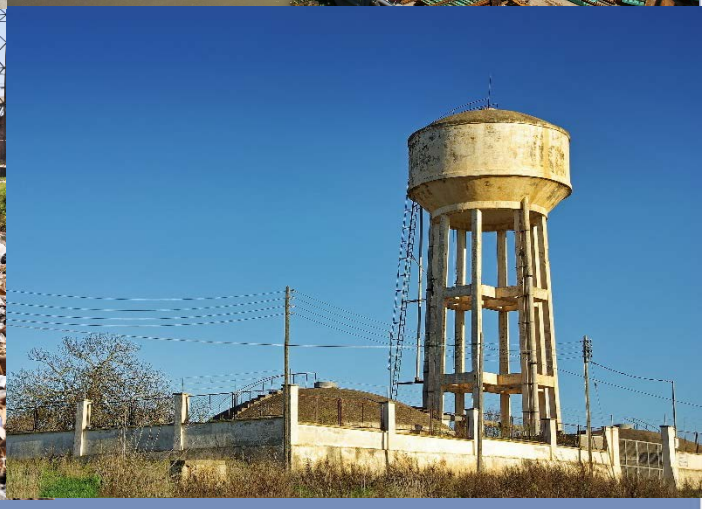
Netherlands Commission for Environmental Assessment

BENIN (ORIO 13/BJ/01)

# Quick Scan (Review) of the ESIA for the Parakou Drinking Water Improvement Project

27 February 2015
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# Advice of the Secretariat

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| **To** | **ORIO** |
| **Attn** | Ms Barry Nieuwenhuijs |
| **CC** | **ABE** |
| **From** | The Netherlands Commission for Environmental Assessment (NCEA)<br>Mr Sibout Nooteboom |
| **Date** | 27 February 2015 |
| **Subject** | **Quick Scan (Review) of the ESIA for the Parakou Drinking Water Improvement Project**<br><br>By: the Secretariat of the Netherlands Commission for Environmental Assessment – Mr Sibout Nooteboom, Mr Reinoud Post and Ms Ineke Steinhauer<br><br>Advice 2015-05 |

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# 1. Introduction

In January 2015, ORIO requested advice on the ESIA for a drinking water project in Benin. The Société Nationale des Eaux du Bénin (SONEB) of Benin is applying for ORIO funding in order to provide better access to drinking water for the city of Parakou, Benin.

This advisory report was prepared by the NCEA secretariat based on the ESIA report, entitled: "Projet de renforcement du système d'alimentation en eau potable de la ville de Parakou. Etude d'impact environnemental et social. SONEB le 17 Octobre 2014". This is annex 17 of the main project document, called "AEP Parakou – Improvement Drinking Water Supply Parakou – Project Plan Implementation Phase ORIO 13/BJ/01 Parakou Bénin13 December 2014 Final Report V1.0". The project is called, in short, "AEP Parakou". Other annexes were also available.

### Approach

This advice is a so-called NCEA 'Advice of the secretariat', for which no external expertise was used. This advice used the Terms of Reference (ToR) annexed to the ESIA (see annex), and the national ESIA requirements (see annex). The ToR make no specific reference to other international guidelines. The ESIA itself indicates that, according to ORIO requirements, certain international standards are applied (IFC and OECD).

The aim of this advice is quality assurance. On the one hand, the NCEA checked whether the ESIA report contains the information it should. At the same time, NCEA verified whether the ESIA report contains adequate, accurate and sufficient information (on environmental and socio-economic impacts and on options/alternatives to deal with these) that is needed for decision making on this project. In the case of shortcomings, the consequences for decision making are assessed and recommendations are given for supplementary information needed to address these shortcomings.

