this is an inefficient approach. Effectiveness is not the main worry, since the GWSSB is rather well organized for this type of work. Nevertheless, persistent under-staffing threatens also the effectiveness.

A main problem facing the GWSSB is to bring and keep the amount of unaccounted-for water under control. In the Santalpur scheme leakage from the pipelines is probably still too high while uncontrolled and illegal consumptions need to be checked. As stated before, we doubt that technical and disciplinary measures alone will solve this problem. In the Lathi-Liliya scheme actions are being taken to bring the excessive leakage in the rising main between the dam and the treatment plant under control.

For the Santalpur scheme a comprehensive operation & maintenance manual was prepared by the RSM in 1990. The GWSSB informed us that the proposed procedures were introduced with good results. The RSM should be asked to evaluate the results so far and take steps to introduce the system in the other NA projects. Of course, possible shortcomings should be remedied first.

Regular supply to the tail-end villages in the Santalpur area has been a problem from the day they were connected. In 1989 ORG carried out an evaluation of the Santalpur-1 project [47]. From 397 households surveyed in 15 villages, 48% were not satisfied with the water supply. In the Santalpur Taluka (tail-end) this fraction was 63%. This was echoed in February 1990 by the RSM:

"The water supply situation at the tail-end of the Santalpur scheme remains far from satisfactory."

Presently problems persist in a number of villages in the Santalpur-1 scheme. SEWA estimates that 25% of the villages of the Santalpur-1 scheme get hardly or no water. In another 25% the supply is irregular. Also CHETNA staff stated that regular supply remains a problem, although they could not quantify it. We visited 5 villages in the Santalpur-1 area; 3 of them reported irregular supply. It concerned villages that were not mentioned by GWSSB or the RSM as having problems. As these findings are hardly conclusive, this aspect should be investigated thoroughly in an external evaluation that should take place shortly after the Santalpur-Extension is commissioned.

As stated before, the systems are designed to provide 24 hours per day water to the cisterns in the villages. The flow to the cisterns would have to be adjusted in such way that each village gets the correct total quantity of water each day. In addition, the cisterns are supposed to be fitted with float valves to prevent overflow. To facilitate the "tuning" of the system, water meters are now being installed in the inlet to each cistern.

The envisaged method of water distribution will prove difficult to implement since it is inherently instable. If the flow to one village is adjusted, it affects (in principle) the flow to all other villages. All the other villages would thus have to adjust their inflow, each one affecting all the other ones, etc. On the other hand, rationing in time will not be easy either, since it will result in peak flows for which the system was not designed. The present approach of (re-)installing water meters at the headworks and in all villages, and having pressure gauges read along the main pipelines may help to find practical solutions.

We like to make three further remarks:

- It was disappointing to see that no way was found yet to make use of the pumping station Boratwada in the Sami-Harij scheme. It is standing ready but idle for one year already, while villages downstream suffer from low pressure.
- Electricity supply does not pose undue problems so far. Power failures are partly covered by the diesel generating sets installed for this purpose. The main problem at present seems to be the shortage of power at the treatment plant in the Lathi-Liliya scheme. Since water demand is still low, this does not create inconveniences yet.
- The site of the Shihori headworks is very well maintained and an example of how it could be in other places.

3.6 Financial aspects

3.6.1 Investments

A comparison between the originally approved investment budgets and the (expected) actual expenditures on completion for the four schemes concerned is presented in Table 5.

TABLE 5 Total costs water supply schemes (in Rs million)

Scheme	Approved budget	(Expected) cost on completion	Cost overrun (%)
Santalpur-1[7]	87.3	97.7	11.9
Santalpur-Extension	104.4	97.0	-7.1
Sami-Harij	248.1	199.0	-19.7
Lathi-Liliya	72.8	76.6	5.2
Total / average	512.6	470.3	-8.3

It is remarkable to see that on average there is some underspending of the Rs budgets, while implementation periods have been much longer than planned. Buying pipes at a time of low prices has been given as one of the reasons by GWSSB. Underspending of the Dutch Guilder budget is much more substantial. It is expected that on the total budget of Dfl 82 million about Dfl 20 will not be spent. The main reason being the strong loss of value of the Rupee against the Dutch Guilder. This is demonstrated with the following figures:

- 1982 1 Dfl = Rs 3.6
- 1988 1 Dfl = Rs 7.3
- March 1993 1 Dfl = Rs 16.7

Per capita investment costs for the design population have been calculated for the actual expenditures ("current costs") and for the expenditures expressed in 1993 prices. The latter costs are calculated by applying the price deflator for gross domestic capital formation on the current costs [66]. The results are given in Table 6.

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7 The approved budget shown is for the 1st phase as per final project document of June 1982. It is remarked that the project was first proposed in 1978 for a total budget of Rs 46 million. A number of design changes requested by the RSM, and probably price increases led to the amount given in the table. By the time this budget was established some works were already completed, while the bulk of the pipes had been procured.

TABLE 6	Per capita costs water supply schemes (in Rs)		
Scheme	Investment in 1993 prices (Rs million)	Per capita cost	
		in current prices	in 1993 prices
Santalpur-1	244.7	810	2,030
Santalpur-Extension	120.0	630	770
Santalpur (total)[8]	396.3	720	1,270
Sami-Harij	238.8	600	720
Lathi-Liliya	95.1	750	930

The Santalpur-1 scheme has been extremely expensive. A per capita investment in current prices of Rs 810 is a very high figure for the time it was planned and constructed[9]. We did not really investigate the causes, but as mentioned before, the transport mains appear heavily over-designed. Of course, the scheme is relatively expensive given the long transport distances (about 100 km maximum) and the modest total capacity (no economy of scale).

3.6.2 Operation & maintenance costs

Total future water production requirements are determined by the expected total number of consumers and the total per capita production requirements[10]. Table 7 lists the results for the different schemes for the period until 2018.

Based on the actual practice and experience of GWSSB, operation & maintenance costs have been set at 2% of investment costs per annum during the first 10 years of the operation of new schemes and 4% per annum thereafter. At present, GWSSB does not make any reservations for depreciation. According to the World Bank norms, depreciation allowances for the type of projects under consideration should be set at 2.5% per annum (assuming an average life-time of the assets of 40 years).

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8 Investment for Augmentation scheme was Rs 29 million (current), and the design population 38,000.

9 The per capita investment cost for the SP-I project in Uttar Pradesh that was implemented in about the same period was Rs 180 (current cost). It is noted that the situation allowed for a cheaper design than in Santalpur-1. In Andhra Pradesh until 1991 regional water supply schemes had never been more costly than Rs 660 per capita.

10 Like it is done in most reports, we have used the maximum production figure of 55 lcd. Actually the average figure of 50 lcd should be used.

Using the actual investment costs as mentioned earlier, the annual production cost will then be as shown in Table 8. The figures are in constant 1993 prices.

TABLE 7 **Projected water production requirements**

Year	Santalpur total		Sami-Harij		Lathi-Liliya		Total	
	Popul. (x1000)	Demand (Mld)	Popul. (x1000)	Demand (Mld)	Popul. (x1000)	Demand (Mld)	Popul. (x1000)	Demand (Mld)
1993	186	10.2	198	10.9	61	3.4	445	24.5
2003	230	12.7	245	13.5	75	4.1	550	30.3
2018	313	17.2	333	18.3	102	5.6	748	41.1

TABLE 8 **Projected annual production costs (Rs million, 1993 prices)**

Year	Santalpur total		Sami-Harij		Lathi-Liliya		Total	
	O&M	Total	O&M	Total	O&M	Total	O&M	Total
1993	7.9	17.8	4.8	10.8	1.9	4.3	14.6	32.9
2003	15.9	25.8	9.6	15.6	3.8	6.2	29.3	47.6
2018	15.9	25.8	9.6	15.6	3.8	6.2	29.3	47.6

By using the figures for the total production capacity as given in Table 7, the cost per m^3 water produced will be as in Table 9, again in constant 1993 prices. It is noted that the cost of water **consumed** will be higher since water is lost from the system before it reaches the consumers.

TABLE 9 **Cost of water produced (Rs per m^3 in 1993 prices)**

Year	Santalpur total		Sami-Harij		Lathi-Liliya		Average	
	O&M	Total	O&M	Total	O&M	Total	O&M	Total
1993	2.12	4.78	1.21	2.72	1.53	3.46	1.63	3.68
2003	3.43	5.65	1.95	3.17	1.54	4.14	2.65	4.30
2018	2.53	4.10	1.44	2.33	1.86	3.03	1.95	3.17

With an average production of 55 lcd the average per capita cost of production can now be calculated. The results are shown in Table 10 in constant 1993 prices.

TABLE 10	Average per capita cost of water produced (Rs per year in 1993 prices)							
Year	Santalpur total		Sami-Harij		Lathi-Liliya		Average	
	O&M	Total	O&M	Total	O&M	Total	O&M	Total
1993	42	96	24	55	31	70	33	74
2003	69	112	39	64	51	83	53	86
2018	51	82	29	47	37	61	39	64

3.6.3 Cost recovery

Based on the above calculations, financial self-sustainability of the NA schemes as a whole could be achieved if present **average** water charges would be fixed at a level of Rs 75 per capita per year. This would be more than five times as high as the Government proposals presently under consideration. In order to maintain financial self-sustainability also in future, this price would, of course, have to be adjusted regularly according to the level of inflation.

For recovery of only the operation & maintenance costs, the average present water charge would have to be about Rs 40 per capita per year.

At present GWSSB's income from water charges from the NA schemes (as from all schemes) is negligible. The financial viability of these schemes is completely dependent on the ability of the State Government to make available the major part of the necessary funds for operation & maintenance and replacement investments. In view of the scarcity of capital in India, this is an highly unsatisfactory situation. Assuming that GOG will follow the water rates policy of the Central Government, water charges will gradually have to be set at a level:

> *".... adequate to cover the annual maintenance and operation charges and a part of the fixed costs"* [90].

Taking the NA schemes as a whole, the implementation of such a policy would mean that the present average water charge for these schemes would have to be fixed at a level of, say, Rs 60 per capita. This would include 50% of the fixed costs. A further gradual increase to Rs 75 (adjusted for inflation) to cover all costs would then have to follow.

Little is known about the **ability** of consumers to pay for water, but it is probably much higher than generally assumed. Particularly the section of the population with the highest incomes would be able to pay the full cost. Nothing is known about the

willingness to pay for water in the project areas. The willingness of the consumers will probably be lower than the amounts required for recovery of even O&M costs only, for a service level as offered by public standposts[11]. For house connections, the willingness may be expected to be higher. Furthermore, the political willingness has to be mentioned. At present the policy of the government is not firm in the sense that cost recovery is required. Politically low water rates are still used as a vote catcher.

3.7 Impacts

The main objectives of the programme are to improve health and living conditions in general (see section 2.3.1). There is little doubt that improved living conditions are achieved in the Santalpur and Sami-Harij water supply schemes. The convenience of piped water most of the time at a reasonable distance from the homes relieves the women of much drudgery. It makes time available for more productive activities.

The health impact cannot be assessed since reliable data are lacking. The ORG evaluation of the Santalpur-1 project found some indications of a positive effect on mortality where water supply was reliable [47].

It is certain that the health objective is not fully achieved. In many villages piped water is not available from time to time for a day or more. In such cases often there is no choice but to obtain drinking water from unprotected local sources. Possibly this use of bacteriologically unsafe water negates the positive effects of the new water supply. This risk was clearly identified in the ORG evaluation in 1989.

The population will always depend to a certain extent on local sources since 100% reliable supply from the regional schemes can never be achieved. For this reason, measures to have local sources protected for back-up use should be part of the projects. It is noted that this suggestion was done already before, e.g. the RSM [GU-13] and the ORG evaluation. Also IRC has repeatedly drawn attention to the importance of village level water sources.

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11 Some indication are the electricity connections. The cost for a house connection is about Rs 80 per capita per year. Only a limited number of villagers is willing to spend this amount for a much desired convenience.

In the Lathi-Liliya scheme it is almost certain that the envisaged relief from fluorosis will be achieved to a large extent. We observed a strong discipline in using the "new" water for drinking purposes.

We noted that drainage from the platforms of the standposts was mostly made as required. However, we noticed that the area around the standposts became muddy in the many cases where the standpost is located in low areas. This is particularly the case in the Santalpur and Sami-Harij schemes. Ways should be found to prevent these unhygienic conditions, particularly since malaria is making a strong comeback anyway.

The effect of the small pilot project for sanitation on the total programme area is insignificant. It may be assumed that in the 2 villages concerned a positive health effect is achieved, since utilization is good. The improved convenience is appreciated particularly by the women.

4 EVALUATION SOCIO-ECONOMIC ACTIVITIES

4.1 Objectives

In the RSM report of May 1982 [GU-5] suggestions already have been made for a joint Indo-Dutch project preparation mission for an integrated area development programme and supporting activities.

In the RSM report of November 1986 [GU-15] effective community involvement was made a major issue. A step-by-step approach of relatively simple, practical measures towards the ultimate goal of effective community participation and awareness raising was suggested. Grass root level (village) organization was placed in a broader context of self-reliance and socio-economic development at village level. Water and sanitation issues were supposed to serve as a vehicle in this development process. It was realized by RSM that effective community participation was a long term process influenced by a number of socio-economic, cultural and political factors. A top-down decision to establish local organizations was not considered to be a realistic approach, because initiatives also have to come from the local level itself.

GU-15 mentioned three major decisions regarding the execution of the socio-economic components taken around that time:

a. The major actor in the community participation process was indicated to be the GWSSB itself:

   "the technical staff members have to become facilitators and trainers, with the capacity to influence and to convince, which is not an easy task" [GU-15].

b. The establishment of Pani Panchayats was already considered to be "the key issue" towards an effective community involvement (see also annex H, GU-15, TOR village Pani Panchayats). Again, GWSSB was the leading party to take the initiative to establish the Pani Panchayats. The establishment of Pani Panchayats was translated into concrete targets to be realized (see section 4.3).

c. Apart from the GWSSB also other parties like the Jalseva Training Institute and NGOs like SEWA and CHETNA were considered to play a role in the health education and community participation process.

4.2 Health education

The task of providing health education support has been assigned to CHETNA, a large Gujarat-based NGO specialized in this particular field of action.

4.2.1 Activities undertaken

The overall objectives of the health education programme are a sustained, hygienic and optimum use of the improved water supplies and a reduction in waterborne and water and sanitation related diseases. The strategy and methodology of the CHETNA health awareness campaign is as follows:

- at grass root (village) level: conducting health education camps for women and school children and training selected women to become health educators in their own village;
- at infrastructure (institutional) level: strengthening GO channels (e.g. Health Department, Primary Health Centres, Paramedical staff, Block Extension Educators, Integrated Child Development Scheme workers, linemen);
- the approach is phased: first villages are organized in clusters, followed by health awareness interventions with large scale women fairs as entry point in the village.

CHETNA initiated activities at grass root level by carrying out Knowledge, Attitudes and Practices (KAP) studies in 18 sample villages to collect baseline data and assess existing attitudes towards water, sanitation and hygiene. Based upon these findings appropriate health education campaigns were planned and designed.

The CHETNA communication package mainly consists of five health education messages:

- importance of safe tap water;
- hygienic water collection and transport;
- water management and hygienic storage;
- personal and household hygiene and cleanness;
- improved environmental sanitation practices.

CHETNA has a three year contract with the RNE which will expire in December 1993. Their work has been concentrated in the villages of Santalpur Taluka and has consisted of three types of activities: (i) training of village women, health educators and linemen, (ii) direct contact with village women through "shibirs" (village meetings) and (iii) holding "bal melas" (children's health camps) at schools.

Since CHETNA's contract started in January 1991, 165 health educators from 56 villages have been trained. Two women from each village are selected and brought together for a two day training programme organized for a cluster of villages. Training consists of water related health information as well as of the development of training skills (e.g. through songs). After the women return to their villages, they should attend a monthly follow-up meeting conducted by the CHETNA trainers.

A shibir is to be conducted in all 95 villages in the project area. The objective of the shibir is to inform and educate the women about water and water related practices. CHETNA trainers conduct the meetings and for many of the women it is the first and only contact with the CHETNA staff. The normal duration of a shibir is two days. The informal style in which the meetings are conducted encourages participation and women were observed being very much at ease. Women who attend range from teenagers to young mothers and grandmothers. Till present these meetings have been held in 43 villages with an attendance of about 60 women per village.

CHETNA has, since the start of the project, conducted 10 bal melas. Bal melas are held in schools during school hours. They aim at children between 10 and 15 years of age. Camps are spread over two days and replace the normal classes.

4.2.2 Observations

We would like to make the following observations based upon our own findings as well as based upon a recent review as conducted by the RSM in January 1993 [116]:

a. A major overall assessment of the activities being conducted by CHETNA is that while awareness levels may have been raised, impact on actual practices has been limited.

b. The CHETNA programme implementation is behind schedule. One issue to be considered is that of CHETNA's capacity. At present two trainers based in Radhanpur and a coordinator are responsible for the implementation of the programme.

c. Materials to support the health educators are an urgent need. This material has only recently been developed and is actually being field tested.

d. Some important aspects of health education are currently not being addressed (e.g. cleaning of the ground level cisterns by linemen). Training of linemen does not get the attention required.

e. The women health educators trained by CHETNA are hardly being used for further local training and follow-up. They do not have a visible role during the visits of CHETNA trainers.

f. A specific plan for follow-up has not been developed for every village in which a shibir and a bal mela have been conducted.

g. At present men and poorer families are mainly outside the reach of the educational activities. It may be worth considering the additional impact of holding shibirs for men in the evenings with the linemen as trainers. Women from poor families, probably away at work during the afternoon hours, could be reached through education being combined with income generating activities.

4.3 Community participation

4.3.1 Start of community participation

Taking into consideration the 1986 GU-15 statements on community participation as described before, the following general observations can now be made:

a. Community participation was correctly considered to be a long term process leading to self-reliance, to be implemented in a flexible way depending on the local circumstances.

b. The concept of community participation, its strategy and approach are not made operational yet.

c. The GWSSB, a technical organization, was meant to be the leading party in realizing community participation.

d. Pani Panchayats (village water committees) were meant to be the vehicle to ensure an effective community participation in drinking water and sanitation schemes. However, responsibilities and tasks of Pani Panchayats are not elaborated yet.

TOR were made by RSM.

e. To guide the establishment and functioning of Pani Panchayats RSM and GWSSB agreed to closely monitor this process and to draw lessons to improve the system, if deemed necessary. Already in 1987 RSM recommends to carry out an action oriented study to get more insight into this process GU-16].

f. Branch Line Committees are proposed to be established at branch pipeline level [GU-15].

4.3.2 The establishment of Pani Panchayats

The establishment of 267 Pani Panchayats at village level and approximately 20 Pani Panchayats at neighbourhood level in the 4 rural growth centres, as well as approximately 40 branch line committees were among the targeted outputs of the 1st and 2nd batch schemes [GU-22]. Per 1 January 1993 a total of 147 Pani Panchayats were established in the following schemes:

- Santalpur total: 108 Pani Panchayats out of 112 villages connected;
- Sami-Harij: 33 Pani Panchayats out of 72 villages connected;
- Lathi-Liliya: 6 Pani Panchayats out of 35 villages connected.

Pani Panchayats are composed of six persons: the Sarpanch or Deputy Sarpanch as the chairperson, two female members, two male members and the lineman (local caretaker financed by GWSSB). The members are nominated by the GWSSB in consultation with the Sarpanch. The village Panchayat has to pass a resolution in order to form a Pani Panchayat and convey it to the higher level Taluka and District Panchayats. Equitable representation is to be given to various socio-economic groups, while only motivated persons are to be selected.

The responsibilities of Pani Panchayats have been (differently) defined at several occasions by the GWSSB and RSM. The Pani Panchayat's responsibilities as described in the action research report "Pani Panchayat, an exercise in community management and participation" by FPI, September 1990, seems the most complete one.

Regarding the responsibilities as described in the various documents, the following general observations can be made:

- The large majority of Pani Panchayats has been established at a post-implementation phase, so that some responsibilities as site selection could not be taken up by the Pani Panchayats;
- A large number of the Pani Panchayat responsibilities as described above are beyond their control and cannot be enforced;

- Other responsibilities have been added at an ad hoc manner.

Some working rules of the Pani Panchayats have been described in the FPI report (frequency of meetings, minutes to be made, venue). Any resolution passed in the Pani Panchayat meeting has to be passed to the Branch Line Committee, which is composed of all Sarpanches of all villages linked to a branch pipeline. The branch level Junior Engineer is the chairperson of the Branch Line Committee.

4.3.3 Training

The need for awareness creation and training of Pani Panchayat members and villagers was recognized by RSM and the GWSSB. Various parties were supposed to play a role:

- The Jalseva Training Institute of the GWSSB mainly through training of GWSSB personnel at various levels;
- FPI and SEWA through an exposure programme for about 250 Pani Panchayat members (mainly women on subjects as water conservation, economic use of water and economic activities);
- CHETNA, through the identification of motivated candidates for Pani Panchayat membership (to replace inactive members);
- GWSSB for an exposure programme of villagers to headworks.

Regarding the training component under community participation and Pani Panchayat the following general observations can be made:

- An overall Pani Panchayat members training plan including various components of training is lacking, while follow-up of training is not provided for;
- No attention has been paid as yet to leadership training and (project) management training to increase the management capabilities of the Pani Panchayat members;
- Most training, awareness creation and exposure trips were aimed at women.

4.3.4 Functioning of the Pani Panchayats

The functioning of the Pani Panchayats has been reviewed by the Foundation for Public Interest (FPI). The FPI report of September 1990 was based upon discussion with members of 30 Pani Panchayats (mainly with chairmen), 5 village profiles and interviews with GWSSB staff.

The main conclusion is that a large number of Pani Panchayats do not function properly. The report identifies a large number of constraints hampering the proper functioning and draws conclusions on various issues. It comes up with concrete

recommendations on a broader, comprehensive water resource development approach with specific recommendations for community participation and the role and responsibilities of Pani Panchayats.

The RSM also describes the functioning of the Pani Panchayats as an area of concern [GU-26 and GU-27]. However, RSM expects positive effects from a more active involvement of the District Level Advisory Committees, the Zilla Panchayats and an active role of Pani Panchayats in cost recovery for operation and maintenance as well as from the organization of exposure trips. RSM does not see the need to take more structural measures to realize effective community participation.

