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57305
November 20, 2000

Support for Rural Water Supply Project (SURWAS)

Rural Water Supply & Sanitation Specialist. Internal Project Assessment

Mission report, October 2000

Client **General Authority for Rural Electricity and Water, Republic of Yemen**
Government of the Netherlands, NEDA, Royal Netherlands Embassy in Sana'a

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- ISO-9001: for the organisation wide quality management system;
- STERLAB: for the activities of our Environmental Laboratory and Technical Environmental Services (accreditation number L51 resp. L152);
- VCA*: the safety management system for Technical Environmental Services

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Abbreviations

BO	Branch Office
BOIS	Branch Office Implementation Support (project)
FY	Financial Year
GAREW	General Authority for Rural Electricity and Water
GON	Government of the Netherlands
GOY	Government of Yemen
HQ	Headquarters
IWSP	Integrated Water supply and Sanitation Project
LHP	Local Health Promoter
MYR	Million Yemeni Ryal
NGO	Non-Governmental Organisation
O&M	Operation & Maintenance
PMA	Planning and Management Assistance Unit (in GAREW)
RNE	Royal Netherlands Embassy
RWS&S	Rural Water Supply & Sanitation
SPU	Social Participation Unit (in SURWAS)
SURWAS	Support for Rural Water Supply (Project)
ToR	Terms of Reference
TWP	Tihama Water Project
US$	United States Dollar
YR	Yemeni Ryal

1 Introduction

The Terms of Reference (see appendix 1) requested to assess:

- the SURWAS implementation methodology as applied since mid 1999 vis à vis the sustainability of the installed water supply and sanitation facilities, community participation, service level and speed of implementation;
- the perspectives to integrate the SURWAS approach in the GAREW Hudaydah Branch Office (BO) working methods;
- the possibilities of integrating SURWAS project staff (including GAREW counterpart staff) in that BO, and
- to present recommendations so as to avoid the shortcomings of the handing over of project activities and assets in Dhamar Governorate to GAREW in 1997.

The mission studied a multitude of SURWAS reports and documents, project evaluation and reformulation reports, RNE policy documents and year plans, GAREW documents, and visited a number of project sites (GAREW and SURWAS) in Hudaydah and Dhamar Governorates. The mission also conducted in-depth interviews and held elaborate discussions with GAREW BO Management and staff in Hudaydah and Dhamar, as well as with all SURWAS key-staff in Hudaydah and Sana'a. The mission's itinerary is shown in appendix 2.

The objectives of the SURWAS project as reformulated early 1999 are in outline:

- implementation of integrated water supply and sanitation schemes;
- planning and management support to GAREW HQ and BO's;
- support for the establishment of a GAREW BO in Hudaydah.

Through a long process (since 1982, first in Dhamar and later on in Hudaydah), the implementation activities of the project have produced a number of important and valuable assets, which can be summarized as follows:

- Well over 65 functioning water supply schemes and sanitary facilities in Dhamar and Hudaydah Governorates, which to a large extent are managed by the communities resp. the households themselves.
- An approach for the delivery of sustainable community-owned RW&S systems and facilities which - through a process of social mobilisation, community participation, assistance in legal arrangements, and training in technical and financial management - can be operated and managed by the community itself.
- A team of approximately 20 highly motivated, experienced and competent executive staff for the implementation of the above approach. 50% of them are GAREW staff seconded to the project on leave of absence basis, and 50% attached to the project on contract basis. The other employees of the project are support staff.
- A well developed set of working procedures, engineering and supervision practices of high standard; tendering and contracting procedures; social survey and mobilisation techniques; well testing methods and training materials.
- An organized filing system (partially computerized), hosting a wealth of information.

Since mid 1997, the SURWAS project through its PMA-component in Sana'a, has also been active in supporting the BO's (and HQ) by the development in working groups of more general concepts and procedures for decentralized planning, budgeting and implementation of community-owned and -managed water supply and sanitation schemes. The results of these activities are not discussed here in detail (beyond scope of the TOR), but it is clear that the two components of the project are strongly interlinked and can have a very beneficial synergetic effect. Where appropriate, links between the two are indicated in this report.

Under the new sector-wide approach (SWA) of GON, the direct implementation activities of the SURWAS project must, with some flexibility in timing[1], come to an end. It would be a destruction of capital if the project would be terminated under similar conditions as occurred in Dhamar, from where - at the time of establishment of the GAREW BO in mid 1997 - all executive SURWAS staff had already been transferred to Hudaydah. The challenge is thus to find ways and means to preserve and re-deploy the above assets of SURWAS to the benefit of the development of the rural WS&S sector in Yemen as a whole.

Chapter 2 of this report describes the results of the mission's assessment of the implementation methodology as applied by the SURWAS project since its introduction by mid 1999. A preliminary judgement on the suitability of this approach to be integrated in the working methods of the GAREW Hudaydah Branch Office is presented in Chapter 3.

The nature and extent of future support activities by the SURWAS- and/or a successor-project very much depend on the size of the BO's operations. Therefore, an analysis of that scope was made on the basis of available data on the existing water supply and sanitation situation, and on planning and budget figures of the Hudaydah BO. The results are described in Chapter 4.

Useful conclusions can also be drawn from the experiences of the Dhamar Branch Office which has developed in the past three years without any support from the SURWAS project. Chapter 5 presents a summary of these experiences, on the basis of discussions with the BO management and staff.
In the light of further assistance to the rural water supply and sanitation sub-sector development as a whole, suggestions are given in Chapter 6 for an optimal valorisation of the built-up knowledge and experience of the present SURWAS staff.
The report is concluded with recommendations on activities of the SURWAS project during the remaining period of the year 2000 and during a recommended 'Bridging Phase' (year 2001), in preparation of a new longer term support project for the GAREW Branch Offices on implementation level. These are summarized in Chapter 7.

[1] As indicated by RNE Sana'a during briefing of the mission.

2 Assessment of SURWAS Implementation Methodology

2.1 Progress

1. During the Inception phase of the reformulated project, (2nd of 1999) the social mobilisation activities of the SPU have been thoroughly revised and streamlined into a more systematic approach geared towards the main tasks of the project : water supply and sanitation. Establishment of General Committees and election of Supervisory Committees with nominated executive staff (operator and accountant) have replaced the previous more or less random approach of traditional village leaders forming a water committee. Project policies with regard to purchase and installation of water meters have been revised. More recently, trainings for scheme operators and for village accountants has been conducted, introducing simple bookkeeping methods. Also a billing system, easily applicable on village level, has been introduced.

2. Until mid 1999, not much attention had been paid by the SURWAS project to the issue of sanitation, and more in particular to the integration of water supply and sanitation. Emphasis had always been on the implementation of water supply projects, with occasionally a sanitary facility (public toilet and/or washing place) near the mosque in a village. In a different sense, and at the same time serving other purposes, the project did however contribute to help preventing the generally unsanitary conditions at public standposts (pools of stagnant water) by the introduction of house connections in the water supply projects.

3. It was only after the redefinition of the SURWAS project, and in particular after the arrival of the sanitary engineer in October 1999, that a systematic approach for sanitation at the household level was developed, in conjunction with water supply. As a matter of fact, one can now speak of truly integrated water and sanitation projects in the new project villages.

4. There is a very positive attitude amongst all project staff to continuously analyze, evaluate and further improve the working methods, aiming at higher efficiency (proper use of available resources) and higher effectivity (sustainability of systems, impact on development). As one staff member mentioned: 'SURWAS is a school where things are learnt by doing'.

5. An overview of completed and ongoing SURWAS projects as per 01-10-2000 is presented in Appendix 3.

2.2 Methodology

1. Since the start of implementation of the new approach by mid 1999, only a limited number of schemes has been fully completed along those lines. Three schemes were selected for a comparison with three earlier completed schemes in Tihama[2]. Selection criteria were size of population, size of scheme, socio-economic conditions, the initial attitude towards the water project, and the anticipated

[2] The projects concerned are TWP-104 (Al Bokariah), TWP-118 (Dir Maqbooli), TWP-89 (Al Meghlaf), and TWP-43 (Al Janadiah), TWP-82 (Al Homarah), TWP-88 (Al Khalifa & Al Doman) respectively.

community participation as far as could be deducted from the first surveys in the villages.

2. Because the sample is small and only rough comparisons can be made (impossible to find earlier schemes with exactly similar conditions) the conclusions must be seen as indicative. The most important effects of the changes in approach on sustainability, community participation, service level and speed of implementation are given below. They are based on observations and interviews in the field, data in project files, and discussions with project staff.
   A questionnaire (see Appendix 4) was used to structure the analysis.

2.3 Findings and conclusions

1. The introduction of the new systematic approach as well as the new project management have created an atmosphere of mutual understanding and appreciation of each staff member's tasks, leading to much improved working relations within the project, in particular between the SPU staff and the Civil Section staff. This situation clearly has a positive impact on the overall performance of the project.

2. As far as sustainability of the systems is concerned, much has been improved in terms of community ownership and management. The community at large, committee members and executive staff are proud of their water supply and sanitation systems which are kept functioning well at affordable cost.

3. Users and operators report - and observations have confirmed - that the households receive water in sufficient quantity at sufficient pressure at any time; per capita consumption is approx. 20 liters per day; sanitary facilities are kept clean, do not smell and are used by all members of the family. Particularly women and girls have expressed their satisfaction with the acquired comfort and privacy. Time gain for the water drawers is considerable, in many cases leading to higher school attendance by the children.

4. Coverage can be considered very high: mostly over 95% for house connections and over 90% for latrines. This can mainly be attributed by the project's two-pronged approach of:

   - only providing a house connection if a latrine has been built, and
   - only supplying water if a certain percentage of house connections has been installed.

   Especially the combination of water supply, hygiene education and sanitation is expected to have a positive impact on the health conditions in the villages. However, since impact monitoring has not yet started (procedures are there, but schemes are too young), it is not yet possible to evaluate.

5. It is difficult to assess the influences of social mobilisation on village participation and organisation separately. Village participation and organisation are reported to have improved (shorter implementation time, better system management). The conclusion might be drawn that social mobilisation is more effective than before, but a generic higher degree of willingness to participate may just as well have caused this in some cases. Where disputes on individual participation used to lead to endless discussions with many different people in the village, these kind of situations are now generally dealt with by members of the supervisory committee, much to the relief of the project supervisors during construction.

6. The new social mobilisation methodology appears to be more efficient in terms of time and vehicle input of the SPU. Total intervention time and number of visits per village have decreased by an estimated 10-20%. This is mainly caused by the positive effect of organising village participation and hygiene education through official committees resp. Local Health Promotors (LHP) who are trained by the SPU staff. The new methodology has also resulted in decreased implementation time in the sanitation projects, and in a much lesser number of interventions after handing over of the project. This may have a positive effect on the suitability of the approach for integration in the GAREW methods of working.

7. The introduced election of the supervisory committee members provides the possibility of removing them from office in case of poor performance, either by the project during implementation or by the general committee in any case. This has already proven useful. The legal status of the village project organisation also offers the possibility to benefit from certain government subsidies. It is not known if this facility has already been exploited.

8. So far, the project has maintained the policy of demanding a relatively high degree of village participation in the implementation phase: provision of labour - except for elevated tanks - and locally available materials. When capitalized to market values, the village contribution may be as high as 15-20% of the total project costs, depending on the capacity of the village and the configuration of the system. In the case of sanitation, the household contribution is estimated at some 40-50%. However, the drive for maximum possible contribution may yet lead to implementation times which may not be acceptable anymore when scaling up activities.

9. House connections with water meter and payment per m3 have proven their usefulness: they create awareness on water use and help develop the financial/administrative management system. The percentage of connected households before scheme handing over has considerably increased, and has led to a shortening of implementation time. The earlier policy that households had to pay for the water meter (now free of charge) always resulted in lower coverage in the village, and in ever continuing disputes with individual villagers coming to the office later.

10. More discipline in payment and revenue collection has been created, and billing as well as bookkeeping have much improved notably after a training course in Hudaydah on 'Accounting for non-accountants'. In general, the revenues just cover the costs of O&M and management, but they do not yet cater for reserves in case of major repairs or replacements.

11. The project has recently adopted a policy and approach towards sanitation with the following elements:

- one contract with the committee instead of contracts with every household
- only house connection if latrine is installed
- visit to nearby 'demonstration' village
- sanitation promotion by trained male LHP's
- bonus for quick implementation

This policy has led to a considerable time gain in the provision of sanitary facilities on household level[3], to such extent that - contrary to earlier practice - the sanitation component is now more rapidly completed (with very high degree of coverage) than the water supply component of the integrated projects.

12. The sanitary facilities installed by the project are of appropriate design: simple pour-flush latrines as standard, and dry latrines with small-bore sewer for the liquids in case of proximity to the well. The size of the cesspits (big enough for about 15 years use without emptying or replacement) is largely dictated by the construction method under the unstable soil conditions in the project area. The costs of sanitation are still high in absolute terms: approximately 50 US$ per capita (including 50% household contribution), thus arriving at about the same level as the cost of water supply.

2.4 Recommendations

1. From a point of view of health impact, and in order to build up further experience with the integrated implementation of water supply and sanitation, it is recommended that this approach be continued in the remaining programmed villages within the limits of the available budget.

2. The project should address the relatively long implementation time for the pumping and distribution mains, for which trench digging, pipe laying and backfilling are done by the villagers under supervision of the project. Given the high overall level of village participation, also in other components of the scheme, the project may consider to have this work contracted out. This would render the methodology more in line with present GAREW practice (one of the concerns of the BO General Director), probably without jeopardizing the long term sustainability of the system. It is recommended that this method be tested in one or two villages on the GAREW BO list where preparation has not yet started.

