APPENDICES

Advisory review of the environmental impact statement / feasibility study Shabwah: water and sanitation and recommendations for project identification, Yemen

(appendices 1 to 4)

APPENDIX 1

Letter from DGIS dated 16 November 1995, in which the Commission has been asked to submit an advisory review

Ministry of Foreign Affairs

The Hague

Commissie voor de milieu-effectrapportage
t.a.v. de heer drs. J.J. Scholten
Postbus 2345
3500 GH Utrecht

Directorate-General
International Cooperation

Date : 16 November 1995

Re : Shabwah/Yemen
WW92850
JRC 381-93
MER/93/01

Ref : DST/ML
587/95

By letter dated 19 July 1993 the Environment Programme of DGIS asked the Commission to advice for the Terms of Reference of the Environmental Impact Statement for the water supply, sanitation and waste water disposal projects for Ataq, Wadi Jirdan, Nisab and Beihan areas in Shabwah Governorate of the Republic of Yemen. The Evironmental Impact Statement is part of the feasibility study made by NEI. The draft final report of September 1995 has been sent to you.

With reference to the EIA agreement between DGIS and the Commission and the budget indications for the total of NLG 33,052.- made by you on 2 September 1993, I would appreciate receiving an advice for the review of the Environmental Impact Statement as soon as possible.

THE MINISTER FOR DEVELOPMENT COOPERATION
For the Minister
Head Environment Programme,

K.A. Koekkoek

APPENDIX 2

Project information

Proposed Activity: The government of the Republic of Yemen and authorities of the Shabwah Governorate plan to upgrade and develop the water supply, sanitation and waste water disposal facilities for the population centres of Ataq, Nisab, Beihan and the rural area of Wadi Jirdan in Shabwah Governorate. The government of the Netherlands intends to assist the government of the Republic of Yemen in implementing this initiative.

Categories: rural water and sewerage DAC CRS-code 92011

Project numbers: WW/92/850, vlgnr. 001; Commissie m.e.r. 001

Progress:
letter with request to submit an advice on Terms of Reference: 19 July 1993
mission working group: 19 - 30 September 1993
advice on Terms of Reference submitted: 14 October 1993
Terms of Reference determined: January 1995
letter with request to submit an advisory review: 20 November 1995
advisory review submitted: 19 March 1996

Special features: Main findings of the review: the EIS is incomplete and the presented information is insufficient for well informed decision making. For the development of the alternatives no use is made of the sustainability concept and an integrated area-specific approach. This resulted in two project proposals which do not offer sustainable solutions for the existing problems. In the advisory review recommendations of new projects are presented.

Composition of the working group of the Commission for EIA:
Mr Abdulkadir Mohammed Hassan (Terms of Reference)
Mrs Ilham Ali Abdulla Basahi (Advisory review)
Mr H.T.J. Chabot
Mrs L. Scheepers
Mr J.L. Terweij
Mr D. de Zeeuw (voorzitter)

Technical secretary: Mr J.J. Scholten (Terms of Reference) and Mr A.J. Kolhoff (advisory review).

APPENDIX 3

Letter from the Commission for EIA dated 15 February 1995 concerning the ToR for EIS/feasibility study Shabwah: water and sanitation, Yemen

commissie voor de milieu-effectrapportage

Ministerie voor Ontwikkelingssamenwerking
T.a.v. dr. K.A. Koekkoek
Hoofd Milieuprogramma (DST/ML)
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uw kenmerk	uw brief	ons kenmerk
--	--	U005-95/Sc/eb/001-101
onderwerp	doorkiesnr.	Utrecht,
TOR Feasibility Study/EIS Water supply, sanitation and waste water treatment Shabwah, Yemen (YE/93/005-007)	030 - 347 600	15 februari 1995

