Commission for environmental assessment

# Advice on Terms of Reference for an SEA for a Road Master Plan Socotra - Yemen

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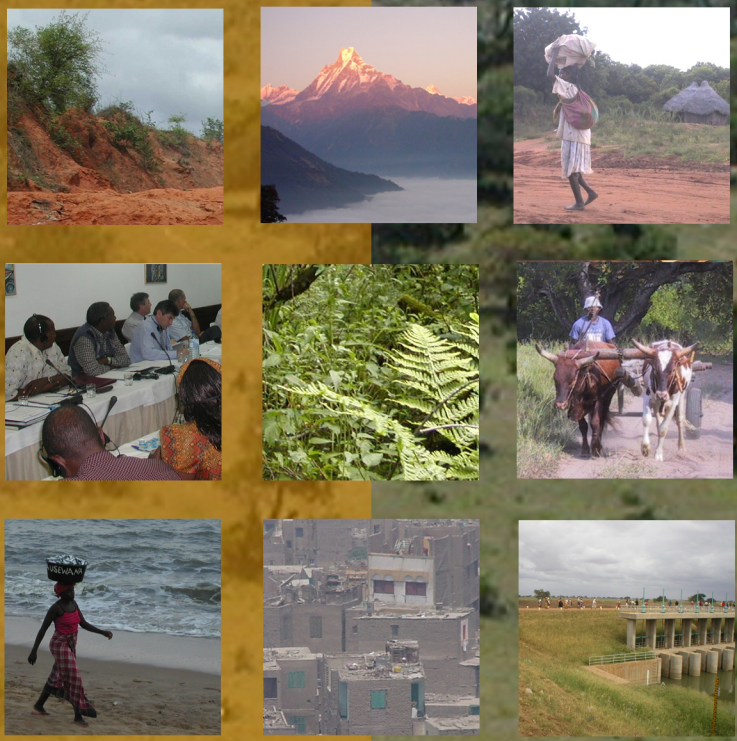


Netherlands Commission for
Environmental Assessment

To
Eng. Abdul-Rahman F. al-Eryani
Ministry of Water and Environment
P.O. Box 19237
Sana'a
Yemen

| your reference | your letter of | our reference |
|---|---|---|
| -- | 4 August 2008 | OS25 - 084/Ak/Lw |
| subject | direct telephone number | Utrecht, The Netherlands |
| Advice on ToR for an SEA for a Road Master Plan, Socotra - Yemen | + 31 30 234 76 66 | 8 July 2009 |

Excellency,

By letter dated 4 August 2008, you requested the Netherlands Commission for Environmental Assessment to advise on:

- the Terms of Reference for the EIA for the updating of the Road Master Plan on Socotra island and;
- the Terms of Reference for the EIA for the Ring road on Socotra island.

In one of our meetings we have agreed to prepare one advisory report for guidelines for the SEA in which the guidelines for the Road Master plan are included.

It is my pleasure to submit herewith the draft advisory report for your comments prepared by a working group of the Commission. This advisory report focuses on guidelines for the EIA (we use the term Strategic Environmental Assessment – SEA) for the Road Master plan and it includes guidelines for the EIA for a Ring road.

Unfortunately, in this advisory report we have not included the requested guidelines for the preparation of the Road Master plan. This because the generic Terms of Reference (ToR) for Road Master plans have not yet been made available to us by the Ministry of Public Works and Highways / Rural access roads programme. Waiting for the TOR has unfortunately created some delay for the attached advisory report.

I would like to draw your attention to the following:

During the site visit to Socotra the Commission noticed that:

- legally mandatory EIAs have not been conducted for routing and construction of new and upgrading of existing roads;
- criteria used for selection of road categories on mainland Yemen have not been applied on Socotra. As a consequence asphalt roads of category B and C have been constructed (respectively 7.3 and 6 meters wide), whilst the same road on

VISITING ADDRESS
Arthur van Schendelstraat 800
Utrecht
The Netherlands

POSTAL ADDRESS
P.O. Box 2345
NL - 3500 GH Utrecht
The Netherlands

T +31 (0)30 - 234 76 60
F +31 (0)30 - 230 43 82
E mer@eia.nl
W www.eia.nl

Netherlands Commission for
Environmental Assessment

mainland Yemen would have been constructed as a category D (5 meters wide asphalt road) or as an unpaved all-weather road ( 4 meters wide);
- construction of roads do not meet environmental good practice;
- road construction has caused significant negative impacts on the environment and landscape and has, most likely, negatively affected the tourism potential. These impacts could have been avoided or mitigated.

Based on interviews with government officials, road engineers and villagers we noticed that a culture of road construction has developed that may be characterised as follows:
- those people that have benefitted from this uncontrolled way of road construction would like this approach to continue;
- most people want new roads, however are not able to justify this on the basis of convincing arguments;
- those villages that are currently not connected with an asphalt road expect to be connected as well.

The MoU dated 5 June 2007 between the minster of public works and highways and the minister of water and environment, as well as the UNESCO world heritage status, are important frameworks for future road development. These frameworks will be further elaborated in the Road Master plan. The preparation of this plan offers the opportunity to change the afore-mentioned culture. SEA can have an important role in this process. However, it should be realized that a change from the "old" towards the "new" way of road construction on Socotra takes time. I would, therefore, suggest to consider the possible merits of a moratorium on road construction for at least the period until approval of the new Road Master plan.

Finally, I would like to offer, when deemed useful, our services for: (i) coaching of the team that will execute the integrated Road Master Plan / SEA and/or (ii) review the quality of the draft plan / SEA when it will become available.

The Commission would appreciate receiving comments on the draft report before publishing the final version. Moreover, we would appreciate receiving the generic ToR for a Road Master plan, so we can provide an advisory report for an integrated SEA / Road Master plan as we have agreed upon in one of our meetings.

Yours sincerely,

Klaas Jan Beek

Chairman of the working group on road planning for Socotra
Netherlands Commission for Environmental Assessment

VISITING ADDRESS
Arthur van Schendelstraat 800
Utrecht
The Netherlands

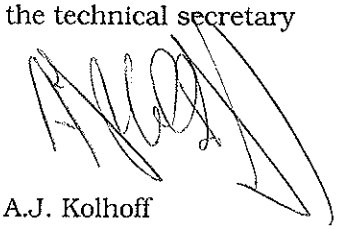
POSTAL ADDRESS
P.O. Box 2345
NL - 3500 GH Utrecht
The Netherlands

T +31 (0)30 - 234 76 60
F +31 (0)30 - 230 43 82
E mer@eia.nl
W www.eia.nl

# Advice on Terms of Reference for an SEA for a Road Master Plan, Socotra - Yemen

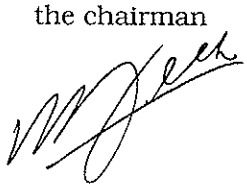
Advice submitted to the Minister of Water and Environment, by a working group of the Commission for Environmental Impact Assessment in the Netherlands.

the technical secretary



A.J. Kolhoff

the chairman



K.J. Beek

Utrecht, 9 July 2009

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# 1. INTRODUCTION

## 1.1 Project setting

**The initiative: SEA for the road master plan**

This advisory report provides guidelines for the preparation of an Strategic Environmental Assessment (SEA) study that will be conducted as part of a road master plan for the island of Socotra, Yemen. The preparation of the road master plan is planned to start in 2009. Moreover, the advisory report provides guidelines for the preparation of Environmental Impact Assessment (EIA) for the construction of new or upgrading of existing roads.

**Geography of Socotra**

The Socotra Archipelago is a group of 3 islands located in the Indian Ocean and is part of Yemen. Socotra is by far the largest island and inhabited by approximately 50,000 Socotris. The Socotri people have developed their own language and lived for centuries in relative isolation. For their livelihood they were largely dependent on the use of the existing natural resources, mainly fisheries and goat raising. As a consequence they have developed some ways of natural resources management that have proven to be very sustainable. In the last 15 years this isolated position has been changing and external influences have increased. The poverty situation of the population is comparable with the rural areas on the mainland.

Socotra is often referred to as the 'Galapagos of the Indian Ocean'. Socotra is a distinct eco-region. Its long isolation has contributed to a high level of endemism of species, many of which have disappeared from their African and Arabian origins. The case for Socotra as a site of outstanding universal value lies largely in its high plant diversity and levels of endemism. Of 825 plant species, 307 species do not occur anywhere else in the world (endemic). Often the distribution of these species on the island is very localised. Especially the high cliffs are known for their high endemic plant diversity. More than half of the 200 plant species on these cliffs are endemic. Overall, 157 plant species are considered vulnerable, endangered or critically endangered. Among the 34 reptile species there is 90% endemism. Of the 192 bird species, 44 breed on the island, 26 have internationally important populations on Socotra and 6 are endemic. BirdLife has identified 22 important bird areas on Socotra. It is important to note that the full extent of the island's fauna is yet to be described, including the fauna of the vast underground cave systems.

**Policies**

The archipelago is governed by a '*Conservation Zoning Plan for the Socotra islands*' under Presidential Decree 275 (2000). This zoning plan is based on a consultative process and reflects the interests of all stakeholders on the island. It recognises 3 main categories of areas, differing in management objectives and level of protection.

In April 2007, Yemen requested nomination of Socotra as a World Heritage Site. In response to an official request by IUCN for additional information, a

field mission and external review were carried out, resulting in a Cabinet Decision (12 February 2008) on improved conservation and sustainable development on Socotra. All of the above has resulted in the formal recognition of the majority of Socotra island as a UNESCO World Heritage Site in 2008.

With respect to roads, the Cabinet decision (Decree No. 46 - 2008) announces:

- The update of the existing road master plan for Socotra island, taking into account the Socotra Conservation Zoning Plan.
- The search for funding to rehabilitate and maintain natural areas that were damaged by road construction activities in previous years.
- The preparation of guidelines for road construction, in cooperation with the Ministry of Water and Environment (MoWE).

The Cabinet Decree No. 49 (2008) mandates the Ministry of Water and Environment to present a proposal to establish a national entity for the island (a management authority).

Contradictory objectives between road construction plans, some by presidential instruction, and the conservation zoning plan have resulted in government intervention. The immediate cause was the ongoing construction of a road, planned to cut through an area with highest level of protection, a nature sanctuary. The road construction was stopped. In a Memorandum of Understanding between MoWE and Ministry of Public Works and Highways (MoPWH) it was decided that all future road plans for Socotra have to be approved by the (MoWE) and that Environmental Impact Assessment (EIA) has to be applied.

## 1.2 Request for advice and objectives

At the request of the MoWE of Yemen, made on 4 August 2008 (see Appendix 1), an advisory report is prepared by the Netherlands Commission for Environmental Assessment (hereafter called "the Commission")[1]. The purpose of this report, prepared by the Commission, is to advise the MoWE and the Director of the Environmental Protection Agency (EPA):

- Firstly, to screen the draft Terms of Reference for the EIA for the updating of the road master plan on Socotra island and;
- Secondly, to screen the draft Terms of Reference for the EIA for the Ring Road on Socotra island.