3. The water supply systems in the Tihama are designed for a future demand of 60 l/c/d. However, in the majority of the villages (also those where schemes were installed some years ago), average water consumption appears to be in the order of 20 l/c/d. Once the population is used to the comfort of easy access to the water, this initial consumption rate may go up. Also the installation of sanitary facilities (particularly pour-flush latrines) will probably give rise to an increase in consumption, but no data are as yet available. The mission recommends to monitor water consumption closely because:

[3] The first sanitation projects started in Al Mighlaf and Dir Al Maqbooli in October 1999. It took one year to complete some 100 pour-flush and 30 dry latrines in Dir Al Maqbooli, and construction of the small-bore sewer for the dry latrines has only just started. The mentioned new policy/approach is now applied in Al Madafen and Al Mahabeeb, where sanitation projects started in July and September 2000 respectively. About 95% resp. 70% of the works had already been completed by 01-10-2000.

- something must be wrong if water consumption in villages with IWSP schemes is not higher than in villages with water supply schemes only;
- design criteria may need to be revised if initial consumption does not go up (risk of over-dimensioning and over-investment).

4. In the case of integrated water and sanitation projects, it is the project's internal policy to start providing the water only after some 90% of the households have constructed their latrine. The project may consider relaxation of this rather high figure somewhat. A sanitation coverage of 75% of the households will probably be sufficient to stimulate house owners afterwards to construct their latrines, even if they would then have to bear the full costs.

5. The project should undertake serious efforts to reduce the cost of sanitary facilities, in particular those of the more expensive components of the latrines and cesspits (e.g. the concrete cover). Cost reduction may also be achieved by the shared use of the relatively large cesspits by two households. However, if no cost reduction can be achieved by any possible means, the high costs should perhaps just be accepted: *in urban areas the cost for sanitation are usually two to three times higher than* those for water supply.

6. The mission recommends to continue the already started programme for improvement of the system of billing and revenue collection, and to promote deposits on village bank accounts to build up the necessary capital for future major repairs and replacements by the villages themselves.

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3 Integration of SURWAS Approach in GAREW Working Methods

3.1 Background

1. In the presently applied SURWAS approach, the WS&S schemes are for the largest part implemented by the beneficiary communities themselves. Only elevated water tanks and sometimes part of the pumphouse are constructed by contractors. Both are supervised by the project who supplies the materials (except for tanks) and also installs pumps and engines. The project assists the villages by social mobilisation activities, election of management committees, selection and training of village level executive staff, hygiene promotion by peer education, setting up of accounting and billing system etc. The ultimate objective of this assistance is that after handing over, the schemes can and will be operated, maintained and managed by the villages themselves, without further external support. The preliminary conclusions of the previous chapter indicate that this objective can indeed be achieved within a reasonable timespan and at reasonable costs.

2. By virtue of the ongoing decentralisation of the GAREW organisation, operational tasks that used to be or still are executed by Headquarters in Sana'a, are in the process of being delegated to the Branch Offices in the Governorates.
   Upto present date, practically all activities related to the provision of water supply (and to a limited extent sanitation) to the rural population were carried out by HQ. These included selection of villages, planning, budgeting, surveying, design, contracting of works, payments to contractors. The main task delegated to the BO's - after they came into existence - was the supervision of works. Gradually, however, also other tasks will be delegated.

3. Simultaneously and also under influence of the results and activities of SURWAS, the awareness is growing at GAREW (HQ and BO's) that its traditional approach towards RWS&S does not lead to long term sustainability of the systems, nor to independence of the villages from central or decentralized government. Daily experience at the BO's (see also chapter 5 on the experiences in Dhamar) points to the contrary. For that reason, a gradual move is being made by GAREW towards more involvement of the communities in the design, construction and management of the systems.

4. It should be recognized, however, that the project has developed this approach more or less in isolation from GAREW, in the relatively 'luxury' position of having sufficient financial, human and physical resources at its avail, and without being hampered by too many administrative and procedural constraints. In the short history of cooperation between SURWAS and the Hudaydah BO, the project was often more considered a competitor than a useful resource base. Not yet being familiar with the approach and the results thereof, the BO was initially quite reluctant as to implement its RWS&S schemes along the lines of SURWAS.

5. Although not always based on facts and figures, doubts prevailed at the Hudaydah BO about the effectiveness and efficiency of the SURWAS approach in terms of production capacity, speed and cost of implementation. Another serious preoccupation of the BO was whether the claimed project results really justified all the laborious project inputs and the high level of village contribution.

6. However, that situation has gradually changed: practical on-the-job training by SURWAS and joint field visits have convinced the BO management of the usefulness of the approach. The BO has now expressed its sincere wish to adopt the approach for all projects planned to be implemented from 2001 onwards, and parts of the approach are already being applied in a number ongoing BO projects. Despite all this, the BO still has to operate within the financial and administrative procedures of GAREW which do not (yet) allow for full implementation of the approach.

7. Several intensive meetings were held with the BO and SURWAS managements and senior staff in order to investigate the possibilities and constraints to integrate the SURWAS methodology in the BO operations. The entire chain of activities in the project cycle has jointly been scrutinized on its merits and deficiencies, and possibilities for simplification and/or contracting out of certain activities have been identified.

3.2 Findings and conclusions

1. Once the BO will have full autonomy, the main tasks below can be distinguished. Most of these tasks are also presently carried out by SURWAS, be it under different administrative procedures.

   a. planning, monitoring and evaluation
   b. budgeting and reporting
   c. financial and administrative management
   d. hydrogeological studies and well testing
   e. social mobilisation and establishment of Village Committees
   f. survey and design
   g. tendering and contract award for works
   h. supervision of works
   i. contract management
   j. pump/engine installation and training of operators
   k. enabling community management: training of committees and exec. staff
   l. procurement, storage and supply of materials
   m. materials quality control

2. It was concluded that for the realisation of water supply and sanitation facilities in the rural areas, in principle a balanced distribution of tasks between the BO, the communities and private sector (consultants and contractors) would be ideal in the future. However, there is still too little experience within the BO with the approach itself, and with the programming, coordination and control of all related activities. Once experience has been built up, such distribution of tasks can be reconsidered.

3. In principle, tasks d) through f) and h) through m) can be contracted out to consultants or NGO's; the latter could notably take care of tasks e) and k). However, for a number of reasons outlined below, this is not a realistic option as yet:

   - the BO prefers to keep tasks e) and k) in-house in order to establish and maintain contact with the population;
   - contracting of consultants will add to the costs of the systems;
   - the GAREW system does not (yet) provide the budgetary facilities for this purpose.

4. Part of the procurement, storage and supply of materials could also be included in the tasks of the contractor(s) selected for the execution of works. This would have the advantage to the BO of smaller required storage space, but it might have a negative effect on the efficiency and quality of the work. If there are guarantees for a proper control of contractors, this possibility can be considered.

5. Conclusion of the brainstorming and consultation sessions was that some of the works which are currently executed by the village under supervision of SURWAS, might just as well be contracted out, without jeopardizing the desired effects of village commitment towards ownership and management of the systems. This may particularly hold for the trench digging and pipe laying for the main pumping and distribution lines. The major gains would be:
   - considerably shorter implementation time (important when activities will be scaled up);
   - supervision of a contractor is more in line with existing GAREW practice than supervision of a community.

   Total implementation costs may slightly rise and physical village participation would be less, but it is expected that participation in other scheme components (pumphouse, reservoir, house connections, sanitary facilities) will be sufficient to guarantee sustainability of the schemes.

6. The claim of Hudaydah BO that projects carried out by SURWAS would cost more and would take more time than when executed by the BO, cannot be substantiated by any means. On the contrary, it appears over and again that the systems completed by SURWAS take considerably less time, even when full sanitation coverage is included. The SURWAS water supply schemes are also much more cost effective given the provided service level and the high degree of sustainability. Appendix 5 provides the details of a preliminary cost comparison.

7. Moreover, the traditional GAREW system of a budgetary spreading of works (well, pumphouse, reservoir, main pipelines) over a number of years (as shown in the five-year plan 2001-2005 in Appendix 6) has a very negative impact on the credibility of government interventions in general and on the commitment of the communities towards participation in and management of the water supply schemes.

8. The SURWAS project, its policies and approach are getting known in the communities of Hudaydah Governorate. For that reason, it can be expected that social mobilisation and village organisation activities of the project can gradually be reduced to a certain extent. This would remove some of the preoccupations of the BO management. However, a warning with this respect is in its place. Although largely standardized, the SURWAS approach is not a blueprint that can indiscriminately be applied under all circumstances. An example can be found in the case of Al Khanaws village[4].

[4] GAREW has constructed a large comprehensive scheme for the water supply of Al-Khanaws village with a population of approx. 30.000 inhabitants. In reality this village consists of some 50 to 60 subvillages which are all intended to be served by the scheme. The BO is considering operation and management of this particular scheme by the BO, since it may constitute an opportunity for income generation. The tribal structure of the village would also favour independent management. SURWAS has been requested to assist the BO in organising the villages for this purpose.

9. In a modified SURWAS/BO approach for integrated RWS&S (well construction included, reduced SPU interventions, main pipe laying contracted out, cost saving measures for sanitation), the per capita cost to the charge of the project/BO are expected to be in the order of 70 US$ all-in. This would still be less than the cost for water supply only along the traditional GAREW lines, with the inherent low service level and limited sustainability.

3.3 Recommendations

1. It is recommended that the project once more scrutinizes all steps of the approach and all components of the working methods in order to arrive at cost and time savings. This holds both for SPU (see if community mobilisation can be achieved with less interventions) and for the Civil Section (pipelines contracted out, cost savings on sanitation). After that, a pilot on the resulting modifications should be prepared and carried out in one or two villages, in close collaboration with the BO staff. The pilot should be carefully monitored and evaluated, including a detailed cost report. If found appropriate, the entire methodology should be documented and laid down in training modules, so that new BO staff to be recruited (but also staff of other BO's) will have easier access to the ins and outs of the approach.

2. Progress in production and dissemination to BO's of practical tools and instruments by the PMA working groups is understandably limited as yet, given the complexity of the entire decentralisation operation. Whilst discussing the perspectives for integration of the SURWAS approach in the Hudaydah BO, the need was felt for an intensified coordination of the SURWAS activities in Hudaydah and the SURWAS activities through PMA at GAREW HQ, in particular those of Working Groups 1 (planning, management) and 5 (decentralisation).

A number of observations have to be made on the situation:

1. Schemes may be so big or complex that the communities cannot provide the required management skills for operation, maintenance, billing and revenue collection (even after training). In such cases, an option might be the involvement of the private sector (water supply company), and different modalities (lease or management contract,...) could be investigated. A supervisory/regulatory and/or shareholders role of the BO could then be more appropriate.
2. The organisational set-up should be adapted to the technical design and vice versa. SURWAS, before embarking on any activity for social mobilisation and village organisation, should first get a better idea about the possible future technical set-up of the scheme. For example, will water be supplied and/or sold to the different villages in bulk? Should the villages have separate storage facilities for internal distribution? Will there be house connections? What will be the consequences for the capital and operational costs? Will a future company also participate in the capital costs? Etc, etc. And in the end, what will be the implications for the social mobilisation and village-level organisation?

3. A serious attempt should be made to change the budgeting method of the BO whereby construction of schemes is split up into smaller components. This practice is killing for community participation. The timespan should be reduced to a maximum of two budget years.

4. The mission recommends RNE to consider a further financial assistance to the BO for those components of the (modified) SURWAS methodology that were or could not yet be included in the BO budget for FY 2001.

5. Special assistance is recommended for the (re-)design and the set-up of an operations and management structure of the Al Khanaws water supply scheme.

4 Size of future Hudaydah Branch Office Operations

4.1 Key issues for operations management

1. According to the 1994 Census, there are some 2.300 villages in the Hudaydah Governorate distributed over 22 Districts, with a total rural population of 1.220.000. Extrapolated for an annual growth of 3%, the present rural population can be estimated at slightly less than 1,5 million. In 2010, the figure would be almost 2 million.

2. The water supply and sanitation inventory in the district of Al Mansuriyah, carried out by the project in 1999, indicates that only 25% of the population in that district has access to a functioning improved water supply system, and that the other 75% has either a non-functioning improved system or a traditional system or is without any system at all. Except for the above district, no systematic data is available on the actual water supply and sanitation situation in the governorate. The BO has admittedly no clue on real demand and priorities in the villages, and is thus in a very poor position for proper planning and budgeting as will be required from the BO's from next year onward.

3. Although it is not yet clear whether the figures in this inventory (summarized in Appendix 6) can be considered representative for the entire governorate, still some tentative conclusions can be drawn with confidence as to the order of magnitude of the tasks ahead for the BO. If the results of this inventory would be extrapolated for the entire governorate, work in varying degrees of urgency would be at hand in some 1.750 villages throughout the governorate, constituting a population of approximately 1,1 million today. Even with a budget and production capacity for 50 completed schemes per year (estimated at 5,5 million USD, 50 qualified staff of various professions, transport, office, etc) this would mean full-time occupation of the BO for the coming 35 years, to be followed immediately by a new round of extensions of systems, major overhauls etc.

4. There is no doubt that, apart from the necessary human and physical resources, proper planning and budgeting constitute the key factors for the success of these operations. Present practice and facilities at the BO are still far from appropriate, and the tools and instruments for that purpose are still under development (through PMA working groups), It is considered extremely useful if SURWAS-Hudaydah would assist the Branch Office in these matters.