The ESIA report (Annex 17 D3 - BC9518_EIES AEP Parakou_Benin Rapport provisoire final v1.2 20141020) was reviewed as a stand-alone document, meaning that all information necessary for decision making should be contained in the ESIA report, without requiring the reader to consult other documentation to complement gaps in information in the ESIA itself. Where information relevant to the ESIA was available in the project documentation, this is indicated as an insufficiency, from the point of view that the ESIA (not the project documentation) is subject to public review in the ESIA procedure. The project documentation available was:

- BC9518-101-113 ORIO FINAL Project Plan V1 20141223_merged
- Annex 1 documentation consulted
- Annex 2 Map of project area
- Annex 2_2_Zone du Projet_zoom1_20141008
- Annex 2_3_Zone du Projet_zoom2_20141008

In the following chapters, we first present our key observations in relation to the national ESIA requirements and the technical contents of the draft ESIA (chapter 2). In chapter 3, we elaborate in detail how we have come to this conclusion, by providing observations for each chapter of the ESIA report.

# 2. Key observations

## 2.1 Conformity with national ESIA procedure

The potentially relevant national ESIA legislation of Bénin is listed in the Annex. The national environmental code, ESIA Decree n°2001-235 and the general ESIA guide have been put in place about 15 years ago. The procedure has the 6 steps as indicated in the annex. The ESIA document provided (17 Octobre 2014) appears to be in the second phase of the full ESIA procedure ("EIES profondue").

According to the ESIA, the specific Terms of Reference for this project (ToR) have been approved by the competent authority Agence Beninoise pour l'Environnement (ABE), and the elements in the ToR are all considered in the ESIA report.

The ESIA is well written. The general guide for ESIA specifies the general table of contents of an ESIA, which is largely followed (the ESIA for AEP Parakou has additional chapters on introduction, legal context, methodology and consultations). These additions are useful. Consultations of the public and stakeholders are not required during preparation of the ESIA, because a possible public participation may follow preparation of the ESIA, which is a case-by-case decision of the competent authority. This stage hasn't arrived yet, but the public has informally been consulted during ESIA preparation already. In 2014, the consultant (preparing the ESIA on behalf of SONEB) and SONEB itself have consulted local stakeholders and authorities and local chiefs. A public gathering was organised in the Kpassa village near the Okpara dam. The concerns of these stakeholders are listed in the report.

■ The NCEA has no specific recommendation with regard to conformity with the national ESIA procedure.

## 2.2 Quality of Technical content

The AEP Parakou project is about an investment in enlargement of existing facilities, including:

- the Okpara dam and its reservoir
- its untreated water intake point and pumps and its sand trap,
- the water pipeline from the pumping station to the treatment plant,
- the treatment plant Bannikani,
- the storage station and pumping station called "2 kilo", and
- the distribution network into the city, with 2 pressurized zones.

Since the ESIA (not the project documentation) is the formal documentation for public decision-making in Benin, the NCEA has primarily verified the presence of crucial environmental and social information in the ESIA itself. The NCEA believes that the following information is missing in the ESIA that is needed before a well-informed decision on general design can be made:

- According to the ESIA, a socio-economic study is needed to identify the persons and their assets affected by the project, and if necessary a plan to restore their livelihood and to engage with these stakeholders. The costs of the study and compensation are

estimated in the EISA, but it is not verifiable if these are foreseen in the financial analysis of the project documentation. Not to have risk of harm to the population due to construction of the distribution system, the implementation of this study needs to be secured before the project is developed.