The EPA, operating under the responsibility of the Minister for Water and Environment, is responsible for approving the Terms of Reference for EIA as well as the review of the EIA-report. Yemen has no legislation for SEA.

During the visit of the Commission to Yemen, it was agreed with the following parties, that a Strategic Environmental Assessment (SEA) will be integrated into the road master plan: Minister for Water and Environment, Director of Environmental Protection Agency, Assistant Deputy Minister of Public Works and Highways and the EU representative who will fund the preparation of the

[1] the Netherlands Commission for Environmental assessment is an independent advisory body, has a legal basis in the Netherlands and was established in 1985. For more information see: www.eia.nl

road master plan as well as the SEA. In comparison with an EIA, an SEA provides more opportunities for considering environmental and socio-economic aspects in the preparation of the road master plan. An EIA is primarily applied to projects, whilst SEA is applied as tool for well-informed strategic decision-making on plans and policies. In box 1 some general information on SEA is provided and in box 2 conditions are provided for SEA to have an effect on transport planning.

## 1.3 Justification of the approach

**Working group**

This advice is prepared by a working group of experts of the Commission. The working group represents the Commission and comprises expertise in the following disciplines: road engineering, infrastructure planning and economy, ecology and sociology. For the composition of the working group, see Appendix 2. For the preparation of this advice, the working group visited Yemen from 11 – 18 November 2008. A four day visit was undertaken to Socotra island from 14 - 17 November and nearly all constructed and planned asphalt roads have been visited. Moreover, the Commission had meetings with the main decision-makers in Haribo and Qulansiah, the two district capitals on Socotra. Appendix 4 provides an overview of Socotra and the existing road infrastructure. Appendix 5 provides an overview of the programme of the site visit as well as a list of key person met. See Appendix 7, for photos of the study area that were by the working group members.

**Approach**

Starting point for the Commission's advice on ToR for SEA of the Road Master Plan are:

- The request by the Minister as mentioned above;
- The Memorandum on environmental road design and construction on Socotra, dd. 5 June 2007 signed by Minister of Public Works and Highways and Minister of Water and Environment (see Appendix 3);
- The agreement to provide ToRs for the Road Master Plan and integrate the SEA into this plan.

Aim is to develop a road master plan in which an SEA is integrated. The reasons for an approach that integrates planning and environmental assessment lie in the importance of the environmental assets of this World Heritage Site, and the urgent need for an updated road master plan. A combined team of experts working together would provide the most effective way to execute this integrated process, assuming that (i) a good ToR is available and (ii) the quality of the process and the outputs is guaranteed by independent review, preferably by internationally acknowledged experts.

To prepare the advice for ToR for such an integrated road master plan / SEA (hereafter called "the integrated plan / SEA") the Commission first reviewed the existing practice of road planning and construction. The available first road master plan, prepared in 2002 but never formally adopted, was used as a reference. The findings of this review provided important building blocks for the ToR of the proposed new integrated plan / SEA.

For both the review and the guidelines for the new integrated plan / SEA, the Commission used the following fundamental questions:

- **Why** develop roads? The answer to this question has to provide a justification for the proposed development. In other words, what social, economic and ecological needs are prevalent?
- **What** mode of transport can meet the identified need and if development of roads is deemed necessary **what** category of roads. Do roads provide the best solution?
- **Where** will roads be planned? Is the routing of present and planned roads optimal?
- **How** will roads be constructed and maintained? Do road classification and associated mitigation measures meet environmental, economic and social requirements and available national standards?

The preliminary findings of the working group of the Commission have been presented dd.18 November 2008 at the Ministry for public works and highways to representatives of the Environmental Protection Agency, the Ministry of water and environment, the Ministry of public works and highways and a number of donors. The discussion was facilitated by an independent moderator who also prepared the minutes of that meeting. See Appendix 8 for a report of this meeting.

## 1.4 Outline of this advisory report

Chapter 2 summarises the review findings of the Commission on the applicable policies and the actual practices of road planning and construction on the island.

The chapters 3 to 6 provide guidance on how to carry out an SEA for a plan according to the steps of the SEA process, following good practice, provided by the SEA guidelines prepared by the Organisation for Economic Co-operation and Development - Development assistance Committee (OECD-DAC).

A. Establishing the context for SEA (chapter 3)
   1. Identify stakeholders in the planning process and prepare a communication plan;
   2. Screen and decide on the need for SEA;
   3. Set objectives; develop with all stakeholders a common vision on (environmental) problems, objectives and identification of alternatives;

B. Implementing SEA (chapter 4)
   4. Scope the content for the SEA; consistency with applicable policies
   5. Collect baseline data;
   6. Assessment of alternatives;
   7. Mitigation of impacts;
   8. Assure quality through independent review and public involvement of draft reports;
   9. Document results and making these available;

Phase C and D below are the steps to be taken after the integrated plan / SEA has become available, leading up to decision-making and implementation. In chapter 5 and 6 these will be elaborated briefly.

C. Informing and influencing decision-making (chapter 5)
   10. Organise a dialogue among stakeholders on the SEA results and make recommendations for decision-making;

11. Justify in writing the (political) choices that have been made in the finally adopted policy or plan;

D. Monitoring and evaluation (chapter 6)

12. Monitor decisions taken and the implementation of the adopted policy or plan;
13. Evaluate both SEA and policy or plan.

Chapter 7 provides guidelines for institutional arrangements and implementation modalities for the integrated plan / SEA. Chapter 8 provides guidelines for the preparation of an EIA for a ring road or other roads on Socotra.

**Box 1: General information on SEA**

**What is SEA ?**

We define Strategic Environmental Assessment (SEA) as a family of approaches that aim to integrate environmental considerations into policies, plans and programmes and evaluate their inter-linkages with economic and social considerations.

More concrete, SEA is a tool to:

1. structure the public and government debate in the preparation of policies, plans and programmes;
2. feed this debate through a robust assessment of the environmental and, where required, other consequences;
3. ensure that the results of the assessment and the debate are taken into account during decision-making and implementation.

This means that public participation, transparency and good quality information are key principles. SEA is thus more than the preparation of a report; it is a tool to enhance good governance. Where needed, SEA also includes social and economic issues.

Whereas EIA aims at better projects, SEA aims at better strategies, ranging from legislation and country-wide development policies to more concrete sector and spatial plans. SEA is widely applied in different shapes and forms and in countries as diverse as Canada, Nepal, Mozambique and Bolivia. This wide variation may create confusion and therefore inspired OECD-DAC to come up with a more harmonised SEA Guidance, supported by a large number of countries. The information provided in advisory report is in line with the OECD-DAC Guidance.

**What are the advantages of SEA?**

The final objective of SEA is to contribute to sustainable development, poverty reduction and good governance. To decision-makers the advantages of SEA are:

- Enhanced credibility of their decisions in the eyes of stakeholders, leading to swifter implementation;
- A better understanding of the cumulative impact of a series of smaller projects, thus preventing costly and unnecessary mistakes;
- Better insight in the trade-offs between environmental, economic and social issues, enhancing the chance of finding win-win options;
- Easier assessment at the project level because strategic discussions, e.g. on locations, have already been brought to a conclusion.

**How is SEA conducted?**

Starting points for SEA design are the national context and the characteristics of the planning processes in which SEA is applied. Traditionally, SEA is often applied as a stand alone process, parallel to planning. This is a good way of learning how to carry out SEA. From here, SEA can be further developed into its most effective form: integrated in the planning process, bringing stakeholders together during key stages of the planning process and feeding their debate with reliable environmental information.

**Box 2: Conditions for SEA to have an effect on transport planning**

1. Political will to act on the outcome and use of information: Participation of politicians and other decision-makers from the very outset is as important as the participation of other stakeholders. Especially, for the problem definition this is a prerequisite.
2. Integration: Integration of teams involved in the preparation of the plan and the SEA. Integration and scoping of environmental, social, economic and institutional aspects in the plan as well as the SEA.
3. Tiering: Tiering aims at ensuring that there are links from the strategic level to the concrete project level and vice versa.
4. Timing: Timing of the plan process and the SEA process in such a way that assessment data are available during the preparation of the plan is a prerequisite for SEA to have any influence on relevant decisions.

Source: Hilden M. et al (2004): Views on planning and expectations of SEA: the case of transport planning. Environmental Impact Assessment Review 24, pp 519-536.

# 2. MAIN REVIEW FINDINGS: POLICIES AND IMPLEMENTATION IN PRACTICE

In this section the Commission will review: (i) the existing policies and policy framework influencing development of activities on Socotra in general and development of road infrastructure in particular and; (ii) the current practice of road planning and construction on Socotra. The review findings have been used as a reference framework for the preparation of the guidelines for the integrated plan / SEA.

## 2.1 Policies and policy framework

**Conservation Zoning Plan for the Socotra islands**

The Conservation Zoning Plan for the Socotra islands under Presidential Decree 275 (2000) provides clear reference to what is allowed within defined geographic areas. The plan recognises three main categories of land, the first category further subdivided. This section focuses on the guidelines for road construction as mentioned in this plan for each of the categories.

1a. *Resource use reserve*: allows (enhanced) traditional management practises, within the overall goal to protect and maintain biodiversity and other natural, cultural and landscape values. Road construction is allowed, within the aforementioned criteria, indicating that environmentally friendly alternatives have to be sought, including mitigation measures indicated in section 8.

1b. *General use zone*: allows the development of essential infrastructure to improve the standard of living of the local community. All types of road construction allowed, but with the demand to minimise negative environmental impacts to acceptable levels.

2. *National parks*: primarily focus on protection of natural habitats and landscapes of high national and international significance for scientific, educational, recreational and ecotourism development purposes, and to maintain biodiversity. Road construction is allowed, but should be limited to the upgrading of existing tracks. These tracks already connect communities in need of transportation; by following these historical tracks, the influence on the surrounding natural environment is minimised. Environmentally most friendly technologies should be applied to mitigate negative impacts (see section 4.4.1).

3. *Nature sanctuary*: to preserve rare and fragile habitats, ecosystems, species and unique landscapes in as undisturbed a state as possible for the long term and for future generations. Road construction is not allowed. Where roads already exist, any upgrading should be done in such a manner that disturbance to the natural environment is minimised to the maximum extent.

The Commission is of the opinion that this plan provides an important policy framework for development initiatives on Socotra, because it has been prepared in a participatory process representing the interest of stakeholders, it provides a clear review framework for future activities, it was the basis for

listing on the UNESCO world heritage site and it has been approved by Presidential Decree.

**Socotra Road Master Plan**

The first road master plan for Socotra was funded by the European Union and developed by Atkins in 2002. This plan has not been adopted by the Government of Yemen. It was stated that not enough attention was paid to the political embedding of the plan and the consultants were too hasty and superficial. This road master plan was one of the volumes of an extensive study for the development of the Socotra Archipelago Master Plan that was developed in the period 2000-2002 and has not been approved formally.

