

FP7 CLARA (Capacity-Linked water supply and sanitation improvement for Africa's peri-urban and Rural Areas)

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Short summary

The FP7 CLARA (Capacity-Linked water supply and sanitation improvement for Africa's peri-urban and Rural Areas, contract number 265676) project overall objective was to strengthen the local capacity in the water supply and sanitation sector, given the limited local capacity to adopt, implement and operate integrated water supply and sanitation. The work, based on the main outcomes of the FP6 projects ROSA and NETSSAF, was focused on three main activities: 1) field research in Arba Minch, Ethiopia, 2) the development of the CLARA Simplified Planning Tool (SPT), and 3) the work in pilot-communities in 5 African countries.

The CLARA SPT aims to provide the missing link for the technical part of the overall planning process by providing a tool to local planners which not only allows but even encourages the comparison of fundamentally different water and sanitation systems at a very early planning stage. Using the SPT requires a limited amount of effort from the planner thus resulting in minimal cost for the client. Using the tool gives the planner - i.e. consultants and/or municipal planning departments - real costs of various alternative water supply and sanitation systems. Environmental, social and health aspects are not considered explicitly since it is assumed that these aspects are already considered in the framework conditions, i.e. it is assumed that all systems fulfilling the legal requirements benefit environment and health and are socially appropriate. However, the tool can be used to compare e.g. water-borne and dry sanitation systems.

The CLARA SPT has been tested and evaluated in five geographical African regions, Ethiopia, South Africa, Burkina Faso, Morocco and Kenya. For all CLARA pilot-communities a full planning process for water supply and/or sanitation was carried out. As no money for implementation was available in CLARA, application documents were prepared as a final output that were submitted to donors for funding further detailed planning and/or implementation.

Keywords

Reducing untreated wastewater; Increasing recycling and safe reuse; Protect, restore and sustainable use of inland freshwater related ecosystems; Increase water use efficiency across sectors; Ensure sustainable withdrawals; Ensure supply of freshwater to address water scarcity; Reduce number of deaths and number of affected people;

Issues addressed

Water quality (pollution, dumping of toxic materials, wastewater management, recycling, reuse): The main objective is that the planner uses the tool to implement the water management system by combining the technologies selected (those of application in the African context) in the different functional groups (covering from water source to reuse).

The developed SPT permits the planner to select the most efficient technologies for each functional group. A functional group is a group of technologies which perform a similar function in the water supply and sanitation system. For the CLARA SPT we used the functional groups as defined in the Sustainable Sanitation and Water Management toolbox:

- Water source
- Water purification
- Water distribution
- Waste collection
- Waste treatment
- Reuse

For each functional group, several technologies have been implemented in the tool, including those of resource oriented water and sanitation systems.

Therefore, the CLARA SPT is a decision making tool to better manage the available water resources and treatment options for selecting the adequate system based on a cost benefit analyses. This costs benefit analyses allows the quantification of revenues of water and nutrients when reusing options are considered.

Risks (mortality, economic losses caused by natural and human-induced disasters): The implementation of an adequate water management system would prevent the wastewater reaching water bodies and causing therefore water borne diseases such as diarrhoea which cause mortality.

Tools for implementation

Technology: As already mentioned, the SPT is based on technologies grouped in functional groups to allow planners the selection of those most appropriate under specific conditions. From a technological point of view, existing low cost technologies for decentralized water supply and sanitation systems were assessed and adapted for African conditions with the focus on reducing risks in use and reuse of water and sanitation products, and providing demand oriented water quality. Based on these technological improvements and the experiences gained in the projects ROSA and NETSSAF, the SPT for integrated water supply and sanitation systems for small communities and peri-urban areas incorporates the key factors for sustainable long-term running systems, i.e. operation and maintenance issues and reuse potential. These factors need to be considered from the beginning of the planning process and tailored to available local capacities.