- Details about the bathymetric study are missing in the ESIA; they are probably included in the report "Royal HaskoningDHV (RHDHV) (2014d). Renforcement alimentation en eau potable Parakou. Analyse de la disponibilité de l'eau. Rapport Final 1.0. Juillet 2014". The conclusions cannot be verified without that document. For example, it is not clear if the study has taken climate change into consideration: Bénin is a zone of high vulnerability to climate change, which may have impact on the needed storage capacity of the reservoir.
- Choice of water treatment technology is not justified in the ESIA; it is unclear if any alternative options are available and how they compare. The project documentation gives reasons for the choice of technology, and suggests that there are no feasible, more environmentally friendly alternatives. The NCEA secretariat cannot verify that suggestion.
- The ESIA does not clearly indicate how the waste water management masterplan of Parakou will be adjusted. The risk of non-action is not described. This point is addressed in the project documentation, identifying the municipality of Parakou as responsible. Including this risk in the ESIA (as formal document of public decision-making) may increase the sense of urgency.
- Whereas IWRM is seen as a primary objective, SONEB's commitments to it are not clear in the EISA. In the long term, IWRM might be crucial to avoid problems like pollution. The project documentation describes more clearly how in the implementation phase, a consultant will support SONEB in its contribution to IWRM. Again, here it is suggested that the ESIA more clearly underlines the risk of not engaging in IWRM, and how this risk is reduced.
- The ESIA provides no economic and financial estimate, demonstrating that the project is viable, taking the envisaged water pricing and environmental protection measures into consideration. The project documentation includes analysis of financial feasibility and sustainability and economic viability. From the available information the NCEA cannot verify that the cost of environmental protection measures is included. The costs themselves are estimated in the ESIA (the NCEA secretariat cannot evaluate if these estimates are realistic).
- The ESIA does not describe in sufficient detail (in its section 9.3) for the NCEA to be able to verify how SONEB ensures it will have the human resources and the organisational capacity of implementing all identified environmental protection measures and environmental management plan. The ESIA recommends making an onsite engineer responsible, but SONEB's commitment is unclear. The project documentation gives additional information in its sections 5.5, 6.1 and 7.1, but a clear assignment of environmental tasks is not yet included. Section 11 (monitoring and evaluation) does not specify how SONEB's environmental and social organisational input and output will be monitored (referring to Orio's standard reporting template). Based on this information, the NCEA cannot assess the risk of insufficient environmental performance.

# 3. Detailed observations per chapter

Major observations are included in section 2.2. Relatively minor observations are added hereafter. The NCEA doesn't view these as critical for project decision-making, but they deserve attention during implementation. The structure of this chapter follows the chapters that are prescribed in national legislation.

### 1. Description of the project, including plans, maps and figures relevant to understanding the proposed project

According to the ESIA, the project should connect 90% of the population of Parakou in 2025 to drinking water, ensure water provision for 3 nearby villages, increase water efficiency in the urban zone to 75%, and integrate water management (improvement of reservoir water quality) by changing cattle routes, less use of fertilizer and pesticides upstream, removal of water hyacinth and bad herbs from the reservoir. The land needed to construct facilities is owned by SONEB or the state of Bénin.

- The NCEA has no specific recommendation.

### 2. Initial state of the site, of its natural environment and socio-economic and human development

The ESIA describes locations of facilities (including the distribution system), reservoir plus 15 km upstream and downstream the Nanon river, plus the neighbouring land uses.

- The NCEA has no specific recommendation.

### 3. Analysis of environmental impacts of the project

According to the ESIA, the elements of the project will have the following sizes of impacts.

Construction of canals / pipes (table 1 of ESIA)

- Moderate: disruption of local economy, health and well-being of residents and workers
- Minor: Loss of private goods

General construction activities (table 2 of ESIA)

- Moderate: soil contamination, heavy traffic effects
- Minor and negligible: pollution via runoff, air pollution, noise, health and well-being of residents and workers

Operation and maintenance phase: increased water volume pumped (table 3 of ESIA)

- Major: lowering of water table in the river and in the reservoir, and their physical-chemical water quality
- Major to moderate: more difficult access of livestock to the reservoir water
- Moderate: impact on terrestrial fauna and flora, impact on aquatic fauna and flora, local fishery, health impact of less stagnating water
- Minor: river morphology and flow speed, access to irrigation water

- Unknown, possibly negative impact: lowering groundwater table with impact on water availability

Operation and maintenance phase: Correct working of valves (table 4 of ESIA)

- Moderate to minor: downstream effects of flora and fauna; at present there is leakage which causes some downstream runoff in the dry season, which will disappear and the river will be completely dry again; this does not weigh up to beneficial effects of a higher upstream water table

Operation and maintenance phase: Working of AEP pumping and treatment stations (table 5 of ESIA)

- Moderate: accidental soil pollution from stocks and wastes
- Negligible: air emissions, noise, hygiene