Our own observations together with the review mentioned and observations made by field workers from various organizations leads to the conclusion that the Pani Panchayats as established till present do not (and cannot) function properly. They do not function at all in the majority of the cases.

The non-functioning of the majority of the Pani Panchayats, and herewith the non-functioning of the effective community participation, is due to the following main set of factors:

- The overall concept on community participation and the role of Pani Panchayats within the programme is not made clear and operational. Broad (often valid) statements have not been followed by a translation into action, e.g.: who should do what, which steps to be taken, by whom and when; results expected, phases of intervention, indicators to measure;
- Hardly any concrete lessons have been learned from past experience, although valuable information is available;
- The institutional framework of Pani Panchayat is not clear, nor are the roles of various parties concerned.

4.4 Income generating activities

4.4.1 General

SEWA has launched since July 1992 a long term regional development programme as an "add-on" to the Santalpur Regional Water Supply Scheme. The programme "Banaskantha Women's Rural Development Project" was formulated by SEWA together with the Foundation for Public Interest (FPI) based on a pilot action research programme. The programme is meant to give full employment to the women involved. The programme is financed from Netherlands funds. Action Research through SEWA/FPI has been financed from Dutch funds since 1989 (IN/88/06).

The project mainly aims at the involvement of the local communities, especially the women, through their local organizations in generating and strengthening their economic activities. It also aims at preparing the communities to actively participate in the operation and maintenance of water supply schemes. The time and energy saved by the piped supply of water are to be harnessed for productive activities for their economic empowerment and uplifting of their social status for leadership role in managing the water supply schemes at village level.

The link between the income generating activities and the rural water supply programme takes place along two principal lines according to the project document:

- Strengthening of community level organizations in view of carrying out operation & maintenance tasks;
- Strengthening the financial position of households in order to generate a regular contribution for operation & maintenance.

4.4.2 Specific activities

Based upon experiences and lessons learnt in the past years of field experience, SEWA has identified and consolidated the seven income generating activities. These are described in the following sections.

Women Artisan Support Programme

This has become the major income generating programme. About 3,000 women from 27 different villages are provided work and employment. This support programme is based upon the existing craft know-how in the area, which is home-based, non-farm, zero-water, zero-energy and high potential activity. This activity is further expanded through skill upgrading and skill refinement programmes.

Eco-regenerative activities

About 300 women from 15 different villages are involved in raising plants in nurseries.

Dairying and fodder security system

The 5 women's primary milk cooperatives registered during 1990-91 are being maintained and strengthened with a total active membership of 900. No new cooperatives were registered. The total income is Rs 250 per month per member.

Minor Forest Produce Collection

Minor forest produce collection became an important source of income for about 300 women in 8 villages. However, the programme got a major setback when the State Forest Development Corporation reduced the buying rates of gum from Rs 8

per kg to Rs 4 per kg. This problem has not been solved as yet. The average monthly income earned was Rs 300 prior to the price drop.

Salt farming

A first ever women's salt farming cooperative took up the salt production during the 1991-92 season and 50 women got employment during the salt farming season. The total gross production value was Rs 400,000.

SEWA considered supportive services like health care, child care, housing and insurance as the major need of the salt makers. SEWA submitted a proposal for these support services to the Rural Labour Commissioner. As a result GOG made substantial funds available to implement a welfare scheme for the salt workers all over Gujarat.

Water as regenerative input

The programme so far indicated by SEWA mainly aims at anti-desertification and economic regeneration. This calls for expanding tree cover in the area through massive plantations and developing green belts. It also calls for water harvesting and conservation through revival of the traditional water resources like village ponds, tanks, wells and streams. This will also help build up local village water committees who will manage the utilization of water resources economically. Thereby also the participation in the operation and maintenance of drinking water facilities at village level is enhanced.

Rural Women's Saving Programme

After providing work security to women, the need of the women is for savings. SEWA started rural saving groups. So far 25 savings groups with about 750 women members have been formed with a monthly saving of Rs 10 each.

4.4.3 Observations

Regarding SEWA's project the following general observations can be made:

a. The relation between income generating activities and water as expressed in the reports of the RSM (e.g. strengthening the financial position of the women to enable them to pay for the water) is a too simplistic reasoning. The relation between SEWA income generating activities and water supply mainly lays in the empowerment of women and herewith in the strengthening of local groups. This fact alone is crucial and fully justifies the SEWA project within the NA programme.

b. The SEWA programme does not directly "follow" the water, but is based upon need assessment and interest shown by villagers. As such the relation with the water supply is not direct. Most activities are not directly related to the supply of drinking water (zero-water based).

c. The SEWA approach puts emphasis on income generation for women and building up management capabilities of women at village level. Through this integrated approach SEWA has the potential to make water supply, health education and sanitation more interesting for the villagers.

d. Most activities are zero water or minimum water based activities and thereby can lead to development by providing sustained work and employment to the communities. Once a group is registered, each group of 15 to 20 women gets a revolving fund of Rs 15,200 from the Government for their economic activities. Also, since the groups are recognized by the Government, they are entitled and have priority to all GOG assistance for development.

4.5 Gender issues

4.5.1 General

Findings and conclusions regarding gender issues are an integral part of the sections on sanitation, health education, community participation, income generation and institutional development. This section summarizes gender according to the four evaluation issues, viz. (i) project cycle, (ii) baseline data availability, (iii) effects / impact and (iv) sustainability.

Within the NA programme attention paid to gender issues differs from hardly any attention within GWSSB to all attention and the focal point within SEWA (NGO) activities.

4.5.2 Design, appraisal and implementation

Water supply

At present there appears to be no village level involvement at all in project preparation. At this stage, the GWSSB takes on the entire responsibility. After the system has been designed, there is some consultation for the siting of the cistern, the standpost and the cattle trough in the village, but this too is only with the Sarpanch. It is the latter who is in a position to give permission to locate the cistern and cattle trough on government land; hence, consultation with him is unavoidable. No

attempt is made to obtain from the village women their views on convenient points for locating the standposts.

Sanitation

The two villages selected for the pilot project were chosen by the GWSSB. Beyond that stage this component appears to be guided entirely by the villagers and the NGO entrusted with implementation. Since these villages were targeted for 100 per cent coverage, it was essential to get the support of the entire community. This was achieved through village meetings in the preparatory stage conducted by the NGO.

The location of the latrine and bathroom unit was decided by the individual household, with some "technical guidance" being provided by the NGO. It was here that women in the family appeared to have had a strong say. Their role extended also to the actual building stage: they joined the men in providing the labour for the construction of the unit. The sense of ownership and pride resulting from this (in one village, Kalyanpura) was quite evident.

Gender equality prevails when it comes to cleaning the facility: men and women are involved in the everyday routine cleaning. The unit, therefore, has not had a negative impact on women as far as maintenance is concerned. But where an additional burden does seem to have been imposed on her is in the time and physical effort required to fetch water for bathing for the entire family. in past ?

Village Water Committees (Pani Panchayats)

The six-member Pani Panchayat has an obvious numerical bias against women: only two women are included, along with two male villagers, the lineman and the Sarpanch. The selection of the women by the sarpanch, endorsed by the GWSSB, seems to be undertaken as a formality without any training inputs or empowerment effort aimed at instilling the "representative" nature of the women's role. The women did not have the consciousness nor the outspokenness to be expected of their position. They were reluctant to speak boldly in the presence of the elders. On the few occasions when they did speak out, they were virtually censured, whereupon they reverted to their passive silence.

The Pani Panchayat must perform its role without any formal authority. Thus, when compliance is to be obtained, it must be done through informal persuasion; there is no scope to impose formal sanctions for non-compliance. (An exception was Koliwada, where a fine of Rs 5 was levied informally by the Pani Panchayat for misuse of water.)

On the whole, therefore, the impact of the Pani Panchayats on the perception and status of women in the community has been limited. Since there are no females on the project staff (except for one lineman in Per), no role models are offered. However, CHETNA and SEWA more than compensate with their predominantly female staff actively portraying what women can do to support the project. A slow change may well be expected in the villages where these two NGOs have been working.

4.5.3 Effects and impact

The Santalpur project in the Banaskantha District spreads over three talukas: Kankrej, Radhanpur and Santalpur. The first two talukas generally have water available and service reliability is high. In Santalpur, where health education and income generation activities are taking place, reliability of service is not assured. Water supply is particularly erratic in the tail-end villages. Despite these shortcomings, the project has produced enormous benefits for the woman. The savings in time and the reduction of work load has been considerable: the strenuous, energy-depleting task of hauling water from the well and carrying it back in head loads over long distances is a burden which the woman no longer has to bear (when the piped water supply is available).

Access to the water is, by and large, of acceptable levels, although consultation with the women on the location of the standposts would have been desirable. In some areas the women have to walk as much as 500 meters to get to the standposts, against the project norm of 150 to 250 meters. In other villages, even though the supply of water is plentiful, it is being used only for cooking and drinking purposes on a daily basis by a number of women in the village. This is because the standpost is located at one end of the village and the women at the other end of the village are sometimes discouraged from regular usage by the distance. Consequently, in such cases there is little improvement made by the water supply in personal hygiene.

Access is also dependent on the timings of supply. In some cases, the erratic nature of supply probably prevented women from gaining the full benefits, particularly if they were among the poorer sections and had to be away at work when the water was suddenly turned on.

The income generation activities being conducted by one of the NGOs have produced results well beyond tangible monetary benefits. A quiet revolution has been initiated that is bringing about a change that is intangible but important. This is the emergence of a sense of self among the women stemming from the realisation that they are capable of solving some of their own problems. The fact that they are

doing this in a group setting, under the leadership of a local woman, further strengthens the feeling of empowerment.

The implication of the process of heightened self confidence is that women will be able to play a more active role in the management of the water, including the Pani Panchayat. Since a number of villages in the area covered by the income generation activities are not receiving water as yet, the link with water management has, understandably, not been stressed by the NGO. But the empowerment gained by the women of these villages from the income generating activities will have adequately prepared them to manage the community water supply when the water does come.

A few observations may be made about the impact of income generation activities on the relationship between husbands and wives.

a. Because of her status as bread-earner, the wife is now able to achieve a relationship with her husband that may be described as syncratic. No longer is decision making dominated by the husband, but some sharing approximating equality may be expected. What adds to this is the fact that she is earning her income through a group effort. Along with her economic strength thus comes an apparent social identity: a transformation from a casual, unorganised status to an organised one.

assumptions, or based on actual info.?

b. Because the woman is frequently away from the home on her work, there is a tendency that family members start helping with the collection of the water from the standpost. The gender-based division of labour can, therefore, gradually be broken down. In addition to the physical relief this could provide to the woman, the long term psychological readjustment of relationships.

c. The likelihood of men reacting negatively -- grudgingly -- to the women's new earning status is low. This is because the women are, after all is said and done, making an important contribution to the family income. In addition, the men see the water system as a life-line to better living in the village and for the health of their own children. The combined effect of these two, tangible income enhancement and water related benefits must wash away any possible resentment they may have toward contributing financially to the water and sanitation component.

4.5.4 Data availability

Baseline studies as conducted by ORG contain a number of gender differentiated data regarding water related issues. The general weakness of these baseline studies

restricts the usefulness of these data. FPI and SEWA provide gender specific data as they only deal with women.

4.5.5 Sustainability

The smooth functioning of the Pani Panchayats is critical to the sustainability of this project. As noted earlier, these groups have no formal authority and must, therefore, achieve community acceptance based on the quality of "service" they provide. The present situation is that most of the Pani Panchayats are not functioning and lack clear role definition and operating guidelines. Thus, as an important step toward ensuring sustainability, the role, responsibility and authority of the Pani Panchayats should be laid down and made known to the members and the community.

A second aspect relevant to sustainability is the nature of activities in which the Pani Panchayat engages. Experience in other sectors has shown that if community groups take on a single-issue focus, they are unlikely to last very long. It would be worthwhile for the Pani Panchayat to expand its area of activity and get involved with, for instance, the upkeep and upgrading of traditional water sources, village cleanup drives etc.

The membership of the Pani Panchayat will also have a bearing on sustainability. The present token membership of women in the six-person committee needs to be increased so that women are at least 50 percent of the total. Along with this, adequate briefing and induction training should be given to them to encourage them to adopt a stance of women's representatives: articulate, uninhibited and sensitive.

4.6 Implementation and finances

The implementation of the socio-economic activities is the responsibility of various parties.

The main responsibility for the establishment of the Pani Panchayats remains with the GWSSB. A total of 147 Pani Panchayats has been established between November 1986 and January 1993. There is no separate budget for the establishment of Pani Panchayats. It is incorporated in the GWSSB budget for the NA programme.

Socio-economic action research by SEWA and FPI has been financed from four votes under IN/88/06 for a total amount of Dfl 630,300 for the period October 1989 till December 1991. The action research has been completed in time.

Health education by CHETNA has been financed under a separate vote under IN/88/115 for a total amount of Dfl 319,000 (from 1 November 1990 till 31 October 1993). The contract was signed between RNE and CHETNA. Under this contract CHETNA plans to develop and execute health awareness campaigns to cover the 95 villages of the Santalpur scheme. The implementation of this project is behind schedule.

The Banaskantha Women's Rural Development Project by SEWA has been financed under a separate vote from the Netherlands budget category IIa2, sector fund Asia, for a total amount of Dfl 3,682,550 (for a period of five years starting 1 June 1992). Under this contract SEWA will implement supporting activities in the field of income generating activities, action oriented research and training in proper use of drinking water especially regarding women's participation in water committees (for details see sections 4.4 and 5.5).

4.7 Environment

1) Drainage around standposts and cattle troughs is often insufficient, particularly in the Santalpur and Sami-Harij schemes. Although the standposts and cattle troughs themselves are usually constructed according to the standard, the areas directly surrounding the platforms become muddy. One reason being in many cases the low area in which these facilities are located.

2) Asbestos-cement pipes are used in the schemes. Although this is allowed in the Indian situation, use of this material is discouraged in several countries. Health hazards are recognized in cutting and machining the pipes while laying them and when discarded at the end of their lifetime. No serious objections are known against transporting water through such pipes.

3) The provision of drinking water for cattle generally has effects on the existing migration patterns of the herds. Better drinking water supply is said by some to strongly affect this pattern in Santalpur area. Better water supply could partly delay or stop migration of the herds to areas with better water and fodder supply. This could possible lead to more overgrazing in already endangered areas. However, this effect should not be exaggerated as the availability of fodder remains the determining factor (natural grasses which depend on rainfall, as well as irrigated fodder).

4) Abstraction of ground water for drinking water further aggravates the already severe problems of ever pumping of the aquifers. However, this effect is insignificant in comparison to the abstractions for irrigation and cannot be easily mitigated since

drinking water is a basic need for the population. Of course conservation of water remains important. Also in this respect the village sources should remain in use where appropriate. This might include the defluoridation or desalination of such sources. These possibilities are not seriously pursued in the present approach.

5) Eco-regeneration undertaken in the social forestry activities under the SEWA programme for income generation has a positive effect on the environment in the semi-arid areas. However, the use of scarce and expensive drinking water for this purpose remains an area of concern.

5 ORGANIZATIONAL AND INSTITUTIONAL FRAMEWORK

5.1 General

Organisation and institutional strengthening at grass root level is an integral part of the institutional framework and sustainability. Grass root level institutional strengthening has been dealt with in section 4.3 on community participation.

5.2 Institutional objectives and strategies

The Netherlands Assisted Programme in Gujarat does explicitly include the following institutional objectives and strategies (immediate objectives see GU-22, March 1990):

- To establish local level social organizations;
- To adjust the institutional framework to the integrated approach.

These immediate objectives have been translated in the following specific activities:

- The establishment and functioning of 267 Pani Panchayats at village level (see also section 4.3);
- Adjustment of institutional arrangements with the establishment of a socio-economic unit at the executive level of GWSSB and the initiation of the NGO panel.

Within the context of the above objectives and activities, specific attention was paid in the NA programme to the following institutional issues:

- Decentralization towards the District level with the installation of District Level Advisory Committees;
- Training of GWSSB staff;
- Training of villagers and members of Pani Panchayats.

5.3 Indian parties involved in RWS/S

5.3.1 Formal role of parties

a. The Central Government of India is involved in the NA programme through the Department of Rural Development in the Ministry of Agriculture. The National Technology Mission on Drinking Water (Water Mission) is the specific unit within the Department of Rural Development which interfaces with the NA programme.

b. The Gujarat State Government is directly involved in the programme through the Secretary of Water in the Department of Health and Family Welfare. This Department is the formal partner for the NA programme.

c. The Gujarat Water Supply and Sewerage Board (GWSSB), an autonomous body under the Department of Health and Family Welfare, is the key agency for the preparation, execution, operation and maintenance of the rural water supply and sanitation under the NA programme. All GWSSB levels are involved in the programme. The Jalseva Training Institute offers short term training courses in the broad field of water supply and sanitation. This institute is part of GWSSB. The establishment of a Socio Economic Unit (SEU) within GWSSB has been formally approved by the GWSSB in December 1992. This unit is not operational yet.

d. SEWA and CHETNA, two major NGOs, play an increasingly important role in the execution of the socio-economic component of the programme. ESI, another NGO, plays a role in the rural sanitation programme of the GWSSB. Other NGOs, like CEE, will be included in the future programme.

e. The District administrative level is directly involved through the District Level Advisory Committees, in which also Panchayat Raj participates.

f. The Village Government (Gram Panchayat) is directly involved in the programme through their chairpersonship of the Pani Panchayats.

g. The Operations Research Group (ORG) plays a role in conducting baseline surveys and reviews of project components.

h. Various departments (e.g. Health and Family Welfare, Labour and Rural Development) play a role in the implementation of the programme through their relations with NGOs involved.

All together a large number of Governmental and Non-Governmental parties are actually involved in the NA programme.

5.3.2 Decision making structures and procedures

Proposals for technical water supply projects are prepared by the GWSSB. The socio-economic component of the 3rd batch of projects was also prepared under the responsibility of the GWSSB with assistance of the RSM. Proposals are submitted

by the State Government of Gujarat to the Central Government of India, which submits the proposals to the Netherlands Government.

Major project components regarding health education and income generation that are implemented through two NGOs have been prepared by the NGOs concerned and have been sent directly to the Netherlands Government (through RNE) for approval. Agreements have been signed between RNE and NGOs concerned. GWSSB plays no formal role in these NGO agreements.

The District administrative level plays no decision making role in the programme as yet. The formal role of the Village Government is not clear as the position of Pani Panchayats as legal or informal bodies has not been decided upon as yet.

The sanitation programme in two pilot villages is subcontracted to ESI (an NGO) by GWSSB.

5.3.3 Priorities and absorption capacity of major parties

a. The technical absorption capacity of the GWSSB is large. However, the implementation capacity (preparation and supervision) is limited due to a number of bureaucratic factors (e.g. existing procedures for tendering and contract awarding). The socio-economic know-how and consequently the absorption capacity of the GWSSB in this field is very limited.

b. The training capacity and capabilities of the Jalseva institute are considerable.

c. The absorption capacity as well as the capabilities of NGOs involved are considerable. In general, the NGO potential in Gujarat State is large.

d. The absorption capacity and specially the willingness of various departments at District level to be involved in the programme, mainly through relations with NGOs, is considerable.

5.4 GWSSB

5.4.1 General set-up

GWSSB was established in August 1979, subsequent to the passing of a Bill (No.50 of 1978) by the Gujarat State Legislative Assembly. The duties and functions of GWSSB are described fully in the Gujarat Water Supply and Sewerage Board Act of

1978. Essentially it was established to take over the functions of the Public Health Engineering Service (PHES) but as an autonomous body. On 1 April 1981, the entire responsibilities of PHES were formally vested in GWSSB.

The functions of GWSSB are broadly concerned with investigating, preparing, and implementing water supply and sewerage schemes, subject to reimbursement for all costs by the local authorities concerned. The Act originally did not permit the GWSSB to carry out operation and maintenance of schemes because they are normally handed over to the local authorities after implementation. However, the Act does empower GWSSB to operate a system for a specific period in case of mismanagement or when requested to do so by GOG. Nowadays the GWSSB is responsible for the operation & maintenance of all regional schemes. The Municipal Corporations do not come under the jurisdiction of GWSSB, but may make use of the services of GWSSB at their own discretion.

GWSSB is at present organized in six separate sections (see also organization chart in Appendix 6). To permit operational efficiency the organization has been decentralized into several regionally based circles. GWSSB's total sanctioned labour force is about 5,900, of which about 2,800 technical staff. A total of 1,400 posts are vacant. An institutional and financial management study on GWSSB has been proposed by the World Bank prior to any further involvement of the Bank in GOG drinking water supply. The terms of reference for this study are very comprehensive and are important for the NA programme as well [72].

The Jalseva Training Institute is working under the control of GWSSB. The institute, consisting of main training building, hostel, workshops and staff quarters, was established under the financial support of the World Bank (Rs 30 millions). The complex was commissioned in 1988. The GOG bears 100% of the recurrent costs. The training institute offers short term training courses in the field of water supply and sanitation. The courses are offered through in-house training programmes and also through field training programmes at District and Taluka level. Participants are provided a combination of theoretical and practical inputs.

The institute takes care of the training needs of in-service professionals in GWSSB, representatives of municipalities and Panchayats. Training is given from grassroot level to the level of executives in the water sector. The training programme includes courses on project formulation, implementation, operation and maintenance, mass awareness, community participation, administration and finance. During the period 1988-1993 more than 300 courses were run with a total of about 13,000 persons trained. The tasks of the institute in the Indo-Dutch project have been described as follows:

- to develop a general course on the integrated approach including socio-economic and health aspects;
- to train technical GWSSB staff;
- to develop and provide special course for linesmen and 2nd generation staff.

The faculty is headed by a Director in the rank of chief engineer. Two joint directors function in the rank of superintending engineer. Seven senior training officers(rank of executive engineer), ten training officers and five assistant training officers are involved in Jalseva.

5.4.2 Set-up for NA projects

The GWSSB combined the coordination of the World Bank projects and the programmes with bilateral assistance within the World Bank Cell of the GWSSB [GU-18]. The cell is supposed to serve as a focal point for design and implementation of programmes and projects. At the same time new insights and approaches developed in the various schemes can be disseminated at a wider scale. Till present there is no evidence of such a dissemination or diffusion process.

