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FINAL EVALUATION OF THE ASSESSMENT OF THE POLLUTION STATUS AND VULNERABILITY OF THE WATER SUPPLY AQUIFERS OF AFRICAN CITIES

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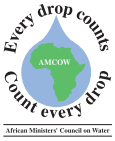

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Executive Summary

Introduction

This project, *Assessment of the Pollution Status and Vulnerability of Water Supply Aquifers of African Cities*, is a follow up to the project, *The Urban Pollution of Surficial and Groundwater Aquifers in Africa*. The focus of the two projects has been on pollution threats to groundwater arising from unplanned expansions, effluent leakages in open sewers, leaking septic tanks, latrines, domestic waste disposal, and uncontrolled industrial and commercial activities. The objective is to extend the projects' scope and coverage to other African countries in order to establish a pilot network of early warning contamination and trend detection for urban and peri-urban water supply aquifers. This has been achieved through four main clusters of activities.

Evaluation results

This report presents the results from the final evaluation of the project. The objective of the evaluation was to review and evaluate the implementation of planned project activities and outputs against actual results, establish project impacts as described in the project outline, and evaluate the project's execution performance and potential for sustainability.

The evaluation exercise produced the following key findings:

- From the evidence gathered, the assessment and technical capacity-building efforts, stakeholder involvement and collaboration have all been relevant, timely and highly effective. In this respect, the project must be judged an overwhelming success.
- The technical information reviewed in the final reports, the project presentations, and submissions to a forthcoming book on groundwater pollution in Africa, point to outputs of a satisfactory scientific quality and standard, which should serve as valuable reference points for both national and regional urban groundwater assessment activities.
- A solid network has been established for the exchange of groundwater-related information and a database set up for the active exchange of data and interaction between the countries involved.
- Practical methodologies have been developed for assessing and monitoring the current and potential contamination of groundwater aquifers. While the rationale was similar in each site, the project identified the need for, and inspired the development of, site-specific approaches and methods based upon the characteristics and requirements of each city.
- Based on evidence in the reports, feedback from the country coordinators and project consultant, and the field visits, it is clear that awareness of groundwater quality issues was enhanced at all levels, together with the institutional capacity of each country and the continent as a whole.
- In each country, the project teams have made meaningful contributions to influencing policy at local, national and regional levels. Due to time and budgetary constraints, these impacts have been more significant at the city level, although many countries show evidence that national or regional stakeholders have taken cognisance of their study results. With some additional time and effort, the evaluators are confident that the findings obtained will form the basis for formulating or improving groundwater-use policies and protection measures.
- In each of the project countries, the aquifer vulnerability has been mapped for an urban area reliant on groundwater, regular sampling of the water quality has been undertaken, the results have been processed and interpreted, and the implications have been communicated to decision-makers and the general public.
- The project has significantly impacted on the technical proficiency in each country and on the continent as a whole, and has provided a strong platform on which to link these results to other freshwater protection initiatives in Africa.

Lessons learned

1. **People only become concerned with groundwater quality when they have a large enough supply.** As important as groundwater quality issues are, both the general public and politicians who are in a position to promulgate laws are generally not concerned with quality issues until there is enough water readily available to them. In Lusaka, for example, community leaders showed that, while they have taken cognisance of groundwater quality protection issues, they are more concerned with the amount of water being supplied to them.

2. **Public education on groundwater protection should not be a one-off action but a continuous process.** The trickle-down strategy of public awareness does work but needs reinforcement at regular intervals otherwise behaviour will not change. While the project relied to some extent on a trickle-down approach, the fruits of this have only been felt in the countries where the project has been operating for longer (e.g. Ghana), due to the extended repetition of its messages.

3. **Scientific bulletins are an excellent tool for conveying technical information but not an effective public communication device.** Bulletins are good communication tools for other scientists but not for the general public, water managers or politicians. This was evident from the self-evaluation exercises and the country visits, with technical personnel such as those in the Lusaka Water Supply in Zambia and the Addis Ababa Environmental Protection Agency in Ethiopia rating the bulletins as highly effective, while the same could not be said for community leaders and elected representatives in these countries.