4.2 Findings and conclusions

1. For the five-year plan 2001-2005, the BO has presented a tentative budget for works in 100 villages in total. The budget (in Arabic) and a summary (in English) are shown in Appendix 7. The list of villages was supplied by GAREW HQ, and was established on the basis of requests from the villages concerned or sometimes simply on order from above. That only 100 villages out of 1750 (less than 6%!) have appeared on the list of HQ, has probably much to do with the relatively low income level and the limited political influence of the people living in the Tihama coastal plain (the 100 villages are mockingly called the 'Tihama tigers'). The inventory in Al Mansuriyah district also indicates that just the bigger villages have an improved system, functioning or not. It is therefore very questionable whether provision of water supply to these 100 villages is really 'demand driven'.

2. The true demand (and willingness to pay) for improved water supply and sanitation in Hudaydah governorate is most likely much bigger than would appear from the figures supplied by GAREW HQ. This can only be verified by a complete inventory of the situation in all districts. Such inventory would not only be extremely useful for planning and setting priorities, but also for more realistic annual budgeting. Both in Hudaydah and in Dhamar, the BO managers have expressed the urgent need for district-wise WS&S inventories. Lessons can be learnt from the Al Mansuriyah inventory for further standardisation of field surveys, type and format of output data and unit prices of WS&S components.

3. Implementation budget for the year 2001 has been submitted by all BO's to HQ. The one for Hudaydah BO is given in Appendix 8. Rather than clubbing all BO budgets and HQ budget into one GAREW budget, HQ will now submit to the Ministry of Finance an overall budget with separate lines for each BO, and budget will be approved and allocated to each BO separately. Budgets for the village systems, however, were until now made up on the basis of studies which were reportedly carried out by HQ as far back as even 10-20 years. In many cases the BO managers do not know if and to what extent the cost estimates have been adapted to the present design criteria and price levels, and each estimate is thus potentially full of surprises.

4. Moreover, the implementation budget is still based on the traditional GAREW working methods, and is limited to the value of contracts for the execution of works (well drilling, pumphouse, reservoir, main pipes, public standposts). So far, the BO's are supposed to supervise these works, without being provided the required physical, financial and human resources to carry out this task. Operational costs related to implementation (transport costs, staff allowances, overhead, office costs) are not formally budgeted as yet (perhaps for the year 2002). Only very limited funds are made available by HQ in spite of extensive lobbying of the BO managers: for the year 2000, Hudaydah BO received 800.000 YR from HQ (sic!). Although income generating activities by the BO's are informally encouraged by HQ for compensating the shortages, they will firstly require a certain body of mainstream activities and secondly will have a negative influence on the size of the operational budget as will formally be allocated by HQ to the BO.

5. Consequently, a number of activities and physical elements which have proven to be essential for the sustainability of community-managed integrated WS&S systems, cannot be carried out by the BO as yet from the available budget:

   - community mobilisation, training of LHP's and hygiene education;
   - survey, design check and possibly re-design, pre-construction report incl. detailed cost estimate;
   - provision of distribution network, house connections and sanitary facilities;
   - training of scheme operators and financial managers at village level;
   - monitoring and evaluation.

6. Also the limited available funds for supervision of works may seriously jeopardize the technical quality of the works undertaken by contractors. GAREW salaries are very low, and field allowances are only paid after one upto three years or maybe never. Under such conditions, engineers and supervisors understandably experience great difficulties in remaining independent in their working relation with contractors who arrange their transport, lodging, food, etc. In this manner, GAREW staff is almost forced to loose professional integrity.

7. The BO managers both in Hudaydah and in Dhamar have many complaints about this situation, which is partially explained by the overall economic situation in the country, but to some extent can also be attributed to the many uncertainties and transition measures brought about by the decentralisation process.
PMA working groups at GAREW HQ make an effort to provide the BO's with the necessary institutional instruments and tools: mandate and powers, policies on RWS&S, budgeting -, planning -, tendering - and accounting procedures, organisational structure, design criteria, working methods, etc. But BO management is often at a loss regarding the formal status of those instruments.

8. Coordination on a number of issues seems to be sub-optimal. For example, this mission was told by the BO manager that no special budget lines were allowed by HQ for items such as community involvement, village level training, sanitation etc. However, at PMA level it was reported that HQ accountants had even travelled to the BO's to explain the new budgeting procedures, which would indeed allow for incorporation of the said items. Whatever the true story, it would have been very simple to coordinate with the project management of SURWAS for supporting the BO simultaneously on two levels: a) on concepts and procedures by SURWAS-PMA and b) on practical application by SURWAS-Hudaydah.

4.3 Recommendations

1. High priority should be given to further assistance by the project to the Hudaydah BO (and perhaps also those of Hajja and Dhamar) for the joint execution of the district-wise inventories (where necessary complemented by staff from HQ or local consultants). The exercise should preferably be completed before the budgeting sessions for the year 2002.

2. An enhanced coordination of the activities of SURWAS-Hudaydah and SURWAS-PMA is considered to have a positive synergetic effect on the support of the BO's. It is recommended that initial attention of these two branches of SURWAS will be given to the five already chosen pilot governorates: Hudaydah, Hajja, Dhamar, Ibb and Shabwah: support on theoretical concepts, management tools and instruments by PMA; and support in terms of field experience and practical application by SURWAS Hudaydah.

3. As a first step, SURWAS should assist BO Hudaydah (and Dhamar?) in the planning and budgeting exercise for FY 2002, which will take place in August/September 2001. Provision should be made for incorporation of all items pertaining to the SURWAS methodology or a suitably modified version thereof. Simultaneously, action should be taken by PMA to get budgeting procedures approved and implemented throughout.

4. Until the time has arrived that budgets for operational and implementation cost are somehow in equilibrium - and at least for the year 2001 - the mission recommends financial assistance by RNE to Hudaydah BO for those components in the projects which have not been (or could not be) budgeted for by the BO. These may comprise the costs for social mobilisation and community organisation, hygiene education and sanitation works, distribution networks and house connections in the villages, training of committees and executive staff on management of the systems. The SURWAS project may manage these funds on behalf of RNE.

5. In order to remove a number of the present uncertainties, it is strongly recommended that GAREW (with suggested assistance of PMA) prepares a time schedule for the different steps in the decentralisation of operational tasks to the BO's and in the restructuring of HQ organisation and tasks. The schedule may be different per BO, but that is not important as long as the status of steps, mandates and procedures is clear to all parties concerned.

5 Dhamar Branch Office - Development and Experiences

The Review and Reformulation Mission of June 1998, comes to the conclusion that "the transfer in Dhamar of the SURWAS achievement to the GAREW Branch Office has been incomplete. The original intention of a gradual withdrawal of SURWAS staff and taking over by GAREW BO staff over a period of 3 years (1995 -1997) could not be realized. The current GAREW staff only arrived 6 months after the withdrawal of SURWAS[5] and had no knowledge of the SURWAS approaches[6]. Office equipment and materials have been transferred but the staff is not familiar with the old SURWAS files". Also some transport facilities (1 Pick-up and 1 hard-top 4x4) were handed over later on to the Branch Office.

In order to obtain a better apprehension of the 'independent' developments at this Branch Office, a two-day visit was paid to Dhamar, where discussions were held with the Director General, Mr Ahmed As-Sharari, and his staff. Also some field visits were made to projects which were carried out by SURWAS at the start of phase V, as well as by the Branch Office later on. Some facts and figures are given in Appendix 9.

5.1 Findings and conclusions

1. Dhamar Governorate has the Branch Office with the longest history, followed by Tayiz and Aden. This is clearly reflected in the degree in which decentralisation has already taken place, as shown in staff development, size of project portfolio, and mandates. For example, from 2001 onwards the BO will be authorized not only to prepare and launch tenders, but also to evaluate bids and award contracts below a ceiling of 25 million YR (150.000 US$). For that purpose a tender committee will be installed at BO level. For contracts valued over 25 million YR, the bids will be opened by BO, and advice will be sent to the Sana'a based central tender board of GAREW.

2. The BO started by mid 1997 with 11 staff. With an increasing number of water supply projects, staff deployment picked up rapidly, but has been stable from 1999 to date at 32 (of which approx. 50% support staff). For the year 2001, the addition of 11 professional staff is foreseen. Present implementation capacity is estimated at some 30 complete schemes per year. With the allocated implementation budget of 1.662 million YR, it is expected that some 160 project components (wells, pump installations, civil works) can be completed in FY 2000.
   A new building for the BO was completed 3 months ago, and furniture was carried over from the former SURWAS office, which was temporarily in use by the BO.

[5] Early 1997, all SURWAS staff moved to Hodeidah; GAREW BO staff arrived in Dhamar by mid 1997.

[6] At that time, the SURWAS approach had not yet developed into the methodology as presently in use in Hodeidah Governorate. In particular the institutional aspects of community organisation and the financial aspects of community management of the schemes were not yet dealt with by the project in a systematic manner. Also, sanitation and hygiene education were only in a rudimentary stage of development.

3. In order to cope with deficiencies in the operational budget, the BO generates additional income from wells construction, sales of tendocs, water quality and yield testing. According to the DG, this is informally promoted by HQ (the statutes of GAREW do not prevent it), but the obligatory reporting on these activities to HQ has also had repercussions on the size of the allocated operational budget. The staff projections for 2001 reflect the drive of this BO for becoming more independent from HQ in terms of operational costs by further developing its income generating activities: chemist for laboratory analyses, geophysicist for more effective well siting.

4. After some 15 years of activity in the Governorate, only few remnants of the SURWAS methodology - as applied at the time of transfer - can be traced in the present routine execution of projects by the BO. Due to budgetary constraints and due to non-familiarity of the BO staff with the SURWAS approach, the BO was at the start of operations more or less obliged to return to the traditional GAREW working methods: survey, design and contracting by HQ; supervision of works and handing over of schemes to the beneficiary villages by the Branch Office.

5. Nevertheless, it should be acknowledged that the village participation in the SURWAS schemes and the many advices of the technical project staff have much facilitated the development of community management of the schemes afterwards. In quite some cases (the village of Hawra'a is a good example), the villages have organised the technical and financial management of the water supply system wonderfully well, virtually without any support from the BO.

6. As far as planning and budgeting is concerned, the Dhamar BO finds itself in the same situation as the Hudaydah BO. A five-year plan for the period 2001-2005 (only projects, not operational costs) has been submitted to HQ, but the factual basis is lacking. Dhamar Governorate has some 3.400 villages, of which the coverage by water supply is estimated at 60%. However, real conditions in the field are not known. The BO management has expressed the urgent need for a complete inventory in order to arrive at better planning, more solid cost estimates and less surprises during implementation. Required inputs are estimated by the BO at 5 million YR and 3 vehicles for a period of 2 months.

7. The BO management and senior executive staff have indicated their growing need for a change of implementation methodology. The experienced poor level of sustainability of completed schemes, and the participation in the activities of PMA (workshops, trainings) have opened up the minds of the 'traditional' engineers towards a more participatory approach and towards community ownership and management of systems. The BO's staff projections for the year 2001 may be indicative for the changes that are currently promoted through PMA with respect to new desirable modalities of execution for water supply (and sanitation) projects: database specialist, social mobilisers, sanitary engineer, training expert. It is not yet clear, however, if HQ will indeed facilitate employment of this new staff.

8. It is encouraging to notice that, independently from HQ directives or guidelines, already some changes have been made in implementation policy. For example, although HQ designs and cost estimates are still based on public standposts, the BO in practice installs house connections with water meters for the purposes of more conscious water consumption, and enhanced chances of community management.

9. The felt need for change is also reflected in a number of other issues mentioned by the BO management during discussions with the mission. Implementation of these issues as listed below is mostly hampered by a lack of human, physical and financial resources:
   - The BO sees the necessity of training for a more efficient community organisation, but lacks an experienced trainer and means of transport for this purpose.
   - The BO has expressed the need for social mobilisation activities in the villages, prior to implementation, but is lacking the funds for employment and training of an SPU (in SURWAS terminology).
   - Although there are no reported breakdowns of pumps and engines installed during the last 3 years, the training of appointed village operators (about 40 in number) has only consisted of watching during installation. A more comprehensive training of these operators in operation and maintenance is perceived at BO level as dearly needed.
   - In some villages where GAREW systems were installed before the BO came into existence, the operation has been grinded to a halt just because the population expected government to solve simple problems like replacement of a broken sparepart. The BO wishes to prevent such situations in the future, by application of a new approach. However, the knowledge and experience (and also the financial means) to do this are not available.

10. The mission has the impression that price levels for scheme components as installed by BO Dhamar are categorically and substantially higher than for comparable components installed by the project in Hudaydah. To mention a few: deepwell at US$ 35.000 vs. 25.000; pump at US$ 27.000 vs. 22.500. Average investment cost for scheme construction (well not included, population 1500-2000 per village) are US$ 75-90/capita at Dhamar BO. The per capita cost for SURWAS schemes are some 30 to 40% lower. If the provided service levels and expected sustainability would be taken into account, the difference would even be bigger. The differences are only partially explained by the fact that the materials and equipment provided by SURWAS, are exempted from customs duties.

11. The BO's means of transport are extremely limited in relation to the workload: 1 truck (GAREW), 1 Toyota PU (SURWAS, 92 engine, poor condition) and 1 Toyota hardtop (SURWAS, 87 engine, finished). Moreover, budget for operational costs (transport, allowances, etc) is very limited too. Consequently, BO engineers and technicians in charge of supervision of contractors, are more or less at the mercy of these contractors, with all inherent risks for the technical quality of the works. BO management and staff have many complaints about this situation; in their own words: 'they loose their professional dignity'.

5.2 Recommendations

1. In view of the poor transfer of knowledge and experience after a long-duration involvement of SURWAS in the Dhamar Governorate, in view of a felt need at BO level to change the water supply and sanitation implementation methodologies, and in view of already undertaken efforts by the BO in that direction, it is the mission's opinion that Dhamar BO deserves a particular attention from the SURWAS project and its recommended successor project.