The RSM requested GWSSB to establish a socio-economic unit (SEU) within the GWSSB in February 1988 [GU-18]. At Central level the establishment of the SEU has been formally approved by the Department of Rural Development, New Delhi in 1992 [GU-26]. The GWSSB finally formally approved the establishment of the SEU in December 1992. The Netherlands Government will finance this unit during a period of three years after which GOG will guarantee the continuation of the SEU from its own funds. According to RSM and GWSSB the SEU is considered to be an important step towards an organizational structure which is in line with the integrated nature of water and sanitation programmes.

The objectives for the SEU for the first three years have been formulated as follows:

- To facilitate integration and institutionalisation of relevant socio-economic activities and methods in GWSSB's current program for water supply and sanitation;
- To coordinate and contribute to the development of integrated sustainable and replicable strategies which will improve hygiene and health practices related to the safe use of water;
- To strengthen or establish mechanisms which enable people and their local institutions to plan and participate in activities related to water supply, sanitation and hygiene education.

Regarding the establishment and functions of the SEU we would like to made the following observations:

a. A SEU within a purely technical organization like GWSSB can be useful to stimulate discussion about socio-economic issues in the organization. Moreover, such a unit can possibly have a limited liaison function with other organizations.

b. A SEU in GWSSB can never play the role of an overall creative and coordinating unit for an integrated drinking water and sanitation programme. In view of the strength and importance of other parties involved, such a coordinating unit should be placed at a higher level. The GWSSB should concentrate on its "core business" to provide reliable drinking water up to the village boundaries.

5.4.3 Decision making powers

The responsibility for investments and for operation and maintenance in Gujarat are in different hands. The GWSSB is responsible for the operation and maintenance of regional schemes. Tariffs are set by the Government and are not realistic as yet. This is one of the reasons that all regional schemes run at a loss even though depreciation is not taken into account. The State Government reimburses all costs to the GWSSB (or: pays all deficits).

5.5 Other parties involved

5.5.1 CHETNA

In November 1990 CHETNA (Centre for Health Education Training & Nutrition awareness) entered into a three year agreement with the Royal Netherlands Embassy to develop and execute health awareness campaigns to cover 95 villages of the Santalpur scheme with special emphasis on community health aspects.

The objectives are the following:

- to make the community aware of the importance of safe drinking water and to impart knowledge regarding hygienic conditions and practices so as to reduce and eventually to eliminate the major transmission risks of water borne and water related diseases;
- to create awareness regarding general health aspects and nutrition;
- to create awareness regarding existing available services and facilities in the field of health;

- to develop a comprehensive communication strategy for health awareness campaigns which could be replicated in other project areas.

In the implementation of the programme, CHETNA staff will liaise with relevant GWSSB officers. CHETNA will participate in the bi-annual NGO panel meeting with GWSSB. The review of the development of the programme is the responsibility of the RSM.

5.5.2 CEE

CEE (Centre for Environmental Education) plays a pivotal role in the nationwide effort to increase environmental awareness. The Centre is supported by the Ministry of Environment and Forests, Government of India, and affiliated to the Nehru Foundation for Development. This foundation has been promoting educational efforts in the areas of science, nature study, health, development and environment. It was identified as the foundation for building a national institute for environmental education. The Centre (CEE) was established in 1984 under the Ministry's scheme promoting Centres of Excellence.

The main objective of CEE is to create or increase awareness and knowledge among children, youth and the general community about all aspects of the environment. To achieve this, CEE develops innovative programmes and educational materials, and field tests them for their validity and effectiveness. The aim is to provide models that could be replicated elsewhere with modifications to suit local conditions. Specific programmes are developed for selected target groups.

In 1992 CEE submitted a proposal to the Netherlands Government to develop educational and training programmes to create an awareness among the consumers of the Lathi-Liliya Regional Water Supply Scheme about the varied aspects of water. These programmes are to be used by NGOs, local self-government institutions and governmental staff. For this purpose CEE will demonstrate and field-test the programmes and develop methodologies for involving the people of the area and government functionaries in understanding and tackling water-related issues. The proposal covers the period 1993-1996 and is still in the Netherlands for approval (proposal on water-related health and sanitation issues, awareness and training programmes, CEE November 1992). The total amount involved for the 3 year period is Dfl 330,000 for about 70,000 people, hence about 14,000 families in 37 project villages.

5.5.3 SEWA

In May 1992 SEWA (Self Employed Women's Association) and the Royal Netherlands Embassy in Delhi entered into a five year agreement to continue to implement supporting activities in the field of income generating projects, action oriented research and training in the proper use of drinking water especially regarding women's participation in water committees.

The objectives of the five year agreement are the following:

- To equip women for increased participation in the management and development of water resources through "Pani Panchayats" and other forums of village women;
- To decrease the burden of women in fetching water, fodder and fuel. To organise them for utilising their saved time and energy for gainful economic activities;
- To prevent ecological degradation of the region through promotion of activities leading to ecological and economic sustainability;
- To strengthen the skill, knowledge, assets and organizational base of poor rural women.

SEWA will coordinate whenever needed with GWSSB, with other parties involved and will participate in the bi-annual NGO panel meeting. A periodic review of the development of the programme will take place twice a year involving representatives of SEWA and RNE.

SEWA attempts to bring the cooperative movement to self employed women so as to change its structure and form to make it useful for these workers. SEWA's role has been to initially help the worker-producers in forming a co-operative and to continue to support it through technical help, management know-how, access to capital and training. In view of the difficult situation in rural areas in some districts, SEWA has encouraged the members to form village level Producers Groups rather than register a formal co-operative. In Ahmedabad and Banaskantha Districts "DWCRA Groups" (DWCRA: Development of Women and Children in Rural Areas) have been registered that function as informal co-operatives and are linked to the Department of Rural Development.

SEWA works with urban poor as well as with rural women. There have been 52 co-operatives (mainly in Gujarat) sponsored so far by SEWA in the following five categories: artisan, land based, livestock, trading and service co-operatives. SEWA provides banking, community health, child care, technical, communication and

community organizing (capacity development of members) services. The total membership in 1991 was 46,000 women.

In 1988 SEWA started its work in the Radhanpur and Santalpur Talukas of the Santalpur project in the framework of the action research as conducted by the Foundation for Public Interest (FPI). The entry was through the NA drinking water programme. SEWA first focused on the organisation of women for employment opportunities. Wherever possible SEWA tries to function through existing GOG channels and mobilizes GOG support.

5.5.4 ESI

ESI (Environmental Sanitation Institute) was established in 1963 primarily to impart orientation and training in low cost sanitation. This programme caters to the needs of rural masses and slum dwellers, aiming to train masons, sanitary inspectors, overseers, engineers, student community, social workers and policy makers with support of national and international funding agencies. During the period 1963-1992 more than 70,000 persons have been trained. The main activities include the design and development of low cost sanitation units, awareness raising as well as practical demonstration in constructing simple sanitation devices.

Under the World Bank financed rural sanitation programme (IDA-1643-IN) 20,000 latrines were planned to be constructed. This target was raised to 50,000 in 1990. The programme was implemented by GWSSB with the support of ESI. In 1988 GWSSB issued a resolution to hand over the work of the rural sanitation programme to ESI as a nodal agency. The programme is implemented with the help of local NGOs. The concept of involving NGOs in construction work is based upon the fact that NGOs are in direct contact with the rural people. They can easily understand their needs and motivate them to construct latrines. ESI adopted the model of assigning individuals or local NGOs the responsibility for implementation of the programme. ESI confines itself to training, monitoring and supervision.

By 1992 a total number of 48,000 units have been completed in 1,510 villages in 18 districts of Gujarat State. About 100 NGOs were involved in the implementation of this programme. The programme is monitored by the World Bank Cell of GWSSB.

The pilot sanitation project of the NA Programme was taken up in two villages (Kalyanpura and Tembi). ESI had the overall responsibility for the execution. Following their normal method of operation, ESI handed over the implementation to the Sahyog Foundation, a NGO based in Banaskantha District. The role of ESI, thus, was restricted to monitoring and supervision. Responsibility for health education

was given to CHETNA. The collaboration between various parties in this pilot programme was weak.

5.5.5 ORG

ORG located in Baroda plays an important role in conducting baseline studies and reviews of various programme components (see also section 5.5). They have shown to have the potential to come up with good results.

5.5.6 Department of Health and Family Welfare

The Health Authorities mainly play a role at District level in direct relation to NGO activities undertaken in the framework of the NA programme. In the successful health awareness creation on the fluoride problem in Lathi-Liliya the Health Authorities played a very important role.

At State level the magnitude of the tasks of the health workers at grass root level is often emphasized. At District level the capability and willingness to collaborate does exists.

5.5.7 RSM

The RSM (Review and Support Mission) is responsible to the Water Coordinator of the RNE in New Delhi. Reporting on all activities in the NA programme is done to the Water Coordinator as well as to the State authorities in Gujarat.

The RSM is also responsible for the periodic review of the development of the CHETNA programme according to the contract as signed between RNE and CHETNA. RSM conducted an in-depth review of the CHETNA programme during the month of January 1993. The report produced provides valuable information on strong and weak points of CHETNA's involvement. RSM worked in close collaboration with CHETNA during this mission.

RSM plays no direct role in the periodic review of the SEWA project according to the contract as signed between SEWA and RNE. Only SEWA and RNE representatives are explicitly mentioned in this respect.

Looking back at 14 years of involvement of the RSM, it can be concluded that they generally succeeded in giving equal attention to the various components and aspects of the projects. The RSM played a crucial role in bringing in socio-economic activities. As such they have been an important change agent.

More specifically, the RSM plays a positive, supportive role towards the programme in the following fields:

- Ground water problems get the highest priority from RSM, which has a substantial know-how on this issue. Attention has rightly shifted from only well hydrology to also regional ground water problems;
- The involvement of SEWA in the programme has been highly stimulated by RSM. This can be considered as a major asset;
- The decentralization towards the District level (District Advisory Committees) has been stimulated by RSM;
- The GOG-NGO collaboration has been stimulated through the establishment of the NGO-panel meetings.

The RSM role has been weak in the following fields:

- The preparation of the 3rd batch of projects was weak in the technical as well as in the socio-economic field. Moreover, the priority ranking of the various proposed schemes has not been critically commented upon by RSM;
- The socio-economic component of the 3rd batch projects has not been made operational although interesting baseline and evaluation studies were available;
- The RSM's insistence to concentrate all socio-economic coordinative and supervisory powers under a SEU in a technical organization as GWSSB did not fully recognize the role of various parties involved.

5.5.8 RNE

The Water Coordinator of the RNE (Royal Netherlands Embassy) plays an important role in the monitoring of the NA programme in Gujarat. The Water Coordinator directly relates to the Central and State Government as well as to major NGOs on all main issues.

5.5.9 DGIS and IRC

The IRC (International Reference Centre) is the advisory body of DGIS (Directorate-General for International Cooperation of the Netherlands Ministry of Foreign Affairs) on rural water supply and sanitation in India. IRC plays a valuable role in disseminating know-how and experiences gained in the NA programmes in the various States. Regarding the advice of IRC as far as directly related to the NA programme in Gujarat the following remarks can be made:

- Comments made on the appraisal reports of the 3rd batch of projects are very valid;
- Socio-economic studies for the NA programme in Gujarat have not been seriously reviewed and commented upon;

- The institutional setting of the NA programme in the specific situation of GOG has not led to suggestions from IRC (or discussions) regarding a balanced future institutional set-up of the programme. yes.

The role of IRC as advisory body of DGIS is complicated by the fact that this advisory body has hardly direct contact with the field and with the RSM. Does this need a change? Isn't it inherent? That has not been an task. RSM has contact with field. see also p.76.

5.6 Coordinative mechanisms in the State

Appropriate linkages between various participants in the project can be a significant determinant of overall project impact. Especially, in programmes aiming at integration of various components (technical and socio-economic). In seeking to change water-related behaviour, interventions being made at various levels by various parties require a recognition of common purpose and a coordinated approach. It would be expected that with appropriate linkages there would be better information sharing, greater efficiency, higher levels of community participation and long-lasting project impact.

In recognition of the desirability of such linkages between the participating organizations, a number of mechanisms have been devised at the stage of project formulation. At the village level, the Pani Panchayat was expected to link the community with the water providers, the GWSSB (for more details see also section 4). At the next level, the branch line committee was planned to enable the same relations to be forged on an area basis. Finally, recently, the SEU was devised to provide the interface between the GWSSB and the NGOs so that more attention could be given to the software components.

integrated approach.

In practice none of these linkages have been established satisfactorily as yet. In part this has been due to lack of information about the roles of the various participants. The Pani Panchayat, for instance, once formed, seemed to be nobody's responsibility, is not known widely and is not accountable to the community. A second reason for linkages not being established the way they had been envisaged, may be the preoccupation with technical operations in the GWSSB. Understandably, the engineering orientation of the GWSSB may have resulted in avoiding issues which appeared not to have any direct bearing on the supply of water to the villages.

The NGOs appear to have their own inter-organizational problems: despite the benefits that would have accrued from operational coordination, neither CHETNA nor ESI seem to have found an operational answer as yet. SEWA and CHETNA, often working in the same village on the same day, did not touch base with each

other. Perhaps the very strength of an NGO, a feeling of identity and ownership of a cause, does not facilitate its establishing a collaborative relationship with other NGOs.

The one area where linkages have flourished is between NGOs and government departments. Particularly SEWA has been very successful in finding ways to involve the government in this project. They have facilitated several links between women's groups and departments / agencies such as DWCRA / Department of Rural Development, the Forest Department and the Labour Commissioner. CHETNA is currently trying to involve the Health Department, including the ICDS structure, in their educational activities. The explanation for the relative success in NGO-government linkages could be the fact that the resources available with the latter are readily made available to an organization that takes the initiative to seek them. In a sense the NGOs are able to act as extension agent for making available government funds and schemes to communities for whom they are intended.

A network of functional relationships based upon equal partnership between parties has not been established as yet. The bi-annual NGO panel meeting is a good starting point, but this meeting cannot play this role (as yet).

District Level Advisory Committees for NA projects have been established in Banaskantha District (Santalpur scheme), Mahesana District (Sami-Harij scheme) and Amreli District (Lathi-Liliya scheme) as coordinative mechanisms at District level. The establishment of these committees has been formalized through Government Order.

These District Level Advisory Committees mainly concentrate on the following issues:

- To stop excessive withdrawal of water for irrigation from deep tubewells in the areas around the project well fields and to keep reserve water in the reservoirs (partly) meant for drinking water purposes;
- To strengthen Pani Panchayats in the villages;
- To take steps for collection of public contribution for O&M as per government rules and regulations in regional water supply schemes;
- To construct and maintain assets through scarcity relief work for conservation of water in watershed area;
- To take necessary action to continue the coordination and contact between GWSSB, voluntary organizations, District Panchayats and health centres;
- To comment on the review of the progress of work;
- To prevent damages by anti-social elements and illegal connections.

Recently a State Level Steering Committee has been approved for the NA programme. The membership of this committee remains limited to Governmental (GOG) organizations.

5.7 Human Resource Development

A number of training activities are undertaken by various parties involved in the programme. Training ranges from health education training for village women to GWSSB staff scholarships at IHE in Delft, the Netherlands.

Within GWSSB the Jalseva Training Institute plays an important role in training, mainly of GWSSB staff of various levels.

5.8 Monitoring and evaluation

A number of socio-economic studies has been conducted in the framework of the NA programme. These activities (called research activities in RSM reports) are being carried out in support of design, implementation, monitoring and review of NA programme activities. All (research) activities are meant to be policy and action oriented and are expected to provide important inputs both for GWSSB and RSM.

a. A number of baseline surveys has been systematically conducted by the Operations Research Group (ORG). The basic objective is to arrive at a socio-economic and demographic profile of the project areas. At the same time the survey is meant to provide insight in general attitudes and practices related to water supply and sanitation. A large number of data has been gathered. However, the analysis of the data gathered and their presentation in the reports is sub-standard and often confusing. The draft ORG reports have apparently not been seriously discussed and reviewed by the GWSSB and RSM. Herewith an opportunity to get better insight into reality and to draw lessons for the programme is partly lost.

b. The action research of FPI was the basis for SEWA's involvement in the Santalpur area. The FPI report contains a number of interesting observations and ideas regarding community participation and Pani Panchayats. A seminar was held on the above issues. However, no follow-up action was taken as yet.

c. Reviews of (aspects of) the health education and sanitation component have been conducted (e.g. CHETNA and ESI reviews of the pilot sanitation pro-

gramme in two villages and the RSM review of the CHETNA programme in 1993).

d. A final evaluation of the Santalpur Scheme was submitted to the Netherlands Embassy in March 1990 by ORG. This study provides interesting data on water related technical and socio-economic issues. The conclusions and recommendations of these reviews have partly been translated into action for future activities.

The NA projects do not have a monitoring system regarding the reliability of the water supply at village level (per village hours and days of supply), nor do they systematically monitor the functioning of the Pani Panchayats.

The GWSSB is in the process of introducing a computerized management information system. This comprehensive system has the following components: accounting, village data analysis, monitoring and evaluation, engineering designs, rigs monitoring, inventory control and management at project level. The system is not operational as yet.

5.9 Observations on institutional sustainability

a. Decentralization of tasks regarding the preparation, implementation and monitoring of the NA programme towards District level has started, although still at a limited scale. The need for further, accelerated decentralization of decision making tasks towards the District level as well as towards the village level has to be further emphasized and subsequently enforced to facilitate a sustainable development effort.

b. An institutional and financial management study of GWSSB should lead to concrete recommendations on an effective organization and management set-up of GWSSB to cater to the needs of a business-like technical organization.

c. SEWA substantially contributes to institutional sustainability at grass root level by establishing DWCRA groups with the Department of Rural Development. These groups get access to capital and services after registration. To further strengthen and promote the village DWCRA groups SEWA has formed a District Level Association of all the groups, known as "Banaskantha DWCRA Mahila Sewa Association" which was registered under the Societies Registration Act in December 1992.

d. A mechanism (small neutral, professional team) to initiate, to coordinate and to supervise the integrated NA programme is needed. This team (or unit) should function at a level high enough to guarantee equality between parties. The various parties in the NA programme have a substantial potential to realize an (always complicated) integrated drinking water supply and sanitation programme.

6 FINANCES AND ECONOMY

6.1 National level

Since the beginning of the International Drinking Water Supply and Sanitation Decade (1981-1990), total actual Government expenditure (Centre and States) on the water supply and sanitation (WS/S) sector has gradually increased in absolute terms[12], particularly for rural water supply (see Table 11).

TABLE 11 All-India expenditures for WS/S (Rs billion per year, 1980/81 prices)

Period	Central		States		India	
	Urban	Rural*	Urban	Rural	Urban	Rural
6th plan (actual)	n.a.**	1.5	2.1	2.8	2.1	4.3
7th plan (actual)	0.03	2.0	2.7	2.8	2.7	4.8
1990/92 (actual)	0.1	2.5	3.3	3.0	3.4	5.5

* Accelerated Rural Water Supply Programme

** Not available but negligible.

Spending has remained virtually constant as a percentage of total plan expenditures, but is expected to rise in the coming period (see Table 12).

TABLE 12 All-India expenditures for WS/S (% of total plan)

Period	Central		States		India	
	Urban	Rural*	Urban	Rural	Urban	Rural
6th plan (actual)	0.0	0.8	1.1	1.5	1.10	2.30
7th plan (actual)	0.0	0.9	1.2	1.2	1.20	2.10
1990/92 (actual)	0.0	0.9	1.3	1.1	1.30	2.00
8th plan (budget)	0.0	1.3	1.3	1.2	1.30	2.50

* Accelerated Rural Water Supply Programme

Total anticipated nation-wide expenditure on WS/S during the Eighth Plan indicates that both the Central Government and the State Governments are planning to protect public spending on drinking water supply. In particular RWS/S continues to receive

12 Amounts are given in constant 1980/81 prices. These were calculated using the price deflators for the gross domestic capital formation.

great attention. This sub-sector will, as before, absorb some 65% of total outlay in the sector as a whole. Total WS/S-expenditures in current prices during the plan periods concerned are presented in Appendix 7.

Tables 11 and 12 indicate that financing investments in WS/S, particularly those in the urban sector, is primarily the responsibility of the State Governments. The latter roughly provide three-fourths of total finance required. Central Government involvement in financing WS/S-investments in the various States is mostly limited to **rural** water supply and sanitation (RWS/S). Such finance is provided through the centrally sponsored Accelerated Rural Water Supply Programme (ARWSP). During the plan periods covered in Table 11, the total ARWSP contribution to all-India RWS/S-expenditure has gradually increased from 35% to 45%. This trend is expected to continue during the Eighth Plan (see Table 12). The increased support by the Central Government of the RWS/S-sector of the States, has enabled the latter to gradually increase their investments in urban water supply (in both absolute and relative terms).

Central Government participation in the financing of urban water supply programmes of the various States is negligible. This trend is expected to continue in the future, although the Eighth Plan projections indicate a slight increase in this respect.

Investments in sanitation, particularly in the rural areas, continues to remain neglected. Capital expenditure in this sub-sector amounts to less than 6% of total Government expenditure in RWS/S and, during recent years, this percentage has even been declining.

6.2 State level

During recent years, GOG-expenditure on WS/S has been as indicated in Table 13 which gives average yearly amounts in constant 1980/81 prices.

TABLE 13 Gujarat expenditures for WS/S (Rs million per year, 1980/81 prices)

Period	Normal plan		Scarcity programme		Gujarat	
	Urban	Rural*	Urban	Rural	Urban	Rural
6th plan (actual)	66.9	152.3	n.a.	n.a.	66.9	152.3
7th plan (actual)	64.2	225.3	71.7	169.0	135.9	394.3
1990/92 (actual)	19.5	260.9	37.1	159.6	56.6	420.5

* Minimum Needs Programme plus Accelerated Rural Water Supply Programme

Expenditures in current prices during the plan periods concerned are presented in Appendix 8. Expenditures as a percentage of total plan budgets are shown in Table 14. It is remarked that the expenditures under the Scarcity programme are expressed as a percentage of normal plan.

TABLE 14 **Gujarat expenditures for WS/S (% of total plan)**

Period	Normal plan		Scarcity programme		Gujarat	
	Urban	Rural*	Urban	Rural	Urban	Rural
6th plan (actual)	1.1	2.4	n.a.	n.a.	1.10	2.40
7th plan (actual)	0.9	3.2	1.0	2.4	1.90	5.60
1990/92 (actual)	0.3	3.8	0.5	2.3	0.80	6.10
8th plan (budget)	0.8	3.8	n.a.	n.a.	0.80	3.80

* Minimum Needs Programme plus Accelerated Rural Water Supply Programme

Drinking water supply in Gujarat State is problematic and the State Government apparently does give high priority to solving these problems. This is strongly reflected in Tables 13 and 14, which indicate that the State has been and is still spending, under the Normal Plan, relatively higher amounts on the WS/S-sector than the national average. Besides, during the Seventh Plan period and the Annual Plans 1990-1992 the State Government had to cope with drought during in three successive years. The Government was forced to spend substantial additional funds under its special Scarcity Programme to meet the urgent drinking water supply situation.