Op 23 januari 1995 ontving de Commissie voor de milieu-effectrapportage (m.e.r.) de in januari 1995 vastgestelde richtlijnen (Terms of Reference) voor de "Feasibility study of water supply, sanitation and waste disposal projects in Shabwa province, Republic of Yemen". Voor de vaststelling van deze richtlijnen had de Commissie voor de m.e.r. op 14 oktober 1993 een advies uitgebracht op verzoek van de minister voor Ontwikkelingssamenwerking: "Advice on the Specifications for the content of the EIS on the water supply, sanitation and waste water disposal projects for Ataq, Wadi Jirdan, Nisab and Beihan areas, Shabwah Governorate, Republic of Yemen."
De Commissie voor de m.e.r. wil op de vastgestelde Terms of Reference (ToR) reageren met het oog op de toetsing van het EIS en verder vanwege het leereffect voor de opstelling van volgende richtlijnenadviezen.
Uit de vastgestelde richtlijnen (ToR) kan niet worden opgemaakt op welke wijze het advies van de Commissie voor de m.e.r. is gebruikt en waarom is afgeweken van het advies. In de ToR wordt slechts terloops naar het advies van de Commissie verwezen. (De ToR wijken niet veel af van de het eerste concept van de ToR die door RWS Flevoland werden gemaakt en die dateren van 15 oktober 1993. De concept-ToR dateren dus van ongeveer gelijke datum als het advies van de Commissie.)
Dit betekent dat de status van het advies van de Commissie onduidelijk is. De vraag die zich daarbij voordoet is: in hoeverre zullen de opstellers van de Feasibility study/Environmental Impact Statement (EIS) gebruik maken van het advies van de Commissie?
Deze vraag is belangrijk omdat de ToR onevenwichtig van opzet zijn en daarom niet goed in staat zijn de opstelling van het EIS te sturen. Op sommige punten zijn de ToR vaag hetgeen wordt geïllustreerd door het gebruik in de tekst van de ToR van "*etc.....*", terwijl andere punten op de ToR gedetailleerde informatie vragen over met name de bestaande toestand. De ToR omvatten een ruimer terrein dan het advies wat betreft de afvalbehandeling (waste disposal – waste water disposal).

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Verder gaan de ToR niet in op de werkwijze waarop de Feasibility study/EIS zal worden opgesteld. Te zijner tijd zal de Commissie voor de m.e.r. gevraagd worden het EIS-gedeelte van de Feasibility study/EIS te toetsen op relevantie voor het te nemen besluit over de projecten en op de kwaliteit van de milieu-informatie. De onevenwichtigheid en algemeenheid van de ToR zal die toetsing bemoeilijken. Daarbij zal de Commissie om haar taak naar behoren te kunnen uitvoeren genoodzaakt zijn het MER te toetsen aan haar advies voor richtlijnen.
De Commissie zal graag uw standpunt vernemen over de status van haar advies en over het gebruik van de ToR en het advies bij de toetsing van het EIS. Dit is ook van belang voor nog komende richtlijnenadviezen die de Commissie gevraagd zullen worden te maken.

prof.dr.ir. D. de Zeeuw
voorzitter van de werkgroep m.e.r.
YE/93/005-007

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APPENDIX 4

Review of the EIS

Table of Contents

1. REVIEW OF THE EIS

In this appendix the EIS/feasibility study will be reviewed in detail. The structure of this appendix is similar to the structure of the scoping advice for the EIS as prepared by the Commission for EIA in October 1993. In order to facilitate reading, each (sub)paragraph of this appendix starts with reference to the information requested in the scoping advice, see the boxes.

1.1 Statement of the problem and objectives

The EIS must present a description of the background of the proposed initiative leading to a clear statement of the problem. The statement of the problem must form the basis for clearly formulated (and if possible quantitative) objectives which must be observed for the various components of the initiative for a certain planning period during the subsequent stages of implementation.