2. The mission strongly recommends that the SURWAS project will support the Dhamar BO in the design, planning and training for a full inventory of the water supply and sanitation conditions in the governorate.

The project should also evaluate the BO's estimate for input requirements and assist the BO in submitting a request for (co-) financing of execution of the inventory to RNE.

3. During the mission's visit, the General Director handed over a list of required field- and office equipment and means of transport for the BO. Part of the items has already been provided by GAREW HQ or BO itself, but support is still sought for the procurement of items that are listed in Table C of Appendix 9. The total estimated value is just under US$ 150.000. The mission recommends the project to scrutinize the list in consultation with the Dhamar BO and - if found justifiable - to incorporate the required equipment in the FY 2001 project budget for consideration of RNE.

4. Within the recommended wider framework of assistance to a number of BO's, the project should - in close cooperation with the Dhamar BO - make an inventory of the training needs of that BO, particularly for skills that are required for training of the communities in the management and O&M of water supply systems and sanitation facilities. Implementation of identified trainings should be programmed with a certain priority for Hudaydah and Dhamar BO's.

5. In order to make the data on earlier implemented SURWAS schemes (surveys, designs, cost estimates, as-built drawings, etc) accessible to the present BO staff, it is recommended that the project provides some support to the Dhamar BO in the filing and transfer of these data from the old SURWAS office to the new office.

6. Much of the differences in construction cost is explained by the fact that the SURWAS project can operate independently from a financial point of view, and without all kind of administrative restrictions. However, the per capita investment costs at the Dhamar BO also seem to be higher than those at the Hudaydah BO. Morphological differences (mountains vs. coastal plain) may be accountable for this situation, but it may be worthwhile to carry out a detailed cost comparison.

6 Valorisation of SURWAS Hudaydah Capacity

6.1 Present situation and projections

1. For the year 2001, the Hudaydah BO has submitted budget request for the starting up or completion of 50 water supply schemes. Earlier experience, also in other BO's, indicates the likelyhood of the Ministry of Finance to cut the submitted budget by some 30-50%, thus reducing the number of schemes to perhaps 25 to 35. Whatever the case may be, the Hudaydah BO will be confronted with a future workload to which the organisation will have to be geared in terms of management and coordination capacities, qualified staff, and physical resources. The present level of experience and resources is not sufficient to cope with that situation, particularly if the SURWAS approach (or a suitable modification thereof) will be followed.

2. Since its establishment by mid 1999 (appointment of General Director and Director of Projects) the Hudaydah BO has developed its staffing to the present number of 14 (7 technical professionals and 7 support staff). The majority of staff has been appointed from within the ranks of GAREW and are salaried as such. Some others have been recruited on contract basis, and their salaries are paid from operational budget or from BO generated income. Their listing is presented in Appendix 10. Although SURWAS has regularly advised the BO management on recruitment of new staff in terms of required qualifications, the effect of this advice has been very limited (e.g. a computer expert is now being trained to take up work as planning officer).

3. The SURWAS project is at a present strength of 43 staff (see Appendix 10). Out of these, 14 are GAREW staff on absence of leave, 26 are on contract basis, and 3 senior staff (project manager, sanitary engineer and community development expert) are from a Yemeni consultancy firm. Although present production is at about 10 integrated projects for the year 2000, it is estimated that with some reorganisation and change of implementation method, the true capacity of SURWAS lies at approximately 20 complete projects per year.

4. Big differences do (still) exist between the two organisations in terms of approach towards RWS&S, working environment, culture of organisation, and employment (read payment) conditions. SURWAS staff appears to be quite sensitive to these highly interdependent factors.

5. Estimates have been made for the required staffing of the BO for different production levels (see Appendix 11). For the implementation of 20 complete projects per year, 27 executive staff and a similar number of support staff would be required. That BO staff requirements are estimated somewhat higher than for SURWAS at the same production rate, can mainly be attributed to:

   - higher proportion of support staff (in particular financial/administrative) in a government organisation;
   - lower level of experience at the BO.

6.2 Findings and conclusions

1. In the present situation, the project implementation capacity of Hudaydah BO is extremely limited: apart from the Director of Projects, there are only one engineer and two extension staff. Capacity for community mobilisation, hydrogeological studies, survey and design, preparation of tenderdocuments, and supervision of works is virtually absent. Planning and budgeting capacities are also limited as yet.

2. If the SURWAS approach for community involvement would not be followed at all, the BO would still face great difficulties in executing the annual plan and in performing the tasks delegated from HQ. Implementation of projects along the SURWAS approach would pose even greater difficulty without considerable increase of staff and development of skills. For a proper execution of tasks, extensive support to the BO will be required.

3. Management and executive staff of the BO are not sufficiently familiar yet with the integration of social and technical aspects in the implementation of water supply schemes which is traditionally considered 'hard-core' engineering. Also, sanitation has formally not yet been included in the tasks of GAREW. It will take a decent number of years before such methodology is 'in the blood' of a BO, and before the traditional GAREW engineering practice has turned into so-called 'social' engineering.[7]

4. Simple arithmetics in the Table of Appendix 11 show that a transfer of the large majority of SURWAS staff to the BO with some additional specialist recruitments (such as a hydrogeologist) would cater for the future requirements of the BO. However, most of the project staff would probably decide to look for employment elsewhere, if asked to go back to or join GAREW. It cannot be expected that the economic situation in the country would allow for a drastic overall salary restructuring for GAREW as a whole.

5. One of the SURWAS objectives is to support the establishment of the Branch Office in Hudaydah. Within that framework, the project has gained positive experience with the contracting out of 'GAREW projects' to the BO. This method of working provides good possibilities for practical training and capacity development. At the same time it creates the opportunity of income generation for the BO, without jeopardizing the main task of the BO: provision of water supply and sanitation in the rural areas. In that way, BO staff can be employed on contract basis against reasonable payment. Moreover, expenditures and technical quality can be easily controlled.

6.3 Recommendations

Given the need for further building up of implementation capacity within the BO, given the limited perspective for a direct integration of SURWAS staff in the Hudaydah BO, and given the express desire of RNE to preserve the assets of SURWAS to the benefit of the sector as a whole, the following is recommended:

[7] Even if all additional skills for the implementation of a 'SURWAS' or similar approach would have been developed, coordination of these skills for the programming and implementation is not immediately secured. Fifty good musicians do not necessarily make an orchestra. Working along a new approach requires a change of mindframe, in particular on the side of the BO management and senior staff.

1. Assistance to the Hudaydah BO should be continued in the form of management and coordination support and practical on-the-job training in all aspects of project implementation, for a to be defined number of years to come. In that period the BO should build up its own staff, with emphasis on the implementation of projects. Support through contracting of RWS&S schemes to the BO seems to be an attractive option.

2. A workplan should be prepared for intensified assistance to Hudaydah BO for the year 2001 (on the assumption that budget will be made available by RNE). That year could be considered as a bridging phase between the present Phase V of the SURWAS project, and a new project of approx. 5 years during which the SURWAS experiences and skills of staff will be optimally exploited to the benefit of a larger number of BO's (to start off with Dhamar and Hajja, and later extended to all BO's eligible for the planned World Bank RWS&S programme).

3. Carry out a feasibility study (institutional setting, staffing, resources) for the establishment and functioning of a special Task Force for Branch Office Implementation Support (BOIS), through which the field experiences and knowledge of senior professional SURWAS staff can be exploited to the benefit of the sector.

4. Assist GAREW in the preparation of a project document and financing request to RNE for sector support at the decentralized level, through a five-year programme of activities of above mentioned BOIS Task Force, which will be complementary to and should coordinate its activities with PMA in a highly interactive process. PMA to concentrate on the translation of theoretical concepts to practical tools and instruments for the BO's.

5. Once the project has moved from its present office to the new BO building, some of the (executive and support) staff of SURWAS may be transferred to the BO, if prospects are there for a reasonable remuneration. A detailed programme should be prepared for the transfer to the Hudaydah (and Dhamar/Hajja) BO of those SURWAS staff and assets which will not be required for the proposed BOIS Task Force.

7 Recommendations on SURWAS Activities 2000 - 2001

At the moment of this mission, it was not yet clear how and in which timeframe the GON support to the rural water supply and sanitation sector will be continued. It has been assumed that a new long duration sector support programme will be defined, and that some time will be required for that purpose. Given the procurement procedures of GON for financial and technical assistance, a period of about one year was considered reasonable. The year 2001 might thus serve as a bridging phase between the formal ending of SURWAS V (most likely at the end of April 2001), and the start of a new programme.

7.1 Phase V until April 2001

- Prepare detailed workplan and budget for SURWAS activities and Technical Assistance during the proposed Bridging Phase.
- Assist Hudaydah BO in the preparation of a request for financial assistance by RNE in 2001 for the non-GAREW budgeted components of the SURWAS methodology.
- Finalize ongoing 'SURWAS projects' and intensify support to the BO for implementation of its regular GAREW programme.
- Publish the results of the WS&S inventory in Al Mansuriyah district and prepare input/output formats for future inventories, also in other Governorates.
- Prepare with the BO a workplan and mobilize 2 or 3 teams for accelerated joint execution of the district inventories throughout the Governorate.
- Continue the training of available BO staff through on-the-job training and special courses on selected subjects, in order to prepare for mainstreaming of BO activities along the lines of the (modified) SURWAS approach.
- Make a plan for proper documentation of 'SURWAS methodology' for implementation of WS&S projects (video documentaries, laying down of procedures), which can be used for dissemination through PMA to other BO's and for training purposes both at BO and at village level.
- Prepare a programme for the establishment of community organisations and management in those villages where SURWAS has implemented schemes before introduction of the new methodology, i.e before mid 1999.
- Assess the need for technical assistance to Hudaydah BO in the field of water resources management.
- Assess the need and feasibility of the office -, field - and transport equipment assistance as requested by the Dhamar BO, prepare a detailed cost estimate and assist the BO in submitting the request to RNE.

7.2 Bridging phase

- Intensify coordination between the two components of the SURWAS project: Hudaydah and PMA.
- On the basis of approved budget, assist Hudaydah BO in identifying requirements of additional staff and other resources, preparing job descriptions, recruiting staff for project implementation and coordination, mobilising resources, the latter in close cooperation with PMA.
- Carry out a training needs assessment, and prepare and carry out a training plan for BO staff.
- Identify - together with PMA - support requirements in the other four selected pilot BO's.

- Finalize district inventories and - on the basis of the results and priority ranking criteria - establish with Hudaydah BO priorities for provision, augmentation or rehabilitation of WS&S systems in the governorate.
- Assist Hudaydah BO - in cooperation and consultation with PMA - in the preparation of comprehensive budgets for project implementation and operational costs for the year 2002.
- Carry out two pilot projects according to the SURWAS approach but modified to some extent to better suit the GAREW working methods.
- Assist the BO - in close cooperation with PMA - in the mainstreaming for larger scale project implementation, i.e. standardisation of working procedures, administrative matters, monitoring and evaluation.
- Continue joint implementation - with an emphasis on advisory and training services - of the regular GAREW projects, including all necessary steps for empowerment of the communities.
- Manage the proposed financial assistance from RNE to the Hudaydah BO.
- Documentation of all essential SURWAS experiences, upgrading of filing system, and preparation of modules and materials for training at community level; dissemination to other BO's through PMA.
- Assist GAREW in the preparation of a project document and financing request to RNE for sector support at the decentralized level, through a five-year programme of activities of higher mentioned BOIS Task Force.
- Prepare in detail and carry out a programme of transfer to the Hudaydah (and Dhamar/Hajja) BO's of those SURWAS staff and assets which will not be required for the proposed BOIS programme.

Appendix 1
Terms of Reference

IWACO

Consultants
for water and environment

Division International Projects
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Royal Netherlands Embassy, Sana'a
Attn.: Water Projects Officer, Mr Al-Aroosi
Sana'a
Yemen

Date
17-09-2000

Enclosure(s)

Reference
PK-79686

Project number
57305

Subject
SURWAS Phase 5 - Activity YE009402

Dear Mr Al-Aroosi,

During the inception period of the SURWAS project we agreed that the first support mission of the Rural Water and Sanitation Specialist would be carried out by Mr. Bergsma because of the technical character of the mission. The second mission should have a more evaluatory character and carried out by Mr. Blankwaardt as foreseen in the contract Agreement.

This mission will take place from 15th till the 5th of October 2000 and will consist of an evaluation and internal assessment of the implementation activities through the Hudaydah Project Office and the results achieved.

The elements of the mission will be as following:

- Assessment of the implementation methodology as applied since second half of 1999 with respect to (but not necessarily limited to) the sustainability of the systems implemented, community participation, Service level provided and pace of implementation. This assessment concerns the water supply as well as the sanitation facilities;
- Assessment on the perspectives and possibilities to integrate the SURWAS approach in the GAREW Hudaydah Branch Office working methods;
- Appropriateness and possibilities to integrate SURWAS project staff (included the GAREW staff working in the project on absence of leave basis) in the GAREW Hudaydah Branch Office;
- Recommendations to avoid the shortcomings felt when project activities were handed over to the GAREW Dhamar Branch Office.

Mr. Blankwaardt will prepare a mission report and the results of his mission will be used to further formulate the future support to the GAREW Hudaydah Branch Office for the Rural water Supply and Sanitation Sector.

Chamber of Commerce
Rotterdam no.
24113916

IWACO

Consultants
for water and environment

Date
17-09-2000

Reference
PK-79686

Project number
57305

Mr. Blankwaardt will stay in Hudaydah until 21st of September and will travel to Sana'a and Dhamar in the period between 22 and 26 September. He will finalise his mission in Hudaydah from 27 September till 2 October. I would ask you to receive him at the Embassy sometime in the period between 22 and 26 September to discuss the contents and findings of his mission with you and Mr. De La Bije if possible. Mr. Blankwaardt will agree with you on the exact timing of this meeting.