On the whole, the State of Gujarat has, therefore, during the last seven years, been spending more than twice as much on drinking water supply than the national average (see Figure 5).

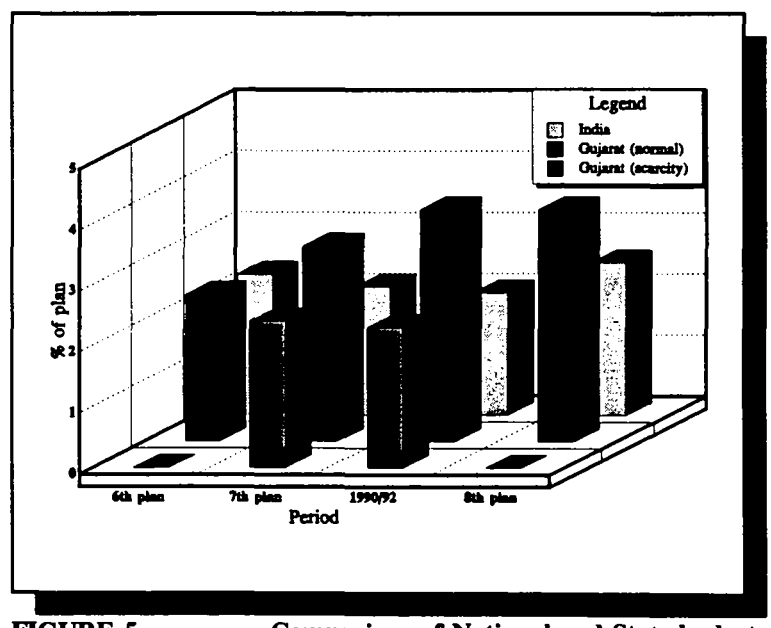

FIGURE 5 **Comparison of National and State budgets**

The decrease in capital expenditure on urban water supply projects, particularly during the last two years, is striking. It is assumed that

this set-back has at least been influenced by the recent tight drinking water supply situation in the rural areas, which has forced the State Government to pay additional attention to this sub-sector.

The contribution to Gujarat under the centrally sponsored ARWSP has, as a percentage of total State RWS/S-expenditure, remained below the national average. In other words, the State of Gujarat is not "compensated" for the fact that, due to the geo-hydrological situation, it has to spend relatively higher amounts on the RWS/S-sector than the national average.

Expenditure on sanitation in the State of Gujarat, expressed as a percentage of total investment in the WS/S-sector, is considerably higher (varying from 11 to 18%) than the national average. The major part of these investments, however, is concentrated in the urban areas.

Total contributions by GON for the NA water supply schemes amounted to Rs 470 million (see Table 6). This is about 11% of total expenditures for rural water supply in the State over the period 1980 -1992.

6.3 GWSSB

The implementation of GOG's policy regarding WS/S has been entrusted to the Gujarat Water Supply and Sewerage Board (GWSSB). This policy has been and still is supply-driven. According to the Eighth Plan 1992-1997:

> *".... the water supply programme taken up by the State Government aims at providing safe and potable drinking water supply facilities mainly in rural areas in the State and providing financial and technical assistance to the urban local bodies for urban water supply projects"* [90].

This policy implies that GOG is prepared to bear the full costs of both construction and operation & maintenance of drinking water supply schemes. And this is exactly what has been happening thus far. A comprehensive and consistent cost recovery policy in Gujarat State is still lacking. Moreover, existing regulations, directed at partial cost recovery only, have not been strictly adhered to. Consequently, all initial investments costs and virtually all recurrent expenditures for WS/S, including replacement investments, are for the account of the State.

The above policy is reflected in the annual accounts of GWSSB (see Appendix 8), in which the latter simply presents an overview of the way in which the funds that have been made available by the State have been spent. The profit & loss accounts

only represent the GWSSB's "internal" activities and do not represent the financial results of the work which is carried out on behalf of and with funds of the State Government. The latter activities are "hidden" in the net "Deposits for Work" on the balance sheets. So reflect expenditures for O&M from state subsidies. Not what is really required - but what is actually done.

Up till now, income from water charges has been negligible. Existing regulations stipulate that consumers in rural areas should pay an amount of Rs 6 per capita per year (shortly, an increase to Rs 14 is likely to be adopted by GOG). However, billing procedures are absolutely inadequate and only a very minor proportion of bills actually outstanding are being paid. According to information provided by GWSSB for regional water supply schemes, at 31 March 1992, out of the total billings amounting to Rs 95 million only Rs 0.9 million (less than 1%) had actually been paid.

Up till now, virtually all costs for operation & maintenance are thus born by the State. According to information provided by GWSSB, total operation & maintenance costs for Rural Water Supply Schemes during the period 1980-/81 - 1991/92 have amounted to Rs 726 million. The exponential development over the past 5 years is shown in Figure 6.

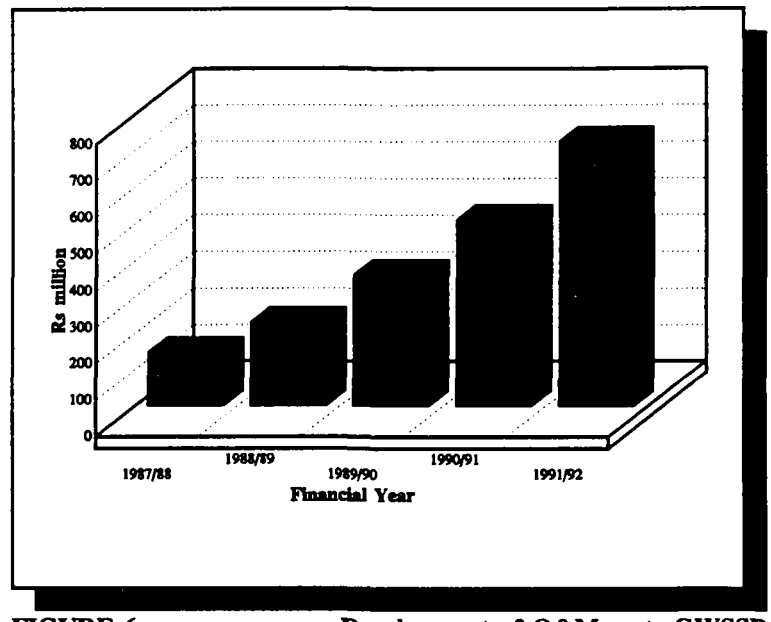

FIGURE 6 **Development of O&M costs GWSSB**

Table 15 shows the O&M cost over the same period in comparison with the total expenditure for RWS/S under the normal plan. In only 5 years time the share of operation & maintenance has increased from 12 to 32% of the total budget for RWS/S. If this trend continues, soon all available funds will be required for operation & maintenance only.

TABLE 15	Operation & maintenance expenditures		
Year	Normal plan RWS/S (million Rs)	O&M expenditures	
		million Rs	% of plan
1987-88	491	58	12
1988-89	420	84	20
1989-90	616	130	21
1990-91	586	149	25
1991-92	670	213	32

So far, GWSSB has not made any allowances for depreciation. Total costs for the exploitation of the water schemes may thus well be higher than follows from the above figures. To get an impression of what the real costs might be, the findings from section 3.2.6 for the NA schemes will be extrapolated for the whole State. GWSSB operates 280 regional schemes with in total 2,400 villages. Assuming the average population per village at 1,500, the total population served through these schemes is 3.6 million. The total cost for operation & maintenance and depreciation for the NA schemes is estimated by us at Rs 75 per capita per year. Applying this amount to 3.6 million people, the total costs for operation & maintenance and depreciation for piped schemes in the State would be Rs 270 million. The amount thus found is in the same order of magnitude as mentioned earlier. However, in addition to the regional schemes, GWSSB is responsible for the maintenance of handpumps. The amount calculated by us should thus be considered a minimum.

It is doubtful whether such large recurrent outlays are justified, particularly in view of the fact that a certain proportion of rural consumers is, in fact, able to pay substantially more than the present nominal rate.

7 APPRAISAL OF PROPOSED 3RD BATCH OF PROJECTS

7.1 Objectives and targets

In 1992 5 new regional water supply projects were brought forward by the GWSSB for possible inclusion in the NA programme. The RSM had assisted the GWSSB in the formulation of 4 of them [GU-26].

Priority ranking was done using the multi-criteria analysis as developed for the NA projects in 1985 [GU-13]. The two highest ranking schemes, Ghogha and Lathi-Liliya-2[13], were selected by GON for appraisal during our visit. The objectives and physical targets of the water supply components are mentioned in Section 2.3.2.

Substantial sanitation and socio-economic components are proposed as add-ons to the new schemes. As far as concrete targets are concerned, the project documents [93 and 94] do not provide much more information than the proposed budgets as related to the water supply component:

- approx. 20% for sanitation and improvement of environmental conditions;
- approx. 10% for community development and hygiene education;
- approx. 5% for institutional development.

For the sanitation component, it is proposed that 50% of the households and all schools would get pour-flush latrines.

We are of the opinion that the possibility of taking up the Ambaji-Danta scheme should be reconsidered. This scheme scored 3rd in the priority ranking. The supply area has a large proportion of tribals, while it is situated in the north of the State where water scarcity is most severe. This would give it a relatively high priority in the Dutch policy.

7.2 Feasibility

Feasibility studies have not been made for the proposed projects. The scale of the projects and the complexity of the water situation would have fully warranted such studies.

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13 In the project document the name Lathi-Liliya Extension is used. This might lead to the impression that it really is an extension of the existing project, like with Santalpur-Extension. This is not the case. The project is only in the same Taluka's. Hence our name Lathi-Liliya-2.

The need for improved water supply is dealt with in one short paragraph in the project documents and is expressed in general statements like:

> *"... the sources have gone dry ... and in certain cases quality of water has deteriorated due to salinity ingress or increase in fluoride content."* [93 and 94]

In the second half of 1992, ORG carried out additional studies with special reference to non-technical aspects [92 and 115]. According to this study, all villages proposed for the new schemes had at least one "safe water source". The main deficiency reported is the quantity of water which is below 25 lcd in many villages and below 40 lcd in nearly all villages.

Confronted with our remarks that these findings do not justify the large investments proposed, the GWSSB provided additional data by the end of our field visit. According to these data the water problems in the villages are as shown in Table 16. Three types of problems were mentioned:

- rate of supply less than 40 lcd (not alarming as in the NA programme only 25 lcd is provided for domestic use);
- water quality unfit for drinking (bacteriologically unsafe, high fluoride or salinity problem);
- water had to be supplied by tankers (it is not clear how often).

The chemical quality problems in the Ghogha area are mostly high salinity, and in the Lathi-Liliya area high fluoride contents of the ground water.

TABLE 16 **Numbers of villages with water problems**

Scheme	Number of villages with				Total villages
	no problem	1 problem	2 problems	3 problems	
Ghogha	12	28	26	13	79
Lathi-Liliya-2	3	20	20	8	51
Total	15	48	46	21	130

Apparently quite a number of villages have serious water problems. Even so, the problems need to be looked into in more detail. For example, if a village is listed as having a salinity problem, this may be based on the sampling of one well. As we noticed during our field visit, it is quite possible that additional and better sources are already available or could be developed in such village.

Only after the actual problems and needs of each village are identified solutions can be sought. These should also include desalination or defluoridation of local sources. In any case, they should include improvement of traditional or existing sources to a

level that they can be a back-up for a new system. Various possibilities should be evaluated on their technical, financial (investment and running costs), maintainability and organizational aspects before a choice is made.

7.3 Water supply and sanitation

The design criteria were discussed in section 3.2.2. Particularly in these areas, where water scarcity is not the main problem, the blanket approach of 55 lcd is not suitable. Special attention is required for the fact that many house connections on existing piped systems are found in these areas.

For the Ghogha project, the Shetrunji reservoir would be the source. This reservoir is already in use since 1965 and now provides (i) water for irrigation, (ii) drinking water for the city of Bhavnagar and some rural areas and (iii) water for industrial use. At 90% reliability the inflow is estimated by ORG at 76 million m^3 per year [115]. Non-irrigation demand is already 27.1 million m^3 per year. The design demand for the Ghogha scheme of 10.3 million m^3 per year would be added to this non-irrigation demand. This means a substantial reduction in the quantity available for irrigation in a dry year. Irrigation authorities have already given written permission for the additional abstraction for the Ghogha scheme. However, this permission is set in general wording. A more concise permission, stating that the required (and specified) quantities will be made available every year should be obtained. Moreover, an operational plan for the new situation should be made to prove the feasibility of such promises. The possibility of several drought years in a row should be taken into account.

Roughly 50% of the proposed supply area for drinking water lays within the irrigated area. On the other hand, substantial parts of the irrigated lands remain outside the supply area.

The source for the Lathi-Liliya-2 project would be the Thebi dam, which is under construction by the irrigation authorities. The reservoir would be much smaller than in the Ghogha scheme, but would exclusively serve the drinking water supply system. For this reason the full cost is included in the estimate of the project. The catchment is relatively small and the reservoir shallow. The inflow will thus be highly variable and evaporation losses high. According to the ORG study, at 90% reliability the inflow is 6.74 million m^3 per year, while the design demand is 4.1 million m^3 per year. However, reservoir losses are to be deducted from the inflow. Worrisome is the fact that inflows as low as 4 million m^3 per year were recorded 3 times over the 24 year study period. Before a decision would be taken to use the

reservoir, detailed investigations of both the safe yield and the topography are required. Proper attention should also be paid to the requirements of resettling 2 villages with a total 1981 population of 1,200 as well as to the renewal of the road infrastructure.

The supply area of the Lathi-Liliya-2 project overlaps the area already provided under the present Lathi-Liliya scheme (see Figure 1). This is of course unacceptable.

Irrigation reservoirs in Gujarat are usually designed for 50 to 75% reliability. A reliability of 90% is acceptable to the GWSSB for water supply and seems relatively high. Nevertheless, this means that on average once every 10 years the (full) demand cannot be met for a certain period. In reality this might happen several years in a row. If this reliability is accepted, back-up supply should be planned.

The technical plans in the project documents are already quite detailed. The Lathi-Liliya-2 scheme has 2 pumping stages in series and the Ghogha scheme 3. Too many pumping stages impede operational reliability. In the Ghogha scheme probably one pumping stage can be omitted. Further remarks related to the designs are:

- Population projections are based on the 1971 and 1981 census data. The 1991 data are now available and should be used;
- The total yearly water requirements are based on the figure of 55 lcd. However, this figure is assumed to include a peak factor of 1.2 for domestic use. The average production figure should thus be about 50 lcd. (It is remarked that we propose an approach in which the real need of each village is considered.);
- In the raw water transport main between the dam and the treatment plant in the Ghogha scheme, 3 different diameters are proposed along its length, from 600 to 900 mm diameter. This cannot be correct. The 3 elevated reservoirs standing side by side just downstream of the treatment plant should be combined in one structure. In the first sections of the main lines in the different zones, high pressures are found. This should be remedied;
- The choice for chemical water treatment with rapid sand filtration in stead of slow sand filtration should be justified;
- Small diameter (250 to 400 mm) mild steel pipes are included. Internal coating of such pipes at the joints is hard to ensure;
- The provision in the design of diesel generating sets in all cases should be checked;
- In the Lathi-Liliya-2 scheme 5% additional losses are assumed in the hydraulic calculations; in the Ghogha scheme 10% is assumed. The latter figure is more realistic;

- Problems were encountered in the 1st and 2nd batch schemes in planning and constructing village level facilities. Therefore, the use of village maps derived from satellite images (Spot or Landsat) should be considered;

We did some checks on the hydraulic calculations and cost estimates, and found no major errors. However, a number of minor mistakes was there. The designs and estimates should be thoroughly checked before the could be accepted.

The guidelines for the formulation of a proposal for sanitation [113] are comprehensive, balanced and therefore valid. They should be fully used to prepare and operational plan for the sanitation component of the new projects.

7.4 Socio-economic aspects

Much attention is given to the approach and strategy for these components in the project documents. However, all statements are of a very general nature. No attempts have been made to translate these socio-economic aspects in more operational terms. There is no relation described with the technical components. The SEU would play a central role in coordinating the various components in the project. The why and how is not clear. Coordination of an integrated programme should be done at a higher level than that of the technical implementing agency.

7.5 Financial aspects

The costs estimates for the water supply components of the 2 proposed projects include 17.85% establishment charges, contingencies and price escalations until commissioning. For the 2026 design population the investments are:

- Ghogha Rs 760 per capita;
- Lathi-Liliya-2 Rs 1020 per capita.

The costs of operation & maintenance are only worked out for the design year. For cost recovery only the possibility of billing the "beneficiaries" Rs 6 per year is mentioned. The increasing burden on the GWSSB caused by the exploitation deficit and its concomitant risk for the sustainability are not mentioned.

7.6 Conclusions

- The project documents are not yet at a level where appraisal really makes sense. Also, the blanket approach is particularly unsuited in the areas proposed. As will be worked out later, a community based and need driven approach is called for. The Ghogha area may be taken up first since the proposed water source seems the most reliable;
- The possibility to include the Ambaji-Danta scheme in the NA programme should be considered;
- The technical feasibility of the Thebi dam should be investigated in detail.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 General

Overall, the programme has achieved substantial results in providing safe water. The changes that took place in the past few years towards an integrated approach are noteworthy. Nevertheless, real integration and community participation in all phases of the project cycle were not achieved yet; the new activities remain "add-ons" to the technical programme and still have a limited reach. This will hamper the institutional and financial sustainability of the programme.

Given the results achieved so far, we strongly recommend to continue the Indo-Dutch collaboration in the water supply and sanitation sector in Gujarat. We are convinced that the lessons drawn from past experiences will enable further improvements in future activities. The recommendations that follow the conclusions in this chapter are meant as suggestions for such further improvements.

It is remarked that at the time of our visit the 2nd batch projects were not yet completed. Nevertheless a large number of villages already receives water from the new systems.

8.2 Conclusions

8.2.1 General

- The main objective of the Netherlands assisted (NA) programme for water supply and sanitation is to improve the health and living conditions of the people, with special reference to the poorer sections of the communities. The new regional water schemes are being utilized by the majority of the people. However, the reliability of supply is still low in several places and can never be 100%[14]. Protection or rehabilitation of local sources is not part of the NA programme. At times of non-supply from the new systems, the population in many places thus depends on bacteriologically unsafe local sources. Therefore, it is doubted that the health objective is being realized. (It is remarked that consumption of water with a high level of fluoride or chloride during short periods is not considered to be a serious health hazard.)

[14] GWSSB considers a regional scheme reliable if water is supplied during 29 out of 30 days.

- The well fields of the Santalpur and Sami-Harij schemes are threatened by rapidly declining water tables. The tubewells of the Santalpur scheme appear to be deteriorating rapidly and the fluoride content in the Sami-Harij scheme is already far above permissible levels. The situation may well become untenable before new sources can be developed.

- Implementation of the Santalpur-1 regional water supply scheme took more than 8 years. The 3 schemes of the 2nd batch may be completed in 6 years, provided they can be commissioned in 1993. These implementation periods are far too long. Expectations of villagers remain unfulfilled over too long periods, while capital investments remain without returns.

- Now 14 years after the start of the implementation of Santalpur-1, several villages in the tail-end have never had a reliable supply of water.

- In designing the 1st and 2nd batch schemes, a "blanket" approach was adopted. Village level sources were not taken into account. Full new supplies were provided. This has caused unnecessary high demands on new, scarce water resources and caused high investment and operation & maintenance costs.

- In accordance with the design criteria no house connections are provided under the NA programme. We doubt that providing house connections can be avoided for a long time in the future, particularly in the Lathi-Liliya scheme.

- Community participation was introduced in the programme in 1988. The need for an integrated approach was expressed much earlier. Till present community participation is mainly limited to participation in the siting of the standposts. The institutional sustainability at grass root level will not be realized with the present approach.

- Gender related issues get more and more attention during the last few years. This is a positive development.

- The GWSSB provides technical and socio-economic services. Its technical role is performed better than the latter. NGOs, generally of good quality, gradually came to play a more important role in the programme.

- The financial sustainability of the regional water supply schemes depends for nearly 100% on subsidies from the State for operation & maintenance. With the level this subsidy has already reached and the further increases to be expected, this situation is not sustainable.

- The information on the problems with present water supplies in the areas for the proposed new 3rd batch of projects is not yet complete. There was no opportunity to confirm the available information in the field. The designs do not take into account the continued use of the existing sources in the villages. The sanitation and socio-economic components are only qualitatively indicated; operationalization is completely lacking. Consequently, we were not in a position to arrive at an opinion on these projects. Nevertheless, we feel that the tribal areas in the Ambaji-Danta scheme may merit a higher priority.

8.2.2 Water resources

- Ground water resources are rapidly being depleted in many places in Gujarat. Legislation is not enforced. Only indirect and limited control takes place when financing of tubewells it sought through Nabard.

- Also surface water sources in the State are rapidly being depleted, and the conflict between the different users will be become ever more evident. Although there is widespread acceptance that irrigation water has to be traded for drinking water in periods of drought, this acceptance may have its limits.

- In the Lathi-Liliya scheme no water was available for drinking purposes during 15 days before the start of the monsoon in 1992. This year (1993), the remaining quantity in the Kalubhar reservoir will be just sufficient for drinking purposes only, provided the monsoon starts in time. The situation in the Lathi-Liliya scheme is aggravated by the fact that the command area of the irrigation system is situated in Bhavnagar District, while the supply area for drinking water is in Amreli District.

- In the proposed 3rd batch projects the reliability of the sources is not yet sufficiently ensured. Particularly the Thebi dam gives rise for doubts.

8.2.3 Water supply, technical components

- The transport pipelines in the Santalpur-1 scheme are heavily over-designed, contributing to the exceptionally high per capita investment costs of the system.

- In the Santalpur and Sami-Harij schemes the local sources are mostly village tanks and dugwells. These are unprotected and consequently heavily polluted. Water is drawn in buckets, mostly by women and girls.