Who is involved?: For the development of the planning tool: the CLARA project consortium. For implementation: those actors working in planning at rural and urban level, which normally includes local authorities, technician, water management agencies, and CSOs.

What objectives?: The objective is to support the local planners to find the best solution for water supply and sanitation in an early stage of the planning process. Using the SPT, the planner can choose according to their specific conditions, existing low cost technologies for decentralized water supply and sanitation systems adapted for African conditions with the focus on reducing risks in use and reuse of water and sanitation products, and providing demand oriented water quality, getting at the same time real costs of various alternative water supply and sanitation systems. The tool was thought to be widely used for standardising the selection steps of the water system management. This would lead to more transparency and objectivity in the decision making/planning process.

Implementation challenges: The main challenge is to simplify as much as possible the tool for the planner and this implies that a huge amount of reliable data is needed to make the tool work properly in specific countries. This has been done for the five participating countries in the CLARA project but for making it work for other countries, the data should be compiled.

Another challenge is the need of updates on the data included in the current data base.

Main task/activities undertaken /Tools used: Selection of technologies and functional groups to be included in the SPT; Compilation of costs data; Development of costs functions to link the costs with the data to be provided by the planner; The development of the tool (software) itself based on MSExcel ®; Use of the SPT in the five case studies.

Main outcomes / impacts (what has changed?): Conclusions from the 5 case studies:

Frasers, Kwa-Zulu Natal, South Africa: The SPT provides an excellent tool to conduct direct comparisons between technologies across the water delivery value chain or water cycle. The results present valuable information that allow engineers and planners to come up with a first order indication of which of the systems tested present the most appropriate and viable option to the specific settlement. The tool is the only known tool of this kind in the South African water service industry and carries a significant potential to be further developed and applied on a national basis. A number of elements may be addressed via further development, which mostly relates to specific cost items that could be included in the tool to allow enhanced cost comparison.

Arba Minch, Ethiopia: Economic performance evaluation of proposed alternatives for water and sanitation systems is mandatory to select an optimal solution concurrently with environmental and social criteria based evaluation. It is important to look at the entire time expenses and benefits of systems, in order to assess economical preference of solutions. CLARA SPT provides an opportunity to estimate life time economic value of alternatives by analyzing one-time cost (initial investment cost) and recurrent costs (annual O&M, reinvestment cost and revenues) as well as salvage/residual value. The tool aids decision makers and planners to select economically most advantageous solution for both utility providers and service users.

Njoro Township, Kenya: The results for the water supply alternatives show that all the costs for the River water extraction are lower than those of groundwater extraction. Therefore, River water extraction will be preferred as a water supply system for the Njoro Township. The result for sanitation show that water-borne with sewerage alternative is the best option in terms of total costs concerned. In terms of O&M costs, the dry sanitation (UDDT) alternative is very expensive compared to the other two alternatives. In general, the cesspit and faecal sludge treatment has extremely a high investment cost compared to the other two options.

Ait Ider, Morocco: The results of the SPT use indicate that the cost progressively increases with the adding of additional service options. In terms of using the SPT, one alternative includes the potential of selling the composted sludge, based on estimated current cost of purchasing compost.

Ouagadougou, Burkina Faso: The presentation of the results of the test with the SPT to the partners during a stakeholder event showed an interest about the tool. A training session for local stakeholders in the use of the SPT as well as the presentation of the results by applying the SPT to the pilot communities was organized. The stakeholders agreed with the selected alternatives and they requested to put in place a core team who will be following the submission of the application document to the funding partner. They also requested a continuous assistance even after the project in the use of the tool to test specific alternatives

Lessons Learned:

Triggers: Lack of water planning; Corruption and lack of transparency in the decision making process; Health problems associated to the bad management of wastewaters; High number of water and sanitation system implemented that failed as they are not appropriate to local context; Demand from the civil society to planners (authorities) to take actions to solve this problem; Demand from the private water sector offering solutions to have fair and transparent tender processes; Water scarcity problems.