The Commission observed that this road master plan provides a rather complete overview of the situation in 2002. However the following aspects are unconvincingly elaborated and provide therefore limited guidance for actual decisions on routing and road construction:

- Justification of the needs for new roads;
- During participation with Socotris, only men were contacted. As a consequence the needs of women most likely are less considered;
- Impacts of roads on daily life of women;
- Routing of roads and justification of road categories;
- Requirements for road construction and maintenance;
- Recent proclamation of World Heritage Site and associated Conservation Zoning Plan not addressed.

**Governorate 10 yr road master plans**

As from 2004, for the mainland of Yemen, road master plans (for a 10 year period) have been developed for all governorates. The contents of one of the latter plans (Hadramout governorate 2005, excluding Socotra) has been assessed by the Commission. It was concluded that the contents of these plans are in accordance with "good practice road master plans". Yet, for the preparation of the integrated plan / SEA it is advisable to take notice and make use of the existing experiences with preparation of road master plans in Yemen.

**Rural Access Programme – Sectoral Environmental Assessment**

The Rural Project Central Management Office of the Ministry of Public Works and Highways has executed a sectoral environmental assessment of the Rural Access Programme for mainland Yemen. It has been prepared in accordance with the World Bank Operational directive (OP) 4.01 on *Environmental Assessment*. The objectives of the rural access programme are an improved livelihood and reduced isolation for rural populations. The programme has improved and will continue to improve planning and implementation of rural roads in three phases (Phase I 2001-2005; Phase II 2005-2007; Phase III 2007-2011). For construction or upgrading of roads more than twenty EIAs have been executed following the World Bank guidelines for EIA.

The Commission observed that this programme has gained good practice knowledge and experience with road planning and construction that should be used to built on in Yemen and in particular on Socotra. For example, criteria for road categories have been developed. The two volumes with environmental and social guidelines provide valuable experience for the preparation of the integrated plan / SEA as well as for the foreseen EIAs for road con-

struction. In addition, the Commission would like to note that, until October 2008, EPA has not been involved in reviewing any of these EIAs. It is recommended that EPA will be involved in EIAs for road construction, as required by the Environmental Protection Law (No. 26) of 1995.

**Draft ToR for Socotra Road Master Plan**

The draft ToR for the road master plan prepared by the Ministry of Water and Environment Socotra Conservation and Development Programme (2008) is rather general and does not yet provide specific guidelines for the contents nor the process of this plan. The ToR refer to the road master plan developed by Atkins in 2002 and it is stated that the proposed new plan could be considered as an update of the first plan. However, the ToR do not clarify to what extent the contents of the first road master plan should be followed.

The Commission advises to make use of this advisory report, prepared by the working group of the Commission, to replace the above mentioned draft ToR for the EU funded Socotra Road Master Plan.

## 2.2 Road planning and construction in practice

In this section the Commission presents its main findings concerning road planning and road construction on Socotra in the period 2002 until October 2008. These observations are based on a four-day site visit to Socotra making use of the observation of nearly all available asphalt roads as well as meetings with the engineers of the only existing road construction company on the island and other stakeholders as listed in Appendix 4.

The Commission uses the four questions introduced in section 1.3 as framework for review.

**Why?**
The need for construction of new roads does not seem to be justified. For the development of tourism the construction of roads may be justified to provide access to potentially interesting spots. However, the way in which the roads have been constructed, does not contribute to the tourism product of the island. Large scale, visible environmental damage and inappropriate dimensions of roads (too large) seriously affect the ecotourism potential of the island. A social and economic development plan for the island which justifies the need for roads does not exist and there is no assessment of the present social or economic needs of local communities.

**What mode of transport and what road category?**
It seems that barely any investigations have been carried out, or investments have been made in other modes of transport, such as transport by water.

**Where?**
The routing / location of a number of newly constructed roads does not seem to be justified. The location of roads has in several cases been contradictory to the Conservation Zoning Plan, leading to damage to biodiversity and environmental services linked to biodiversity such as landscape values, fisheries revenues, and the potential for long-term biodiversity conservation. Most visible examples are:

- In nature sanctuary: (i) road constructed too close to the coastline; as can be expected with long term roadside development, this is a serious threat to turtle beaches; (ii) a new road was planned to cut through a nature sanctuary. This plan was cancelled at the last moment; the road was diverted, leaving 12 km of paved road unused.
- In national park: (i) construction of a new roads, not serving any people and not following existing tracks. This facilitates the creation of new settlements in the national park, including the associated exploitation of water and wood resources and introduction of grazing by livestock. On the other hand, some existing tracks along which many people live have not been upgraded. So human needs have not been served while biodiversity and associated economic interests have been damaged. New roads are still planned in national park areas, threatening some cliffs with high levels of plant endemism.

**How?**
The manner in which roads have been constructed has in some areas had consequences for biodiversity and its associated economic values. Examples:
- In sanctuaries: upgrading of existing roads resulted in obstruction of water courses, in one case severely affecting exchange of species between open sea and an inland estuary. In other cases, wadi's are planned to, or have been simply blocked by road crossings.
- In national park: extensive deposition of road spoil along steep cliffs has ruined large proportions of slopes and threaten the integrity of lower lying wadi's. Uncovered cuts in mountain slopes lead to severe erosion and clogging of wadi's with debris. Especially the higher cliffs represent high levels of endemism and road construction should follow a practise with the least possible damage.

Rehabilitation work is needed to restore the ecological integrity of the affected locations, such as the Khor Quayih wadi which is blocked by ford crossing.

In many places quarries, borrow pits, and untreated spoil along the roads create disturbances in the landscape. These localised features do not pose a threat to biodiversity, but they do affect the overall quality of the islands landscapes and tourism potential. It is however not clear what impacts these quarries, borrow pits and road spoils have on village life and household economy. For example, while men might make the decision for allowing the areas to be used for materials collection and might receive cash compensation, women could loose these areas for water supply, grazing their animals, and collecting fodder and firewood.

**Maintenance?**
So far, no structural maintenance funds have been allocated for Socotra. If such budget would be available, the maintenance costs for the existing paved roads probably already surpasses the norm budget, given the number of inhabitants served.

**Concluding**, road planning and construction in the period 2000-2008 is characterised by an almost complete lack of well informed and open decision-making with regard to the need of roads, the routing of roads and road dimensions. None of the roads constructed were subjected to EIA which is a legal obligation. In some areas, especially sanctuaries, road construction was conflicting with the conservation zoning plan and EPA-Socotra has stopped or re-routed some construction of roads.

The Commission recommends to take the existing policies and cabinet decisions mentioned in section 2.1 as point of departure for updating of the road master plan. The strategic environmental assessment component of the proposed integrated plan / SEA has to guarantee that the new plan is consistent with these policies and decisions.

The chapters 3 to 7 provide the guidelines for the preparation of an integrated plan / SEA.

# 3. PHASE A: ESTABLISHING THE CONTEXT FOR AN INTEGRATED PLAN / SEA

*The purpose of this phase is to agree with all stakeholders in a transparent manner on the process of how to come to an integrated plan / SEA, what objectives underlie the plan / SEA, and what boundaries are created by existing policies and decisions. Review and approval mechanisms and moments have to be agreed upon at this stage.*

## 3.1 Step A1: Identify stakeholders and announce the start of the process

The activities undertaken during the one week visit of the NCEA already comprise the first steps according to the good-practice SEA guidelines. The most important stakeholders in the process have been brought together (see working programme, appendix 4), which includes, the MoWE, the MoPW&H and EPA.

The Commission recommends:
- to obtain reliable and gendered information about interests, concerns and expectations of all stakeholders; and
- to carry out a precise information and consultation process on the basis of this information.

Since this case has to balance two rather conflicting issues: the need for socio-economic development of people living under poverty conditions with the need to conserve internationally important biodiversity in a World Heritage Site, it is essential to design a sound stakeholder participation plan. This plan should contain information on:

1) Formal stakeholders related to the plan/SEA process (institutional actors), including representatives of international stakeholders.
2) Informal stakeholders; in order to identify the current use of roads and (future) need for roads, use should be made of rapid participatory techniques using semi-structured interviews, focus group discussions, ranking and mobility mapping, etc. involving both women and men of the various social village strata and not just (male) village leaders and local (male) government representatives.

Main findings of stakeholder meetings, both in terms of process and contents should be well documented to enhance transparency and be distributed to all relevant stakeholders to verify the data, show appreciation for participating in the process and increase local ownership.

## 3.2 Step A2: Screen and decide on the need for SEA

The decision to undertake this Plan / SEA has been made together by the Minister of Water and Environment and the Minister of Public Works and highways: Memorandum on environmental road design and construction on Socotra 5 June 2007.

Based on the findings of the Commission during the field visit, described in section 2.2, the Commission recognises the planning process as one for which SEA can have added value. She endorses the proposed updating of the road master plan for Socotra, integrated with an SEA in order to provide necessary environmental, social and economic information enabling well-informed decision-making on road construction.

## 3.3 Step A3: Objectives of the integrated plan / SEA

Based on discussion during the site visit, the Commission concluded that the objectives of the integrated plan / SEA for the period 2010-2019 are to decide on:

Why and What?
- the need for development of new and upgrading of existing roads by developing clear and justified criteria for road planning and construction in each of the identified land use zones;
- the need for development of transport over water.

Where?
- corridors for new roads, providing new roads are necessary. If a road is deemed necessary it is recommended not to decide on the precise routing of new roads in this plan / SEA. This has to be done in an EIA of a detailed road design, where more detailed information is required.

How?
- criteria for construction of new and upgrading of existing roads, including criteria for site selection of quarries, borrow pits and workers camps. In section 4.1.5 it is recommended to develop two or three quarries for the island. Site selection of this quarry could be subject of this SEA;
- scale of road construction (large scale versus small scale);
- criteria for use and maintenance of the existing and future road network.

# 4. PHASE B: IMPLEMENTING PHASE

## 4.1 B4: Scope the content for the integrated plan / SEA

*The <u>purpose</u> of scoping is to prepare Terms of Reference (ToR) on the basis of a vision on problem analysis, goals, alternatives and a 'consistency analysis' (see 4.1.4), on which all relevant stakeholders should reach agreement. Based on these ToR, the Plan/SEA can then be executed.*

### 4.1.1 Alternatives for development of new and upgrading of existing roads

Development of new and upgrading of existing roads is primarily based on the present and future needs of the population, and the desired future development of Socotra. This means that road development will have to be based on a prognosis of Socotra's socio-economic development. One can imagine that different stakeholders have different views on the desired future development of Socotra. These views can be translated in alternatives for road development. Based on our visit to Socotra and extensive discussions, the Commission proposes that the integrated plan / SEA process uses the following three alternatives. These alternatives cover the entire spectrum of development directions, and assess the expected environmental, social and economic impacts, using the situation in the period 2000-2006 as a reference situation[2] [3]. The alternatives as presented here have not been discussed with all the stakeholders the Commission has met in Yemen.