- In the Lathi-Liliya scheme, many old single village piped systems and hand-pumps continue to function side by side with the new system. The people are generally well aware that drinking water should be obtained from the new scheme. Many house connections are found on the old systems.

- A uniform design capacity of 55 lcd for drinking water is adopted in all schemes, including those proposed for the 3rd batch. This rate does not take into account: (i) the fact that in many cases existing sources (can) continue to be used and (ii) that there is a large variation in cattle populations, both in numbers and in composition.

- Not enough is known about the actual water consumption of cattle. However, we have strong doubts that the present provision of 15 litres per (human) capita is sufficient. Particularly in the case there is a large number of buffalos, demand may be higher. This leads to deliberate spillage of water from stand-posts and cisterns.

- In the design of the schemes, including those proposed for the 3rd batch, the supply of water to standposts and cattle troughs is from ground level cisterns in each village. This low pressure system does not allow for possible house connections in the future. These would require considerably more pressure.

- In several cases we observed walking distances far in excess of the design criterion of 150 or 250 metres (up to 500 metres). Apparently, adherence to this criterion is not sufficiently checked.

8.2.4 Operation and maintenance

- In regional schemes all operation & maintenance is the responsibility of the GWSSB. Since operation & maintenance of village level facilities could well be undertaken by the villages themselves, this is a rather inefficient policy.

- The GWSSB is in rather well organized for the operation & maintenance activities. However, persistent shortages in staffing threaten the effectiveness in the respect.

- The operation & maintenance system as developed with the assistance of the Review and Support Mission (RSM) has been introduced in the Santalpur scheme.

8.2.5 Sanitation

- The latrines in the two pilot villages / hamlets in Santalpur are generally being used, while the coverage of this programme is 100%. The school latrines are not used at all. The effort required to realize 140 latrines in two small communities with 100% coverage is beyond any reasonable programme input and is therefore not replicable.

- Much expertise already has been gathered during the long history of the World Bank / ESI sanitation and latrine programme (as well as in other programmes). A new small pilot programme under the Indo-Dutch programme was thus superfluous.

8.2.6 Health education

- The concept and the operational strategy differ considerably between various parties. The NA programme has no overall concept and strategy on this subject as yet.

- CHETNA has created health awareness at the village level through women's camps (shibirs). It also attempted to train health educators. However, they are not yet able to function independently because they have not been fully trained (technical and communication skills).

- The CHETNA programme does not contain a follow-up phase at village level. Emphasis on awareness raising is not sufficient as a take-off for sustained behaviour change at household and community level. As CHETNA itself is aware, its strength is in training of trainers more than in direct grass root level community based interventions.

- The health awareness programme does not include a systematic follow-up on actions undertaken, nor does it include a monitoring mechanism. The programme implementation is far behind schedule.

- The non-reliability of water in a number of villages connected to the scheme hampers the implementation of the health education and latrine programme.

- The exclusive targeting of women and children in the health education programme does not facilitate the spread and acceptance of the messages at community level. At present men and poorer families are mainly outside the reach of the educational activities.

- The health education component of NGOs includes attention for training of staff of the Health Department at District and Taluka level.

- The idea of SEWA to consider health awareness and education as an integral part of a comprehensive community based development process, is valid. It is too early to assess effects of this approach as it only started recently.

8.2.7 Community participation

- Community participation was correctly considered to be a long term process leading to self-reliance, to be implemented in a flexible way depending on the local circumstances.

- GWSSB, a technical organization, was meant to be leading party in realizing community participation. This has not been successful as yet.

- Effective community participation in the programme, in the sense of active participation in all phases of the planning cycle, only takes place in the SEWA income generating project in the Santalpur area.

- The overall concept on community participation and the role of Pani Panchayats in the programme is not made clear and operational. Broad (often valid) statements have not been followed by a translation into action.

- Water committees (Pani Panchayats) should be the back-bone of the village level water management structure. Generally the establishment took place in an ad-hoc top-down manner. Appointment of members mostly took place by GWSSB and Sarpanch without people's involvement. The role and responsibilities of these committees have only been described in very general terms, while training has not sufficiently catered to the needs of the members. Therefore, water committees do not really function in most of the villages.

- The institutional framework of Pani Panchayat is not clear, nor are the roles of various parties concerned.

8.2.8 Income generating activities

- The SEWA project aims at the involvement of the local communities, especially the women, through their local organizations in generating and strengthening their economic activities. The SEWA concept is clear and will ultimately

strengthen the grass root level management capabilities which will be crucial for a community based water supply programme.

- The SEWA programme does not directly "follow" the water, but is based upon need assessment and interest shown by villagers. As such the relation with the water supply project is not direct. Most activities are not directly related to the supply of drinking water (zero-water based).

- The SEWA approach puts emphasis on income generation for women and building up management capabilities of women at village level. Through this integrated approach SEWA has the potential to make water supply, health education and sanitation more interesting for the villagers.

- We did not make an assessment of the effectiveness of the individual economic activities as undertaken by the various women groups. The creation and strengthening of local level (women) groups, the broader objective of SEWA, is being realized.

- The relation between income generating activities and water as expressed in the reports of the Review and Support Mission (e.g. strengthening the financial position of the women to enable them to pay for the water) is a too simplified reasoning. The relation between SEWA income generating activities and water supply mainly lay in the empowerment of women and herewith the strengthening of local level groups. This fact alone is crucial and fully justifies the SEWA project in NA programme.

8.2.9 Gender issues

- In immediate programme objectives, gender related issues are not explicitly mentioned. During implementation special attention is given to 6 issues of which the role and position of women is the first one.

- During implementation much emphasis is put on the role of women through NGOs with special reference to SEWA and CHETNA.

- The programme has a number of positive effects on the role and tasks of women:
  * reliable water means more time available for other activities;
  * the health situation specially of children improved with the supply of low fluoride water in the Lathi-Liliya scheme;

* strengthening of local women groups through SEWA income generating activities contributes to a syncratic relation between men and women;
* latrines and bathrooms are used by women;
* women are explicitly mentioned as members of water committees.

- The programme could have the following negative effects on the role and tasks of women:
  * no training took place for members of the water committees;
  * the latrine programme often did lead to a extra burden for the women (no proper health education);
  * women are mostly not involved in the siting of the standposts;
  * access to water is often limited because of the distance to standposts. The standard maximum walking distance is not strictly observed.

- The tendency to concentrate efforts solely on women has a negative impact on the effectiveness of the programme and the functioning of the water committees as men are not aware of, or interested in the subject and do not support women if required.

- Other conclusions regarding the gender issues are an integral part of the sections on sanitation, health education, community participation and income generation.

8.2.10 Monitoring and evaluation

- A number of socio-economic studies has been conducted in the framework of the NA programme. These activities (called research activities in the RSM reports) are being carried out in support of design, implementation, monitoring and review of NA programme activities. Baseline surveys have been conducted by ORG. The analysis of the data gathered and their presentation in the reports is sub-standard. The draft ORG reports have not been seriously discussed and reviewed by the GWSSB and RSM. Herewith an opportunity to get insight into reality and to draw lessons for the programme is partly lost.

- The research of FPI and SEWA was the basis for SEWA's involvement in the Santalpur area. The action research contains a number of interesting observations and ideas regarding community participation and Pani Panchayats. A seminar was held on the above issues. However, no follow-up action was taken as yet.

- Reviews of (aspects of) the health education and sanitation component have been conducted. Moreover a final evaluation of the Santalpur-1 scheme was submitted to the Netherlands Embassy in March 1990 by ORG. The conclusions and recommendations of these reviews have partly been translated into action for future activities.

- The NA programme does not yet have a monitoring system regarding the reliability of the water supply at village level (per village hours and days of supply), nor does it systematically monitor the functioning of the Pani Panchayats.

- No (joint) external evaluation of the programme took place till present.

8.2.11 Institutional aspects and HRD

- GWSSB as a technical institution gets (socio-economic) training support through its Jal Seva institute, which provides a large number of training courses for all levels of personnel.

- Since 1988 NGOs play an important role in the supply area of Santalpur scheme. This initiative, taken by the GWSSB / Dutch parties, is very important. In most cases the performance of the NGOs is good. Working relations of NGOs with District level GOG organisations have been established and are gradually being strengthened.

- The GOG-NGO collaboration has been formalized in the bi-annual NGO panel meetings. These meetings do not provide an effective coordinative mechanism as yet.

- The establishment of a SEU within the GWSSB has been approved in December 1992. The role and responsibilities of this SEU are not clear as yet. A programme management unit within the GWSSB is not properly placed to play the coordinative and monitoring role for the future, integrated programme. However, the SEU could play an important role in creating awareness in the GWSSB for the relevance of non-technical issues. This would be an internal activity within the GWSSB.

- A State Level Steering Committee has been approved involving only GOG parties as members.

- The District Level Advisory Committees as established in Banaskantha, Mahesana and Amreli Districts are a first step towards decentralisation of the programme. The actual role of these committees still remains limited.

- The institutional relation between the grass root level and the GWSSB is mainly one-sided, top-down. This leaves hardly any opportunity for a real exchange of information, ideas and actions. The Panchayat structure does not play a significant role as yet.

- Under-staffing up to 30% is found at all levels in the GWSSB. This is mostly the result of a blanket ban on appointing employees in the State.

- A total of 12 GWSSB engineers followed a long term course in the Netherlands. Only two out of these 12 are actually involved in the NA programme.

- The Jal Seva Institute plays a role in the training of GWSSB staff in socio-economic aspects of water supply.

- The RSM was instrumental in tapping the potential of the existing NGOs. On the other hand, the role of the RSM in conceptualizing and elaborating an integrated community based programme proved weak.

8.2.12 Further environmental aspects

- Drainage around standposts and cattle troughs is often insufficient particularly in the Santalpur and Sami-Harij schemes.

- The provision of water for cattle has a some effect on the migration patterns of herds. However, the availability of fodder remains the decisive factor. Negative environmental effects due to overgrazing by herds remaining in the area that would otherwise have migrated, may thus be expected to be insignificant.

- Abstraction of ground water for drinking water has some negative effect on the lowering of the water table. However, this effect is insignificant in comparison to the abstractions for irrigation and cannot be easily mitigated.

- Asbestos-cement pipes as used in the project are allowed under Indian regulations. In several countries their use is discouraged because of (suspected) health hazards.

- Eco-regeneration undertaken in the social forestry activities under the SEWA programme for income generation has a positive effect on the environment in the semi-arid areas.

8.2.13 Finance and economy

- The per capita investment costs of the Santalpur 1 scheme were extremely high. The budget overrun for was about 12%.

- It is expected that the 2nd batch schemes can be completed within the allocated budget, with the exception of Lathi-Liliya scheme. The latter may show a budget overrun of about 5% (all in Rupees).

- Cost recovery of the NA schemes is yet negligible.

- Official water charges are likely to be increased shortly from Rs 6 to Rs 14 per capita per year. For the NA water supply schemes we estimate that costs for operation & maintenance costs are approx. Rs 40 per capita per year. Including depreciation the full costs are approx. Rs 75 per capita per year.

- Nearly all operation & maintenance costs for regional schemes are borne by the State. In only 5 years time this amount has increased from 12% to 32% of the total (normal) plan expenditures for rural water supply and sanitation in the State. With the number of regional schemes still increasing the burden on the State may soon reach unsustainable levels.

8.3 Recommendations

8.3.1 General

- The main objective of the Indo-Dutch water supply and sanitation programme is to improve the health situation of the rural population and consequently improve the living conditions. This can only be attained with projects that are sustainable and reliable. This, in turn, will only be the case if (eventually) full cost recovery is achieved. Thus, a community based, demand driven approach is required in which the villages participate in all phases of the project cycle. Special reference should be made to the crucial role of women in the programme. Such approach will ensure that (i) real needs of the population are addressed, (ii) use of existing local water sources is made where possible, (iii) operation & maintenance of village level facilities is undertaken by the com-

munities and (iv) cost recovery of investments and operation & maintenance is optimized.

- At all stages of the project cycle it should be well defined what the rights and duties of the various parties are. Particularly between the GWSSB (as the supplier of water from a regional scheme) and the village (as the client for such supplies), an agreement should be drawn up that spells out in detail such rights and duties for both parties.

- A community based approach requires (i) strengthening of the management capabilities at village level through various types of training by NGOs, (ii) decentralization of tasks to the lowest possible levels, (iii) the different parties each concentrating on their core business and (iv) effective coordinating and monitoring mechanisms at a "neutral level" above the various implementing parties. Involvement of the three levels of local government is required. These requirements imply that the GWSSB would solely concentrate on its technical tasks.

- During the planning phase this would mean:
  * That the village Panchayat is responsible to take decisions on facilities to be developed and activities to be undertaken at village level. This includes (i) upgrading and protecting of local water sources, (ii) negotiating the conditions for a connection to the regional scheme, (iii) the implementation of a sanitation programme, (iv) making preparations for establishing a Pani Panchayat, (v) making arrangements for revenue collection etc.;
  * That a planning group headed by an internationally experienced consultant draws up a plan for all activities required for the realization of the project. This group would include representatives of the local governments, of the GWSSB and of various NGOs. The tasks of the planning group would include raising awareness in the villages and providing information to the villages to facilitate the decision making process;
  * That Steering Committees at District level monitor the progress of the planning and implementation activities. These Committees would be chaired by the Collector or the District Development Officer. They would include representatives of the various local governments and the implementing parties. That the District Steering Committees are supported by District Project Supervisory Units, staffed with Indian experts and staff on secondment from parties involved in the programme. The units should be financed from Dutch funds;

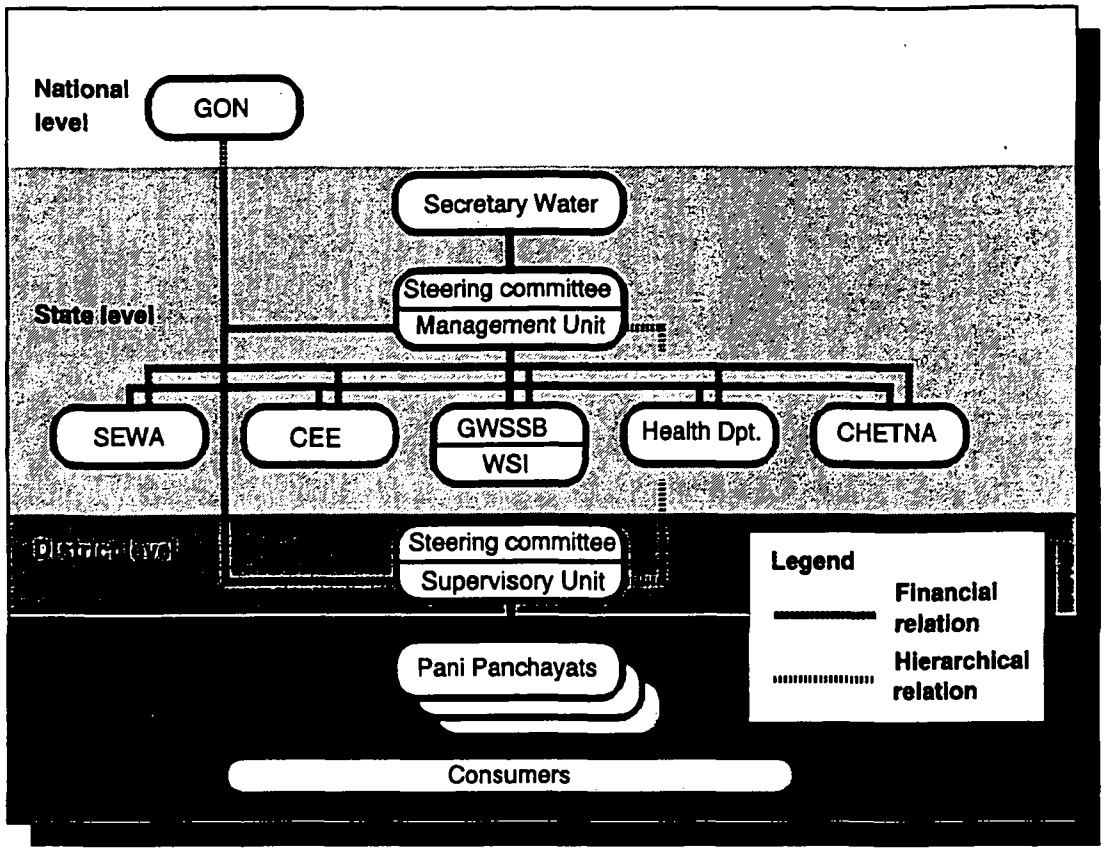

FIGURE 7 **Proposed organization for implementation NA programme**

* That a Steering Committee at State level coordinates the activities of implementing parties at State level. The Steering Committee would be chaired by the Secretary Water and further consist of representatives of the implementing parties (including NGOs).

* That the State Steering Committee is supported by a Programme Management Unit consisting of Indian and expatriate experts. This unit would be financed from Dutch funds and would come under the umbrella of the office of the Secretary Water. It would be directly related to the Royal Netherlands Embassy.

The proposed organization structure is shown in Figure 7. A more detailed description of tasks and responsibilities of the committees and units is given in Appendix 9.

During the implementation and operation phases the structure would be the same with the exception that the planning group will no longer be required. Furthermore, at some time during the implementation the Pani Panchayats should become fully functional. Simple transparent monitoring systems for all programme components should be included in the plan document. Every party is responsible for the internal monitoring of its own component. The programme management unit is responsible for the overall monitoring and intervenes if deemed necessary.

- The above mentioned approach would apply to schemes newly to be adopted in the NA programme. Schemes to be considered to be taken up are the Ghogha scheme, the Lathi-Liliya-2 scheme and the Ambaji-Danta scheme. A comprehensive 5-year plan for the period 1993-1997 is proposed in section 8.4 below.

- For the three schemes of the 2nd batch which are nearing the operation phase, emphasis should be given to the following:
  1) ensure reliable water supply, particularly to the tail-end villages through technical improvements;
  2) until such reliable supply can be ensured through the piped system, tankers should be deployed. It is recommended to hire additional tankers from the remaining Dutch project budget if and when required;
  * preparing a complete inventory of existing village level water supply sources. Plan and implement improvements through NGOs and village Panchayats or Pani Panchayats from Dutch funds. This includes the 1st and 2nd batch projects. Provisions could include (i) improving or protecting local sources, (ii) arrangements for boiling drinking water and (iii) arrangements for tanker supply. (It is remarked that consumption of water with a high fluoride or chloride content would be acceptable during short periods.);
  * strengthen Pani Panchayats through training and establish a legal basis for them;
  * introduce a full fledged latrine programme and elaborate on health education;
  * intensify contacts with the Health Department to make optimal use of its facilities, field functionaries and know-how;
  * continue income generating activities in the Santalpur scheme and start these in the Sami-Harij scheme;
  * further elaborate tasks and responsibilities for the District Level Steering Committees. Protecting ground water sources and reservoirs for drinking water should remain high on the agenda;
  * closely monitor various project components.

- At short notice decisions should be taken how to ensure adequate water sources for the Santalpur and Sami-Harij schemes. Waiting for the World Bank project in Mahesana District to materialize may cause unacceptable delays. Desalination and defluoridation should receive serious consideration. In the mean time monitoring of the well fields should be continued.

- Completing the physical works in the 2nd batch schemes should be achieved before the end of 1993. Socio-economic activities in the project areas should continue until the end of 1996.

- The latrine and bathroom programme should be implemented based on a demand driven approach. Thereby, the choices for the superstructure is left to the clients. The original idea of 100% coverage per village should be dropped. Clients should contribute 25 to 50% of the total costs of latrines and bathrooms. Contribution in kind or in cash would depend on their income level.

8.3.2 Water resources

- The Thebi dam and reservoir for the proposed Lathi-Liliya-2 scheme should be thoroughly checked by an independent party. This should include the reliable yield, a realistic plan and time schedule for implementation and the costs of all works, including resettlement and rerouting the road. A satisfactory outcome would be a precondition for the scheme to be taken up.

- For the proposed Ghogha scheme definite arrangements should be made for the use of water from the Shetrunji reservoir with the irrigation department. This should include an operational plan that takes into account all actual and planned abstractions. Such arrangements in writing should be available before any construction works for the scheme starts.

- The possibilities for integrated water resources planning and management should continue to be stimulated under the NA programme.

8.3.3 Water supply, technical components

- Drainage around standposts in the Santalpur and Sami-Harij schemes should be further improved.

- The maximum walking distance to the nearest standpost should be checked in all schemes of the 1st and 2nd batch. In case of excessive distances, additional standposts should be placed.

- Diesel generator sets in the Santalpur scheme should be checked on their adequacy and where necessary replaced.

- Actual water needs for cattle should be established, distinguishing between different types of cattle. The actual needs should be taken into account in the

design of new schemes. At the same time the possibility to commercialize the provision of water for cattle should be considered.

- The design of new schemes should allow for the possibility for inclusion of house connections in the future. This would not be necessary where new schemes only cater for the need of consumption water and other water is provided from local sources.

- The design of standposts should be made more user-friendly and possibly more durable. A design contest among students of the National Institute of Design in Ahmedabad may be considered. The possibility for prefabricated elements should be included. Application would be in new schemes and where standposts have to be replaced anyway. At the same time a safe drinking water logo may be developed to be used for distinguishing safe sources from unsafe ones.

- The causes of the problems with the solvent cement joints in the PVC pipes in the Santalpur scheme should be identified. Subsequently, measures to prevent such problems in the future should be taken.

- The causes of increasing drawdown in the wells in the Santalpur scheme should be identified. Subsequently, actions to solve the problems (if any) and measures to prevent such problems in the future should be taken.

- The designs of the proposed new schemes should be revised before they are taken up with respect to the following aspects:
  * The possible use (for non-drinking purposes) of local sources in the villages should be taken into account;
  * 1991 population data should be used;
  * Selection procedures should allow that surface water treatment plants are selected on a combination of the following aspects: (i) investment costs, (ii) durability, (iii) reliability and (iv) running costs. The possibility to apply slow sand filtration should be studied in all cases;
  * The overlap in supply areas of the Lathi-Liliya-1 and Lathi-Liliya-2 schemes should be redressed or clarified;
  * Prestressed concrete pipes should only be used when long term experience elsewhere of the same manufacture has proven satisfactory and when effective control of the manufacturing process is ensured;
  * Mild steel pipes in diameters under 600 mm should only be used if internal coating of the joints can be ensured;
  * Possibilities to reduce the number of pumping stages from 3 to 2 in the Ghogha scheme should be worked out;

* The optimum diameter for the raw water transmission main in the Ghogha scheme should be established over the full length.