He will debrief his mission on the last day of his visit.

Trusting to have informed you sufficiently.

Yours sincerely,

IWACO B.V.

P. Keijzer
SURWAS Project Director

Appendix 2
Itinerary of the mission

Itinerary

14-09-00, Thursday
Travel Amsterdam-Frankfurt-Sana'a.

15-09-00, Friday
Study draft workplan PMA 2001. Meeting Mr Tawfiq, PR officer SURWAS in Sana'a.
Travel Sana'a-Hudaydah.

16-09-00, Saturday
SURWAS office. Meetings and discussions with project management and senior WS&S staff.
Study available reports.

17-09-00, Sunday
SURWAS Office. Introduction to SPU staff. Programming of the mission.
Meeting with Mr. Talal Saif Al-Qadasi, General Director GAREW Hudaydah BO.
Visit to BO building under construction.
Study available reports.

18-09-00, Monday
SURWAS office: preparation fieldtrip. Discussions with Civil Section on possible improvements.
Preparation questionnaire for scheme comparison.
Preparation of meeting SURWAS-GAREW BO.

19-09-00, Tuesday
Field visit Dir Maqbooli (2000) and to Al Janadiah (1997) with SPU and CS staff.
Arrangements with DG Dhamar BO for fieldtrip.
Social Fund for Development, Hudaydah branch, Eng. Nyazi Khan, responsible for projects.

20-09-00, Wednesday
Study SURWAS progress reports of previous phases.
Report on findings field trip.

21-09-00, Thursday
Weekend.

22-09-00, Friday
Travel Hudaydah-Dhamar with M. Abdul Waly As Shamy. Stay overnight in Plaza hotel.
Received by Mr. Ahmed Al Shahari, DG Dhamar BO.

23-09-00, Saturday
Discussion with DG and senior staff on functioning BO and request for material support.
Field visit to new WS projects GAREW in Ziraja and Geerah..

24-09-00, Sunday
Misc. arrangements in relation to death of SURWAS supervisor Mr Abdel Ghani As Shwoabi in Hais.
Field visit to SURWAS projects in Al-Manzil and Howra'a.
Travel Dhamar-Sana'a (Mr Abdul Waly back to Hudaydah). Meeting Mr. Tawfiq.

25-09-00, Monday
Briefing and discussions at RNE (Mr de la Bey, Mr. Al-Aroosi).
GAREW: meeting with Mr Abdel Momen (PMA WG-4). Mr Abdel Qadir Hanash had travelled to Shabwah.
Travel Sana'a-Hudaydah.

26-09-00, Tuesday
Public holiday: Revolution Day
Meeting with key-staff SURWAS on adaptations in SURWAS approach.

27-09-00, Wednesday
SURWAS office: discussions with sanitary engineer and SPU/CS on approaches/strategies for sanitation and community-based financial management.
Discussion with staff BO and SURWAS on most required and appropriate amendments to SURWAS approach.

28-09-00, Thursday
Weekend.

29-09-00, Friday
Weekend. Report writing

30-09-00, Saturday
SURWAS office: meeting with BO senior staff on planning, budgeting, staffing; 5-year plan; BO longer term vision.

01-10-00, Sunday
Discussion with SURWAS key-staff on scenario's for transfer of knowledge and further future support.
Report writing.

02-10-00, Monday
Draft mission report discussion with SURWAS Project Manager

03-10-00, Tuesday
Travel Hudaydah-Sana'a.
GAREW HQ: meeting with Abdel Qadr Hanash, coordinator PMA

04-10-00, Wednesday
Debriefing at RNE with Mr. de la Beij and Mr. Al Aroosi.

05-10-00, Thursday
Travel Sana'a-Frankfurt-Amsterdam.

Appendix 3
Completed and ongoing SURWAS projects as per October 1, 2000

SUMMARY OF COMPLETED AND ONGOING SURWAS PROJECTS

a. Completed SURWAS projects since 1991

Year	Dhamar	Hudaydah	Total
1991	2		2
1992	5		5
1993	7		7
1994	6		6
1995	1	5	6
1996	5	3	8
1997	1	9	10
1998	1	4	5
1999	1	3	4
2000	1 *	11 **	12
Totals	30	35 ***	65

Notes

*) With the completion of WAP-79, there are no further SURWAS obligations in Dhamar governorate.

**) Seven schemes are expected to be completed during the 4th quarter 2000.

***) In 1991, one integrated water supply and sanitation scheme (then called IWP) was completed. All other mentioned schemes were purely water supply projects, until sanitation projects were re-introduced in 1999.
Out of 11 completed schemes in 2000, 5 are full-fledged sanitation projects

b. Ongoing SURWAS projects as per 01-10-2000
(TWP = Tihama Water Project; SAP = Sanitation Project)

TWP-49 Zaferaan
Waiting for new well. System is there except for pump house, pumping main and pump (materials in stock). Not expected to be completed before end 2000.

TWP-53 Doghan
Project was stopped because of non-cooperation in pipe laying and other expected participations. Should be removed from the list.

TWP-89 Al Mighlaf
Due to inhomogeneous community character (district center), difficulties with participation. Sanitation for the poorest part of population poses problems due to extra cost of small-bore sewer. Temporarily stopped due to outbreak of Rift Valley fever.

TWP-96 Al Rad
Long delays due to policy change re. buying or not of water meters (mid 99) and already sold water meters. Problem has been solved. Remaining work now is extension of scheme to 3 small sub-villages.

TWP-108 Nafhan
Handed over in December 1998, but still pending water meter problem. Some 100 water meters to be bought. Consider giving remaining water meters free of charge.

SAP-108 Nafhan
Latrines at mosque too close to water sources for application of pour-flush latrines. Therefore dry latrines with small bore sewer for liquids to cess-pit further downstream. To be completed: roof of cess-pit and connection mosque-latrines to pipeline.

TWP-109 Madafin
Only remaining work is installation of last water meters and some pour-flush latrines. No specific problems.

SAP-109 Madafin
See above.

SAP-118 Dir Maqbooli
Small-bore sewage pipe + latrine at mosque to be completed.

TWP-121 Al Monirah
Training and assistance project to GAREW BO for the rehabilitation of an existing water supply. After approval of pre-construction report, support contract was signed between GAREW and SURWAS on 01-07-2000. Tanks to be constructed under Public Works Programme (WB). Duration of works estimated at 5-6 months.

TWP-123 Al Madman Al Thani
Elevated tank for 90% completed. Major part of pips on-site. Trench digging just started, but contractor and project decided to leave the area temporarily because of Rift Valley Fever risks. Project to be continued after green light from health authorities.

TWP-127 Haïs
2 weels, 2 pumps, 1 boosterstation. 1st pumping line +sump now under construction, the 2nd pumline (overhead tank already available. The rehabilitation of network. Sewage system (incl. treatment plant) has been estimated at 6 times the cost of water supply upgrading.

TWP-128 Al Rabat
Pumphouse, tank, pumping line and main distribution line. Construction of main reservoir at 95%; delay due to difficulties in last 20% of access road to tank. Connection to existing distribution system. Water meters?

TWP-134 Al Mahabeeb & Al Ghawanim
With 7 sub-villages. 2 tanks under construction; pumphouse for 905 completed. Good cooperation. Completion expected April/may 2001.

SAP-134 Al Mahabeeb & Al Ghawanim
Under construction; mostly pour-flush latrines and few houses with dry latrines.

TWP-135 Amer Al Olya
Agreement signed. Supervisor will go there in first week October for supervision of superstructures.

SAP-135 Amer Al Olya
Not yet started.

TWP-136 As Saqyah
Solar pumping unit. Waiting for equipment (has been ordered); well has been deepened; design for special elevated tank (extra wide for installation of PV panels on top); agreement to be signed.

TWP-137 Ad Dobania
Dual water system. Survey carried out; design done; now waiting for right of use of wells. Practical cooperation foreseen with TDA: re-use of waste water for nursery and greenbelt.

Appendix 4
Questionnaire for comparative analysis of schemes

Project Implementation Assessment

Project nr.: TWP-..... SAP-..... Village name:

Basic data

Population : Number of men: Number of women:

Number of households :

Subvillages :

Socio-economic conditions :

Initial attitude towards the project:

Existing degree of village organisation before start of project:

Existing water supply before project:

Lay-out and dimensions of scheme: (sketch, distances well, tank, length of mains, etc)

Cost of project in US$: Per capita cost in US$:

Community participated in: -
-
-
-
-

Questions

a. Service level

1. Do all HH have sufficient water under sufficient pressure at any time? Y / N
2. If not, what is the reason and what can be done about it? Y / N
3. Is the water from the taps bacteriologically safe? Y / N
4. At the moment of handing over of the project to the village:
   (a) How many house connections finished? ..... (.....% of total households)
   (b) How many latrines completed? ..... (.....% of total households)
5. What is the average consumption in l/c/d? .....
6. Are the latrines free of smell / odour? Y / N
7. Could people decide themselves on the materials for walls and roof of the latrine? Y / N
8. If yes, did they contribute in the costs accordingly? Y / N
9. Do the people have complaints on the supplied HH facilities (water meter, tap, latrine) ?
   Women : Y / N
   Men : Y / N
10. What are the main reasons for positive or negative appreciation? (water supply and sanitation)

(a) for women :

(b) for men :

11. Is there also demand for additional or other types of water- related facilities ? Y / N
12. If yes, what?

b. Institutional matters

13. Is the General Committee big enough to represent the entire community? Y / N

14. Were women also allowed to vote for the election of the Supervisory Committee? Y / N

15. If no, how can the women have enough influence on the water affairs of the village?

16. How many men and women in the Committees?

For old system	For new system
VWSC: .....men .....women	General Committee: .....men .....women
	Supervisory Comm.: .....men .....women

17. Can members of the Supervisory Committee or executive staff be replaced if necessary? Y / N

18. If so, who decides on this?

19. Has the executive staff been trained by the project? If yes, how? If no, why not?

    (a) Accountant : Y / N .....

    (b) Operator/mechanic : Y / N .....

20. Did women participate in design of WS&S (system and/or HH level)? Y / N

21. How many LHP's were selected and trained? ..... women .....men

22. How many local builders were trained? .....

23. Do men and women understand all the educational and promotion material of SURWAS? Y / N

24. How many households were visited by the LHP's? .....

25. Were technical and economic options discussed in all clusters and HH? Y / N

c. Village participation in implementation of water supply and sanitation

26. What has the village contributed to the project in cash, kind, or labour?

    (a) For the water supply project .....
    .....
    .....
    .....
    .....
    .....

    (b) For the sanitation project .....
    .....
    .....
    .....
    .....
    .....

27. Were there big problems with respect to participation of the village? Y / N

28. If yes, what was the reason and how were the problems solved?

29. How many additional visits have been made to the village in comparison with the theoretical case that there would have been no participation problems at all?

30. Has there been intervention by District Director or other authorities to solve problems? Y / N

31. For what purpose ? and was that intervention effective?

32. Could poorer people participate according to their financial capacity? Y / N

33. If yes, how?

34. After all, has the village fulfilled all obligations of the agreement? Y / N

35. How often did villagers come to the office for complaints, discussions, etc?

    (a) During implementation .....

    (b) After handing over .....

36. Is it in general the same person(s) or representative who comes to the office? Y / N

37. How many trips had to be made to the village by SURWAS staff after handing over, in order to resolve remaining problems? .....

d. Community management of the project

38. What has been agreed in the village about the water tariffs? (flat rate, progressive rate, rate per m3, connection afterwards)

39. Are there special arrangements for poorer part of the population for payment of water bills? Y / N

40. If yes, explain.

41. Has a formal billing system been established? Y / N

42. Is record kept of the revenues and expenses for management and O&M? Y / N

43. Do the revenues cover the expenses? Y / N

44. Which internal regulations are applied in case of non-payment of water bills?

45. Does the Committee have a bank account for the operations of the water project? Y / N

46. How much has been saved from the start of operations? .....YR

47. How many times per year does the Supervisory Committee report to the General Committee? .....

48. Have there been replacements in the Supervisory Committee or executive staff? Y / N

49. If yes, who and why?

e. Design and construction

50. Is the use of pour-flush latrines taken into account in the design water demand of 60 l/c/d? Y / N

51. Were the construction and WS&S materials according to desired standard and quantity?

(a) As supplied by the villages: Y / N

(b) As supplied by the contractor(s): Y / N

(c) As supplied by SURWAS: Y / N

52. If not, what were the shortcomings?

53. How were/are shortcomings tackled?

54. How was the contractor for the tanks selected?

55. Did you experience any problems with the selected contractor? Y / N

56. If yes, what was the nature of the problems?

57. What steps were undertaken to prevent similar problems in the future?

58. Was the quality of the work by the village good? Y / N

59. If not, what were the main problems?

60. Did the installation of house connections have to wait for completion of the sanitation? Y / N

61. If yes, how long? ..... weeks

62. Has the project been implemented according to design? Y / N

63. If not, what were the major changes?

64. Has the project been implemented according to planning? Y / N

65. If not, how long was the time overrun? ..... weeks

66. What were the major causes of this overrun?

f. Operation and maintenance

67. Is record kept of the daily pumping hours? Y / N

68. Is the pumphouse clean? Y / N

69. Is oil changed at the required intervals? Y / N

70. Is regular maintenance of pump, engine, tank and main pipes done? Y / N

71. Is the tank washed out at regular intervals? Y / N

72. Is record kept by the operator of all maintenance and repair activities? Y / N

73. Are spareparts for pump and engine available on the market? Y / N

74. Are pipes, fittings (saddles!), water meters, etc. for later house connections available on the market? Y / N

75. If not, how can they be obtained by the Committee?

76. Is an O&M manual available for the operator? Y / N

g. Monitoring

77. Are as-built drawings of the project archived in the office? Y / N

78. Does the VWSC or Supervisory Committee have a copy? Y / N

79. How are changes or additions in the system recorded after handing over?

80. Are changes/additions also reported to SURWAS or GAREW? Y / N

81. In how many households have baseline data been collected for later monitoring?.....

IMPLEMENTATION TIME

Project nr.: TWP-..... SAP-..... Village name:

Step nr	Activity	Date start	Date completion	Days
1	intro, presentation to village			
	baseline survey			
	technical survey			
2	establishment committees			
	commitment contract			
3	promotion programme			
	alternatives WS & S system			
	alternatives at HH level			
	package presentation			
4	training LHPs and WSC for hygiene			
	training builders			
	demonstration facilities			
5	cluster and HH discussions hygiene			
	cluster and HH discussions technical / cost			
	WS&S facilities selected			
	Implementation contract			

6	**reservoir, if elevated:** **tender** **contract award** **construction** **pumphouse** **pump/engine installation** **pumping main** **distribution mains** **house connections** **latrines and pits**			
7	training - pump/engine - O&M for system - O&M for HH - bookkeeping/account/consumpt. O&M manual Management/admin. Guidelines			
8	Monitoring			

COST CALCULATION TWP-..... Village: .....