A. Conservation-oriented development: In this alternative it is anticipated that new roads and upgrading of existing roads will only be permitted in the general use zone. This alternative is fully geared towards the maintenance of the unique character of Socotra by strict planning and review of development activities followed by strict control and guidance in the use zones. In the sanctuary and national park zones, roads and other developments are not allowed.
B. Balanced development: In this alternative it is anticipated that in the national park zone and the resource use reserve zone, upgrading of existing roads only, will be permitted. This alternative aims at the economic development of Socotra, based on sustainable use of the natural resources. In sanctuaries, roads and other developments are not allowed; in the national park, development is authorised under strict conditions, as stated in the Conservation Zoning Plan.
C. Ring road development: In this alternative it is anticipated that construction of new and upgrading of existing roads is permitted in national parks and in the resource use reserve. The Commission has been informed about the idea of developing a ring road around the island, even though background information, design and justification of this concept are not available. Sections of this road have already been constructed. In the present situation, with a presidential decree blocking the further development of the outer ring road, the concept of an inner ring road can be conceived, situated more inland and avoiding the high cliffs on the outer edges of the island. This could serve as an alternative providing maximum road connections to small settlements.

The Commission recommends to consider the restriction of vehicle weight for the island as a separate measure to investigate as part of the three alternatives. If the vehicle weight is reduced to 9-tonnes, the road dimension and

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[2] In the ideal situation a socio-economic development plan for Socotra should guide the development of roads. So far, such a plan has not been requested and will not be available within one year time and therefore the Commission advises to follow a practical approach in the preparation of the integrated plan / SEA. See box 3 for an explanation of the ideal approach.

[3] The terminology used to name the three alternatives is indicative. It is recommended to agree on those names together with the stakeholders.

bearing capacity can be reduced and consequently the construction and maintenance costs and environmental impacts will be reduced.

For all three alternatives design of new and upgrading of existing roads should be based on best available practice and minimal environmental impacts, guidelines for further elaboration are provided in section 4.4.1.

Table 1: Opportunities for road development in the conservation zones for three identified alternatives (as suggested by the Commission).

| | General use zone | | Resource use reserve | | National park | | Nature sanctuary | |
|---|---|---|---|---|---|---|---|---|
| | New roads | Upgrading | New roads | Upgrad-ing | New roads | Upgrading | New roads | Upgrading |
| Alternative A | yes | yes | **no** | **no** | **no** | **no** | no | no |
| Alternative B | yes | yes | **no** | **yes** | **no** | **yes** | no | no |
| Alternative C | yes | yes | **yes** | **yes** | **yes** | **yes** | no | no |

In table 1 the potential opportunities and constraints for development of new roads and upgrading of existing roads are presented for the identified zones. This table is based on the conservation zoning plan and shows that opportunities for road development are identical for each alternative in the general use zone and in the nature sanctuary. For the resource use reserve and the national park zone, the differences between the alternatives are clearly shown (**in bold**).

**Criteria for new roads and upgrading of existing roads**

Criteria should be determined for the construction of new roads and upgrading of existing roads for each of the road categories identified in Yemen[4]. For each of the three alternatives different criteria can be developed that have to be justified by an assessment of the needs. For further elaboration, the criteria developed by the Rural Access Programme could be used as reference. In section 4.2, guidelines are provided to identify the need for roads.

### 4.1.2 Alternative modes of transport

During its visit, the Commission observed that transport by boat - although limited during a large part of the year because of the monsoon - is not considered. In this plan / SEA it is recommended to study the opportunities for

[4] Paved roads in Yemen are divided in the following categories:
Category A Highways (double lanes)
Category B Dual carriage way 7.3 m wide with 2 x 1.5 m shoulder
Category C Dual carriage way 6 m wide with 2 x 0.5 m shoulder
Category D Carriage way 5 m with 2 x 0.5 m shoulders
Unpaved all weather roads used for rural access have mainly a width of 4.0 m

transport by boat, in particular for tourists. The western and south-western parts of Socotra are attractive to tourists and most feasible for this type of transport.

### 4.1.3 Selection of corridors for new roads

In case it is decided to construct new roads in the resource use reserve or national park it is recommended to determine corridors for the routing in the integrated plan / SEA. This integrated plan /SEA does not and should not provide sufficient level of detail to demarcate the precise routing of new roads in these two zones. This means that new roads should be mapped as an indicative road corridor. Final decision-making on routing of new roads should be based on a detailed design study and associated EIA.

In case it will be decided to construct complete new roads in the resource use reserve and national park in the period until 2020 it is recommended to identify 1 km wide corridors for routing. The criteria for selection of those corridors should be elaborated in the integrated plan / SEA and should include and elaborate at least the following criteria:

- The Conservation Zoning Plan provides clear instructions and criteria for road construction in the identified four zones;
- In a coastal zone of 300 metres, road construction is legally not permitted;
- Topography; in general, the natural terrain should be followed. This implies no deep cuts and fills. As a consequence the road will be longer, but more cost effective because of reduced cuts and fills;
- Biodiversity: use should be made of vegetation maps made by the Royal Botanic Garden, Edinburgh. The biodiversity on Socotra is so unique that it is <u>not</u> recommended to elaborate generic guidelines to assess the selection of corridors for new roads on Socotra. For the selection of each new road corridor(s) vegetation mapping should be carried out.
- Social / gender criteria can be extracted from the consultation of stakeholders as mentioned in section 3.1.

For the routing of new roads in the general use zones in the cities of Hadibo and Qualansiah development of corridors is not relevant. The planning for new roads and upgrading should be elaborated on a large scale city map.

### 4.1.4 Alternative approach for road construction

Until today road construction on Socotra makes use of large and heavy equipment and labour that is recruited mainly from the mainland of Yemen. The Commission recommends to elaborate another approach of road construction that might fit better in the Socotra social as well as natural environment and that is characterised by:

- use of small scale equipment that can be used for construction as well as maintenance of all future roads and accompanied work on Socotra;
- training and employment of local men and women in the various disciplines of road construction and maintenance;
- creation of a road construction and maintenance unit.

In our view this approach will create a more continuous demand for work for Socotri people, is less sensitive to corruption and less harmful to the environment.

### 4.1.5 Site selection of Quarries

The Commission recommends that on Socotra, only 2 or 3 areas should be considered when selecting quarry sites. This will comply with the overall requirements of Socotra island for the next 20 years, including the need for road construction. According to the Conservation Zoning Plan quarries can not be located in nature sanctuaries.

### 4.1.6 Consistency analysis

*The purpose of this step in the procedure is to check the consistency of the development of new and upgrading of existing roads with existing policies, plans and programmes, through interagency co-operation.*

For decision-making on new roads and upgrading of existing roads in particular, a consistency analysis is important. This requires an inventory of the relevant sectors (both public and private) at national and especially local level, to ensure that proposed plans are compatible with each other. Some examples for Socotra are (i) the planning of the water sanitation programme on Socotra with water use by natural ecosystems (ii) programme supporting fisheries sector and (iii) tourism development proposals. However, an overview of all plans and programmes of different sectors should be made (e.g. agriculture, fisheries, tourism, water, defence, land use/spatial development plans, social improvement/poverty alleviation plans) that might influence the need and routing for roads. Therefore an analysis should be made of:

- Which policies, plans and programmes generate opportunities for the three development alternatives;
- Which ones set environmental and socio-economic conditions (criteria) for the three alternatives and;
- Which ones have the potential to conflict with the three alternatives and;
- How these conflicts can be solved.

## 4.2 B.5: Collect (baseline) data

With respect to the reference situation it has to be emphasised that presently, no inventory of socio-economic needs of the island population is available. So, to be able to come to a consistent comparison of alternatives, a demographic inventory combined with an assessment of local needs should be carried out. Impact indicators relate to number of people served, access to health and sanitation services, access to education, enhancement of economic activities, access to markets, but also the expected impacts of roads (and incoming strangers) on the freedom of movement of women in rural villages.

Although bio-geographic information on the island is not complete, a significant amount of information is available on this aspect of the reference situation.

**Base line map**
The plan / SEA should provide an up-to-date base line map of the current situation containing the following information:

- Overview of all current roads (per category);
- Overview of other tracks that are frequently used, by whom and for what purposes;
- Location of all settlements, main markets, schools and health centres;

- Land use (conservation zones) economic activities, including subsistence and informal economic activities;
- Social services, including those to maintain social cohesion and informal networks.

Use should be made of existing information that is available at EPA-Socotra and through participatory data collection like mobility mapping and observation in villages and along the road network.

**Need for roads**

The current and expected future development (10 years) should be described for the following sectors/ issues because these activities will influence the need for transport and roads. The needs for men and women differ significantly and should be considered in the future projections. Trend analysis can be used to forecast the future changes and subsequent needs:

- Demographic development of the population;
- Change in access to services for the local population such as access to the market, hospitals, schools and water that can be brought by tanker;
- Development of agricultural /food processing sector;
- Development of fisheries sector;
- Development of tourism sector; As far as not yet available a survey should be conducted among tourists. It should focus on there needs and how they perceive the different road categories;
- Development of (small) economic activities that do not depend on natural resources;
- Development of water availability. Economic and tourism development will lead to an increase in the consumption of water. Therefore, water can become scarce in some areas and expected future availability of water may become a factor to take into consideration in the development of activities in these vulnerable areas[5].

This information should be presented in the form of figures, diagrams and maps. Available digital maps (geographic information systems) should be used and further developed. GIS should be used for overlay mapping to get insight in expected spatial impacts of future developments.

## 4.3 B.6 Assessment of alternatives

### 4.3.1 Alternatives for development of new and upgrading of existing roads

The impacts (costs and benefits) of the three identified alternatives have to be assessed and compared with the reference situation on the following (groups of) criteria:

Economic criteria:

- financial / economic costs and benefits for construction and maintenance.

[5] The Commission is aware that climate change might affect issues like water availability on Socotra. However, in our view assessing the impacts of climate change and adaptation measures "climate proofing" should be part of the development of the socio-economic plan as mentioned in box 3.

Social criteria
- food security, access to human and veterinary health, extension- and educational services;
- change in development opportunities and access to information, specifically for village women who are more restricted in their mobility than men.

Biodiversity
- direct impacts on quality of biodiversity: abundance and distribution of vulnerable species, with special reference to potential loss of endemic plants;
- impacts on integrity of landscape, with emphasis on the national park zones;
- induced roadside development (settlements) and its potential threat to biodiversity (land occupation, water extraction, firewood collection);
- increased access to, and opening up of new grazing lands and its potential threat to biodiversity.

### 4.3.2 Alternative modes of transport

The Commission recommends to justify the development of transport by water by providing insight in:
- economic viability of (seasonal) tourism transport along the coast;
- tourism development opportunities for coastal excursions;
- existing and required facilities (piers, boats);
- location of (sensitive) coral reefs.

### 4.3.3 Selection of corridors for new roads

As stated in section 3, the selection of corridors for new roads should be studied on a case-by-case basis. This means that the selection of a corridor(s) for a proposed new road in the national park or resource use reserve zone should be justified from at least three perspectives: biodiversity value, access by different stakeholders, and economic costs for construction and maintenance.