8.3.4 Operation & maintenance

- The operation & maintenance system as introduced in the Santalpur area should be appraised on effectiveness and efficiency. If appropriate it should be introduced in the other NA schemes.

- Operation & maintenance of village level facilities should become the responsibility of the villages.

8.3.5 Sanitation

- The idea of 100% coverage of the latrine programme per village should be dropped.

- A realistic latrine component should be based upon social marketing principles, it should be demand driven and it should have a substantial peoples contribution. The ESI approach can be used as a starting point. The possibility to use cheaper latrines or latrines that use less water should be considered. Users should be offered a choice of technologies.

- A review of the school latrine approach is needed with special reference to the role and responsibilities of teachers and pupils. The school latrine programme should be demand driven as well.

8.3.6 Health education

- The main lines of the health education concept, approach and strategy should be further elaborated in the plan document for every scheme, taking into consideration that health education is an integral part of a broader (community) development process.

- Modules for health education should not be developed over and over again by individual parties. Existing material as produced by UNICEF and CHETNA should be the basis for health education for all parties involved in NA projects.

- Health department personnel should be more intensively involved to gradually prepare them to take over health related activities.

- A systematic monitoring system with standardized indicators in measuring effectiveness of health education inputs (in bringing about sustained utilization of installed facilities and improvement of hygiene practices) has to be elaborated and installed by the project.

- Men also have to be targeted for health education and sanitation to realize the acceptance at community level.

8.3.7 Community participation

- Pani Panchayats are the backbone of the village level water management structure. They need to be properly equipped in terms of understanding of the scheme, their role and responsibilities, the problem analysis and the problem solving. Pani Panchayats should get a formal status within the village panchayat structure.

- Community participation requires long term involvement at grass root level. Ad-hoc activities in community participation are not effective and should be completely abandoned.

- GWSSB should no longer be actively involved in the establishment of Pani Panchayats. The establishment of Pani Panchayats is an activity of the village community, supported by NGOs concerned.

8.3.8 Income generating activities

- SEWA should continue its activities in Santalpur and expand into the Sami-Harij project area.

- The strengthening of Pani Panchayats should be started at an earlier stage and should get more attention. This without dropping the concept or orientation on economic activities.

- The SEWA programme is an integral part of the water supply programme and should be monitored and backstopped as an integral part of the programme.

8.3.9 Gender issues

- In the new concept as proposed in this document, women will play a crucial role in all phases of the planning cycle. Gender differentiation should be made explicit in the plan document for each scheme.

- The role and representation of women in the water committees has to be increased to at least 50% in all NA schemes.

- All other gender related recommendations are made in the sections on sanitation, health education, community participation and income generation.

8.3.10 Monitoring and evaluation

- Baseline surveys (to be) conducted have to be thoroughly reviewed by the programme management unit prior to finalization of these studies.

- External reviews of the programme should take place every three years. These evaluations will be preceded by in-depth external reviews of key components of the programme.

8.3.11 Institutional aspects and HRD

- An institutional and financial management study on GWSSB as proposed by World Bank is crucial for the NA programme. The scope of work as indicated in the TOR point II, 4e, should be expanded to all (future) districts covered by the NA programme. Our recommendations for local and District level involvement should be explicitly considered in the study to be conducted. In view of the importance of the study for the future of the NA projects the Netherlands Government should consider (co)financing this tripartite study (GWSSB, World Bank and GON).

- In future the programme will be implemented by the following leading parties:
  * GWSSB for all technical works beyond village level;
  * DRDA and the DWAC for all technical works at village level;
  * SEWA for all socio-economic aspects in Santalpur and Sami-Harij (including health education);
  * CEE for all socio-economic aspects in Lathi-Liliya and Ghogha (including health education);
  * ESI for sanitation components in all projects, through GWSSB;
  * in the future possibly the Health Department for follow-up of health (education) activities.

- The SEWA programme is part and parcel of the future integrated community based approach. Therefore SEWA should be considered as a major party. As such the Netherlands support and backstopping of SEWA should not be isolated from the NA water supply programme.

- The engineers trained in the Netherlands should be directly involved in the NA projects, specially as their training in the Netherlands included an integrated approach.

- The SEU with the broad objective of coordinating the full integrated programme in GWSSB is no longer required for NA projects. In future GWSSB should concentrate on technical aspects while the programme management (including coordination and monitoring) will be organized at a higher level. The SEU would play an internal role in the GWSSB. Village level monitoring of the functioning of water supply could be one of its tasks.

- All leading parties will have their own financial flow and monitoring mechanisms.

8.3.12 Further environmental aspects

- Conservation of scarce ground water resources would mitigate environmental problems. This is a further reason to use local sources in the villages to the maximum extent.

- Income generating activities related to environmental improvement (on of SEWA's activities) should be further stimulated.

- The use of solar energy, e.g. for desalination, should be seriously considered in new schemes.

- Re-use of waste water from standposts and cattle troughs for school yards or small gardens should be further promoted.

- Asbestos cement pipes should not be used if an alternative for about the same cost is available.

8.3.13 Finance and economy

- The billing and collection performance needs to be streamlined and strengthened to achieve maximum cost recovery.

- Water rates have to be increased considerably in order to reach an acceptable level of cost recovery. This may have to be done in a gradual way by taking the following steps over a certain period of time: (i) optimized billing efficiency, (ii) full O&M cost recovery and (iii) full cost recovery (including

depreciation). Inflation should be regularly compensated. By bringing operation & maintenance of village level facilities under the responsibility of the villages, the amounts to be collected will be substantially reduced.

- The possibility to offer house connections to the more well-to-do households should be considered anew. For this purpose up-to-date data should be collected of the income stratification in representative areas. Furthermore, an attempt should be made to estimate the level of willingness to pay of consumers in typical project areas. House connections would have to pay at least the full marginal costs for the service offered.

- Water rates, rather than rules, regulations and technical measures should be used as a tool to conserve water from expensive regional schemes. Of course, this should not be pursued to the level that the health of the consumers would be at risk.

- Experiments with commercial water supply for cattle should be undertaken. This might be related to commercialization of water from village tanks.

8.4 Proposed 5-year programme 1993 - 1997

8.4.1 General

The proposed 5-year programme consists of 4 main components:

- continued activities in the areas of the 1st and 2nd batch schemes;
- implementation of an integrated, community based, water supply and sanitation project in the Ghogha area;
- assessing and if appropriate, implementing integrated, community based, water supply and sanitation projects in the Lathi-Liliya-2 and Ambaji-Danta areas;
- further developing and implementing the organizational framework for the NA programme.

The proposed activities are worked out to some detail in the following sections. A time schedule is shown in Figure 8.

8.4.2 1st and 2nd batch areas

Activities would include:

- completion of the 2nd batch regional water supply schemes before the end of 1993;

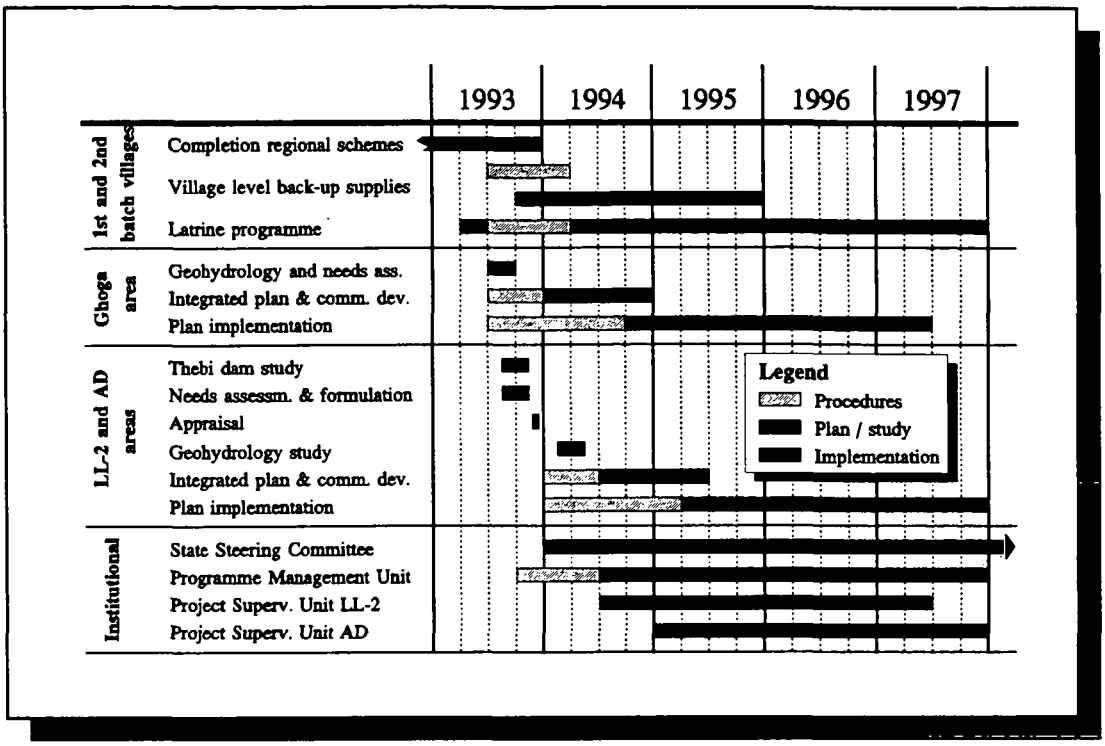

FIGURE 8 **Time schedule proposed 5-year NA programme**

- preparing and implementing plans for improving local village sources to serve as back-up water supplies. This would encompass all villages in the NA project areas. The methodology should be developed with the assistance of the RSM first. This methodology should be assessed regularly during the implementation and adjusted if necessary;
- implementing a full scale sanitation programme in accordance with the guidelines drafted by IRC;
- strengthening management capabilities at grassroot level;
- stimulating income generating activities among women (groups).

8.4.3 Ghogha area

- The water problems in the villages in the proposed areas should be assessed on a village by village basis. This should cover areas bordering the proposed area to make sure the highest priority areas will be fully covered. This assessment should take about 3 months;
- At the same time the geohydrological situation in the supply area would be investigated, mostly using available data. These should be brought in a format that can be used as a tool in preparing the integrated plan;
- Preparing an integrated plan in cooperation with all parties involved. This would take about 1 one year. Some village level works may already start during this period;

- Implementation would take about 2 years. During this period the main water supply works would be constructed in addition to the sanitation and socio-economic activities. The latter may extend beyond this period.

The preparation of the integrated plan is a difficult but challenging job. A well qualified, international consulting firm should be engaged for this task. A draft Terms of Reference for this firm is given in Appendix 10.

8.4.4 Further project areas

For the purpose of this plan it is assumed that the proposed areas of the Lathi-Liliya-2 and Ambaji-Danta schemes will retain their high priority status and can be taken up in the NA programme.

- The Thebi dam and reservoir for the Lathi-Liliya-2 scheme were originally designed for irrigation purposes. The design has to be critically reviewed prior to any further action;
- After the needs assessment and reformulation of the projects these should be appraised;
- Further activities are identical to those for the Ghogha area.

8.4.5 Institutional development

The steering committees, programme unit and project units should be set up and made functional as shown in Figure 7. It is proposed to contract the services of an internationally experienced consulting firm for the programme unit and project units.

8.4.6 Budget estimate

The required budget is worked out in some detail in Appendix 11. In Table 17 a summary is provided. The total costs of the 5-year programme would be nearly Dfl 70 million, of which about 85% for physical works.

TABLE 17	Cost estimate NA programme 1993 - 1997 (in Dfl million)		
Description	Services	Physical works	Total
1st and 2nd batch villages			
- Completion of 2nd batch water supply schemes.	p.m.	p.m.	p.m.
- Village level back-up water supplies.	0.3	5.0	5.3
- Latrine construction.	0	8.0	8.0
Ghogha area			
- Geohydrological study and needs assessment.	0.1	0	0.1
- Integrated plan and community development.	2.0	0	2.0
- Plan implementation, including NGO activities.	0	20.0	20.0
Lathi-Liliya-2 and Ambaji-Danta areas			
- Study Thebi dam.	0.1	0	0.1
- Needs assessments.	0.1	0	0.1
- Geohydrological studies.	0.1	0	0.1
- Integrated plan and community development.	3.0	0	3.0
- Plan implementation, including NGO activities.	0	25.0	25.0
Institutional			
- Programme Management Unit and Project Supervisory Units.	4.0	0	4.0
- Government institutions (Miscellaneous costs).	0.5	0	0.5
Total	10.0	58.0	68.0

APPENDICES

8 March 1993

TERMS OF REFERENCE, EVALUATION AND APPRAISAL MISSION INDO-DUTCH RURAL WATER SUPPLY AND SANITATION PROJECTS, GUJARAT

BACKGROUND

General

Gujarat is the third state in which the Government of the Netherlands started to support rural water supply and sanitation. Financial support is given to comprehensive piped water supply schemes, which are designed, built, maintained and managed by the Gujarat Water Supply and Sewerage Board (GWSSB). The Board also builds single village schemes which are handed over after construction to the local Panchayats for operation, maintenance and management. The former have a better history of operation than the latter, since community involvement in planning is absent and village councils are not prepared for later management.

Rural water supply

The first NA-project was a scheme in Santalpur, a dry area in the north. The scheme uses groundwater and pumps water to originally 72 villages. Haskoning Consulting Engineers carries out bi-annual review and support missions and documents the results in mission reports (GU-1 to GU-26). Construction of the scheme was completed in 1986. An Indian consultant (ORG) evaluated performance and use of the scheme.

Mission Gu-13, with Haskoning, Centre for Women's Development Studies, SEWA and ORG, appraised three new schemes in 1985. These were an extension to the Santalpur scheme (69 villages), and two new comprehensive schemes, one in the neighbouring Sami-Harij (groundwater, 111 villages, 1 town) and one in Lathi-Liliya (water from Kalubhar dam to 36 villages, 1 town) in the South.

Under Santalpur-II, 36 villages have been reached, bringing the total to 108 out of 141 villages. Completion is expected by end-1992. In Sami-Harij, most works have been completed and water flows to 57 of 111 villages. The remainder is to be connected by mid-1993. In Lathi-Liliya, main works are completed, but not yet up to standard. All villages were expected to be connected by September 1992. Five new schemes have been identified, of which four in cooperation with the RSM and 1 additional by the GWSSB alone.

Ecological aspects

All projects suffer from water resource problems. In Santalpur the water table drops at a rate of several meters per year. In Sami-Harij the first layer is almost exhausted and extraction of water from the second and third for irrigation is on the increase. In both areas water quality is affected, as the extraction allows an inflow of new water with a high fluoride content. The problems are counteracted by identifying layers with better water and installing deeper wells. In Lathi-

Liliya, problems occur whenever the Kalubhar dam does not fill up sufficiently due to drought. To cope with increasing water shortage in Gujarat, the number of villages to be connected has been repeatedly increased in all Netherlands' supported schemes. An environmental problem at village level is lack of drainage at public taps.

Organization of the integrated approach
In Santalpur, participation of the community (men and women) takes place through village water committees. Formation is directed by the GWSSB. FPI, an NGO, evaluated the functioning of the committees and has carried out action research to strengthen them in cooperation with SEWA, a women's NGO.

SEWA also carries out a women's income generation programme in the Northern zone. This programme is linked to the RWS project in order to improve women's economic base and influence. Hygiene education is carried out by Chetna, another NGO. Its focus is on raising women's health awareness. The contents of the hygiene education campaign are based on data from a hygiene baseline.

A pilot latrine project has been carried out in two villages after several reformulations. The project was recently completed. A state-level NGO, ESI, which manages several rural latrine programmes on behalf of the GWSSB, has conducted the pilot project. Local voluntary organizations, selected, trained and monitored by ESI, implemented the project. Guidelines for the formulation of a sanitation proposal for the Santalpur scheme have been drafted.

In Sami-Harij, community participation and women's involvement are organized by staff of the GWSSB only.

In Lathi-Lilya, a socio-economic baseline has been conducted and a health awareness programme has been proposed by CEE, another NGO.
GWSSB, NGOs and RSM meet regularly in the NGO Panel.

This year a socio-economic unit has been established within the GWSSB. Recruitment of specialists has recently started. Salary costs are financed for three years by the Dutch Government, while the GWSSB finances the infrastructure. Thereafter the unit is to be integrated into the Board, if proven successful.

Operation and maintenance
O&M of completed water supplies is carried out by the GWSSB. The communities are supposed to contribute Rs. 6 per household per year to the Panchayats on behalf of the GWSSB, but funds are either not collected or not passed on. Willingness to pay was investigated and found to be present given a reliable service. Income levels and water demand vary for the (poor) north and wealthier south. The RSM co-monitors completed schemes and has started to strengthen O&M (leak detection, training linesmen, preparation maintenance manual).

GENERAL AIM OF THE MISSION

To evaluate the preparation, planning, implementation, follow-up, results and organizational set-up of the Netherlands-assisted integrated drinking water supply projects in Gujarat; to draw lessons for future projects and in the lights of these appraise the new projects.

MAJOR OBJECTIVES

1. To evaluate, in broad terms, whether the development from a purely technical and construction oriented approach into one which also includes community participation, hygiene education, sanitation, women's income generation and maintenance increases effectiveness especially with regard to:
   - continued functioning and hygienic use of facilities;
   - service to the poorer section of the population;
   - sustainability of maintenance and sanitary improvements;
   - financing of recurrent costs:
   - development capacities within communities (empowerment).

2. To evaluate, in general terms, whether the present organizational set-up is effective and sustainable, with special attention to:
   - cooperation between the various organizations and utilization of mutual expertise for project implementation;
   - capacity of the technical organizations to include social activities related to rural water supply and sanitation;
   - alternatives to present organizational set-up;
   - strategy to develop a sustainable organization for participatory projects at medium term.

3. To give a summary assessment of the sustainability and replicability of the reviewed water supply, sanitation and hygiene education projects at state, district and village level.

4. To evaluate, in general terms, the roles of the Review and Support Mission, DGIS/DAL/ZZ and her advisors and the Royal Netherlands Embassy in New Delhi in the planning and implementation of the integrated projects.

5. To draw lessons from the present project activities and organization and formulate concrete recommendations for future projects.

6. To appraise the three new projects with the highest priority (Gogha, Lathi-Lilya Extenstion, Ambaji-Danta).

SPECIFIC ISSUES FOR EVALUATION

In its evaluation, the evaluation mission will give special attention to the following issues:

A. PROJECT CONCEPT
B. RURAL WATER SUPPLY
C. ENVIRONMENTAL ASPECTS
D. COMMUNITY PARTICIPATION
E. HYGIENE EDUCATION AND SANITATION
F. INSTITUTIONAL ASPECTS

A. PROJECT CONCEPT

1. To review whether the innovative function of the NA-projects for the rural water supply and sanitation sector in Gujarat is recognized and is reflected in project preparation, planning, implementation and follow-up;

2. To assess whether the short and long-term project objectives reflect the increased emphasis on integration and sustainability and to determine whether adequate targets and indicators have been established to measure the realization of these objectives.

B. RURAL WATER SUPPLY

1. To assess the choice of technology in relation to longer-term sustainability and costs, including the possible use of alternative technologies, ranging from small village water systems to upgrading of traditional sources and used either separately or in combination;

2. To review current design criteria with special reference to water use and demand, population projection, design life, service levels and incorporation of existing water supplies;

3. To carry out special assessments on demand and potential for paid service levels and review the implication which private connections would have for water use, costs, financing and afffordability and access of the poor, and advice on possible alternatives;

4. To assess the various schemes on the utilization of piped water for drinking and the domestic economy (cattle, women's income generation) and to indicate factors influencing (under) utilization of piped water;

5. To make an assessment of present maintenance and maintenance financing systems, including for the productive use of drinking water, and assess planned improvements;

6. To review current systems for monitoring the delivery and quality of piped drinking water to project villages and assess planned improvements;

C. **ENVIRONMENTAL ASPECTS**

1. To review present measures to deal with the deteriorating quantity and quality of drinking water resources and to assess the need for more fundamental strategies;

2. To evaluate the effect of the piped water system on environmental and public health conditions in the villages and assess implications for design, implementation and management.

3. To describe, in general terms, the current approach in public education on and management of water resources at project and village levels and indicate whether these activities need further strengthening to ensure sufficient allocation, reliable deliveries and proper use of drinking water.

D. **COMMUNITY PARTICIPATION AND WOMEN'S INVOLVEMENT**

1. To evaluate current methods for involving village men and women in the preparation, planning and design, implementation, maintenance and management of village water supplies and village sanitation and hygiene projects;

2. To review the composition, formation, tasks, authority, institutionalization and performance of village water committees, including the way female committee members are selected, trained and can function;

3. To assess the level and impact of community involvement in relationship to the sustainability of the water service and of the programmes for sanitation and hygiene education.

E. **HYGIENE EDUCATION AND SANITATION**

1. To assess the present objectives, focus and strategy of the hygiene education and sanitation programmes, especially with regard to the achievement of measurable, sustained and ongoing improvement of environmental conditions and hygiene practices in the project villages;

2. To assess the design, implementation and results of the pilot sanitation project.

F. **INSTITUTIONAL DEVELOPMENT**

1. To assess the effectiveness of the present organizational set-up for the NA-water and sanitation projects, including:
   - the implementation and absorption capacity of the various parties;
   - the coordination and cooperation between the various parties involved in the projects at institutional level and in the field;

- the formal and informal decision-making structures and processess;
- the vertical relations between State, District and Village levels;
- the functions and impact of the NGO panel;

2. To investigate to what extent the concurrent implementation of technical and social activities has influenced the planning and implementation of other rural water supply and sanitation projects in Gujarat;

3. To review the existing system to monitor the technical and social aspects of project implementation, the performance of completed water systems and the maintenance and use of completed sanitation facilities and to relate this to the establishment of a new Management Information System within the GWSSB;

4. To assess whether the present implementation projects contribute to the capacities of local organizations to prepare, implement and sustain integrated and participatory rural water supply projects, and assess whether other support activities than direct implementation projects are also desired;

5. To review the need for capacity building of the technical agencies for community-based water and sanitation projects and for the effective involvement of village men and women in planning and design, maintenance and management of village water systems and village sanitation and hygiene education programmes.