Operation and maintenance phase: Better access to drinking water (table 6 of ESIA)

- Beneficial: more access to clean drinking water, better living conditions, economic development
- Major: risk of not being able to produce enough clean drinking water in dry periods or in case of high water pollution, more discharge of waste water
- Major to moderate: impacts of more waste water on public health
- Minor: water spillage
- Unknown (probably positive): less invasive species like Hyacinth

Operation and maintenance phase: Removal of invasive plant species (table 7 of ESIA)

- Unknown (probably positive)

Cumulative impacts:

- Other main developments in the area are increase of waste water discharge, cotton production, movements of cattle, construction of transport infrastructure. These interfere with the project in several ways.

Risks

- Risks from the project activities can be limited by means of a security plan.

The NCEA observations and suggestions:

■ Explain more clearly why water in the reservoir has to meet WHO drinking water standards before pollutants will be removed in a treatment plant.

■ Explain more clearly how pesticides are a risk and how heavy metal is a risk. (For public health through drinking water? For ecosystems through surface water and sediment?)

■ Indicated more clearly in these tables whether the impact takes the identified mitigation measures into consideration (it seems not), and how the benefits of IWRM are included.

## 4. Comparative analysis of different project alternatives

According to the ESIA:

- The facilities are designed for moderate population growth with a horizon of 2025. Growth assumption is about equal to the assumption in the project plan.
- Because it is an upgrade of an existing system, the optimal choice of locations and main technologies is clear (but the latter is not clearly explained).

- The zero option is not realistic since the existing facilities already start to malfunction, and cause a shortage of clean drinking water.
- The project will not change the price of water the end users will have to pay, which is fine for the population already connected. However, this price may be too high for new families that will be connected by the extension of the system. In particular in the poor to be connected villages it is advisable to develop central water taps rather than individual connections to reduce the costs of water.
- Bathymetric studies show that the reservoir has sufficient capacity until 2025 to bridge the dry season, specific measures to increase its capacity also have adverse impact and may be postponed until reconsideration may be required at some point in the future.

The NCEA observations and suggestions:

- Choice of technology of water treatment: see section 2.2.
- The use and generation of energy for treatment and pumping is not discussed, including possibly more sustainable options such as solar panels, hydro-electric energy (however, production of biogas is mentioned). It is recommended to explain why. The project documentation only states: "Except for the emissions of the extra pumps, the project is not expected to have an impact on greenhouse gas emissions". This seems a missed opportunity.
- Economic and financial viability: see section 2.2.
- Bathymetric study: see section 2.2.

## 5. Environmental protection measures

According to the ESIA, most impacts can be reduced to acceptable levels by applying good practices, which are listed. This must be enforced from the (sub) contractors by good tendering and monitoring. Some major impacts need further study to identify adequate measures, notably:

- Hydro-geological study according to IFC standards; taking into consideration the reservoir up to 15 km upstream and an ecological base flow downstream in the dry season
- Management plan for invasive species
- Waste water treatment system Parakou , also important because part of Parakou discharges its waste water into the reservoir
- Water provision for cattle near the reservoir
- Pesticides management plan
- Study impacts on groundwater availability
- Smaller suggestions, like to study the feasibility of water hyacinth harvesting for biogas production

The ESIA indicates that some major impacts need to be addressed by changes to project design, notably:

- Additional treatment unit to remove pesticides with active carbon in period of high pollution
- For the 3 villages: central water taps (stand posts) rather than private connections
- Look for ways to recycle water used for cleaning filters and drying beds (2% water efficiency may be attainable)

The NCEA observations and suggestions:

- SONEB's capacities: see section 2.2.

## 6. Environmental management plan

According to the ESIA:

- SONEB is responsible for the environmental protection measures – often to be implemented by contractors – and it is recommended that it assigns an onsite responsible engineer.
- SONEB should develop a detailed surveillance and monitoring plan.
- As part of operation and maintenance SONEB will monitor precipitation, hydrology, sediments, sedimentation and water quality in the reservoir and its influents. Costs indications for the further studies are required to decide on final environmental protection measures.