### 4.3.4 Alternative approach for road construction

The current large-scale approach of road construction has to be compared with the proposed small-scale approach for economic, social and environmental / biodiversity impacts.

### 4.3.5 Site selection of quarries

Assess and compare the proposed sites for quarries by making use of the following criteria:
- conservation zoning plan – no quarries in nature sanctuaries;
  impacts on landscape;
- minimal visibility;
- vegetation map – avoid areas with vulnerable/endemic plant;
- vicinity of human population (noise disturbance; safety; potential breeding of malaria mosquitoes);
- transport costs to main construction sites;
- potential for landscaping after decommissioning.

**Box 3: Ideal planning of future development of Socotra**

In the ideal situation a socio-economic plan for the future development for Socotra will be prepared in a participatory way aiming to guide day to day development and act as a review framework for decisions to be taken. In this plan different development scenarios should be developed and assessed for its social and economic impacts and the impacts on biodiversity. Resulting in one desired plan for the future development of Socotra over the next 10 to 20 years. Development of such a plan takes approximately one to two years.

Such a plan could provide an important framework for the desired development of roads.

## 4.4 B.7: Mitigation of impacts

### 4.4.1 Requirements for road construction

The Commission recommends that due to the world heritage status of a major part of Socotra, in principle best practice road construction should be applied, instead of good practice to minimise the environmental impacts to an absolute minimum. Therefore, the integrated plan / SEA should assess the environmental and social safeguards that have been developed by the Rural Access Programme for rural roads development[6] and adopt all safeguards as part of the integrated Plan / SEA that are assessed as best practice. Furthermore, the Commission recommends to make use of the following publication:
Gordon Keller & James Sherar (2003). Low-Volume Roads Engineering: Best Management Practices Field Guide. US Agency for International Development, in Cooperation with USDA, Forest Service, International Programs & Conservation Management Institute, Virginia Polytechnic Institute and State University.
(http://ntl.bts.gov/lib/24000/24600/24650/Index_BMP_Field_Guide.htm)

Additional environmental measures should be laid down in the contract documents and in particular in the general specifications.

**Road construction**
In particular, we ask attention for the following requirements that have to be elaborated in the form of enforceable requirements:
- Earth balance more or less zero; material from cut is not thrown away but used in fill sections;
- Proper dimensions of culverts to avoid blockage and damage to hydrological conditions;
- Avoid blocking of streams;
- Clearing and restoration of road workers camps;

[6] Ministry of Public Works and Highways – Rural Access Programme; Techniplan:
Sectoral Environmental Assessment Volume 1 (October 2008) and Volume 2 (October 2004): Saf guard Policy Frameworks; Resettlement Policy Framework; Natural Habitats Policy Framework; Cu tural Resources Policy Framework.

- Justified selection of sources for water extraction for road construction;
- As stated before in this plan / SEA no routes for road construction will be identified; merely requirements for road construction. One of the requirements to be elaborated in the plan / SEA is the involvement of women in the routing of new roads and upgrading of existing roads. As Socotri women are likely to possess specific indigenous knowledge on plants and it uses unknown to outsiders, this information should be taken into account e.g. when deciding on bio-engineering solutions for slope stabilisation problems.

**Operation and management of quarries**
In section 4.1.5 it is recommended to select 2 or 3 quarry sites to meet the overall requirement of Socotra island for the next 20 years, including the need for road construction. Moreover, an operation and management plan for the existing and new quarry sites have to be prepared as part of the Road Master Plan. One of the suggested measures is that the use of explosives should be forbidden and excavation should be done with hydraulic hammers.

**Borrow Areas**
In case a zero soil balance is adopted as design principle for road construction, general borrow areas can be avoided. However, in case it is unavoidable to use a borrow area, the exploitation depth should be reduced and after use the area has to be returned to its original status and re-vegetated and landscaped if necessary. If required, the excess material from excavation can be dumped in these areas.

**Workers camps**
The selection of workers camps should be well justified. After use the area should be rehabilitated in the original situation.

**Consultation with villagers**
One of the requirements that needs to be elaborated is how the affected villagers will be consulted concerning construction of new roads, routing of roads, upgrading of existing roads, selection of borrow areas and selection of workers camps. The local population should be involved and treated as major stakeholders and not as mere beneficiaries. Employment and compensation schemes should be devised on an equitable base, ensuring that the measures will not exacerbate inequities and increase poverty by excluding poor women and men in particular, from the development process.

With the selection of the routing for new roads as well as the upgrading of existing tracks the impacts/interferences on daily village routine should be taken into consideration and be discussed with the women and men in the villages. As possible impacts/interferences can be mentioned:
- Road alignment design interfering with settlements, markets and water harvesting areas;
- Compromising privacy and restricting movement of women;
- Pollution and invasion of farmlands and grazing areas by road works and spoil materials (and possible compensation paid to men only);
- Decrease of domestic- and irrigation water supply in damaged runoff harvesting systems;
- Domestic fuel wood supply threatened by exposure to collection by third parties for commercial purposes;
- Displacements of graveyards;
- Road safety, especially for children.

To avoid or mitigate those impacts, consultation with the villagers following a strict and clear procedure should be elaborated and incorporated as a requirement.

### 4.4.2 Rehabilitation works

The Commission underlines the recommendation made by the IUCN and reflected in Cabinet Decree No. 46 (2008), the rehabilitation of what went wrong or what is not completed should be taken up. Some measures are suggested below, but we recommend to make a complete inventory and priority listing in collaboration with EPA Socotra:

- The Khor Quayih Wadi is blocked by ford crossing: the ford crossing could be replaced by a submersible bridge;
- Excess material is left along the road side;
- Median of dual carriage way is not backfilled: transport the excess material to the median, level and compact;
- Culverts clogged by stones: adjust height of culverts;
- Landscaping of quarries;
- Blocking or breaking up of roads that have significant negative impacts on biodiversity.

## 4.5 B.8: Review and approval mechanisms of integrated plan / SEA-plan process and contents

It is up to MoWE, in consultation with key stakeholders, to decide on when to insert review moments for (independent) quality assurance of the Plan / SEA contents and process. The quality assurance can be organised at regular intervals during the undertaking, especially as this is a learning process for all parties involved. The NCEA is willing to assist in this process.

## 4.6 B.9: Document results and make these available

The Commission recommends to open a web page on this integrated plan / SEA where all documents will be submitted to enhance transparency and participation, but also to enlarge the learning effect of this plan / SEA during the process.

The final integrated plan / SEA should:

- Present a summary of the integrated plan / SEA;
- The road construction and rehabilitation activities planned for in the period 2010-2020 have to be presented on maps and justified:
  a. Identify development of urban roads in the cities of Haribo and Qualansiah.
  b. Identify corridors for development of new roads in rural areas.
  c. Identify rural roads that might be upgraded per category.
  d. Identify proposed rehabilitation works.
- A maintenance plan for all roads on Socotra (including maintenance of drainage works) for the period until 2020 has to be defined;
- Give an overview of the gaps in knowledge and information;
- The SEA results and decision should be published, use should be made of a Geographic Information System to produce relevant maps to present the results (GIS expertise and baseline maps are available at EPA project office);

- The SEA should also set indicators to monitor the implementation of the adopted Plan/SEA and discuss the outcomes with the stakeholders.

# 5. PHASE C: INFORMING AND INFLUENCING DECISION-MAKING

## 5.1 C1: Dialogue on SEA results

Organise a dialogue among the earlier involved stakeholders on the draft integrated plan / SEA results and make recommendations for decision-making.

## 5.2 C2: Justification of (political) choices in adopted plan

The (political) choices that have been made in the finally adopted plan should be justified and have to be made publicly available.

# 6. PHASE D: MONITORING AND EVALUATION

## 6.1 D1: Monitor decisions and implementation of the plan

Monitor decisions taken and the implementation of the adopted plan.

## 6.2 D2: Evaluate integrated plan / SEA

Evaluate both SEA and the road master plan.

# 7. INSTITUTIONAL ARRANGEMENTS AND IMPLEMENTATION MODALITIES

This chapter deals primarily with the assessment phase of the plan / SEA process:

In EIA, it is generally a consultant who is responsible for the realisation of the EIA and the competent authority reviews and (dis)approves the EIA study. In Yemen this is the Environmental Protection Agency. In SEA, generally government agencies are responsible for the elaboration of the SEA, through for instance an SEA team, assessing strategies in a participative and transparent way.

The Commission has proposed, and this was agreed during the debriefing meeting on 18 November 2008, that the Plan / SEA could best be executed by a team of Yemeni experts. These experts should be recruited preferably from within the EPA, MoWE and Ministry of construction and highways (Rural access programme) and other relevant government authorities or alternatively contracted from outside but then operating in the offices of one of the authorities. Criteria for the selection of experts are knowledge of EIA, preferably in combination with a background in road planning, (socio) economy, hydrol-

ogy and nature conservation. For nature conservation it is recommended to include an expert(s) from the Royal Botanic Garden, Edinburgh, representing the best available knowledge on the unique plant community on the island. There is not one other institute in the world that can provide the required expertise.

The team should be headed by a team leader, with basic knowledge of SEA. The tasks of this individual will be managing the SEA team and secretarial support, arranging contacts with relevant stakeholders, overseeing and editing SEA report production. This person will also be responsible for involvement of all actors and building up mutual understanding and ownership of the results.

The Commission also recommends to form a Steering Group for this Plan / SEA, in which representatives of the most important stakeholders have a seat, women should be represented (e.g. District representatives from Socotra). This steering group meets regularly to guide the plan / SEA process and review progress. This steering group is especially meant to guarantee the political back-up and support for undertaking this SEA. The SEA team leader will attend these meetings.

As there is very limited SEA experience in the country itself, the Commission recommends to make use of international SEA experience to guide and coach the team (e.g. a few days each month). The Commission also recommends to open a website about this Plan / SEA to enhance transparency and participation, but also to enlarge the learning effect (and other possible 'spin-off) of this Plan / SEA.

Study duration: one year. A list of reference material should be added for use by the team. Appendix 6 provides a list of references used by the NCEA.

The final integrated plan / SEA should:

- Present a summary of the integrated / SEA;
- Give an overview of difficulties (such as technical deficiencies and lack of know-how) in compiling the required information;
- The SEA results and decisions should be published, use should be made of a Geographic Information System to produce relevant maps to present the results (GIS expertise and baseline maps are available at EPA project office);
- The SEA should also set indicators to monitor the implementation of the adopted Plan/SEA and discuss the outcomes with the stakeholders.