6. To investigate whether the water supply project has fulfilled the pre-conditions for women's income generation projects, such as time savings, water availability and access and reliability of service;

7. To assess whether the organization of women in the project villages for income generation activities has contributed to women's empowerment with regard to village water supply and environmental sanitation conditions;

8. To assess whether the income generation project for women may have a negative influence on willingness of the men to contribute financially to water and/or sanitation

SPECIFIC ISSUES FOR APPRAISAL

1. To appraise the location of the new schemes in the light of possibilities to support development of more than one sector in so-called concentration areas;

2. To review the choice of water supply technology and assess whether sufficient attention has been paid to other options, including the rehabilitation and/or incorporation of existing water supply systems and traditional sources;

3. To advise whether the proposed studies on adequacy of the water sources and the authorities' guarantee of priority for drinking water supply over irrigation, once obtained, are sufficient to undertake the present project;

4. To assess whether the choice of technology and organizational set-up, including division of tasks and coordination between GWSSB, NGOs and District health and social service programmes have been sufficiently underbuilt and worked out to warrant the start of the design and construction of the main works;

5. To determine the need to work out a more specific plan of operation for the remaining aspects, e.g. sharing of O&M and O&M financing; institutional development for community maintenance, management and financing; rural sanitation; environmental awareness raising; training and monitoring;

6. To assess whether technical assistance is required to work out an integrated Planops.

7. To appraise the organizational capacity at state, district and village level to execute the budgetted sanitation component within the proposed period and to advice on the need to have a more flexible timeframe and targets.

8. To advise on the desirability of expanding Indo-Dutch cooperation in Gujarat beyond the immediate drinking water supply and sanitation sector.

METHODOLOGY

a. The evaluation and appraisal will be carried out through review of documents, interviews with project implementors and relevant authorities, interviews with resource persons who have special knowledge regarding particular aspects of the projects and field visits to select project areas.

b. To increase the effectiveness of the evaluation mission, two preparatory field studies will be conducted prior to the arrival of the evaluation mission:
   - a study of water utilization in Santalpur II
   - a study of the institutional set-up and inter-agency co-organization and cooperation.

These field studies will be conducted in consultation with the GWSSB and NGOs. The results of the preparatory studies will be available in a report by 10 March 1993.

COMPOSITION OF THE MISSION

The members of the mission will be:

1. Mr. A. R. Manuel, Mission Leader, Technical and ecological aspects
2. Mr. B.K. Dallani, Engineering aspects
3. Ms. B. Kakkar, Social and health aspects
4. Mr. A.K. Singh, Financial aspects
5. Mr. B. van Woersem, Institutional aspects
6. Mr. R. Zevenbergen, Economical aspects

RESOURCE PERSONS

In The Netherlands:

Dr. Loes Schenk, Un. van Amsterdam (appraisal SEWA)
Drs. B. Jansen, Aquanet and IOV mission member
Ir. J. T. Visscher, IRC/Advisor DAL/ZZ
Drs. C. van Wijk, IRC/Advisor DAL/ZZ
Mr. J.H. de Goede will accompany the mission as resource person during the first week in Gujarat.

BACKGROUND DOCUMENTS

RSM Mission reports
IOV evaluation report
Indian and Dutch Policy Papers for Rural Water Supply
DGIS Sector Papers 'Women, Water and Sanitation' and 'Women and Energy, Forestry and Environment'
Women Impact Study (VES)
Report 'Hydrogeological Investigations for the Santalpur and Sami-Harij RWSS, January 1992.
Internal evaluation report on GU-I by ORG group, Baroda
Proposals for GU-III
Discussion papers Indo-Dutch programme on institutional development, sanitation and operation and maintenance

REPORTING AND REVIEW

Draft report: before end of April
Review in India and The Netherlands: before beginning of June
Final report: before 15 July

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GU-3 Progress evaluation of Santalpur scheme, April 1981.

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GU-6 Progress evaluation of Santalpur scheme, January 1983.

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GU-22 Progress evaluation and review, March 1990.

GU-23 Progress evaluation and review, October 1990.

GU-24 Progress evaluation and review, July 1991.

GU-25 Progress evaluation and review, January 1992.

GU-26 Progress evaluation and review, July 1992.

GU-27 Progress evaluation and review, January 1993.

PERSONS MET

1. THE NETHERLANDS

Mrs. G.A.C.M. Braken	Desk officer DGIS
Mrs. J. van Krimpen	Desk officer DGIS
Mr. J.T. Visscher	IRC
Mrs. Ch. van Wijk-Sijbenga	IRC
Mr. R.T.J. Wijdemans	Haskoning
Mr. J.H. de Goede	Haskoning

2. NEW DELHI

Mr. P.M.Flik	First Secretary RNE
Mr. S. Sarkar	World Bank
Mr. P.K. Sivanandan	Joint Secretary Rural Development & Director National Drinking Water Mission

3. GUJARAT

3.1 Government

State

Mr. V. Harihardas	Chief Secretary
Mr. A. Bhatia	Additional Chief Secretary, Water Supply
Mr. K.V. Bhanujan	Additional Chief Secretary, Health
Mr. N.B. Desai	Secretary Narmada & Water Resources Department
Mr. A.W.P. Davis	Commissioner and Secretary Rural Development
Mr. S.K. Shelat	Principal Secretary, Planning
Mrs. Joshi	Deputy Secretary Planning

Banaskhanta District

Mr. B.K. Shah	Collector
Mr.	District Health officer

Bhavnagar District

Mr. S. Gupta	Collector
Mr. R. Ghopal	District Development Officer
Mr. D. Baladhia	President District Panchayat

.....	Director DRDA

Amreli District

Mr.	Collector
Dr. Shah	District Health Officer
Dr. Dawalli	Health officer

3.2 GWSSB

Head office

Mr. C.R. Samajpati	Chairman-cum-Managing Director
Mr. A.J. Shah	Member Secretary (outgoing)
Mr. P.M. Modha	Member Secretary (incoming)
Mr. H.D. Nagrecha	Chief Engineer World Bank cell
Mr. R.D. Wadher	Chief Engineer (Zone II)
Mr. P.K. Shah	Superintending Engineer World Bank Cell
Mr. C.B. Davda	Chief Engineer
Mr. J.M. Barot	Joint Director Jalseva
Mr. S.S. Shah	Executive Engineer
Mr. S.P. Vyas	Chief Geohydrologist
Mr. O. Behari	Geohydrologist
Mr. A.J. Shah	Executive Engineer World Bank Cell
Mr. K.M. Shah	Financial controller
Mr. A.D. Patel	Deputy financial manager
Mr. R.B. Darri	Accounts
Mr. K. Chavda	Manager computer cell

Public Health Circle Palenpur

J.C.Shah	Superintending Engineer

Santalpur project

C.C. Shah	Executive Engineer

Sami Harij project

Mr. M.T. Shah	Executive Engineer
Mr. C.M. Pandya	Executive Engineer
Mr. S.J. Patel	Deputy Executive Engineer
Mr. C.P. Bhavsar	Deputy Executive Engineer
Mr. N.T. Santdasani	Assistant Engineer
Mr. B.H. Patel	Assistant Engineer
Mr. S.M. Patel	Assistant Engineer

Public Health Circle Bhavnagar

Mr. Sarvaiya	Secretary of the Superintending Engineer

Lathi-Liliya project

Mr. D.K. Metha	Executive Engineer

Ghogha and Lathi-Liliya-2 Schemes

Mr. K.M. Bhatt	Executive Engineer
Mr. D.P. Pandya	Additional Assistant Engineer

3.3 NGOs

CEE

Mr. K. Deshi	Group coordinator
Mr. M.A. Joshi	Project officer

Chetna

Mrs. Indu Capoor	Director
Mrs. Arati Samajpati	Coordinator HABK
Mrs. Pallavi Patel	Programme officer
Mrs. Jyoti Gade	Senior field officer
Mrs. Maheshwari	Senior field officer
Mrs. Varsha Vyas	Senior field officer
Mrs. Bhanu	Senior field officer

ESI

Mr. P. Arpan	Technical Assistant
Mr. D.J. Mehta	Engineer / Techn. P.A.

FPI

Mr. R.M. Bhatt	Director

SEWA

Mrs. Ela Bhatt	President
Mrs. Renana Jhabvala	Secretary
Mrs. Reema Nanavaty	Coordinator
Mrs. Bina Bhatt	Field worker

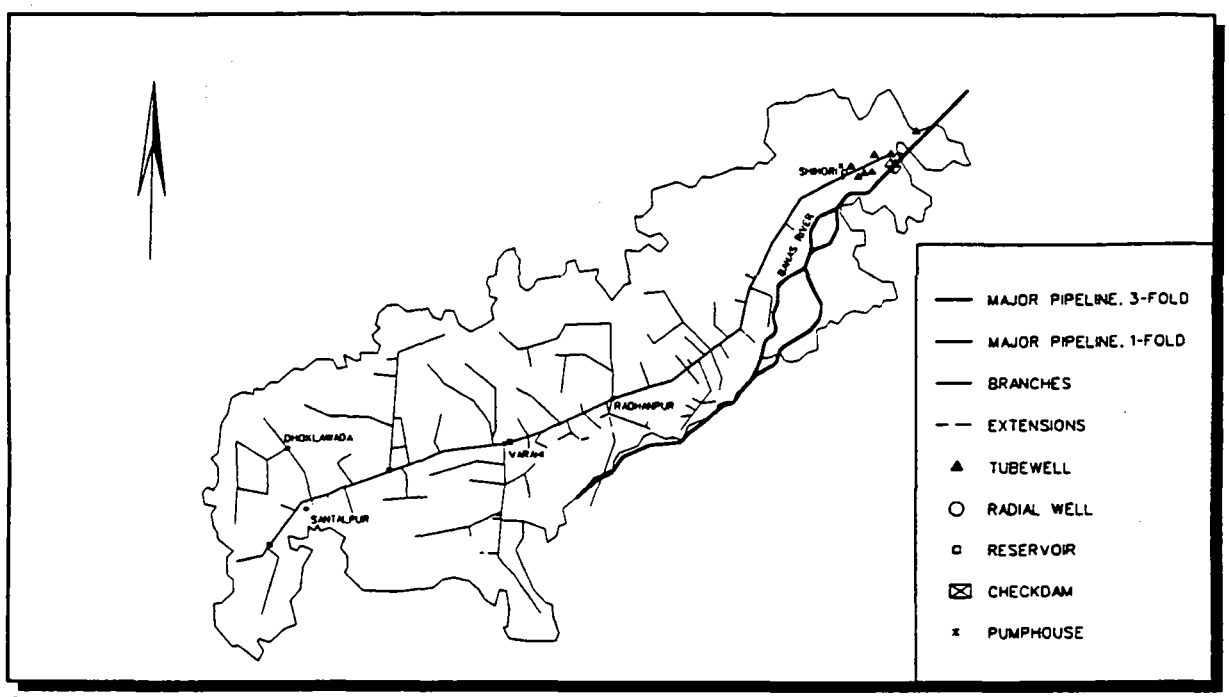
ITINERARY

5 February 1993	Briefing at DGIS (Manuel, Van Woersem).
19 February	Briefing at IRC (Manuel, Van Woersem).
26 February	Meeting with Haskoning (Manuel, Van Woersem).
10 March	Meeting with mrs. L. Hoffman (Van Woersem).
15 March	**Start of activities in India.**
	Briefing at the Royal Netherlands Embassy (team)
	Meeting with Mr. Sarkar, Work Bank office New Delhi (team)
16 March	Transfer to Ahmedabad.
	Meeting with staff and Chairman GWSSB (team).
	Meeting with Secretary Water (team).
	Visit to Jalseva training institute (team).
17 March	Meeting with Secretary Health (Kakkar, Manuel, Van Woersem).
	Meeting with Secretary Water Resources (Kakkar, Manuel, Van Woersem).
	Transfer and site visit Ghoga and Lathi-Liliya schemes (Dadlani).
18 March	Transfer to Santalpur and site visit Santalpur project area (Kakkar, Manuel, Van Woersem).
	Site visit Ghoga and Lathi-Liliya schemes (Dadlani).
19 March	Site visit Santalpur project area (Kakkar, Manuel, Van Woersem).
	Meeting with Collector and District Health Officer Banaskhanta (Kakkar, Manuel, Van Woersem).
	Site visit Sami-Harij project area (Kakkar, Manuel, Van Woersem).
	Site visit Ghoga and Lathi-Liliya schemes (Dadlani).
20 March	Site visit Sami-Harij project area and transfer to Ahmedabad (Kakkar, Manuel, Van Woersem).
	Site visit Ghoga and Lathi-Liliya schemes and transfer to Ahmedabad (Dadlani).
21 March	Holiday. Arrival of Mr. Zevenbergen.
22 March	Arrival of Mr. De Goede.
	Meeting with Chairman and staff of GWSSB (team).
	Meeting with Secretary Planning and Secretary Water (Dadlani, De Goede, Kakkar, Manuel, Van Woersem).
	Meeting with CHETNA (Kakkar, Van Woersem).
23 March	Transfer and site visit to Santalpur and Sami Harij project area (Singh, Zevenbergen).
	Meeting with staff GWSSB (Dadlani, Manuel).
	Meeting with CEE (Kakkar, Van Woersem).

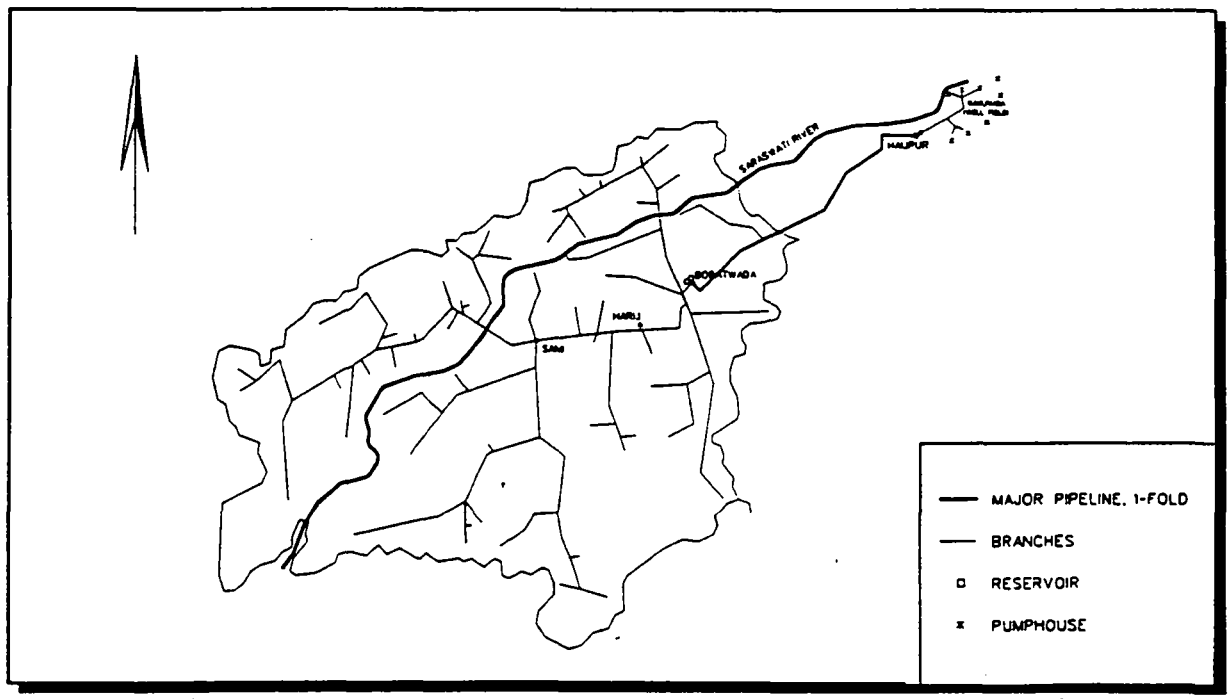
	Meeting with ESI (Kakkar, Van Woersem).
	Meeting with FPI (Kakkar, Van Woersem).
	Site visit to Santalpur and Sami Harij project area and transfer to Ahmedabad (Singh, Zevenbergen).
24 March	Transfer to Bhavnagar, site visit to Shetrunji dam and meeting with Collector Bhavnagar District (De Goede, Kakkar, Manuel, Van Woersem).
25 March	Site visits to Lathi-Liliya and Lathi-Liliya-2 project areas and meeting with Collector and Health officers Amreli District (De Goede, Kakkar, Manuel, Van Woersem).
26 March	Site visit to Ghogha project area, meeting with Collector Bhavnagar District, District Development Officer and President District Panchayat. Transfer to Ahmedabad (De Goede, Kakkar, Manuel, Van Woersem).
	Meeting with World Bank Cell (Singh, Zevenbergen).
	Meeting with Chairman and staff GWSSB (De Goede, team).
	Departure Mr. De Goede.
27 March	Meeting with SEWA (Kakkar, Van Woersem).
	Report writing (team). Departure Mr. Dadlani.
28 March	Holiday.
29 March	Meeting with Chief Secretary (Kakkar, Manuel, Van Woersem).
	Meeting with Secretary Rural Development (Kakkar, Manuel, Van Woersem).
	Meeting with Member-Secretary and staff GWSSB (Kakkar, Manuel, Van Woersem).
	Meeting with Financial Controller GWSSB (Singh, Zevenbergen).
30 March	Meeting with Financial Controller GWSSB (Singh, Zevenbergen).
	Report writing.
31 March	Arrival Mr. Flik.
	Discussions with Mr. Flik (Kakkar, Manuel, Van Woersem).
1 April	Wrap-up meeting with all implementing parties and Mr. Flik (team).
	Final meeting with Secretary water, staff GWSSB and Mr. Flik (team).
	Transfer to New Delhi (team).
2 April	Debriefing with Mr. Flik (team).
	Debriefing meeting with Mr. Sivanandan, Ministry Rural Development (Kakkar, Manuel, Van Woersem).
	End of activities in India.
7 April	Debriefing at DGIS (Manuel, Van Woersem).
6 May	Meeting with Haskoning (Manuel, Van Woersem).
10 May	Submission of draft report.

APPENDIX 5

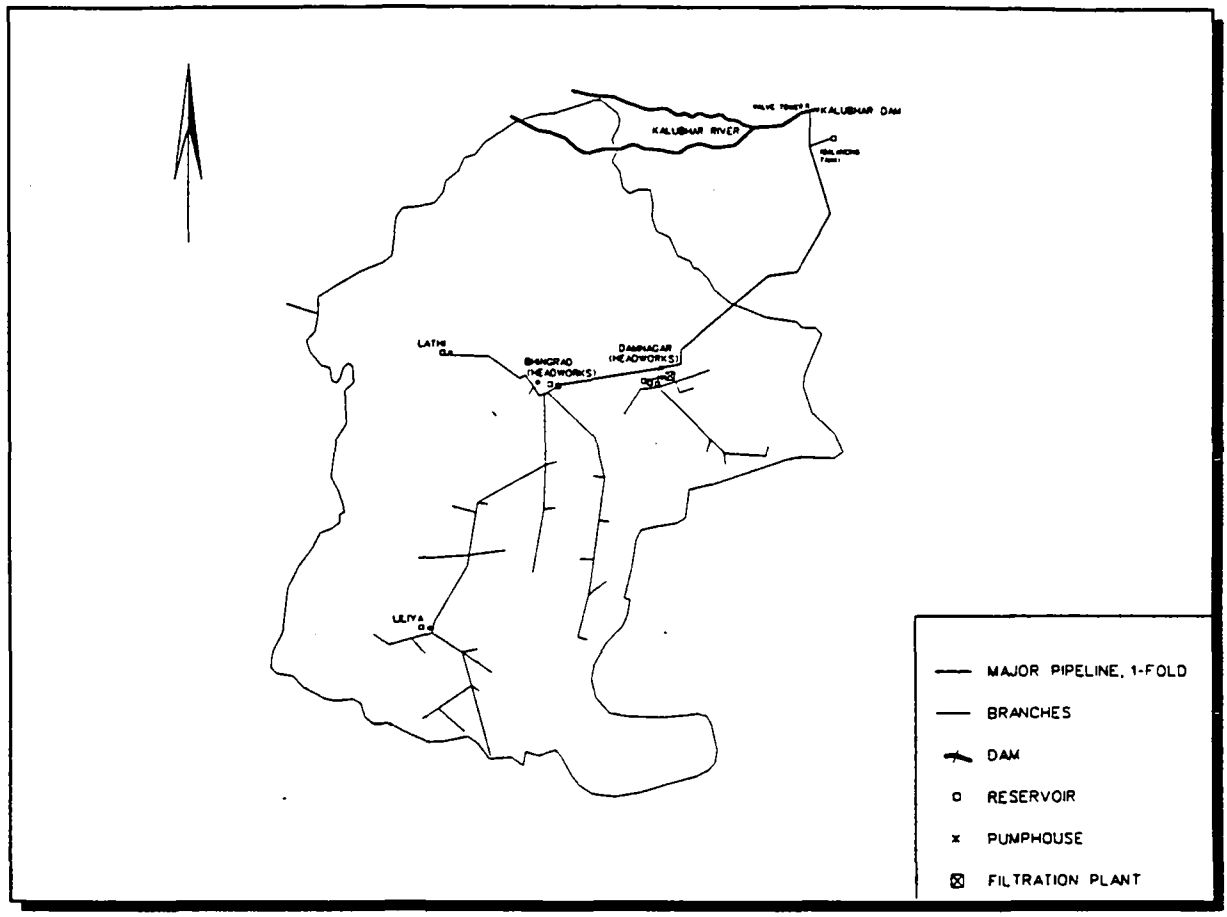
DETAILED MAPS OF PROJECT AREAS



Santalpur project area **(Source GU-27)**



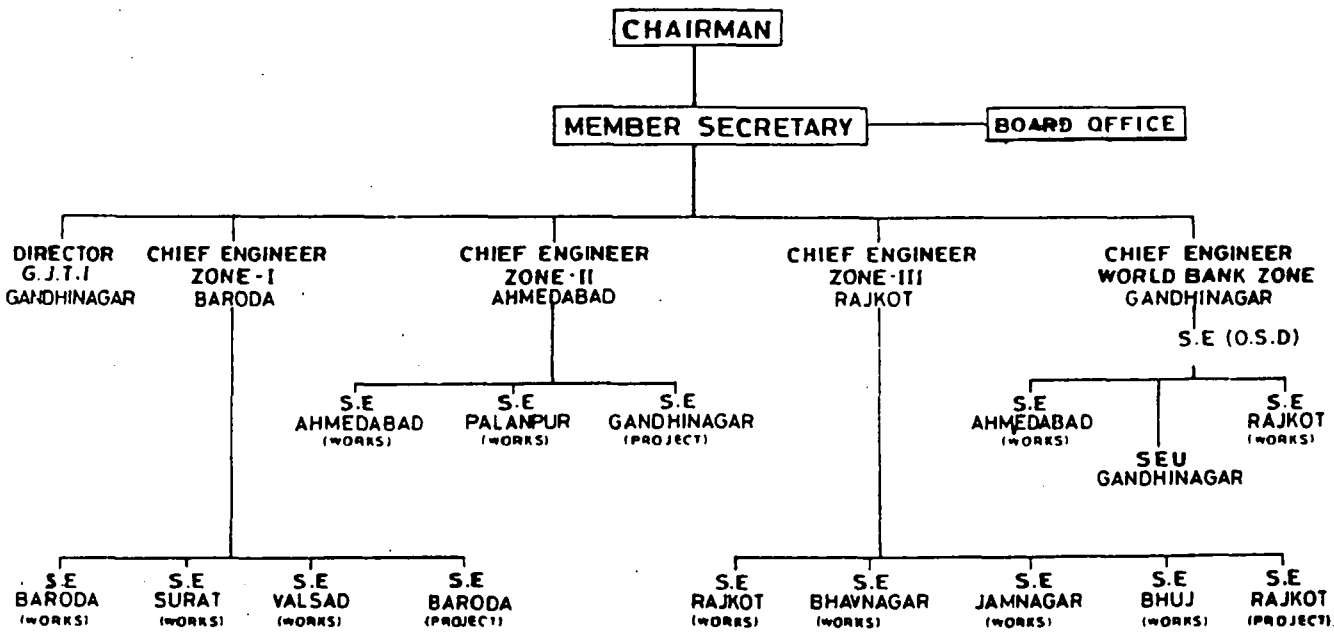
Sami-Harij project area **(Source GU-27)**



Lathi-Liliya project area **(Source GU-27)**

ORGANIZATION CHART GWSSB

GUJARAT WATER SUPPLY AND SEWERAGE BOARD, GANDHINAGAR
STATE : GUJARAT, INDIA.
ORGANIZATION STRUCTURE



PLAN BUDGETS WATER SUPPLY AND SANITATION

1. NATIONAL PLANS

All-India expenditures for water supply and sanitation over the period 1980 until 1992 and budget for 1992-1997. Yearly averages, in current prices (Rs billion).