From 1st Meeting in village until handing over to village.

Water supply Investment costs on SURWAS account

1. Tank + piping (incl. metalwork done in SURWAS workshop)
2. Pumphouse (incl. metalwork done in SURWAS workshop)
3. Pump
4. Engine

For all SURWAS imported pipes, fittings, etc.: ADD CUSTOM DUTIES!

5. Pumping main + fittings
6. Distribution main + fittings + valvechambers
7. Distribution network(s)
8. House connections (incl. metalwork done in SURWAS workshop)

Total investments for this water supply project: .....

Water supply operational costs on SURWAS account

1. Perdiem project staff (take applicable GAREW rates for calculation)
2. Costs related to Village Committees establishment

For calculation of 3. through 7., take totals for the year in which most of the expenditure for this project was made, and attribute these totals over the projects that were completed that year, in proportion to the investment cost for those projects. Taking into account the development character of the project, estimate items 3. to 7. as 75% of the calculated amounts.

3. Vehicles running cost (incl. depreciation)
4. Well testing
5. Office running cost (incl. rent, electr., office equipment depreciation, etc)
6. Promotion and health education material
7. Training courses for village executive staff

Total operational costs for this water supply project: .....

Total investment and operational costs for this water supply project:

Calculate village contributions on basis of market prices for materials and labour, and add to total.

Then calculate percentages of SURWAS and village contributions.

DO SIMILAR EXERCISE FOR SANITATION PROJECT

Appendix 5
Cost comparison GAREW and SURWAS schemes

Preliminary Cost Comparison of GAREW and SURWAS Schemes

COST ITEM	Per capita cost in US$[8]		
	GAREW	SURWAS	SURWAS Modified
Water supply			
Well construction[9]	--	--	6
Contractors/materials	65	18	24[10]
Import duties materials	--	--	4[11]
Salaries/allowances	2	13	6[12]
Operational and other costs	1	7	7
Consultancy	--	10	5
A. Total water supply	68	48	52
Sanitation	--	25	15[13]
B. Total sanitation	--	25	15
C. Total GAREW/SURWAS cost (A+B)	68[14]	73	67
Village contribution			
water supply	4	7	5
sanitation	--	20	15
D. Total village contribution	4	27	20
E. TOTAL RWS&S scheme (C+D)	72	100	87
	Percentage of total cost		
Distribution of cost			
GAREW/SURWAS	94	73	77
Community	6	27	23

[8] Sources:
BO Hudaydah Five-year plan budget 2001-2005
IWACO Inception report SURWAS V (1999)
Recent field data as available in SURWAS office

[9] Is included in item 'contractors' as far as GAREW is concerned. Has never been included in the SURWAS activities, but in a modified approach it should be accounted for.

[10] Including contract for pipe laying (pumping and distribution main).

[11] SURWAS can procure WS&S materials free of duty. It is assumed that the BO will not have that facility.

[12] A higher future salary level at the BO is assumed (approx 3 times present level).

[13] It is assumed that the per capita cost for sanitary facilities can be strongly reduced by savings on SPU interventions and construction methods. See also chapter 2.

[14] Excluding the cost of extensive after-care.

Appendix 6
Estimated required WS&S investments in Al Mansuriyah District

Summary of Estimated Required Investments in al-Mansuriyah District[15]

Present water supply situation	Number of villages	Average population per village	Percentage of population with type of water supply	Estimated investment costs			
				Total in million YR	Average per village in MYR	Average per village in kUSD[16]	USD per capita
Functioning improved system	7	2.735	23	8,7	1,25	8,3	3
Non-funct. Improved system	5	2.400	15	33,7	6,75	45	19
Traditional system	13	1.175	57	112,2	8,6	57,3	49
Without system	3	1.370	5	35,1	11,7	78	57
Totals / averages	28	1.810			6,8	45,3	25

[15] Source: Rural Water Supply and Sanitation Inventory for Al Mansuriyah district; SURWAS; January 2000.

[16] Exchange rate at moment of inventory: 1 US$ = 150 YR.

Appendix 7
Five-year plan Hudaydah BO 2001-2005, Arabic, with English summary

بسم الله الرحمن الرحيم

الجمهـوريه اليمنيه
الهيئه العامه لكهرباء ومياه الريف
فرع الحديده
إدارة مشروعات المياه

الخطه الخمسيه الثانيه (٢٠٠١ - ٢٠٠٥ م)
المشاريع المطلوب تنفيذها في التوزيع الزمني لسنوات الخطه

المبلـــغ × ١٠٠٠

م	اســـم المشـــروع	المديريه	عدد المستفيدين	التكلفه الإجماليه للمشروع	الأعمـــال المنفذه	تكلفة الأعمال المنفذه	الأعمال المتبقيه	تكلفة الأعمال المتبقيه	التوزيع الزمني لتكلفه لسنوات الخطه الخمسيه					ملاحظات
									2001م	2002م	2003م	2004م	2005م	
85	شجينه	السخنه	2000	23,000	بئر	3000	مدنيه + ميكانيكيه	20,000	—	—	10,000	—	10,000	
86	محل خليل	الزريديه	700	15,000	بئر	1000	مدنيه + ميكانيكيه	14,000	—	—	7,000	—	7,000	
87	قرية السوق القديم	اللحيه	946	15,000	بئر	1000	مدنيه + ميكانيكيه	14,000	—	—	7,000	—	7,000	
88	دير دحته	اللحيه	2700	24,000	بئر	9,000	مدنيه + ميكانيكيه	15,000	—	—	9,000	—	6,000	
89	جبل راس	جبل راس	1470	15,000	بئر	1,000	مدنيه + ميكانيكيه	14,000	—	—	7,000	—	7,000	
90	دير سهيل	باجل	820	23,000	بئر	900	مدنيه + ميكانيكيه	14,000	—	—	7,000	—	7,000	
91	المدمن	باجل	3570	22,000	بئر + ميكانيكيه	4000	مدنيه	18,000	—	—	9,000	—	9,000	
92	اللو ٢	المراوعه	720	15100	بئر	1100	مدنيه + ميكانيكيه	14000	—	—	7000	—	7,000	
93	الشراعي	المراوعه	850	15200	بئر	1200	مدنيه + ميكانيكيه	14000	—	—	7000	—	7,000	
94	قرية الحرازي	القناوص	1474	17600	—	—	بئر + مدنيه + ميكانيكيه	17600	—	—	7600	10,000	—	
95	المفدغيه	المايره	1661	20000	—	—	بئر + مدنيه + ميكانيكيه	20000	—	—	10000	10,000	—	
96	الغوبه	اللحيه	5660	25600	—	—	بئر + مدنيه + ميكانيكيه	25600	—	—	12600	12500	500	
97	قرية المنصر	المراوعه	950	18000	—	—	بئر + مدنيه + ميكانيكيه	18000	—	—	9000	9000	—	
98	الحميه	الخوخه	1900	18000	—	—	بئر + مدنيه + ميكانيكيه	18000	—	—	9000	9000	—	
99	مديرية حيس	حيس	4000	74400	—	—	بئر + مدنيه + ميكانيكيه	74400	—	—	34400	40,000	—	
100	الزهره	الزهره	4000	3800	—	—	بئر + مدنيه + ميكانيكيه	38000	—	—	38000	—	—	
101	الدريهمي	الدريهمي	2,500	24,900	—	—	بئر + مدنيه + ميكانيكيه	24900	—	—	24900	—	—	
	إجمالي الورقه رقم (١)		65269	324,842	—	4189237	—	275,362	245,353	15,000	19,000	—	—	
	إجمالي الورقه رقم (٢)		29988	247,895	—	18,598	—	229,300	143,600	85,700	—	—	—	
	إجمالي الورقه رقم (٣)		35,262	337,600	—	25,127	—	313,273	78,137	156,436	51,800	27,500	—	
	إجمالي الورقه رقم (٤)		24,393	292,300	—	31900	—	260,400	—	132,100	62,700	55,400	13,000	
	إجمالي الورقه رقم (٥)		41,478	418,428	—	33028	—	406,500	—	—	230,500	94,500	82,500	
	المجمـــوع الكـــلي		196,390	1,328,765	—	4,265,987	—	1,484,835	467,090	389,236	364,000	177,400	95,500	

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الهيئه العامه لكهرباء ومياه الريف
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									2001م	2002م	2003م	2004م	2005م	
65	قزعة السلام	المسخه	924	12,600	بئر	1000	مدنيه + ميكانيكيه	11,600	—	5,600	6,000	—	—	
66	الزواعر	المسخه	594	11,800	بئر	1200	مدنيه + ميكانيكيه	10,600	—	5,300	5,300	—	—	
67	الدوافع	المسخه	1640	14,200	بئر	1000	مدنيه + ميكانيكيه	13,200	—	6,200	3,400	3,600	—	
68	الحصبه	المسخه	1500	17,000	بئر	1,000	مدنيه + ميكانيكيه	16,000	—	8,000	8,000	—	—	
69	شعف	الزيديه	1090	13,200	بئر	1,200	مدنيه + ميكانيكيه	12,000	—	6,000	6,000	—	—	
70	دير محمد	الزيديه	550	11,000	بئر	1,000	مدنيه + ميكانيكيه	10,000	—	5,000	5,000	—	—	
71	حميشه	المراوعه	2800	18,800	بئر	2800	مدنيه + ميكانيكيه	16,000	—	6,000	4,000	6,000	—	
72	المخداش	الزيديه	900	13000	بئر	1000	مدنيه + ميكانيكيه	12000	—	6000	3000	—	3,000	
73	الطالبيه	الزيديه	600	12800	بئر	1200	مدنيه + ميكانيكيه	11600	—	5600	—	3000	3,000	
74	محل البينيه	الزيديه	618	13000	بئر	1000	مدنيه + ميكانيكيه	12000	—	6000	6000	—	3,000	
75	دير القادري	الزيديه	628	15200	—	—	بئر + مدنيه	15200	—	7200	—	3800	4,000	
76	الرباط	الزيديه	1500	13000	بئر	7000	مدنيه + ميكانيكيه	6000	—	3000	—	3,000	—	
77	بيت عقاد	الزيديه	1139	20000	بئر	8000	مدنيه + ميكانيكيه	12000	—	6000	—	6000	—	
78	محل بن	الزيديه	1450	1320(	بئر	1200	مدنيه + ميكانيكيه	12000	—	6000	—	6,000	—	
79	خوفان	المنيره	1500	1510(	بئر	1100	مدنيه + ميكانيكيه	14000	—	7000	—	7,000	—	
80	المشينه	الخوخه	1,500	17,200	بئر	1200	مدنيه + ميكانيكيه	16000	—	8000	—	8,000	—	
81	محوى للقحيم	زبيد	600	9,995	بئر	1995	مدنيه + ميكانيكيه	8,000	—	4,000	—	4,000	—	
82	الريد	المسخه	978	13,800	بئر + ميكانيكيه	3800	أعمال مدنيه	10,000	—	—	5,000	—	5,000	
83	دير بوطه	المسخه	2200	12,110	بئر + ميكانيكيه	2110	أعمال مدنيه	10,000	—	—	5,000	—	5,000	
84	دير القماط	المسخه	1779	12,923	بئر + ميكانيكيه	2923	أعمال مدنيه	5,000	—	—	5,000	—	5,000	

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الخطه الخمسيه الثانيه (٢٠٠١ - ٢٠٠٥ م)
المشاريع المطلوب تنفيذها في التوزيع الزمني لسنوات الخطه