The NCEA observations and suggestions:

- SONEB's capacities: see section 2.2.
- It is suggested to monitor the effects on groundwater availability and to anticipate measures in case wells in the neighbourhood dry up.
- SONEB's financial plan: see section 2.2.
- The recommendation in the ESIA to create central water taps (apparently meaning stand posts) seems to be in contradiction with the assessment in the project plan (Project Plan Implementation Phase ORIO 13/BJ/01 Parakou Bénin13 December 2014 Final Report V1.0), which indicates a system of "voisinage" to be more adequate in the situation of Bénin. The NCEA recommends clarifying this point.
- IWRM: see section 2.2.

# ANNEX

**Basis of evaluation:**

1. Projet de renforcement du système d'alimentation en eau potable de la ville de Parakou Etude d'impact environnemental et social. SONEB le 17 Octobre 2014 Rapport provisoire final BC9518. Brabant Water, SONEB, RoyalHaskoningDHV (y compris les termes de
   references issus par l'ABE)
2. Project Plan Implementation Phase ORIO 13/BJ/01 Parakou Bénin13 December 2014 Final Report V1.0 BC9518, Brabant Water, SONEB, RoyalHaskoningDHV

**Terms of reference (scoping) document issued by the Agence Beninoise pour l'Environnement (ABE)**

Le Consultant devra :

- décrire le projet ;
- faire l'état des lieux du milieu (physique, biologique, socio-économique) d'accueil du projet ;
- évaluer les impacts environnementaux du projet (négatifs et positifs) ;
- proposer des mesures d'atténuation des impacts négatifs et de maximisation des impacts positifs ;
- analyser les risques liés au projet dans les phases de construction et d'exploitation du projet ;
- proposer des mesures de mitigation ;
- proposer des mesures de sécurité pour prévenir et gérer les risques liés au projet ;
- élaborer un plan de gestion environnementale et sociale ;
- présenter le rapport provisoire d'EIE au commanditaire pour avis ;
- soumettre au commanditaire quinze (15) exemplaires du rapport amendé ;
- présenter le rapport d'EIE au cours de l'atelier de validation à l'ABE ;
- intégrer les amendements et observations de l'atelier ;
- et soumettre au commanditaire le rapport final d'EIE

Le consultant à la fin de l'étude devra déposer un rapport provisoire pour avis comportant au moins les points suivant :

- **Contexte du projet**
- Identifier le promoteur ;
- Décrire ses activités reliées au projet ;
- Présenter sa politique de protection de l'environnement ;
- Exposer les raisons qui motivent la réalisation du projet et le choix du site, incluant les options exprimées ;

- Décrire sommairement le projet ;
- Faire mention des projets connexes ;
- Démontrer que le projet est la meilleure solution en décrivant sommairement les autres solutions envisageables ;

➢ **Description du milieu récepteur**
- Délimiter la zone d'étude ;
- Identifier et analyser les composantes pertinentes ;

➢ **Description et analyse des variantes du projet**
- Identifier les variantes du projet ;
- Décrire les caractéristiques des variantes ;
- Faire une analyse comparative des variantes ;
- Justifier le choix de la variante préférable ;

➢ **Analyse des impacts de la variante retenue**
- Décrire le projet de façon détaillée en mettant en évidence les sources d'impact ;
- Identifier les impacts probables ;
- Evaluer l'importance des impacts ;
- Evaluer les impacts cumulatifs sur les composantes clés du milieu ;
- Déterminer les mesures d'atténuation ou de compensation ;
- Faire la synthèse des impacts résiduels du projet ;

➢ **Gestion des risques d'accidents technologiques**
- Déterminer les risques d'accidents technologiques ;
- Déterminer les mesures de sécurité à prendre ;
- Etablir le plan des mesures d'urgence ;

➢ **Programme de surveillance et de suivi**
- Proposer un programme de surveillance environnementale ;
- Proposer un programme de suivi environnemental.