Objectives

- *to supply safe drinking water without serious interruption over the planning period as well as adequate sanitation facilities to the population centres of Ataq, Nisab, Beihan and Wadi Jirdan;*
- *to meet the predicted water demands in the long run through a balanced and sound exploitation of the available water resources for all sectors of development both in terms quantity as well as quality;*
- *to ensure the institutional sustainability through the strengthening of the technical and social skills of all persons rendering water related services, including coordination capacity;*
- *to ensure social sustainability through the commitment and participation of the beneficiaries (especially women) of the water supply and sanitation facilities in all phases of the project-cycle.*

The problems and the objectives are described in general qualitative terms for the study area as a whole. Area-specific problem analyses and setting of objectives are lacking. Household surveys were undertaken to determine needs, and rank priorities for intervention but the findings of the survey are not translated into area-specific objectives. This is necessary to determine the opportunities and direction for the development of alternatives. This should have been elaborated in close connection with the existing governmental and local structures.

1.2 Current situation and study areas

The EIS must describe the current situation. In the EIS, the study areas for the four different areas must be clearly specified.

General

In chapter 2 the current situation is sectorally described for all the four areas. As a consequence of this presentation it is difficult to get an overview of the current situation in each of the various areas because the information is scattered throughout the text. For the development of integrated area-specific alternatives it is necessary to define the study areas and present for each area a brief description of the main features relating to the physical availability, the social context and the institutional factors contributing to the desired sustainability.

Physical environment
The present and long term availability of ground water is not clear due to lack of information. The expected increase of water consumption from 25 to 50 litres per person per day on average implies that water use increases to about 3% of total exploitable ground water resources in the year 2010. This is correct for water use for drinking water purposes. No estimate has been made of the increase in water use for other purposes. It can be expected that any improvements in the water supply situation in each of the four areas will trigger secondary developments, thereby increasing water demands, not only for drinking water supply but other water uses, i.e. for agriculture and industrial activities.

Water quality data and analyses are lacking; distribution of EC is studied: supporting analyses for chemical composition could not be executed, due to lack of laboratory facilities[1]]. Bacterial contamination is a severe problem.

Beihan
Quantity; In the case of wadi Beihan a drop of 3 metres in the water table has been observed between 1969 and 1977. More recently ground water abstraction is estimated to have increased from about 75 Mm^3/yr to 80 Mm^3/yr in the period 1986 to 1994. In annex 7, table 7.1 (Projections of water use) the total volume of exploitable ground water resources in wadi Beihan has been estimated at 33 Mm^3/yr. This means that overpumping is taking place. Beihan relies on renewable sources of ground water; however, overpumping does prevent a complete recharge of the aquifer during and after floods.

Quality; Data on chemical composition are lacking. Both the contents of nitrate and of salts may be expected to increase, due to infiltration of untreated waste water and to flushing of salt accumulated on irrigated land respectively. In this respect overpumping will cause further deterioration since floods do not recharge the aquifer.

Nisab
Quantity; The total volume of exploitable ground water resources has been calculated as 28.9 Mm3/yr. In 1982 the average water abstraction was 14.4 Mm3/yr. The conclusion, on this basis, that an increase in ground water abstraction may be possible, is not justified. The increase in wells and water pumped for agricultural purposes in this area, since then, is also not known. Nisab relies on renewable sources of ground water.

Quality; Throughout Wadi Hamman the amount of nitrates exceeds the permissable level and it is expected that due to population growth, if infiltration of untreated waste water continues, the nitrate content will even rise in future. This will, not only, be a threat for Nisab water supply, but also for the Ausha well field, located further downstream in wadi Hamman, which is the present water source for Ataq.

Ataq and Wadi Jirdan
Ataq (Ausha well field) relies on renewable sources of water. For Ataq (Shubaika/Bakabira) and for Wadi Jirdan no water balance calculations could be made, due to lack of sufficient data on water quantity and quality. The ground water sources are said to be non-renewable. But the underlying Mukalla Sandstone aquifer is a good water bearing

1 In 1993, the Commission reported and recommended to rehabilitate and upgrade the laboratory of the Aden green Belt project, to carry out the required services.

layer, with a potential of high porosity and storage capacity; high yielding production wells are to be found in fractured and faulted zones. Additional geophysical and hydrogeological investigations are necessary to locate a new well field and new production wells. In annex 7, table 7.1, a figure of 2.18 Mm^3/yr has been mentioned for the total volume of exploitable ground water sources in wadi Jirdan and at Shubaika/Bakabira as well. Since, no water balance calculations could be made for these areas, the value of this figure is questionable.