المبلـــــغ × ١٠٠٠

م	إســـــم المشـــــروع	المديريه	عدد المستفيدين	التكلفه الإجماليه للمشروع	الأعمـــــال المنفذه	تكلفة الأعمال المنفذه	الأعمال المتبقيه	تكلفة الأعمال المتبقيه	التوزيع الزمني لتكلفة أعمال الخطه الخمسيه					ملاحظـــات
									2001م	2002م	2003م	2004م	2005م	
45	الحسيه	المنصوريه	1350	14,000	—	—	بئر + مدنيه + ميكانيكيه	14,000	9,500	4,500	—	—	—	
46	الحجمه	المنصوريه	779	12,800	—	—	بئر + مدنيه + ميكانيكيه	12,800	7,500	5,300	—	—	—	
47	الحبيل	باجل	884	14,000	—	—	بئر + مدنيه + ميكانيكيه	14,000	5,800	7,000	—	—	—	
48	القصيريه	المنصوريه	976	13,600	بئر	1,000	مدنيه + ميكانيكيه	12,600	6,500	6,100	—	—	—	
49	بني غلاب	بيت الفقيه	2000	15,600	بئر	7,563	مدنيه + ميكانيكيه	8,037	4,037	4,000	—	—	—	
50	الجراحي الأعلى	زبيد	2200	15,000	بئر	1,000	مدنيه + ميكانيكيه	14,000	7,000	8,800	—	—	—	
51	دير المقبولي	المسخه	900	17600	—	—	بئر + مدنيه + ميكانيكيه	17,600	—	7,600	5,000	5,000	—	
52	التربيه	زبيد	5825	31600	—	—	بئر + مدنيه + ميكانيكيه	31,600	—	15,600	9,000	7,000	—	
53	باسات	زبيد	5000	28800	—	—	بئر + مدنيه + ميكانيكيه	28,800	—	14,400	4,400	10,000	—	
54	المعامره	زبيد	1855	12,000	—	—	مدنيه + ميكانيكيه	10,800	—	5,800	5,000	—	—	
55	الطويله	زبيد	1600	17,600	—	—	بئر + مدنيه + ميكانيكيه	17,600	—	10,600	3,500	3,500	—	
56	السويد	زبيد	2200	15,000	بئر	1000	مدنيه + ميكانيكيه	14,000	7,000	7,000	—	—	—	
57	الحيمه	زبيد	1550	19,800	بئر	10,164	مدنيه + ميكانيكيه	9,636	—	5,636	2,000	2,000	—	
58	الدمينه	زبيد	1500	17,600	—	—	بئر + مدنيه + ميكانيكيه	17,600	—	9,000	8,600	—	—	
59	الجبليه	زبيد	1700	17,000	—	—	بئر + مدنيه + ميكانيكيه	17,000	—	10,000	7,000	—	—	
60	مصرقده	المسخه	644	14,600	—	—	بئر + مدنيه + ميكانيكيه	14,600	—	7,300	7,300	—	—	
61	شعره	المسخه	1622	11,000	—	—	بئر + مدنيه + ميكانيكيه	11,000	—	11,000	—	—	—	
62	تويب	المسخه	838	15,600	—	—	بئر + مدنيه + ميكانيكيه	15,600	—	7,600	8,000	—	—	
63	محل الشيخ	المسخه	1000	15,000	بئر	1,000	مدنيه + ميكانيكيه	14,000	—	7,000	3,000	4,000	—	
64	الشرافيه السفلى	المسخه	2000	19,600	—	—	بئر + مدنيه	19,600	—	9,600	5,000	5,000	—	

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م	اسم المشروع	المديريه	عدد المستفيدين	التكلفه الإجماليه للمشروع	الأصـــــل المنفذ	تكلفة الأصل المنفذ	الأصل المتبقي	تكلفة الأصل المتبقية	التوزيع الزمني		كلفه لسنوات الخطه الخمسيه				ملاحظات
									2001م	2002م	2003م	2004م	2005م		
26	وادي الخميس	برع	600	8,500	—	—	بئر + مدنيه + ميكانيكيه	8,500	8,500	—	—	—	—		
27	دير الداله	باجل	1286	8,000	بئر	1000	مدنيه + ميكانيكيه	7,000	7,000	—	—	—	—		
28	المسافيه	المراوعه	973	12,000	بئر	1000	مدنيه + ميكانيكيه	11,000	5,500	5,500	—	—	—		
29	المعروفيه	الزيديه	7000	11,600	بئر	1,000	مدنيه + ميكانيكيه	10,600	9,000	1,600	—	—	—		
30	البلسدي	اللحيه	1187	14,600	بئر	1,000	مدنيه + ميكانيكيه	13,600	6,600	7,000	—	—	—		
31	الكدف	الزيدنيه	600	13,000	بئر	1,000	مدنيه + ميكانيكيه	12,000	6,000	6,000	—	—	—		
32	دير القادري الحشابره	الزيديه	1500	15000	بئر	1,000	مدنيه + ميكانيكيه	14,000	7,000	7,000	—	—	—		
33	بني موسى والمصبار	الدريهمي	3000	15000	بئر	1,000	مدنيه + ميكانيكيه	14,000	7,000	7,000	—	—	—		
34	دير البحري و الحشابره	الزيديه	1678	18600	بئر	2,000	مدنيه + ميكانيكيه	16,600	8,000	8,600	—	—	—		
35	الهارونيه وابن عباس	المنيره	605	16,900	بئر	1,100	مدنيه + ميكانيكيه	15,800	7,800	8,000	—	—	—		
36	دير الحربي	حيس	618	14,200	بئر	1000	بئر + مدنيه + ميكانيكيه	13,200	6,200	7,000	—	—	—		
37	الهيلمي	جبل راس	1300	19,000	—	—	بئر + مدنيه + ميكانيكيه	19,000	9,500	9,500	—	—	—		
38	رفاعه والشط	المنصوريه	1666	17,000	—	—	بئر + مدنيه + ميكانيكيه	17,000	8,500	8,500	—	—	—		
39	اللجام	المنصوريه	825	16,000	—	—	بئر + مدنيه + ميكانيكيه	16,000	9,000	7,000	—	—	—		
40	المحل	المنصوريه	780	11,000	—	—	بئر + مدنيه + ميكانيكيه	11,000	8,000	3,000	—	—	—		
41	المحلا	المنصوريه	780	16,000	بئر	1,000	مدنيه + ميكانيكيه	15,000	5,500	9,500	—	—	—		
42	المحوي	المنصوريه	1988	14,000	بئر	1,000	مدنيه + ميكانيكيه	13,000	7,500	5,500	—	—	—		
43	الكوازيه	المنصوريه	768	12,000	—	—	بئر + مدنيه + ميكانيكيه	12,800	7,000	5,800	—	—	—		
44	الكلابيه	المنصوريه	763	19,000	بئر	1,200	بئر + مدنيه + ميكانيكيه	17,800	10,800	7,000	—	—	—		

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م	إســـــم المشـــــروع	المديريه	عدد المستفيدين	التكلفه الإجماليه للمشروع	الأصـــــل المنفذه	تكلفة الأصل المنفذه	الأصول المتبقيه	تكلفة الأصل المتبقيه	التوزيع الزمني للتكلفه لسنوات الخطه الخمسيه					ملاحظـــات
									2001م	2002	2003	2004	2005	
1	مبنى الفرع	الحديده	—	45,200	—	—	مدنيه	45,200	15,200	15,000	15,000	—	—	
2	القطيع	المراوعه	14000	22,221	بئر + ميكانيكي	4144000	مدنيه	18,077	18,077	—	—	—	—	
3	الخوخه	الخوخه	4950	24,442	بئر	2000	مدنيه	22,442	22,442	—	—	—	—	
4	مركز القناوص	القناوص	7000	11,994	بئر + ميكانيكيه + جزء من الأصال المدنيه	10,807	جزء من الأصال المدنيه	1,187	1,178	—	—	—	—	
5	دير الداوديه	القناوص	3000	9,997	بئر + ميكانيكيه + جزء من الأصال المدنيه	8,458	جزء من الأصال المدنيه	1,540	1,540	—	—	—	—	
6	السخنه	السخنه	5000	11,727	بئر + ميكانيكيه + جزء من الأصال المدنيه	7,954	جزء من الأصال المدنيه	3,773	3,773	—	—	—	—	
7	المحلتين	السخنه	2794	13800	بئر	2,400	مدنيه + ميكانيكيه	11,400	11,400	—	—	—	—	
8	دير الزين	المراوعه	1200	11800	بئر	1,618	مدنيه + ميكانيكيه	10,182	10,182	—	—	—	—	
9	كحيل	السخنه	2200	15600	بئر	2,400	مدنيه + ميكانيكيه	13,200	13,200	—	—	—	—	
10	محوى الخليف ومسلب	زبيد	2500	12,449	بئر + ميكانيكيه	1,600	مدنيه + ميكانيكيه	10,849	10,849	—	—	—	—	
11	شعب التاج	زبيد	805	2,400	—	—	بئر	2,400	2,400	4,000	—	—	—	
13	الات ومعدات الفرع	الحديده	—	60,000	—	—	ميكانيكيه	60,000	60,000	—	—	—	—	
14	موشج	الخوخه	1650	16,472	بئر	1,200	مدنيه + ميكانيكيه	15,272	15,272	—	—	—	—	
15	زغفه	الزيديه	2340	10,000	بئر	1,000	مدنيه + ميكانيكيه	9,000	9,000	—	—	—	—	
16	عكزه	الزيديه	2360	17,100	بئر	1,500	مدنيه + ميكانيكيه	15,600	15,600	—	—	—	—	
17	مجمع المطلو	الزيديه	1800	8,800	بئر	1,200	مدنيه + ميكانيكيه	7,600	7,600	—	—	—	—	
18	دير القريطي	الزيديه	3500	15,700	بئر	1,100	مدنيه + ميكانيكيه	14,600	14,600	—	—	—	—	
19	هديمه	السخنه	2000	7,240	بئر	1,000	مدنيه + ميكانيكيه	6,240	6,240	—	—	—	—	
20	العليبي	المراوعه	1800	7,900	بئر	1,000	مدنيه + ميكانيكيه	6,300	6,800	—	—	—	—	
21	جبل الضامر	باجل	1600	9,000	بئر	1,000	مدنيه + ميكانيكيه	8,000	8,000	—	—	—	—	
22	الرافعي	الفلاف	1200	6,095	بئر	2,095	مدنيه + ميكانيكيه	4,000	4,000	—	—	—	—	
23	العجيليه	المراوعه	1500	6,500	بئر	1,000	مدنيه + ميكانيكيه	5,500	5,500	—	—	—	—	
24	محوى البهلولي	زبيد	1180	7,000	بئر	1,000	مدنيه + ميكانيكيه	6,000	6,000	—	—	—	—	
25	المدافن	السخنه	890	8,900	بئر	2,400	مدنيه + ميكانيكيه	6,500	6,500	—	—	—	—	

Summary Five-year plan GAREW BO Hudaydah 2001-2005

Projects[17]	Population 1994 census	Planned implementation period	Budgeted investment costs (contracts only) [18]		
			Million YR	KUSD [19]	USD per capita
01 - 50	100.000	1999 - 2002	1.250[20]	7.580	75
51 - 80	55.000	2002 - 2005	440	2.660	48
81 - 100	40.000	2003 - 2005	420	2.560	64
100	195.000		2.110	12.800	65

[17] The term 'project' is used to indicate a water supply system in a village (with subvillages), with provision of a limited number of public standposts. House connections and sanitary facilities are not included. Also salaries and allowances of staff and other operational costs are not included.

[18] Includes well construction, pumphouse, overhead reservoir, trench digging and laying of main pipes.

[19] Present exchange rate: 1 US$ = 165 YR

[20] This amount includes 632 million YR, being the value of works already implemented in this batch of villages before 2001.

Appendix 8
Submitted budget Hudaydah BO 2001, Arabic

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الجمهـــوريه اليمنيه
الهيئه العامه لكهرباء ومياه الريف
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البرنامج الإستثماري لعام ٢٠٠١م
مشاريـــــع قيـــــد التنفيـــذ

محافظة :- الحديده (١)

المبلـــــغ × ١٠٠٠

م	إســـــم المشـــــروع	المديريه	عدد المستفيدين	التكلفة الإجماليه للمشروع	الأعمـــــال المنفذه	تكلفة الأعمال المنفذه	الأعمال المتبقيه	تكلفة الأعمال المتبقيه	المبلغ المقترح لعام ٢٠٠١م	ملاحظـــــات
1	مبنى الفرع	الحديده	—	45,200	—	—	مدنيه	45,200	1 5,200	
2	القطيع	المراوعه	14000	22,221	بئر + ميكـ كيه	4144000	مدنيه	18,077	1 ,077	
3	القطابا	الخوخه	4950	24,442	بئر	2000	مدنيه	22,442	2 ,442	
4	مركز القناوص	القناوص	7000	11,994	بئر + ميكانيكيه + جزء من الأعمال المدنيه	10,807	جزء من الأعمال المدنيه	1,187	1,178	
5	دير الداؤديه	القناوص	3000	9,997	بئر + ميكانيكيه + جزء من الأعمال المدنيه	8,458	جزء من الأعمال المدنيه	1,540	1,540	
6	السخنه	السخنه	5000	11,727	بئر + ميكانيكيه + جزء من الأعمال المدنيه	7,954	جزء من الأعمال المدنيه	3,773	3,773	
7	المحاتين	السخنه	2794	13800	بئر	2,400	مدنيه + ميكانيكيه	11,400	11,400	
8	دير الزين	المراوعه	1200	11800	بئر	1,618	مدنيه + ميكانيكيه	10,182	10,182	
9	كحيل	السخنه	2200	15600	بئر	2,400	مدنيه + ميكانيكيه	13,200	13,200	
10	محوى الخليف ومسلب	زبيد	2500	12,449	بئر + ميكانيكيه	1,600	مدنيه + ميكانيكيه	10,849	10,849	
11	شعب التاج	زبيد	805	2,400	—	—	بئر	2,400	2,400	
13	الات ومعدات الفرع	الحديده	—	60,000	—	—	ميكانيكيه	60,000	60,000	
14	موشج	الخو خه	1650	16,472	بئر	1,200	مدنيه + ميكانيكيه	15,272	15,272	
15	زغلة	الز ّ ية	2340	10,000	بئر	1,000	مدنيه + ميكانيكيه	9,060	9,000	
16	عنكزه	الزبديه	2360	17,100	بئر	1,500	مدنيه + ميكانيكيه	15,600	15,600	
17	مجمع العطاويه	الزبديه	1800	8,800	بئر	1,200	مدنيه + ميكانيكيه	7,600	7,600	
18	دير القريطي	الزبديه	3500	15,700	بئر	1,100	مدنيه + ميكانيكيه	14,600	14,600	
19	هديمه	السخنه	2000	7,240	بئر	1,000	مدنيه + ميكانيكيه	6,240	6,240	
20	العنيبي	المراوعه	1800	7,900	بئر	1,000	مدنيه + ميكانيكيه	6,800	6,800	