Applicable procedure "Full ESIA"

According to Decree 2001/235 the initiator has to follow the following procedural steps (current status is stage 2):

1. Proponent develops the ToR on the basis of general ESIA guidelines and submits the ToR to ABE for approval.
2. Proponent prepares the ESIA and submits it to the minister responsible for the environment and demands an environmental conformity certificate.
3. The public is informed. The ESIA is published (art. 91 Loi cadre). Any member of the public may request a public hearing. The Minister may prescribe a public hearing, organised by a mandated commission.
4. The ABE advises to the competent minister about approval of the project, taking the ESIA and the reactions of the public into consideration.
5. The environmental competent minister issues, in case of a positive decision, the certificate of environmental conformity. The dossier is transferred to the project competent authority, which is any authority competent to give a (definitive) administrative approval for the construction of the project
6. Proponent and ABE monitor the project implementation.

The ESIA report includes at least the following elements:

1. a detailed description of the project, including plans, maps and figures relevant to understanding the proposed project;
2. a detailed and accurate inventory of the initial state of the site, of its natural environment and socio-economic and human development. Especially the elements and natural resources which are likely to be affected by the project and the use of resources related to it;
3. an analysis of foreseeable, direct, indirect and cumulative environmental impacts of the project;
4. a comparative analysis of different project alternatives with justifications of the choices made regarding the inclusion of the environment;
5. the measures proposed by the proponent to compensate, reduce and if possible eliminate the harmful impacts of the projection the environment;
6. an environmental management plan which includes information on monitoring and follow-up activities during and after the implementation of the project. The environmental management plan is thus directly included in the ESIA report. Further, the report must be accompanied by a summary which was prepared separately in order to facilitate its distribution.

Whilst not clearly stipulated in legislation, it may be assumed that the authorities in Benin apply the following practices:

7. Description of the results of stakeholders consultation in stage 2, taking account of these results in the description of impacts.

General requirements of readability for a wider public

**Relevant legislation of Benin**

Général EIES:

- loi n° 98 – 030 du 12 fevrier 1999 portant loi cadre sur l'environnement en republique du benin | télécharger (pdf – 4.2 mo)
- Décret N°2001-235 du 12 juillet 2001 portant organisation de la procedure d'etudes d'impact sur l'environnement
- schema du processus administratif de la realisation d'une etude d'impact sur l' environnement | télécharger (pdf – 1.1 mo)
- guide general de realisation d'une d'impact sur l'environnement | télécharger (pdf – 229.3 ko)
- decret n°2001-190 du 19 juin 2001 portant organisation de la procedure d'audience publique en republique du benin | télécharger (pdf – 170.3 ko) | télécharger (pdf – 90.8 ko)

Specific:

- Guide sectoriel EIE projets d'adduction d'eau | Télécharger (PDF – 2.6 Mo)
- mémorandum des techniques de foresteries urbaine et rurale | télécharger (pdf – 3.7 mo) | télécharger (pdf – 3 mo)
- decret n°2001-110 du 4 avril 2001 fixant les normes de qualite de l'air en republique du benin | télécharger (pdf – 96.2 ko)
- decret n°2003-332 du 27 aout 2003 portant gestion des dechets solides en republique du benin | télécharger (pdf – 834.4 ko)
- decret n°2001-109 du 4 avril 2001 fixant les normes de qualite des eaux residuaires en republique du benin | télécharger (pdf – 177.3 ko)
- decret n°2001-094 du 20 fevrier 2001 fixant les normes de qualite de l'eau potable en republique du benin | télécharger (pdf – 136.5 ko)
- decret n°2001-294 du 8 aout 2001 portant reglementation du bruit en republique du benin | télécharger (pdf – 79.9 ko)

Inspection and enforcement of legislation and environmental permits:

- decret n°2005-37 du 22 juillet 2005 portant organisation de la procedure d' inspection environnementale en republique du benin | télécharger (pdf – 245.9 ko)
- decret n°2001-096 du 20 fevrier 2001 portant creation, attributions, organisation et fonctionnement de la police environnementale | télécharger (pdf – 27.7 ko)