Drivers: Commitments from the authorities having competences in water; Pressure from international community (Millennium development goals); The sustainability linked to the selection of existing low cost technologies for decentralized water supply and sanitation systems adapted for African conditions.

Barriers: Lack of commitments from the authorities having competences in water; Difficulties to change models from “corruption” to “transparency”; Lack of funding for the adaptation of the tool for other countries and its updates. Lack of funding sources to go to real implementation.

What has worked well?: Full costs (investment, operation and maintenance, and reinvestment costs) of different alternative system solutions can be compared; Resource oriented water and sanitation systems included; Only limited amount of input data required by the planner and thus applicable in the early pre-planning phase; Assumptions made to develop costs functions are clearly described; Costs based on real cost data from 5 African countries; Costs of single technologies can be changed by the planner; Cost functions can be added and changed by the developer if more (detailed) information on real costs is available; Adaptation to other (African) countries possible

What can be improved?: Limited amount of technologies implemented so far (those that have been classified by the CLARA project partners as relevant for their countries); Comparison of systems with different performance is possible but mass flow balance not yet implemented; Simplifying assumptions resulting in uncertainties of costs; Cost functions based on Bill of Quantity (BoQs) and not real cost, due to lack of information/applied technologies; Adaptation to other (African) countries; Costs should be reflected in national currencies instead of the Euro-based cost function; A broader range of technology options (i.e. rain harvesting, CABs, package plants, etc) could be included in the SPT; Indirect cost elements, such as land purchases, need to be accounted for in

order to present a straight non-skewed end result. One must be careful about the results, the SPT only gives first idea.

The way forward: A key element of CLARA was that at the end of the project the local teams had to prepare applications documents. With these documents the pilot communities should be able to ask for funding from donors for implementation of the best water supply and sanitation solutions.

Frasers community, South Africa

For Frasers community is likely that one of the options presented for Sarasvathi School (not shown in this special issue) and Frasers informal settlement will be fully implemented by eThekweni as part of their water and sanitation activities. The Municipality of eThekweni was informed through the project of the options suggested in the pre-assessment phase and after the testing with the tool. They did see the value of the options as presented by the tool and will consult further especially the consideration of the longer term costs.

Arba Minch, Ethiopia

In Arba Minch the proposal for continuation of the work with the **CLARA SPT** was included in the project „Sani- Poor“ which is funded by the African Water Facility (AWF).

The project is aimed at supporting the municipality to implement sustainable sanitation services in Arba Minch. Within the project the application of the CLARA SPT is planned as part of developing a master plan for Arba Minch. Key partners of CLARA, i.e. BOKU and EcoSan Club are involved in „Sani-Poor“ as well.

Njoro Township, Kenya

The Kenyan CLARA team together with NARUWASSCO (Nakuru Rural Water and Sanitation Company) has prepared a draft application document for being submitted to the AWF. The aim of this project is the development of a master plan for water supply and sanitation of Njoro Township.

Ait Ider, Morocco

The implementation of the proposed solutions in Ait Ider was already secured from the beginning of the Project as the Moroccan CLARA team teamed up with the SWIM project

Ouagadougou, Burkina Faso

For continuing the work in Ouagadougou, the WSA team got in contact with the local office of the African Development Bank (AfDB) to discuss funding possibilities. A concept note on how to improve water supply and sanitation for the two pilot communities in Ouagadougou was prepared for submission to the AfDB

Links: Sustainable Sanitation Practice, Issue 19, 04/2014. published by EcoSan Club. Editors Elke Müllegger, Günter Langergraber, Markus Lechner. ISBN 2308-5797

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CLARA project: <http://clara.boku.ac.at/>

ROSA project: <http://rosa.boku.ac.at/>

Sustainable Sanitation and Water Management (SSWM): www.sswm.info

The CLARA SPT can be downloaded or free from <http://clara.boku.ac.at/> and
<http://www.sswm.info/home>.