# 8. GUIDELINES FOR EIA FOR A RING ROAD

Dated 5 August 2008 the Minister for Water and Environment requested The Netherlands Commission for Environmental Assessment to compile an advisory report on Terms of Reference for an EIA for a ring road on Socotra. As stated in justification of the approach (section 1.3) we have not prepared a separate advisory report for an EIA for the construction of a ring road. These were the two reasons:

A. The SEA and Road Master Plan provide essential information on the need, the routing and the construction of a ring road. This information

altogether provides a good starting point for the preparation of Terms of Reference for an EIA for a ring road.
The SEA and the Road Master Plan aims to provide guidance and criteria on the need for new roads and upgrading of existing roads. This means that need for a new or extension of the existing ring road will be justified in the SEA / road master plan. In case, a new or extension of the existing ring road is agreed upon in this plan, this plan will also justify the routing of the ring road as part of the future road network. Instead of an outer ring, an inner ring could be a feasible solution that will be elaborated and compared in the integrated plan / SEA. The plan will also indicate 1 km wide corridors for routing of new roads, such as the ring road. In addition, the integrated plan / SEA will provide requirements for best practice road construction.

B. To enable the preparation of site specific ToR for an EIA for a ring road, more information and fieldwork is required. During the site visit the Commission, in consultation with EPA, has chosen to focus on the guidelines for the integrated plan / SEA as a first priority. Moreover, the Commission has not received any documentation containing information on the ring road, only a map has been provided with an indicative routing of the outer ring road.

The integrated plan / SEA will provide the following information that is relevant for an EIA, in case the outer ring road will be constructed:

- Justification and criteria for the need of new roads, including a ring road;
- Justification of the desired development of the future road network that could include an outer ring road, or an inner ring road(s) or no ring road at all;
- Criteria for road categories;
- Identification of 1 km wide corridors for new roads and criteria for routing;
- Requirements for best practice road construction.

This information altogether provides a good starting point and framework for Terms of Reference for EIA for a new ring road as well as for the construction of each other new road on the island. Concerning the ring road, most likely, additional field work already have to be done in the phase of preparation of ToR for the EIA to further guide the route selection. To what extend additional field work is necessary largely depends on the quality of the integrated plan / SEA.

# APPENDICES

with the Advice on Terms of Reference for an SEA for a Road Master Plan, Socotra - Yemen

(appendices 1 to 8)

# APPENDIX 1

## Letter from Eng. Abdul-Rahman F. al-Eryani, Minister of Water and Environment dated 4 August 2008, in which the Commission has been asked to submit advice on Terms of Reference for an SEA for a Road Master Plan on Socotra, Yemen.

Republic Of Yemen
Ministry of Water and Environment
..... Office

الجمهورية اليمنية
وزارة المياه والبيئة
..... مكتب

Ref : .....
Date : 4-8-2008
No. of Pages : 1

الرقم : .....
التاريخ : .....
عدد المرفقات : .....

The Netherlands Commission for Environmental Assessment
Attn. Mr. Arend Kolhoff
Technical Secretary Development Cooperation

Dear Mr. Kolhoff,

After your assistance to my government on the three wadi projects, I have the pleasure inviting the Netherlands Commission for Environmental Assessment to advise the government of Yemen on planned EIAs on road construction on Socotra. The Socotra Archipelago has recently (July 2008) been listed as a World Heritage Site and because of its globally outstanding value, the Government of Yemen has committed itself (Cabinet decree 4, 2008) to :

*a- Update the existing Road Masterplan for Socotra island. The update should include all future roads, and should take into consideration the Socotra Conservation Zoning Plan and socio-economic factors.*
*b- Search for sources of funding to rehabilitate and maintain the natural areas that were damaged by road construction activities in previous years.*
*c- Prepare specific guidelines for the special criteria for road construction in Socotra, consistently with the IUCN guidelines for sites that have World Heritage Status. This should be done in cooperation with the Ministry of Water and Environment.*

We would be interested receiving your inputs in screening the ToR of planned EIA's for the Ringroad as well the updating of the Road Master Plan. After the finalisation of both EIAs, your expertise in checking its quality would be most useful.

For more information and operational matters, I would like to invite you to contact the Socotra Conservation and Development Programme team (contact persons Dr. Paul Scholte Paul.Scholte@socotraisland.org and Nadem Taleb talebnadim@yahoo.com).

Looking forward working with you.

Yours sincerely

Eng. Abdul-Rahman F. al-Eryani
Minister of Water and Environment

تلفون : ٤١٨٢٩١ - ٤١٨٢٩٠ - ٤١٨٢٨٩ - ٤١٨٢٨٣ فاكس : ٤١٨٢٨٥ ص ب : ١٩٢٣٧
Tel:418291- 418290 - 418289 - 418283- Fax:418285- P.O.Box: 19237- Email : techsec @y.net.ye

# APPENDIX 2

## Project information

**Proposed activity:** Preparation of a road master plan for the island of Socotra. An Strategic Environmental Assessment will be prepared in an integrated way as part of this plan.

**Categories: DCD/DAC**
**21010 – Transport Policy and Administrative Management**
**21020 – Road Transport**
**41030 – Biodiversity**

**Project numbers:** OS25-084

**Progress:** The plan process is in the preparatory phase. The Terms of Reference for the road master plan are expected to be approved in 2009. Start of the preparation of the integrated plan / SEA is foreseen in 2010.

**Composition of the working group of the Commission for EIA:**

Mr. K.J. Beek – Chaiman
Mr R. Slootweg – expert on ecology
Ms C.E.M. van Schoot – expert on sociology
Mr J.M.M. Helmer – expert on economy/infrastructure
Mr L.J. Wetsteijn – expert on civil engineering - roads

**Technical secretary:** Arend Kolhoff

## APPENDIX 3

**Memorandum**
**on environmental road design and construction on Socotra**

Further to the field visit to Socotra (April 27-30, 2007) of our advisors, Mr. Yahya Mohammad Al Ashwal (Ministry of Public Works and Highways) and Mr. Malek Ahmed Abdulaziz (EPA/Ministry of Water and Environment), together with their staff and road company representatives, we decide on the following points:

1. To update the 2002 Roads Master Plan by our two ministries jointly in consultation with the local authorities, taking into account the following points:
   - All future roads to be designed, with their proper standards.
   - Formulating a mechanism to follow up the construction of future roads including environmental mitigation measures to be implemented.
   - Determining locations of quarries and disposal areas.
   - Leveling and discipline the surplus cut material at road sides.
2. Roads should be designed to serve local communities without effecting the environment, in particular national parks and nature sanctuaries.
3. Environmental Impact Assessment studies should be part of any new design through an independent third party, mutually selected by our ministries.
4. We hereby instruct our respective advisors Mr. Yahya Mohammad Al Ashwal and Mr. Malek Ahmed Abdulaziz to follow-up the agreement.

