



***Evaluation of  
Urban Pollution  
of Surficial and  
Groundwater  
Aquifers in Africa***





**Project DA/9999-00-01**  
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**Evaluation and Oversight Unit**

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## PREFACE

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The Urban Pollution of Surficial and Groundwater Aquifers in Africa project addresses the issue of aquifer vulnerability and the need to protect the quality of the continent's groundwater resources. The project is based on a uniform methodology of sample collection, analysis and reporting, while promoting measures for preventing and reducing aquifer pollution.

The project's objectives conform with the primary objectives of the main monitoring programmes of the United Nations Environment Programme (UNEP) and of the United Nations Educational, Scientific and Cultural Organization (UNESCO), including the environmental assessment and reporting element of the UNEP Environmental Assessment and Early Warning Programme. It also supports the Monitoring Strategies for Detecting Groundwater Quality Problems project of UNESCO's International Hydrological Programme (IHP) V 1996-2001 and VI 2002-2007, and is relevant to the Economic and Social Development in Africa programme of the United Nations medium-term plan, 1998-2001.

In this project UNEP and the UNESCO International Hydrological Programme (IHP) worked as facilitators and catalysts to establish and strengthen regional coordination, water management and monitoring systems, with encouragement and support from the United Nations Human Settlements Programme (UN-HABITAT), which has similar complementary activities, and political support from the United Nations Economic Commission for Africa (ECA). Remarkably, this is the first UNEP project to be funded through the United Nations Development Account in New York.

The evaluation of the project was carried out within the UNEP Evaluation and Oversight Unit, with financial support from the United Nations Development Account. An independent consultant and hydrogeologist, Prof. Dr. Lewis Clark, has prepared the current report.



## ABBREVIATIONS

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AMCEN	African Ministerial Conference on the Environment
AMCOW	African Ministerial Conference on Water
BGS	British Geological Survey
CIAPOL	Centre Ivoirien Anti-Pollution
CURAT	Centre Universitaire de Recherche Appliquée en Télédétection (Côte d'Ivoire)
DANIDA	Danish International Development Agency
DESA	Department of Economic and Social Affairs (of the United Nations)
DEWA	UNEP Division of Early Warning and Assessment
ECA	United Nations Economic Commission for Africa
ENRICA	DANIDA Enhancement of Research Capacity
GWSC	Ghana Water and Sewage Corporation
IAEA	International Atomic Energy Agency
IDA	Integrating Development Authority (Ghana)
IHP	UNESCO Division of International Hydrological Programme
INHP	Institut National d'Hygiène Publique (Côte d'Ivoire)
LNSP	Laboratoire de Santé Publique (Côte d'Ivoire)
NEPAD	New Partnership for Africa's Development
ROA	UNEP Regional Office for Africa
SIDA	Swedish International Development Cooperation Agency
SODECI	Société de Distribution d'Eau de Côte d'Ivoire
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UN-HABITAT	United Nations Human Settlements Programme
GIS	Geographic Information System
GRID	Global Resources Information Database



## EXECUTIVE SUMMARY

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### A. BENEFITS

1. An operating network of seven countries with a developing groundwater pollution monitoring and early warning system is in place. At a cost of \$20,000 a year from each country this has been an inexpensive project and the seven country networks can now be a springboard for future progress.
2. The distribution of Pollution Early Warning Bulletins by the various task forces has already had a clear, albeit local, impact on politicians and water industry managers in each country. One MSc thesis has been produced from the work done by the Abidjan team. A project web site has been established and will provide a window into the project for the international community.

### B. OBJECTIVES

3. The objectives of the Urban Pollution of Surficial and Groundwater Aquifers in Africa Project are set out in the UNEP project document as contributing to:
  - (a) Establishing a network on urban groundwater vulnerability;
  - (b) Developing methodologies for optimal monitoring of the contamination of surficial and groundwater aquifers in African urban areas. This will serve as an early warning and trend detection system for possible water supply pollution.
4. The objectives of the project have been attained and the planned outputs of the project have been largely achieved. The activities set out in the project document and more closely defined at subsequent progress meetings have been undertaken successfully and on schedule.

### C. REASONS

5. The main source of potable water in many cities in Africa is groundwater, commonly from shallow hand-dug wells but also from deeper water supply boreholes. The unplanned expansion of the cities leads, almost inevitably, to a serious pollution threat to the groundwater supplies. The project was organized to provide a robust system of monitoring to give early warning of such pollution and allow legislators and water managers to take action against it.

### D. SCOPE OF EVALUATION

6. This report presents the findings of a project evaluation following the guidelines of the terms of reference issued by UNEP on 16 July 2002. The scope of the evaluation included the following:
  - (a) The evaluation shall be conducted as an in-depth evaluation. The evaluation will review and evaluate the implementation of project activities against the actual results, outputs and activities of the project. Further, the evaluation will comprise proposals for a long-term strategy and action plan for the 2003-2004 biennium;



- (b) Field visits will be undertaken to one or two project countries in West Africa and interviews will be conducted with relevant UNEP and UNESCO staff, project personnel and consultants in project countries, including government and city officials and other stakeholders.

## E. CONCLUSIONS

7. This evaluation deems the project successful and very cost-effective. The project covered seven countries and lasted two years, within a relatively small budget of \$280,000. The Evaluator recommends that a continuation of the project for a further two years is entirely justified and should be implemented immediately.
8. The success of the project implementation has been evaluated in terms of six aspects of the project following recommendations by UNEP in the terms of reference. The evaluation of the success of each of these aspects has been made on a scale of one to five, with one being the highest rating. The evaluation results are given in table 1 below. The overall rating for the whole project, based on the ratings in the table is assessed as 2.

Table 1

Aspect of project evaluation	Score
Attainment of outputs	2
Completion of activities	2
Project executed within budget	1
Cost effectiveness of project	1
Impact created by the project	3
Sustainability	2
Overall score	2

9. The project has encountered problems, but these have in the main been overcome and it is now operating well. The problems encountered have been treated as lessons learned and used to formulate a series of recommendations for the extension of the project.
10. The probability of the long-term sustainability of the project is considered very good if the

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