Social environment
A relatively good insight has been gained in the needs of the target population and in the opinions of the government and community officials. With regard to the importance of the needs and the opinions of the participants for the formulation of project proposals, the following is highlighted:

- All areas demand more water. However, the demand for water is differentiated as follows: demand for washing and cleaning 41%, for drinking 23% and for bathing 21%.
- The majority is ready to pay high water tariffs and to pay for sanitation services.
- Sewerage does rank first as a problem and sewerage improvements rank above improvements in water supply.
- Government officials and management of the existing Water Authorities did not consider the community model to be suitable for the towns. They did recognize the need for some sort of institutional reform in these three towns.

With regard to the needs of women in Wadi Jirdan, where women are still fetching water and where the majority of houses do not have a toilet, the gender impact of water supply and sanitation facilities should have been emphasized more explicitly. Water supply facilities would alleviate the heavy workload of women. Sanitary privacy for women would impact on their health, as in other parts of Yemen a link between high incidence of kidney problems in women and absence of private sanitary facilities has been established.

The considerable amount of socioeconomic data reflects very well the importance of community participation and highlights the tradition of community involvement. With regard to the social organization of water supply/distribution and sewerage systems, it is mentioned that self help organizations and arrangements are organized according to tribal roots and are particularly strong in rural areas. Information about rights of passage, land rights and water rights is mentioned in annex 5 water supply basic data for the four areas and the implications of this issue is mentioned in annex 7, § 1.2 page a122 but it is not elaborated upon in the main report when describing the current situation. This information is essential for the formulation of project proposals and for implementation of a properly functioning sewerage system in order to prevent potential conflicts. In annex 3, § 4.2 page a61, it is mentioned that "*Blockages and leakages are common as rights of passage and land rights obstruct the proper layout and operation of sewer lines and networks*". These issues have not been elaborated upon while considering the sewerage options. Importance of the issues mentioned above is recognized in the National environmental action plan in which it is stated that lack of clarity about water rights and property rights is one of the causes of the problems in the water sector.

Public health. The present health situation is insufficiently described. Notably basic epidemiological information concerning water related morbidity and mortality has not been presented, nor has there been an effort made to describe the functioning of the available

services in the areas concerned. The specific request to involve the Ministry of Health in the monitoring of water quality criteria and the development of the necessary IEC messages to be promoted by the health personnel, has not been taken into account. Furthermore, the possible contribution of the various levels of the health services its strength and weaknesses to deal with water related morbidity and mortality has nowhere been documented.

As far as water quality is concerned, according to international standards the findings are alarming:

- Water quality indicators and EC values are too high and therefore will have a negative impact on health (page a21).
- The EIS does mention the more common indicators for bacteriological contamination, the coliform counts in annex 2. In some sources even Salmonella and Shigella bacteria have been found. The EIS correctly states that bacteriological contamination does not only occur at the source but also in the in-house storage reservoirs.
- The EIS gives much importance to Infant Mortality Rate data. As no reliable registration of birth and deaths exists in the area and substantial population bases are needed to make reliable estimates, the figures for the project area are indications at best with a considerable margin (page a9).

Institutional environment

The description of the existing institutions/agencies involved in the water sector, their daily functioning, responsibilities, tasks and their implementation capacity, is incomplete. In fact it is only mentioned that in Shabwah Governorate three different institutional arrangements for the organization of water supply services exist: associations, authorities and private tankers. The functioning of these Water authorities in the main towns of Ataq, Beihan and Nisab has been described extensively. Although in the report it is recognized that these Authorities have demonstrated to possess and to provide the necessary technical know how and guidance to communities without which many projects would not have materialized (annex 3, page a70), it was concluded "*that the authorities are not viable any more and need to be restructured or else be allowed to disappear*" (annex 8, page a133).