4. **Projects must take specific socio-economic conditions into account from the outset so that their aims can be appropriately defined.** A project on groundwater quality needs to recognise that many of its outputs will be obscure to members of the public or political decision-makers, and that expected outputs should clearly define those indicators for which success can obviously be measured. As an example, the current situation in Niger would make supply of water and basic foodstuffs to the wider population a far higher priority than groundwater quality protection. For this reason, the importance of groundwater protection should be emphasised to receiving communities from the earliest start-up phases of water supply projects, quoting tangible results from this and other similar projects.

5. **Groundwater protection projects should learn from and build upon the successes of previous similar projects.** A great deal of the success of this project lies in the fact that the project managers and many of the countries had been involved in the previous project on the *Urban Pollution of Surficial and Groundwater Aquifers* in Africa. This is evident from the timely development of national groundwater strategies in these countries, where the momentum has been sustained and there have been consistent awareness-raising activities.

6. T**angible outputs should be devised for researchers to aim for.** The book currently being published has reinvigorated the research teams and provided them with a specific timeframe for producing outputs of a scientifically acceptable standard. Smaller projects such as conferences or symposia of international standing can serve a similar purpose.

7. **Local structures and community buy-in are critical for public sensitisation and acceptability.** Several countries, including Ghana, Zambia and Senegal, listed examples of attitudes being significantly changed once community members were made an integral part of their projects. It is recommended that all such projects encourage local buy-in from the outset in order to promote their popular acceptance and progress.

Project assessment

Clear criteria were set for the evaluation of the project by the UNEP Evaluation and Oversight Unit (UNEP/EOU) and rated on a scale of 1 to 6, with 1 being the highest rating and 6 the lowest. The following table outlines the ratings given to various aspects of the project's implementation:

Table 1: Overall Rating Table

Attainment of objectives and planned results	2
Achievement of outputs and activities	1
Cost-effectiveness	1
Impact	3
Sustainability	3
Stakeholders' participation	2
Implementation approach	2
Country ownership	3
Financial planning	2
Replicability	2
Monitoring and evaluation	3
OVERALL RATING	2

Recommendations

A. Priority actions

Project results should be repackaged to achieve maximum impact

- A significant amount of relevant, high-quality technical data has been generated by this project. To date, these data have been passed on to stakeholders mainly through local groundwater quality bulletins. Indications are that, while these bulletins have been highly effective in communicating to technical personnel, the format is less appropriate for informing the general public and political decision-makers. The findings and implications in each city should thus be packaged or disseminated differently to spread the significance of the scientific findings to the public and to local regulators. If possible, UNEP should facilitate this process as a matter of priority.

Suggestions:

i. For the general public, readable and attractively packaged 'Citizens' Guides' on groundwater quality and protection issues may have a greater impact.
ii. For regulators, such guides could be used together with the bulletins and some concrete suggestions for policy changes or physical protection measures.
iii. For both regulators and the public, information generated by the project could be further disseminated through public forums or meetings, which public participation specialists could be employed to facilitate.
iv. A fixed template could be developed to provide a standard harmonised structure for the country reports. As well as promoting easy comparisons and information sharing, this would also simplify the presentation and comprehension of key issues in their dissemination over the Internet.

B. Medium-term actions

1. Assistance should be given to individual countries to strengthen their groundwater policies

- In order to sustain the gains of the project, it is recommended that a follow-up project be prepared to assist individual countries to influence policymakers and move from policy to implementation. It is suggested that national-level steering committees should be established or strengthened as part of this process, and that many of the stakeholders who have been involved in this project or have worked on similar projects with UNEP, UN-Habitat or UNESCO could serve on these committees with national decision-makers.
- At UNEP level, the Division of Environmental Policy Implementation (DEPI) should follow up on the assessment outcomes and should take a leading role in developing a proposal to assist participating governments to develop more comprehensive groundwater policies and strategies. This process should also involve close consultation with other potential donors, water supply authorities, and large-scale water users in each country.

2. Groundwater protection strategies should be linked to sanitation initiatives

- The project's findings have strongly identified poor sanitation and informal sewerage disposal as major contributors to groundwater quality degradation. As the project shows, groundwater quality is only prioritised when supply is sufficient and when alternatives are available. The results of this project should be used in conjunction with new sanitation and water supply initiatives in urban centres in Africa, for which collaboration with UN-Habitat would seem appropriate.

3. The project should be expanded

- The findings of this evaluation suggest that the project has been successful in terms of implementation and the production of important results. Based on these outcomes, the project should be expanded if at all possible.