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إدارة مشروعات المياه

البرنامج الإستثماري لعام ٢٠٠١م
مشـروعـــات قيـــد التنفيـــذ

محافظة :- الحديده (١)

المبلـــــغ × ١٠٠٠

م	إســـم المشـــروع	المديريه	عدد المستفيدين	التكلفة الإجماليه للمشروع	الأعمـــال المنفذه	تكلفة الأعمال المنفذه	الأعمال المتبقيه	تكلفة الأعمال المتبقيه	المبلغ المقترح لعام ٢٠٠١م	ملاحظـــات
21	جبل الضامر	باجل	1600	9,000	بئر	1,000	مدنيه + ميكانيكيه	8,000	8,000	
22	الرافعي	الفلاف	1200	6,095	بئر	2,095	مدنيه + ميكانيكيه	4,000	4,000	
23	العجيليه	المراوعه	1500	6,500	بئر	1,000	مدنيه + ميكانيكيه	5,500	5,500	
24	محوى البهلولي	زبيد	1180	7,000	بئر	1,000	مدنيه + ميكانيكيه	6,000	6,000	
26	وادي الخميس	برع	600	8,500	—	—	بئر + مدنيه + ميكانيكيه	8,500	8,500	
27	دير الداقه	باجل	1286	8,000	بئر	1,000	مدنيه + ميكانيكيه	7,000	7,000	
28	العاقيه	المراوعه	973	12,000	بئر	1,000	مدنيه + ميكانيكيه	11,000	5,500	
29	المعروفيه	الزيديه	7,000	11,600	بئر	1,000	مدنيه + ميكانيكيه	10,600	9,000	
30	البلسدي	اللحيه	1,187	14,600	بئر	1,000	مدنيه + ميكانيكيه	13,600	6,600	
31	الكدف	الزيديه	600	13,000	بئر	1,000	مدنيه + ميكانيكيه	12,000	6,000	
32	دير القادري الحشابره	الزيديه	1,500	15,000	بئر	1,000	مدنيه + ميكانيكيه	14,000	7,000	
33	بني موسى والمصبار	الدريهمي والمراوعه	3,000	15,000	بئر	1,000	مدنيه + ميكانيكيه	14,000	7,000	
34	دير البحري و الحشابره	الزيديه	1,678	18,600	بئر	2,000	مدنيه + ميكانيكيه	16,600	8,000	
35	الهارونيه وابن عباس	المنيره	605	16,900	بئر	1,100	مدنيه + ميكانيكيه	15,800	7,800	
36	دير الحربي	حيس	618	14,200	بئر	1000	بئر + مدنيه + ميكانيكيه	13,200	6,200	
37	الهيلمي	جبل راس	1,300	19,000	—	—	بئر + مدنيه + ميكانيكيه	19,000	9,500	
38	رفاعه والشط	المنصوريه	1,666	17,000	—	—	بئر + مدنيه + ميكانيكيه	17,000	8,500	
39	اللجام	المنصوريه	825	16,000	—	—	بئر + مدنيه + ميكانيكيه	16,000	9,000	
40	المحل	المنصوريه	780	11,000	—	—	بئر + مدنيه + ميكانيكيه	11,000	8,000	

بسم الله الرحمن الرحيم

الجمهـوريه اليمنيه
الهيئه العامه لكهرباء ومياه الريف
فرع الحديده
إدارة مشروعات المياه

البرنامج الاستثماري لعام ٢٠٠١م
مشاريـــع قيـــد التنفيـــذ

محافظة :- الحديده (١)

المبلـــــــغ × ١٠٠٠

م	إســـم المشـــروع	المديريه	عدد المستفيدين	التكلفه الإجماليه للمشروع	الأعمـــال المنفذه	تكلفة الأعمال المنفذه	الأعمال المتبقيه	تكلفة الأعمال المتبقيه	المبلغ المقترح لعام ٢٠٠١م	ملاحظـــات
41	المحلا	المنصوريه	780	16,000	بئر	1,000	مدنيه + ميكانيكيه	15,000	5,500	
42	المحوي	المنصوريه	1988	14,000	بئر	1,000	مدنيه + ميكانيكيه	13,000	7,500	
43	الكوازيه	المنصوريه	768	12,000	—	—	بئر + مدنيه + ميكانيكيه	12,800	7,000	
44	الكلابيه	المنصوريه	763	19,000	بئر	1,200	بئر + مدنيه + ميكانيكيه	17,800	10,800	
45	الحصيه	المنصوريه	1350	14,000	—	—	بئر + مدنيه + ميكانيكيه	14,000	9,500	
46	الحجمه	المنصوريه	779	12,800	—	—	بئر + مدنيه + ميكانيكيه	12,800	7,500	
47	الحبيل	باجل	884	14,000	—	—	بئر + مدنيه + ميكانيكيه	14,000	5,800	
48	القصيريه	المنصوريه	976	13,600	بئر	1,100	مدنيه + ميكانيكيه	12,600	6,500	
49	بني غلاب	بيت الفقيه	2000	15,600	بئر	7,563	مدنيه + ميكانيكيه	8,037	4,037	
50	الجراحي الأعلى	زبيد	2200	15,000	بئر	1,000	مدنيه + ميكانيكيه	14,000	7,000	
	الإجمالي العام		100,486	709,837		4128195		632,199	453,690	

Appendix 9
Dhamar BO development in figures

Dhamar Bo Development in figures

Table A. Staff development in Dhamar Branch Office

Actual staff	1997	1998	1999	2000	2001
Technical staff (civil)	2	3	4	4	4
Hydrogeologist	1	2	3	3	3
Drilling supervisor	1	1	1	1	1
Financial/admin. staff	1	1	6	6	6
Mechanical staff	4	6	10	10	10
Guards	2	2	3	3	3
Computer spec.			1	1	1
Secretary			1	1	1
Housekeeper			1	1	1
Repres. Sana'a			2	2	2
Projected extension					2001
Chemist					1
Geophysicist					1
Civil engineer					1
Sanitary engineer					1
Electrical engineer					1
Database specialist					1
Trainer					1
Social mobiliser (female)					4
Total staff	11	15	32	32	43

Table B. Project implementation by Dhamar Branch Office - (from the handing over of project equipment)

Project component	1997 (2nd half)	1998	1999	2000	2001 budget
Well construction	12	27	42	42	)
Pump installation	10	9	30	59	) 193
Civil works	7	6	18[22]	67	)
Generator[21]		8			
Total costs in Million YR	151	350	798	1662[23]	1170

[21] Apart from rural water supply, GAREW also has the task of rural electrification.

[22] Including Branch Office building at a cost of 97 MYR.

[23] Costs upto September 2000, including projects for which tenders have been launched.

Table C. List of equipment requested by Dhamar BO

Item	Quantity	Estimated unit cost in US$	Total estimated cost in US$
Office equipment			25,950
Chair	50	20	1,000
Whiteboard	1	100	100
Drawing board	2	250	500
Large table	2	150	300
Small table	2	100	200
Computer	10	1,500	15,000
UPS	6	600	3,600
Copying machine	2	2,000	4,000
Projector for slides	1	500	500
Video	1	750	750
Field equipment			25,900
Theodolite	2	1,500	3,000
Compass	4	50	200
Altimeter	4	250	1,000
EC meter	4	350	1,400
Electrical waterlevel sounder	4	700	2,800
(200, 300, 400, 500 m)	LS	5,000	5,000
Topographical maps	LS	10,000	10,000
Laboratory equipment	1	2,500	2,500
Portable laboratory			
Means of transport			95,000
Pick-up 4x4	2	15,000	30,000
Hardtop 4x4	1	25,000	25,000
Bus for staff transport	1	40,000	40,000
TOTAL			146,850

Appendix 10
Lists of Hudaydah BO and SURWAS staff

HUDAYDAH BRANCH OFFICE STAFF AS PER 01-10-2000

No	Name	position	Date of empl. Or arrival Hod	Mode of empl.
1	Mr Talal saif AL Qadasi	General Director	07/07/99	GAREW
2	Mr khalid Ahmad Salam	Director of Projects	01/10/99	GAREW
3	Mr Taraque Taher Razaz	Auditing Manager	01/10/99	GAREW
4	Mr Abdul Paset A	Financing Dep	10/09/00	GAREW
5	Mr Waleed Salam	Mechanical Engineer	20/10/99	GAREW
6	Mr Mokhtar Al-Miklafi	Civil Engineer	10/11/99	With contract
7	Mr Yassin Ahmad	Planing officer	23/10/99	GAREW
8	Mr kasi Abdul-Aziz	Storekeeper	05/09/99	GAREW
9	Mr khalid Abdul-Aziz	Purchasing Officer	20/10/99	GAREW
10	Mr Hisham Saif Nagi	Comenity Participation	11/12/99	GAREW
11	Mr Fisal Mosleh	Officer .M	23/10/99	With contract
12	Mr Fouad Khalil Ata	Comenity Participation	11/12/99	With contract
13	Mrs Shefa Abdul .r	Secretary	01/04/00	With contract
14	Mrs Azeza Al-Hamazy	House Keeper	13/05/00	With contract

No.	Office/administration Staff	Position
1	Abdul Kari Omar	Left the project
2	Tayyab Ali Taber	Head of Section
3	Abdullah Omar Almafa	Storekeeper
4	Delia Garcia Kibsi	Senior Secretary
5	Hanan Taher Saleh al Hepsi	Secretary
6	Nagib Ahmed Qasim	PR Officer
7	Mahdi Ali Abdo	Housekeeper
8	Abdo Ali Hamood	Guard
9	Saleh Haider Hassan	Guard
10	Hayel Salim Ahmed	Guard
11	Mohamed Hayel Salim	Guard
12	Mohammed Qasim Al Udayni	Guard
13	Qasim Mohammed Ali	Guard

No.	Civil Section Staff	Position
14	Abdul Waly Ash Shamy	Projects Manager
15	Ahmed Ahmed Al Kibsi	Head of Section
16	Fikri Abdul Galil Mohammed	Extensionist
17	Abdul Aziz Abdullah Turabi	Superviser
18	Abdul Ghani Sayf Rajeh	Senior Technician
19	Qasim Ibrahim Al Udayni	Senior Technician
20	Abdul Jabar Manee	Senior Technician
21	Abdul Ilah Al Gharsi	Senior Technician
22	Abdul Raqeeb Ibrahim Al Magrabi	Tchnician

No.	SPU Section Staff	Position
23	Samira Jahi Ayash	Senior Extensionist
24	Haloom Mashoor Mohammed	Senior Extensionist
25	Hisnah Abdullah Ahmed	Extensionist
26	Ibtisam Hashim Izzy	Extensionist
27	Fatoom Mohammed Al Qanawi	Extensionist
28	Farooq Aly Ghaylan	Extensionist
29	Abdul Jabar Abdul Abdullah	Extensionist
30	Ahmed Al-Bakri	Specialist
31	Abdul Aziz H.M.	Driver

No.	Mechanical Section Staff	Position
32	Abdul Ghalil Mohammed Sayf	Head of Section
33	Adel Abdul Wadood Jazim	Technician
34	Saeed Ali Mohammed	Assistan Office Man.
35	Abdul Rahman Khalid Radman	Technician
36	Wadee Mohammed Nasher	Technician
37	Abdul Salam Ahmed Abdo	Senior Technician
38	Abdullah Abdul Qawi	Technician
39	Abdul Hafeed Ahmed Haider	Technician

No.	Sana'a Staff	Position
40	Abdul Qadir Hanash	Head of Section
41	Tawfiq Abdul Habib	PR Officer

Appendix 11
Anticipated BO staff requirements

ANTICIPATED BO STAFF REQUIREMENTS FOR DIFFERENT PRODUCTION LEVELS

Staffing / Production per year	20 complete systems	35 complete systems	50 complete systems	Present BO staff	Present SURWAS staff
Management					
General Director	1	1	1	1	1
Director of Projects	1	1	1	1	1
Executive staff					
Social mobilisers	6	9	12	--	6
Community organiser	2	3	4	2	2
Senior civil engineer	2	3	4	1	1
Sanitary engineer	1	2	3	--	1
Junior civil engineer	2	3	4	--	2
Hydrogeologist	1	1	1	--	--
Draughtsman	1	2	2	--	1
Supervisor water supply	6	9	12	--	4
Supervisor sanitation	4	6	8	--	2
Technician maint/extension/etc	2	2	2	--	--
TOTAL	27	40	52	3	19
Support staff					
Fin/admin staff	4	5	6	4	1
Workshop staff[1]	10	10	12	2	8
Secretary	2	3	3	1	1
Database expert	1	1	1	--	1
Storekeeper	1	1	1	1	1
Driver	2	3	4	--	1
Guard	6	6	6	--	6
Housekeeping	2	2	2	1	1
TOTAL	28	31	35	9	20
GRAND TOTAL	**57**	**73**	**89**	**14**	**41[2]**

[1] Including mechanical engineers for well testing unit and for pump/engine installation.

[2] Two Sana'a based staff members not included.