Apart from the extensive description of the above-mentioned Water authorities, other institutions involved in the water sector are only briefly described. For example, the Water Resources Division of the Ministry of Agriculture, which is responsible at the governorate level for the water resources, was described as being weakly staffed and having no operational budget for the purposes of water resources management. Furthermore, the recent installation of the National Water Authority was also mentioned, but not elaborated upon. A comprehensive description of existing institutions involved in the water sector on governorate and also on national level, other than only water supply institutions, is essential in view of monitoring the sustainable availability of the water resources. This review should take into account the forthcoming national policy and strategy on water issues, which is of utmost importance in a country like Yemen with a critical water problem.

1.3 Formulation of the interventions (alternatives) and description of their environmental impacts

The following methodological approach is proposed to arrive at the preferred interventions; (i) the (geo)hydrological situation restricts the development potential for future water use, (ii) the use of the potential aquifers must be looked at from the point of view of the principle of sustainability, (iii) the most suitable combination of physical, social and institutional elements must be determined to formulate the preferred intervention for each project area. The impacts resulting from each reasonably achievable intervention must be predicted and considered.

1.3.1 **Methodology**

The method used to develop alternatives differs widely from the guidelines.

First step:
In § 3.3 and annex 5 a number of options (alternatives) are described for each sector:

- waste disposal, 1 option applicable for all study areas;
- sewerage, 4 options applicable for each of the three urban study areas and 1 option for Wadi Jirdan;
- water source, 4 options for Ataq, 4 options for Nisab, 4 options for Wadi Jirdan and 3 options for Beihan;
- institutional options are only described in annex 8, page a133.

The identified sectoral options/alternatives are not combined into coherent alternatives. The sustainability concept as defined by the Commission is not used for the development of coherent alternatives.

Second step:
In chapter 4, 15 alternatives are evaluated on the basis of 10 criteria. The selection of these 15 alternatives is not thoroughly motivated. The alternatives defined are limited to water supply mainly supplemented with institutional reform for a number of alternatives. The options concerning sewerage and waste disposal are no part of the selected alternatives and this is a serious omission. The evaluation of these alternatives is executed for all the study areas together. An evaluation per study area should be preferred.

The availability of renewable ground water is one of the criteria used for evaluation. This should not be a criterion but an absolute precondition. With respect to a guaranteed availability of water in the future the Commission prefers the sustainable availability of ground water instead of availability of renewable ground water.

Third step:
The Commission regrets that the proposed balancing and ranking of criteria during a workshop by all stakeholders could not take place because several groups did not show up. To determine the impacts of the 15 selected alternatives on poverty, gender, health and environment 10 criteria are distinguished in total (§ 4.4). Most of the criteria are well-chosen but it is not clear which weights are given to the criteria. Remarks with regard to the multi-criteria analyses (MCA):

- Ranking of criteria is different between various groups (page a137): is this reflected in the MCA? Does ranking of the options then also differ?
- Which factor causes that option J1 ranks first for all agents? The same for ranking 12 for option N2.

- (Page a133) presentation of the scoring of the criteria would make the ranking and limitation of water sources options visible; scores are basic information, which should be presented?
- Is uncertainty in scores applied? Will ranking differ with an uncertainty of say 50%?

The finally selected alternatives which are translated into proposed projects do not offer sustainable area-specific solution(s) for the existing problems.

Physical sustainability

In annex 2, page a11 is stated : "*The alternatives presented are based on a general understanding of the geohydrological conditions in the four areas and do not imply that suggested water sources are proven*". Furthermore is mentioned: "*The quality of the suggested water sources is in general based on EC values only*".

There are two possibilities for the solution of the increasing water demand: (i) development of new well fields or (ii) a better management of the existing well fields and water use. In the EIS/feasibility study there is a strong preference for the development of new well fields. From the physical sustainability point of view the management of the existing water resources have preference, because there is a situation of overexploitation in Beihan and the potential in the other three areas is not clear.

Alternatives aiming at water conservation (e.g. increase of the irrigation efficiency and reuse of waste water) are mentioned in the study but not elaborated as feasible options for interventions.