Suggestions:

i. As groundwater pollution and vulnerability issues are affecting all developing countries with increasing urbanisation, aspects of this project could be replicated in other African countries and developing nations where they are relevant and applicable.
ii. In almost all of the countries investigated, other major urban areas exist where the same approaches can be followed. Since a core group of expertise has been established by this project, replicating the efforts in an additional area should be achievable at a much reduced cost. This would expand the capacity and project ownership in each country, as well as providing vital data to influence policies and test groundwater protection strategies.
iii. If the project is expanded, experience suggests that some 'lag period' should be built in initially for new countries to launch activities before the new project aims are expanded to existing areas. This would allow for a more equitable evaluation and allow the project to progress at a rapid pace after the initial period.

4. Efforts to train young African water scientists to build on the project's successes should be intensified

- This project has generated core centres of expertise in each country, and the training provided by the project has been key to this achievement. Due to the nature of the project, it is understandable that most participants in the training courses were university professors or senior personnel, but future projects should emphasise, in the memoranda of agreement if necessary, that young local scientists should also be exposed to expert training. This type of training should continue and be expanded with a particular focus on young scientists.

Suggestions:

i. In future projects, at least one training session could be dedicated to the training of young local scientists. The benefits in terms of establishing long-term networks and increasing the expertise base will ensure sustainability.
ii. Future projects should include a training seminar in the region or country for personnel outside the project teams. This would further build local capacity and make local regulators and stakeholders aware of the expertise available in each country.

5. Greater efforts should be made to streamline funding administration

- The limitations of the funding have been alluded to and, while this cannot easily be rectified, indications are that there are some difficulties with the transfer of funds to individual countries. This aspect was discussed with the participants and the project managers, and it appears that the route followed was the lesser of two difficulties. The delays in this process, however, appear to have resulted in delays in the progress of project activities in several countries. This aspect should be carefully considered at the inception of future multinational projects.

6. A financial exit strategy should be incorporated into a future project

- Further funding opportunities seem to exist with both bilateral and multilateral agencies in all of the project countries. It is suggested that better resource mobilisation could be made one of the results of a future project. This should include the provision of a budget line for local resource mobilisation, in order to promote the long-term sustainability of project results.2.

1. Introduction

Groundwater use is widespread in many major cities in Africa. Rapid urbanisation in most of these cities has led to unprecedented population growth, resulting in the development of large areas of unplanned and sub-standard housing. The lack of services in such informal settlements poses serious threats to groundwater through sewerage and effluent leakages, the dumping of domestic waste, and uncontrolled industrial and commercial activities. As many of these settlements rely on groundwater as their main source of potable water, such pollution poses major health risks to a large proportion of their population.

The current project, *Assessment of the Pollution Status and Vulnerability of Water Supply Aquifers of African Cities*, is a follow up to the *Urban Pollution of Surficial and Groundwater Aquifers* project, which established a programme of inter-nation research into the little understood and poorly documented field of urban groundwater pollution in Africa.

1.1 Scope and objectives of evaluation

The objective of this terminal evaluation was to review and evaluate the implementation of planned project activities and outputs against actual results, establish the project's primary impacts, and evaluate its performance and potential sustainability. The evaluation was based on two questions:

i. Whether the assessment and technical capacity-building efforts, including stakeholder involvement and collaboration, have been relevant, timely and effective;
ii. Whether the technical information produced is of a scientific quality and standard that can serve as a reliable reference model, and contribute to national and regional urban groundwater assessment activities.

The evaluation assessed, among other things:

I. Delivered outputs: The project's success in producing each of the programmed outputs, in terms of their quantity, quality, usefulness and timeliness (Sections 2.3, 3.1 and 3.5);
II. Project outcomes and impact: The project's success in achieving its outcomes (Sections 3.3, 3.4, 5.1, 5.2, 5.3 , 5.9 and 5.10);
III. Project sustainability (Sections 3.6, 3.7, 5.7 and 5.10);
IV. Execution performance: Effectiveness and efficiency of project management and supervision of project activities (Sections 2.2, 3.10, 3.11, 3.11.2, 5.4, 5.9 and 5.10).

1.2 Methodology of evaluation

The methodology followed was based as closely as possible on the guidelines provided by the terms of reference. The findings of the evaluation were based upon:

- Interviews with UNEP/DEWA and UNESCO Nairobi project staff;