

Drinking water storing containers with rudimentary water purification filters¹

The project

"LESEAU" is a project for the manufacture and distribution of water storage and purification containers: the product consists of, on the one hand, a bucket with a lid and a draw-off tap to store drinking water without risk of contamination and, on the other hand, a rudimentary filter made up of a mixture of clay, sawdust and colloidal silver (a germicide) to eliminate pathogens and suspended matter².



Project leading institution

Polytechnic National High School of Yaoundé (ENSPY) was founded in 1971 and forms part of the University of Yaoundé. To date, the school has trained almost 3000 engineers in the following fields of engineering: civil, mechanical, industrial, computer, electrical and telecommunications. The institution has almost 80 teachers and accepts over 500 students each year³.

Background

In Cameroon, almost half of the water used by households comes from traditional wells and springs in which the water is unsuitable for consumption and involves high risks of diarrhoea, parasitosis and other illnesses. Water cuts, which sometimes last for a week, frequently force households connected to the drinking water network to use water from wells and springs. As regards the drinking water to which households have access via standpipes or private connections, its quality decreases considerably during transport and storage at home.

Technical details

The proposed model of container has the following characteristics:

- A container in a range of volumes (10, 15, or 25 litres) with or without a screw thread. This container is made of transparent plastic material (PET).
- A lid made of plastic material, with a single-turn screw thread for containers intended for storing water only. Containers that will be delivered with filters will have lids without screw threads.
- A tap made of plastic material with a screw thread system, a plastic nut and two rubber joints so that the assembly may be fitted to the container.
- The tap may be disassembled by the household, enabling it to be cleaned after several uses.

Equipment required for the filter manufacture:

- The acquisition of a grinder fitted with a sieve for preparing the clay and sawdust.
- The manufacture of a mould and a hand press for producing the filter.
- The purchase of germicides.
- The construction of the kiln for firing the filters. The optimum firing temperature is 890°C. This is achieved easily using an electric kiln.

The raw material used for the filter production is clay: white clay (kaolinite).

In addition to this equipment, operating instructions shall be provided, together with a brush for cleaning the filter and a kit for fitting and removing the tap from the bucket.

¹ Grand Prix 2010 : « Water for all Awards »

² The dissemination of the containers is free of rights, with the condition of its non-profit use. The dissemination of the filters is conditioned to a know-how transfer.

³ For further information visit the web site : www.polytechcm.org



Economic details and maintenance

The outlay for a complete filter and container system is only 15 euros.

It costs the household nothing to maintain the system. The device comes with a cleaning brush. The system will be cleaned regularly in clean water after disassembly of the nut and bolt system for the tap. This cleaning operation will take less than 5 minutes a time for an adult. The filter must be cleaned every three days to one week, depending on the quantity of suspended matter in the water filtered.

Results

- Following creation of a prototype, 400 LESEAU containers were distributed to households in the city of Yaoundé.
- Follow-up surveys have been carried out on the use of these containers and on their impact on the quality of drinking water.
- 2000 of these containers were then manufactured. The volume was increased from 16 litres to 25 litres.
- A hygiene awareness campaign was organised in the 15 districts included in the project: it involved over 2000 people in households and schools.
- The Ministry for Energy and Water bought an additional 1000 containers to support the campaign to combat cholera in the areas affected by the epidemic (Yaoundé, Douala and the area of the Far North).
- The initial version of the filter was made of clay only; its porosity was improved by the addition of sawdust. The clay was subjected to characterisation in a laboratory so as to determine the exact composition of the clay/sawdust mixture, making it possible to obtain the required level of permeability and desired filtering rate (1 to 2 litres per hour).
- A miniature prototype of the filter was designed so as to carry out permeability tests on the types of clay identified. Following these tests, actual prototypes were created: they are currently undergoing laboratory testing.

What the project means for the people of Yaoundé

- In addition to the sanitary effects and an affordable solution for households, the team is hoping to create employment-generating activities and improve the competences of local stakeholders through its project.
- People wanted a water purification tool, not just a storage container. This seems fair given their needs. Improvements that will be made to this container, namely the incorporation of a ceramic water purification filter that is currently being manufactured, will open up this product to a larger market (regional and national level).
- All of the people encountered are awaiting a product that completely meets the identified needs. The projected sale price of 10,000 FCFA per unit can be achieved only after three years from the date on which they go on sale. Initially, the actual cost will be 17,000 FCFA per unit, but the value of the SUEZ ENVIRONNEMENT "Water for All" Award will make it possible to cover at least 30% of the retail price for the 10,000 units scheduled for 2012.
- Capacity building has already begun during the first year, with the training of technical staff from the ENSPY Civil Engineering department. Training for tradesmen and SMEs is planned for 2012.