Source options Ataq 2, 3 and Wadi Jirdan 1, 2 are said to be non-renewable sources (page a40). These ground water sources are however from the Mukalla sandstone aquifer, which is generally said to be promising.

The criteria ground water mining and water quality as shown in table 4.5 on p.43 are well-chosen but they do not reflect the impacts which will occur; criterion water quality only ++ and criterion water mining only absolute figures. What matters is to know if a situation of over, under or balanced exploitation will occur.

Social sustainability

Perception and needs research regarding the present services offered (water supply; sanitation; and water related diseases) has been part of the socioeconomic surveys executed (annex 3). Sewerage problems rank first as a problem among all persons interviewed in the four areas (§ 5.1). However, the selected alternatives focus on water supply mainly. It is not motivated why alternatives concerning the improvement of the sewerage/sanitation situation are only partial integrated.

The criteria, number of beneficiaries and number of water carriers and poverty alleviation are well chosen and the expected impacts are correctly filled in (§ 4.4 and table 4.5). However, the impacts of water use decisions for different user groups in the watershed are not described.

Activities in the field of health education as proposed are not sufficient to overcome the health related problems. A more systematic and sustainable approach has to be worked out together with the health authorities. This should include attention not only for water quality and quantity, but also for waste disposal, waste water disposal/drainage. A more

elaborate and continuous institutional link of the proposed interventions with the health authorities in the four respective areas is needed, so as to enhance sustainability and the elaboration of appropriate health and hygiene related messages.

The leading causes of death of children (diarrhoea) would be reduced most through the proposed intervention in sewerage, water provision of acceptable quantity and quality. This relation is not easy to establish (page a22) and certainly cannot be scientifically proven in such a short and small study. The annex 6 that presents the data of a small survey in this area seems too superficial to be used as an argument in this discussion.

From a public health point of view, the conclusion appears valid that sewerage ranks first as a problem and is considered even more important than improvements in water supply (page a39). The Commission, however does not agree with the assumption given on page a34 (box on water supply without a project), that use of smaller quantities of water (due to higher prices paid to the private sector) will lead to less waste water and no significant effects on health. On the contrary, existing evidence makes this relation quite unlikely. In terms of expected public health impact, high quantities (volume) of water might even rank higher than water quality.

Impact criteria, reduced health risk and improvement of EC levels appears of limited value, the criterion mortality related diseases is preferred.

Institutional sustainability
Because institutional reforms are of dominant concern and a precondition for the interventions to be undertaken, all recommendations tend in the direction of community and neighbourhood associations, NGOs and private business. The Commission however does not agree with the following statement: "*transfer of as many of the tasks and responsibilities as possible from the water authorities and housing offices to community organizations*" (page a49). It is the balanced interaction between private and public inputs that will assure long lasting results. The option for "*institutional reform*" in the priority projects (page a49) is therefore correct, but unfortunately remains quite vague and general. The report/alternatives would become more balanced if additional measures to support public institutions to improve their policy-setting, regulatory and control functions were to be elaborated upon in some more detail as part of the approach.

For each area, specific interventions have to be elaborated together with the main stakeholders of that area (as part of the institutional support). However, the descriptions of institutional and financial options, although interesting are not always clear (page a26/a27). Each option should be defined more clearly in terms of responsibilities of the different factors, consequences for the activities to be undertaken and financial implications for the consumers. This should provide a matrix that leads to real alternatives and that provides information about the possible consequences of each alternative, as has been correctly presented in the chapter on sectoral options (page a28 – a32).

Furthermore, it is noted that a human resource development plan, as recommended in the Commission's scoping advice is not elaborated.

1.3.2 Preferred intervention

The nature and features of the preferred intervention in each project area will be determined by the most suitable combination of physical, social and institutional project components.

In § 5.5 two priority projects are defined and project proposals are elaborated in annex 9. The Commission has some general and some project-specific remarks regarding the set up and the sustainability aspects.

In both project proposals no balance between the three components of sustainability has been developed. The first proposal follows exclusively a community approach and the second proposal envisages the restructuring of a governmental water supply authority.