Omar Abdullah Al Kurshumi

Minister of Public Works and Highways

Date: 5/6/2007

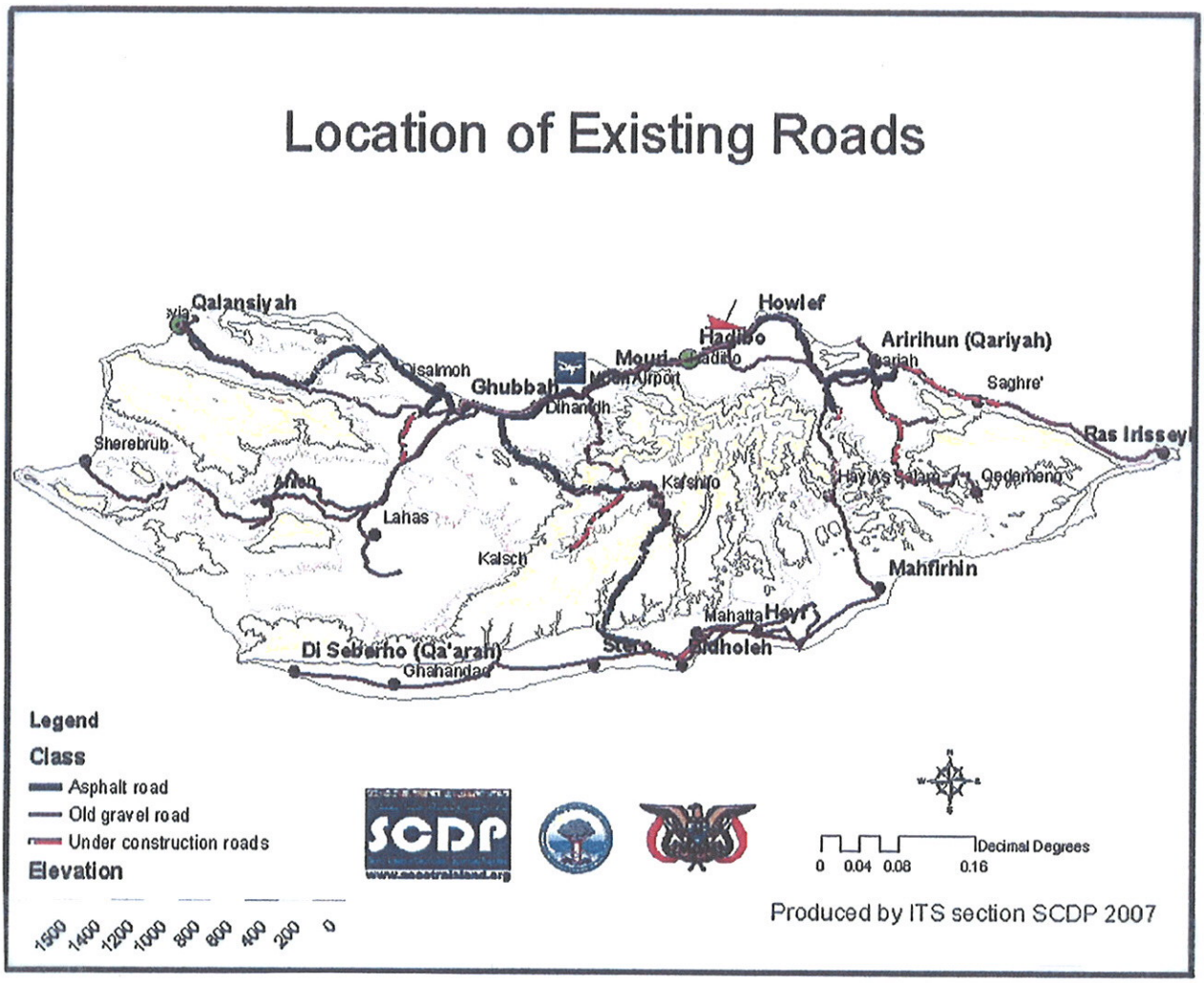
Abdul-Rahman F. Al Eryani

Minister of Water & Environment

Date: 5/6/7

**APPENDIX 4**

**Map of the study area**



**APPENDIX 5**
**Programme of site visit 12-18 November 2008 and key persons consulted**

| | |
|---|---|
| Tuesday 11 | Arrival of the working group of the Netherlands Commission for Environmental Assessment. |
| Wednesday 12 | Meetings with:<br>- Representatives of Socotra Archipelago Conservation & Development programme<br>- Country representative of the European Commission<br>- Mr Job Kleijn of the Royal Netherlands Embassy at Embassy |
| Thursday 13 | Meetings with:<br>- Representatives of Socotra Archipelago Conservation & Development programme<br>- Deputy minister of Ministry of Public Works and Highways<br>- Chairman of Environmental Protection Agency |
| Friday 14 | 06:00 Departure Sana'a<br>09:00 Arrival Socotra<br>10:00 Short visit to EPA-office<br>Short rest in hotel ?<br>12:00 Lunch Dihamri (with Evaluation mission + Minister of Water and Environment)<br>13:00 Erher road construction works<br>15:00 Ras Momi end of the projected ring road (NE end of the island)<br>16:00 Return to Hadibu (or, alternatively, night in Dihamri campsite) |
| Saturday 15 | 07:00 Drive back to Hadibu<br>08:00 Meeting with District director and local council (alternatively Monday morning)<br>09:30 Continuation to Dixam road (Minhin, view on Firmihin, etc.)<br>Qu'ara coastal plain (cliffs – ringroad, SW end of the island)<br>Noged – Mahfarhin – Matyaf Road (ringroad, SE)<br>Overnight in Amak (Noged Southern Plain), meeting with community |
| Sunday 16 | 07:00 Drive to Qualansiya (NW end of the island)<br>08:30 Diverted road to Qualansiya (bypassing Dutwah lagoon)<br>09:00 Meeting with District director and local council<br>11:30 Early lunch Dutwah lagoon<br>12:30 Qu'aisoh ascend (ringroad – Qu'alansiyah Shu'aib), where a detailed botanic assessment has been made<br>Return Hadibu<br>Meeting with road company engineers.<br>19.00 Dinner / de-briefing with Minister of Water & Environment |
| Monday 17 | 07:30 De-briefing with EPA-Socotra<br>11:30 Travel to airport |
| Tuesday 18 | 14.00 Presentation of preliminary findings to EPA, MoWE and Ministry of Public Works<br>17.00 De-briefing at Netherlands Embassy |
| Wednesday 19 | 09.10 Departure to A'dam via London of entire working group |

**List of key persons consulted during site visit by NCEA, 12- 18 November 2008**

**Ministry of Water and Environment**

| | |
|---|---|
| 1 H.E Eng. Abdul Rahman Al-Eryani | Minister of Water and Environment |
| 2 Eng. Mahmoud Shedaiwah | Chairman of Environmental Protection Authority (EPA) |

**Resource persons**

| | |
|---|---|
| 3 Salem Baquhaizel | D.G of Env. Monitoring & Inspection - EPA |
| 4 Amer Al-Ghorbany | Deputy G.D for Env. Policies and Programmes |

**Ministry of Public Works**

| | |
|---|---|
| 1 Eng. Ibrahim Al-Kibsi | Deputy Assistant of Public Works and Roads |
| 2 Ibrahim I. Basalamah | Environmental and social science specialist – Rural access project |
| 3 Eng. Yahya Al-Ga'adi | Representative of MoPW&R – Socotra Island |
| 4 Abdul Hameed Khaled | Head of MoPW&R –Hidibo - Socotra Island |
| 5 Abdullah Salem Kasim | Head of MoPW&R –Qalansiah - Socotra Island |

**Socotra Island**

| | |
|---|---|
| 1 Salem Dahik | G.D of EPA branch |
| 2 Ahmed Sulaiman | Deputy G.D – EPA branch |
| 3 Nadeem Taleb | Resident Programme Manager - SCDP |
| 4 Saad Ali Salmain | G.D of Hidibo district |
| 5 Mohamed Saad Al-Kisi | G.D of Qalansiah district |
| 6 Khan Mohamed | Rep. of GATCO Contracting Company |

# APPENDIX 6
Reference Material

## Documentation on Roads - Socotra

| General Background studies on Socotra – Flora and Fauna | | | | |
|---|---|---|---|---|
| | **Author(s)** | **Title** | **Additional information** | **Year of Publication** |
| 1 | Cheung, C. and L. DeVantier | Socotra A Natural History of the Islands and their People | Odyssey Books and Guides | 2006 |
| 2 | Edoardo Zandri ea | Saving Socotra – The Treasure Island of Yemen | UNDP publication | 2003 |
| 3 | A.G. Miller and M. Morris | Ethnoflora of the Socotra Archipelago | Royal Botanic Garden Edinburg | 2004 |
| 4 | F. Attorre, F. Francesconi, N.Taleb, P. Scholte, A. Saed e.a. | Will dragonblood survive the next period of climate change? Current and future potential distribution of *Dracaena cinnabari* (Socotra Yemen) | Biol. Conservation | 2007 |
| 5 | W. Wranik | Fauna of the Socotra Archipelago – Field Guide (with contributions from O.S. al_Saghier, S, Aspinall, R.F. Porter and H. Rösler. | Universität Rotstock - Germany | 2003 |
| 6 | K. Kral and J. Pavlis | The first detailed land-cover map of Socotra Island by Landsat/ETM + data. International Journal of Remote Sensing | Landsat/ETM 27:3239-3250 | 2006 |

| Governmental Documents | | | | |
|---|---|---|---|---|
| | **Author(s)** | **Title** | **Additional information** | **Year of Publication** |
| 7 | | Conservation Zoning Plan – Presedential Decree No. 275 of the Year 2000 | The Environmental Protection Council – UNDP GEF Socotra Biodiv. Project | 2000 |
| 8 | | IUCN enquiry letter to the GoY (related with the World Heritage Site nomination) | IUCN | 2007 |
| 9 | | MWE response to IUCN-UNESCO (including elements related with ringroad) including 6 annexes (o.a. Cabinet Decree February 2008 relative to road construction) | Ministry of Water & Environment - Yemen | 2008 |
| 10 | | IUCN-UNESCO Socotra – World Heritage Site eval. Report | | May-June 2008 |
| 11 | WS Atkins International Ltd. | Soqotra Archipelago Master Plan | Commission of the European Communities – Republic of Yemen | 2002 |
| 12 | | 2nd directive for Environmental Impact | EPA-Yemen | |

| | | | | |
|---|---|---|---|---|
| | | Assessment (EIA) of Rads (2nd draft) report prepared for EPA-Yemen) | | |
| 13 | | ToR EIA Ringroad Socotra | | |
| 14 | | Request for Proposal for EIA, EMP, SFA and traffic count for road project | Republic of Yemen, Ministry of Public Works and Highways, Rural Access Project | January 2004 |

| Ecological Studies on Impact Roads Socotra | | | | |
|---|---|---|---|---|
| | **Author(s)** | **Title** | **Additional information** | **Year of Publication** |
| 15 | Miller et al. | Roads on Socotra Impacts and recommendations for improved planning and construction | | Nov. 2007 |
| 16 | Lisa Banfield | Royal Botanic Garden background docs. (of various sites) | Royal Botanic Garden Edinburg | |

| Popular articles/presentations on Road construction on Socotra | | | | |
|---|---|---|---|---|
| | **Author(s)** | **Title** | **Additional information** | **Year of Publication** |
| 17 | S. Christie | Socotra's Road to ruin | www.geographical.co.uk | May 2005 |
| 18 | Van Damme and Scholte | Hallah Road Construction | | 2006 |
| 19 | P. Scholte | Presentation road construction 2007 (for EU-ambassadors, Nov. 2007, April 2008; UNDP donor coordination meeting June 2007, etc) | Socotra Condervation & Dev. progr. – MWE/UNDP | 2008 |
| 20 | S.J. Christie and A.G. Miller | Road Construction on Soqotra-Achieving Development Goals while Protecting the Environment | | 2004 |

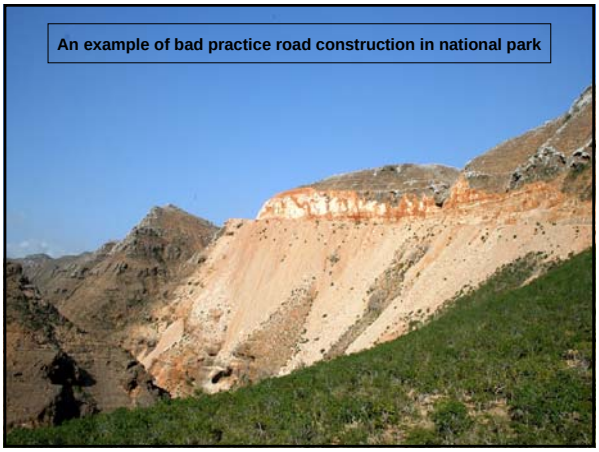
# APPENDIX 7

## Photo's of the study area
## (by R. Slootweg & A.J. Kolhoff)

New Dixam road: not connecting villages

Old North-South road connecting settlements but not upgraded

An example of bad practice road construction in national park



Example of improper culvert dimensions causing blockage resulting in erosion of roads

Taking measurements

Taking measurements

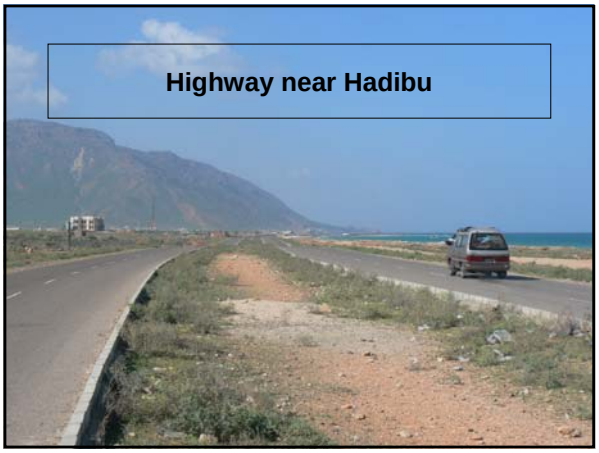
Dragon's blood tree: symbol of Socotra

Explanation route selection on the southern plain

Sanctuary: planned road was stopped

Old road crossing Wadi

Highway near Hadibu



Meeting with Hadibu district authorities

**APPENDIX 8**

# Report on the Results of Consultative Meeting to Discuss Primary Results of the Netherlands Commission on Environmental Assessment of Road Construction in Socotra

## Held on 18 Nov. 2008

**First Draft**

**Please send me your comments or remarks**

**Prepared by**

**Dr. A-Karim Thabet**

**WS moderator and Development Consultant**

**Mobile: 777 143 733**

**E-mail: drkarimt@gmail.com**

**E-mail: drkarim@y.net.ye**

**Sana'a, November 22, 2008**

1) **Importance of the meeting:**

A consultation meeting was held on the invitation of the Min. of Water and Environment attended by the representatives of the Min. of Water and Environment and Min. of Public Works and Roads to discuss the preliminary findings and recommendations of the Netherlands Commission for environmental assessment of road construction in Socotra. The meeting also intended to assess the outlook of the Min. of Public Works and Roads on the recommendations of the Commission on the impact of road construction on the environment in Socotra. The meeting was held on 18 Nov. 2008 at the Min. of Public Works and Roads.