	Sixth Plan 1980-85	(%)	Seventh Plan 1985-90	(%)	Annual Plans 1990-92	(%)	Eighth Plan 1992-97	(%)
Central Plan								
- Urban	n.a.	n.a.	0.01		0.3		0.4	
- Rural	1.8	(0.8)	3.8	(0.9)	6.1	(0.9)	11.0	(1.3)
Sub-total	1.8	(0.8)	3.81	(0.9)	6.4	(0.9)	11.4	(1.3)
State Plans								
- Urban	2.9	(1.2)	5.1	(1.2)	8.1	(1.3)	11.0	(1.3)
- Rural	3.3	(1.4)	5.2	(1.2)	7.4	(1.1)	10.5	(1.2)
Sub-total	6.2	(2.6)	10.3	(2.4)	15.5	(2.4)	21.5	(2.5)
Total, yearly averages	8.0	(3.4)	14.1	(3.3)	21.9	(3.3)	32.9	(3.8)
Total Plan	40.0	(3.4)	70.5	(3.3)	43.8	(3.3)	164.5	(3.8)

Notes: - figures shown between brackets are percentages of total plan.
- n.a. not available, but negligible.

Sources: Seventh and Eighth FYP, GOI and World Bank

2. STATE PLANS

State of Gujarat expenditures for water supply and sanitation over the period 1980 until 1992 and budget for 1992-1997. Yearly averages, in current prices (Rs million).

	Sixth Plan 1980-85	(%)	Seventh Plan 1985-90	(%)	Annual Plans 1990-92	(%)	Eighth Plan 1992-97	(%)
Normal Plan								
Urban	80.4	(1.1)	119.2	(0.9)	47.5	(0.3)	182.0	(0.8)
Sub-total	80.4	(1.1)	119.2	(0.9)	47.5	(0.3)	182.0	(0.8)
Rural								
- Min. Needs Program	129.8	(1.7)	264.5	(2.0)	500.7	(3.0)	660.0	(2.9)
- ARWSP	54.1	(0.7)	154.1	(1.2)	135.7	(0.8)	200.0	(0.9)
Sub-total	183.9	(2.4)	418.6	(3.2)	636.4	(3.8)	860.0	(3.8)
Total Normal Plan, yearly averages	264.3	(3.5)	537.8	(4.1)	683.9	(4.1)	1,042.0	(4.6)
Scarcity Programme								
Urban	n.a.	(-)	133.1	(1.0)	90.5	(0.5)	-	(-)
Sub-total	-	(-)	133.1	(1.0)	90.5	(0.5)		
Rural	n.a.	(-)	314.0	(2.4)	389.0	(2.3)	-	(-)
Sub-total	-	(-)	314.0	(2.4)	389.0	(2.3)	-	(-)
Total Scarcity Progr., yearly averages	n.a.	(-)	447.1	(3.4)	479.5	(2.8)	-	(-)
Grand Total WS/S	1,322	(3.5)	4,925	(7.5)	2,327	(6.9)	5,210	(4.6)

Notes: - figures shown between brackets are percentages of total plan.
- n.a. not available, but negligible.

Sources: GWSSB and Eighth FYP, GOG

ANNUAL ACCOUNTS GWSSB

PROFIT AND LOSS ACCOUNT
1987 TO 1992 (Rs IN Millions)

SR NO.	PARTICULARS	YEARS 1987-88	1988-89	1989-90	1990-91	1991-92
	INCOME					
1	Recovery of Centage	147	181	162	146	196
2	GOG:For Administration charges	23	28	110		80
3	Boring charges charges and lab fees	32	32	39	30	33
4	Sale of water	12	17	23	17	15
5	Other Income	40	37	34	23	46
		254	295	368	216	370
	EXPENDITURE					
1	Payment/provision for Employees	118	131	153	159	200
2	O & M charges for scheme,rigs,survey lab	43	49	56	57	80
3	Office Expenses	68	78	79	87	118
4	Depreciation	23	26	23	21	20
	PROFIT/LOSS(-)	2	11	57	-108	-48
		254	295	368	216	370

BALANCE SHEET 1987-92(Rs.in Millions)

SR. NO.	DETAILES	YEARS 1987-88	1988-89	1989-90	1990-91	1991-92
	LIABILITIES					
1	OWN FUNDS	12	12	12	12	12
2	GOG:GIA RESERVES & SURPLUS.	212	248	422	117	133
3	LOANS FROM GOG.	165	168	93	360	509
4	DEPOSITS FOR WORKS (NET)	927	653	616	648	771
	TOTAL	1316	1081	1143	1137	1425
	ASSETS.					
1	FIXED ASSETS.(NET)	138	156	163	157	165
2	INVESTMENTS.	4	10	10	10	10
3	CURRENT ASSETS. LOANS OR ADVANCES.					
	(a) INVENTORIES.	124	82	56	178	224
	(b) SUNDRY DEBTORS.	22	30	39	30	31
	(C) CASH AND BANK BALANCES.	906	597	800	573	765
	(d) LOANS AND ADVANCES	345	405	445	585	689
		1397	1114	1340	1366	1709
4	Less:-CURRENT LIABILITES.	223	200	370	396	459
5	NET CURRENT ASSETS.	1174	914	970	970	1250
	TOTAL	1316	1080	1143	1137	1425

MANAGEMENT STRUCTURE

The tasks and responsibilities of the various committees and units involved in the implementation of the 5-year NA programme 1993-1997 will be as described below.

A. STATE STEERING COMMITTEE

1. To approve a comprehensive five-year programme, project documents for 3rd generation batch schemes as well as annual work plans and financial plans.

2. To delegate responsibilities for the day-to-day implementation and monitoring to various leading parties involved in the programme (GWSSB, SEWA, CEE, ESI, District authorities);

3. To delegate day-to-day responsibilities for the preparation, supervision, coordination and overall monitoring of the comprehensive five-year plan and the plans of operation for the 3rd batch projects to the State Programme Management Unit (SPMU);

4. To seek approval for major plan components from competent State and Central level authorities and to brief these authorities on progress made;

5. To mobilize funds at State level if and when appropriate;

6. To meet on a quarterly basis as a minimum to discuss quarterly and annual progress reports and other special reports as prepared by the SPMU;

7. To discuss major policy issues and the overall direction of the programme and to pursue these issues at State level if deemed necessary;

8. To serve as a forum for resolving issues which cannot be resolved at an operational level;

9. All major parties involved in the programme will be represented in the State Steering Committee. This will include the Collectors of the Districts in which activities are planned or ongoing. The WACO of the Royal Netherlands Embassy will have an observer status within this committee. The team leader of the Programme Management Unit will be secretary of the State Steering Committee.

B. STATE PROGRAMME MANAGEMENT UNIT (SPMU)

Key functions:

1. Carrying out day-to-day responsibilities related to the preparation, implementation and monitoring of the 5-year programme as delegated by the State Steering Committee;

2. The SPMU will monitor and verify whether all elements as described in the plans are being executed as agreed upon;

3. In case elements are not executed according to the plans, the SPMU will take immediate action to rectify the situation. Actions taken will immediately be brought to the notice of the State Steering Committee and the Royal Netherlands Embassy;

4. To authorize all financial claims for payment by GON. Claims from the SPMU for its own activities will be sent to RNE for authorization;

5. The SPMU will delegate certain responsibilities to the District Supervisory Units after written agreement on the division of tasks between these two levels has been obtained from the State Steering Committee.

Additional functions:

6. To install an overall project management system, which shall cover, among others, internal SPMU operating procedures, working arrangements with parties involved, mechanisms for funds flow, monitoring and evaluation as well as a response mechanism to field concern and mechanisms of operational decision making;

7. To review plans, designs and proposals from parties outside SPMU related to specific programme components and inform the Steering Committee on these issues;

8. To prepare quarterly progress reports for the State Steering Committee and the RNE. These should cover progress made, constraints met and actions taken or proposed;

9. To make recommendations to the State Steering Committee and the RNE about major policy issues, options, strategies and major future programme operations to attain long term and medium term programme objectives;

10. To facilitate and stimulate the collaboration and integration of various GOG and NGO parties at all levels;

11. The SPMU will consist of expatriate and Indian staff to be appointed by the RNE in close collaboration with the State Steering Committee. The SPMU will be financed from Netherlands funds. All major parties involved in the programme will make available one staff member on secondment to the SPMU.

C. DISTRICT STEERING COMMITTEES NA PROGRAMME

1. To monitor progress made in the preparation and planning of new activities;

2. To monitor the implementation of individual schemes and to coordinate activities of various parties involved at district level;

3. To mobilize funds at District level if and when appropriate;

4. To take up all tasks delegated by the State Steering Committee towards District level.

5. The District Steering Committees will consist of the relevant District Authorities, representatives of the Taluka and Village Panchayats involved in the project and representatives of the major implementing parties. The team leaders of the District Project Supervisory Units will be secretaries of the District Steering Committees.

D. DISTRICT PROJECT SUPERVISORY UNITS (DPSU)

1. To take up all tasks as delegated by the SPMU;

2. To verify financial claims for payment by GON and to have these claims rectified if and when necessary;

3. The DPSUs will consist of Indian staff appointed by the SPMU and staff from local Government and major implementing parties on secondment.

DRAFT TERMS OF REFERENCE PLANNING CONSULTANT

1 INTRODUCTION / BACKGROUND

(.... description and history of NA programme in Gujarat ....)

The present approach is supply driven and results in a "blanket" coverage of a large number of villages with identical water supply facilities. This approach has obvious draw-backs:

- villagers are not really involved in planning, design and implementation. They are not asked to agree with any conditions before the system is implemented. This leaves nearly the full burden for operation & maintenance on the shoulders of the GWSSB. This situation is both inefficient and unsustainable;
- the approach does not take into account the existing water sources and may thus result in too expensive systems.

In the present project a need driven, community based approach is envisaged.

2 OBJECTIVES

The immediate objective is to prepare, together with the various parties involved, a development plan for improving water supply and sanitation in the villages in the project area. Furthermore, to arrange for health education, grass root level institutional strengthening (developing management capabilities) and income generating activities, specially for women.

The development objective is to improve the living conditions in the project area in a sustainable way through improved health and additional income.

A key element is the empowerment of women with income generation for women as an entry point (where relevant) and through full and active participation of women in the Pani Panchayats.

3 APPROACH

It is the intention to arrive at a plan that:

- addresses realistic and felt needs of the population in the fields of (i) drinking water supply for humans and cattle, (ii) environmental sanitation and (iii) income generation for women;
- ensures sustained use, operation and maintenance of facilities proposed;

- covers the short term needs and takes into account the possibility of addressing the long term needs.

These requirements entail that:

- villagers, particularly women, are involved in all steps of decision making;
- villagers are provided at the proper moment with all information required to arrive at realistic decisions;
- facilities to be provided are maintainable at village level, preferable by the villagers and from their own budgets. The operation & maintenance of the main components of a regional water supply system would remain the responsibility of the GWSSB;
- village water committees (Pani Panchayats) are (eventually) set up on a legal basis to take care of implementation at village level, operation & maintenance of village facilities and revenue collection;
- the full costs of services to be provided by the GWSSB can and will be recovered from the villagers. This may be achieved through a step by step approach, but with definite and realistic milestones. Village level costs will be dealt with at the village level itself.

4 ACTIVITIES

4.1 Mobilization

- Setting up of an office in the project area;
- Recruiting / induction of Indian members of the core team.

4.2 Methodology development

In the initial phase the methodology to be used in the planning shall be developed. This shall include the following elements:

- develop standard working methods for village level planning activities, involving various parties such as GWSSB, Health Authorities and NGOs;
- define a model socio-economic profile to be made for each village. Collect and enter data available from statistics;
- develop an efficient and effective way to prepare maps scale 1:2,000 giving full details of buildings and land use in each village. The use of satellite images or aerial photographs for preparing the base maps shall be considered.
- identify, collect and if necessary develop standard tools for village level activities, such as information and demonstration materials, questionnaires for data collection etc.;
- define the number of visits required per village and the activities to be undertaken and achievements expected during each visit. The number of visits to each village shall not be less than 5. Enough time should planned between visits to allow proper digestion of information provided and to reach well founded decisions;

- setting up a data base structure geared to the amount and type of information to be generated;
- identifying, collecting and if necessary developing design standards and standard designs for village level facilities;
- drafting standard contract conditions for contracts between the village authorities and the GWSSB and NGOs;
- develop a legal framework for Pani Panchayats;
- define price setting and prepare standard contracts for water supply to villages by the GWSSB through regional pipes schemes;
- prepare a clear description and time schedule of all activities to be carried out in the planning period. This should include a "rolling programme" of the envisaged visits to all villages in the project area.

A ground water map will be made available to the consultant before the start of the project. This map will indicate the quantities and qualities of ground water that can be abstracted in the project area and the depth and method required.

4.3 Village level planning

It is expected that at least 5 visits per village are required. Villages that in the first two visits do not show interest or have no needs, are excluded from the programme. Attention should be given to the availability of the villagers; this may entail work in the evenings. The following activities should be included:

- introducing the programme to all villagers. Special attention should be given to women who will be the main users of new facilities. Information may already be provided before the first visit to the village takes place;
- preparing village authorities for activities at village level and for decisions to be taken by them;
- raising awareness of the population for water supply, sanitation and hygiene;
- identify and discuss with a large and representative section of all villagers the short-comings of the present water supply and sanitation situation. Separate meetings should be organized for women;
- make an inventory of existing and potential sources of water;
- collect data for the socio-economic profile of the village socio-economic profile (income, employment, caste etc.) and for the village maps;
- start training potential members of Pani Panchayats;
- develop a limited number of scenario's for improving the water supply and sanitation situation. These scenario's should take into account the possibility to retain, rejuvenate or protect existing or sources. Possibilities for desalination and defluoridation, either on a single village scale or on multi village scale, shall be considered. Describe the

financial, operational, organizational and other consequences for each scenario. Special attention should be given to the effects on the position of women in each scenario;
- present the scenarios in manner that is easily understood and them with the village authorities. Ensure that in making choices a large and representative number of villagers is involved;
- assist in arriving at a selection from the scenario's and draft an agreement or agreements for the implementation of the same with the various parties involved. Agreements should clearly spell out the rights and duties of the parties involved.

It is expected that for each village a period of about 3 months is required to complete these tasks. Two or three teams each of 3 to 4 persons would be required for this field work. The composition of the teams will vary according the stage of planning. The team leader of each team would be employed by the consultant. Further members of the teams would be on deputation from the following organizations:
- from the GWSSB for technical matters of water supply and water quality;
- from the District Government for legal and institutional matters;
- from the District Health Authorities for health aspects;
- from an NGO like SEWA or CEE for community organizing and training;
- from an NGO like ESI for sanitation.

4.4 Overall plan

From the village plans, the total long term water demand for a regional water supply scheme shall be derived. This information will be provided to the GWSSB and will serve as input for the latter in preparing a design for such system.

Based on all information acquired an overall plan for all activities shall be drawn up. This shall include a time schedule of all activities, indicating the parties to implement these activities, the source of funding, the contractual arrangements to be made etc.

5 REPORTING / MONITORING / EVALUATION

The consultant shall prepare two-monthly progress reports. A standard format shall be used including sections on:
- actual vs. planned progress;
- constraints encountered and solutions found or proposed;
- financial situation;
- detailed work plan for the coming period.

The results of the methodology development phase shall be subject to approval by the client.

Monitoring or supervision of the consultants' activities will be done by the State Level Steering Committee, the RNE (or its appointed consultant) and by the State Programme Management Unit as soon as it is established.

6 STAFFING AND TIME SCHEDULE

It is estimated that for one project area consultants' staffing will include at least 3 long term experts and a total of 6 person-months of short term experts. Disciplines to be covered by the long term experts include:

- community organizing;
- sanitary engineering;
- working knowledge of geohydrology;
- women and development;
- health and hygiene;
- planning and management.

The experts shall be expatriate and Indian. The consultant shall make his own arrangements for office and logistics.

The total time for the consultants' activities will be one year. This includes a period of about 3 months for the methodology development as mentioned under section 4.2.

Already during the planning period implementation by NGOs and villagers can start:

- income generating activities if required;
- training of (potential) member of the Pani Panchayats e.g. in management and organization skills;
- implementation of village level water supply and sanitation facilities.

As soon as sufficient information is available, the final design fro a regional scheme can be taken up by GWSSB. The consultant shall make the necessary arrangements for such activities.

COST ESTIMATE 5-YEAR NA PROGRAMME 1993-1997

TABLE	Cost estimate NA programme 1993 - 1997 (in Dfl million)		
Description	Services	Physical works	Total
1st and 2nd batch villages			
- Completion of 2nd batch water supply schemes.	p.m.	p.m.	p.m.
- Village level back-up water supplies. Total rural population approx. 500,000. Per capita investment assumed at Dfl 10 per capita for improving / developing local sources. Planning by SEWA (Santalpur and Sami-Harij) and CEE (Lathi-Liliya) with assistance from RSM. Implementation by the Board from remaining budgets 2nd batch projects.	0.3	5.0	5.3
- Latrine construction. Total about 80,000 households. 25% coverage. Total 20,000 latrines @ Dfl 400. Cost of planning and supervision included in this amount.	0	8.0	8.0
Sub-total	0.3	13.0	13.3
Ghogha area			
- Geohydrological study and needs assessment. Preparing practical maps with basic geohydrological data from available information and limited field surveys. Field study to assess area most in need of improved water supply. By RSM with assistance of local organization.	0.1	0	0.1
- Integrated plan and community development. International consultant with at least 3 full time experts during 1 year.	2.0	0	2.0
- Plan implementation. Assuming total population of 400,000 and investments at Dfl 50 per capita. This includes cost of NGOs for latrine programme, health education, income generation etc.	0	20.0	20.0
Sub-total	2.1	20.0	22.1
Lathi-Liliya-2 and Ambaji-Danta areas			
- Study Thebi dam. Determining reliable yield by RSM.	0.1	0	0.1

- Needs assessments. Field surveys to establish to establish the areas most in need of improved water supply. By local organization.	0.1	0	0.1
- Geohydrological studies. (See Ghogha)	0.1	0	0.1
- Integrated plans and community development. International consultant with at least 4 full time experts during 1 year.	3.0	0	3.0
- Plan implementation. Assuming total population of 500,000 and investments at Dfl 50 per capita. This includes cost of NGOs for latrine programme, health education, income generation etc.	0	25.0	25.0
Sub-total	3.1	25.0	28.1
Institutional			
- Programme Management Unit and Project Supervisory Units. Staffed by consultant and government staff on secondment. Programme Management Unit during 3.5 years with 2 expatriates. 2 Project Supervisory Units for each 3 years staffed with Indian experts.	4.0	0	4.0
- Government institutions. Costs incurred for inputs by government organizations, e.g. Health Department. Estimate.	0.5	0	0.5
Sub-total	4.5	0.0	4.5
Grand total	10.0	58.0	68.0

ABBREVIATIONS

CEE	Centre for Environmental Education
CHETNA	Centre for Health Education, Training and Nutrition Awareness
Dfl	Dutch Guilder
DWCRA	Development of Women and Children in Rural Areas
ESI	Environmental Sanitation Institute
FPI	Foundation for Public Interest
GO	Government Organization
GOG	Government of Gujarat
GOI	Government of India
GON	Government of the Netherlands
GU-..	Progress reports by the RSM. See Appendix 2 for list.
GWSSB	Gujarat Water Supply and Sewerage Board
HDPE	High density polyethylene
IHE	Institute for Hydraulic and Environmental Engineering in Delft
lcd	litres per capita per day
Mld	Million litres per day (=1,000 m^3 per day)
NA	Netherlands Assisted (rural water supply programme).
NGO	Non-Governmental Organization
O&M	Operation & maintenance
Pani Panchayat	Village level water committee
PVC	Polyvinyl chloride
RNE	Royal Netherlands Embassy New Delhi
Rs	Indian Rupee
RSM	Review and Support Mission
RWS/S	Rural Water Supply and Sanitation
SEU	Socio-economic unit
SEWA	Self Employed Women's Association
Taluka	Administrative level between district and village
WS/S	Water Supply and Sanitation