The needs that were determined during the study have not fully been taken into account in the two proposals as:

- the needs assessment indicated the sewerage improvements as most important whilst the two proposals focus mainly on drinking water supply;
- the most urgent needs for water are respectively 1) for washing and cleaning, 2) drinking and 3) bathing. In view of poor quality of the water available why is the focus of proposals on provision of drinking water and why has the differentiation of different qualities of water to be provided not been considered?

The disintegration of the Water Authorities was among others due to absence of payment. It would have been better if the willingness of the target population to pay higher tariffs was combined with the opinion of the Government officials and management of the existing Water Authorities. The Water Authorities do not consider the community model to be suitable for the towns and recognize the need for some sort of institutional reform. With regard to institutional sustainability a proposal should be formulated in which community participation was combined with institutional reform of government institutions.

Community development support project
Although partnership is advocated (annex 9, page a142), in fact little is proposed to upgrade and improve government support for the interventions mentioned. All the attention (and the money) goes to the community activities while the strengthening of the public sector to support, regulate and control these interventions (like price-setting, access to water and water rights, quality control etcetera) remains almost completely unaddressed. Experience in Egypt (Fayoum) with the setting up of small socioeconomic activities shows, that the budget that is proposed for these interventions (US$ 2M/per year) for 5 years appears grossly overestimated in comparison with expected capacity and needs to run this sort of community initiatives. The Commission has her sincere doubts as to the actual viability of the plan to concentrate entirely on community development. A more balanced proposal giving attention to both public and private responsibilities, needs to be elaborated in the first year of the project.

Rehabilitation of water and sanitation, Ataq subdistrict
Although in annex 4, a description is given of three water authorities in Ataq, Nisab and Beihan respectively, the project proposal focuses on one of these only. Taking into account the opinion of the government officials and management of the existing Water Authorities which did not consider the community model to be suitable for the towns and

which did recognize the need for some sort of institutional reform, the question arises why the community approach was chosen in the towns of Nisab and Beihan instead of a restructuring of the Water Authorities?

The choice of the governmental institution in the project proposal is interesting. However, the strengthening of the technical, managerial and social skills of the employees of the authority, including their coordination capacity, could have been elaborated more explicitly in order to improve the capability of the authority to provide technical assistance to community initiatives. Accordingly, in the project proposal upgrading of the above-mentioned skills of employees of the Water Authority should go along with a community approach.

With regard to the physical sustainability the proposed autonomous status of the Water Authority can be questioned. Water supply authorities could be assumed to become a channel through which the government will implement some aspects of the forthcoming national policy and strategy on water issues. The autonomy of the Water Authority will most likely undermine the authority of other governmental institutions to implement and monitor aspects of this forthcoming national policy and strategy on water issues.

1.4 Mitigating measures

In the EIS additional measures which may further reduce the environmental impacts resulting from the implementation of the proposed projects must be indicated.

Some mitigating measures are mentioned in annex 7, page a129, but these are not incorporated into the alternatives.

1.5 Comparison of the environmental impacts from the proposed interventions with the current situation

In the EIS the impacts which will occur from the proposed interventions in the four project areas must be compared with the impacts from the existing situation as well as with the situation that would develop if the interventions would not take place; the autonomous development.

The autonomous development is briefly described in § 4.2. The described autonomous (without project) development is quite alarming in terms of water supply for the three urban areas. To get insight in the added (environmental) value of the proposed activities it would have been valuable if the autonomous development was compared with the proposed activities\alternatives as a reference situation. Table 4.5 shows the comparison of the 15 selected alternatives. A comparison of these alternatives with the autonomous development has not been executed. Therefore, the added value of the alternatives is not clear.

1.6 Remaining gaps in knowledge and post-project evaluation

The EIS must include a list of the gaps in knowledge which remain. Any uncertainties in forecasting the environmental impacts must also be included. The significance of these gaps in knowledge and uncertainties for the implementation of the proposed projects must also be specified.

A list of the gaps in knowledge which remain and the significance of these gaps for the development of alternatives and implementation of the proposed projects are not specified. A post-project evaluation programme is not included.