In the beginning of the meeting the primary findings of the Commission were represented by the six experts on environment, engineering, economics, social, etc. who were:

- Klaas Jan Beek: chairman
- Arend Kolhoff: technical secretary
- Chrisje van Schoot: social expert
- Louis Wetstein: road engineer
- Jan Helmer: economist
- Roel Slootweg: ecologist

The presentation was structured in four sections:

- The current road planning on the island
- Why we need roads? Observations of the Commission on the current condition of roads and the Island
- Main questions of road construction: What? How? Where?
- And the next steps to be taken (Recommendations)

2) **Results obtained from the meeting:**

After review of the primary findings of the presentation by the Commission and ensuing discussion, the participants discussed the following points:

1- The joint and recommended working mechanism presented by the Commission was discussed and accepted by both ministries representatives (see page 5 of presentation);
2- The importance and necessity of accomplishing a Master Plan for Socotra Island and especially one pertaining to the construction of roads;
3- Adherence to environmental assessment standards and execute environmental studies during the planning phases of roads construction;
4- The need to create a joint working mechanism between the Min. of Water and Environment and the Min. of Public Works and Roads concerning roads construction in general and to Socotra in particular;
5- Importance of publishing an "Environmental guide to protected areas";
6- Stopping work on the construction of main roads on the island and starting work on the Master plan for the forthcoming two years;
7- Involve the Min. of Water and Environment in the discussion of the requests presented by the Local Councils to the Min. of Public Works and Roads concerning roads construction;
8- Formation of a technical team assigned by the Min. of Water and Environment specialising in environmental issues to act as a link / basic coordinators with the Min. of Public Works and Roads;
9- Environmental studies for construction of subsidiary roads on the island are to be executed by the Min. of Public Works and Roads in consultation with the Min. of

Water and Environment, and is being executed currently according to the World Banks TOR;

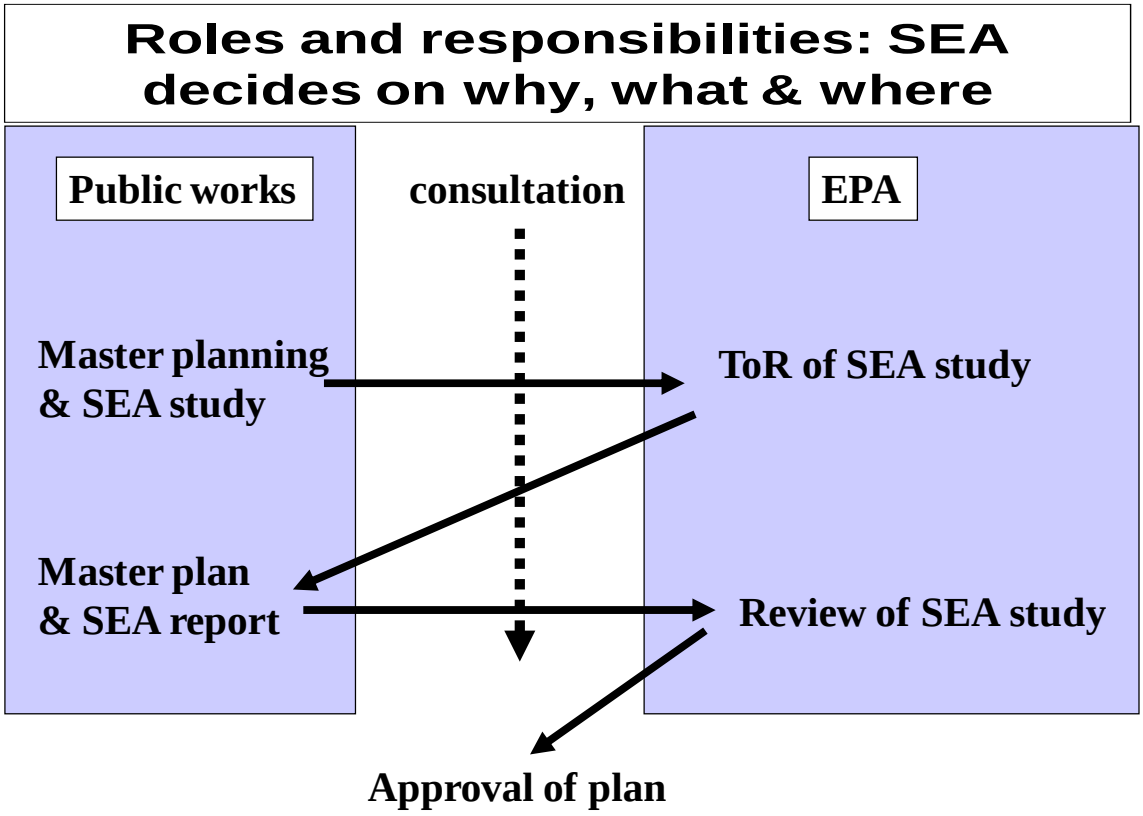
10- Submission of ten roads projects by the end of the year 2008 by the Min. of Public Works and Roads to the Min. of Water and Environment (represented by the EPA) for Environmental Impact Assessment (EIS);
11- Form a cooperation and coordination mechanism on the field level between the two ministries' branches on the island;
12- After submission of the Terms of Reference by the Commission in two weeks form the date of the meeting, it is essential for the Min. of Water and Environment to assign experts on the island to coordinate and work mutually with the Min. of Public Works and Roads;
13- Reliance on the World Banks TOR may not cover the environmental requirements of roads construction of the island because some of its parts could not be applicable on a world heritage site like Socotra Island and hence it is necessary to adopt an environmentally Project Oriented TOR approach;
14- Coordinate between the two ministries on the one hand, and the Min. of Planning on the other, to find out the labours exerted, the financial and technical support expected for the execution of the Master Plan, and especially the support expected from the EU;
15- How is it possible to take into consideration maintenance costs of road projects to incorporate road builders contracts for the next two years at least;
16- Follow-up to issue a "Guidelines for Environmental Impact Assessment for Roads" and make available to the concerned and those working in the road constructions field;
17- Create an institutional structure related to environmental aspects within the Min. of Public Works and Roads to assure sustainability of environmental commitments of road construction and not just to rely institutionally on the World Banks support / TOR in executing environmental studies as it is currently being done.

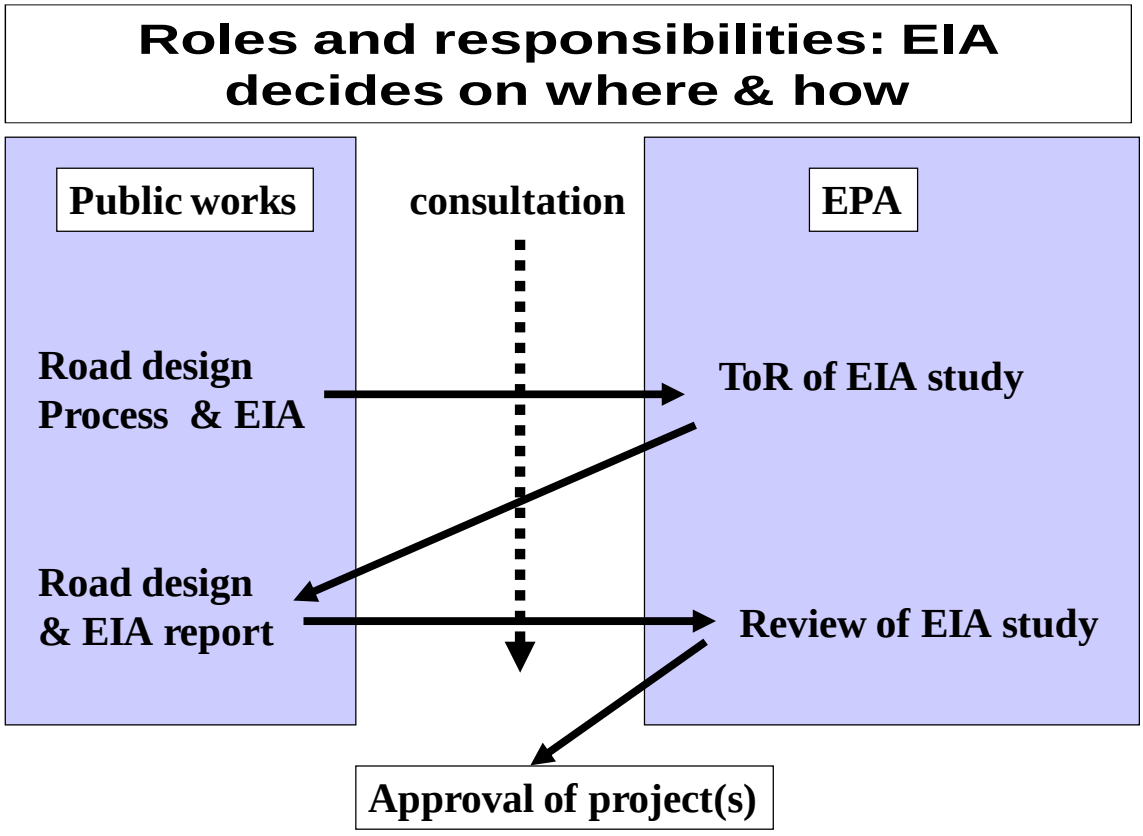
3) **<u>Preliminary commitments of the two ministries (MWE and MPWR)</u>**

1) Accept and apply the following suggested "joint working mechanisms" by the Commission on the procedures of approval of roads projects for the island (see page 5 of the presentation "Next Steps"

# Next steps

- Integration of strategic environmental assessment in upgrading of Roads Master Plan
- Integration of environmental impact assessment in road design
- Stakeholder consultation






2) Establish a comprehensive joint coordination and cooperation mechanism for roads construction.

4) **<u>Preliminary commitments of the Min. of Water and Environment to be approved</u>**

1- Provide the technical expertise for the accomplishment of environmental impact assessment studies for road projects;
2- Assign a technically specific team nominated by name and job description to cooperate and coordinate with the Min. of Public Works and Roads at the two ministries level and on the island's two ministries branches level;
3- Issue an "Environmental Assessment Working Guidelines for Protected Areas" and make it understandable and applicable to the concerned in roads construction institutions;
4- Follow-up to approve and issue and introduce the Directory on Environmental Impact Assessment on Roads Construction, to all concerned institutions. The directory is currently submitted to the cabinet for approval to be part of the environmental protection law;
5- Introduce the environmental Assessment TOR to the Island on Road Construction, which will be accomplished by the Netherland's Commission in two weeks after this meeting held on 18 Nov. 2008;
6- Produce general guidelines on Environmental Assessment and on Environmental Impact Assessment of Road Construction and distribute to the concerned parties.

5) **Preliminary commitments of the Min. of Public Works and Roads to be approved**

1- Work according to the suggested "joint working mechanisms" by the Commission on the procedures of approval of roads projects for the island (see page 5 of the presentation "Next Steps";
2- Ensure the implementation of the environmental studies concerning roads in the preliminary phases of road planning projects and especially those for Socotra;
3- Accomplish a Roads Master Plan for the island for the forthcoming two years;
4- Submit ten roads construction projects to the Environment Protection Authority for environmental assessment of the projects studies;
5- Stop construction work on non-subsidiary roads on the island till the execution of the Master Plan.