

CASE STUDY

DAARA OF COKI

2021

Distributor	Tx-H2O
Project	Installation of a waterproof pilot project System O)) near the Daara of Coki.
Treatment capacity	2 000 L/day
Type of discharge	Collection and reuse of treated water
System area	17.01 m²
Site specifications	As there is no sewage system in the area, we had to install a receptacle to collect the waste water discharged by a vacuum truck, a storage tank and a septic tank.



Green space above the installation and watered with the water from the System O))

CONTEXT

With nearly 4,000 students, the daara (Koranic school) in Coki produces a large amount of wastewater that is collected in septic tanks that are emptied periodically. Since the town of Coki has no sewage system, wastewater management is a major problem in the area. DBO International (represented by Tx-H2O), in partnership with ONAS (Office Nationale de l'Assainissement du Sénégal), has installed a pilot unit of the System O)), financed by the government of Quebec, which allows to treat and reuse this water for irrigation.



PRIMARY TREATMENT

This watertight System O)) installation is preceded by a primary treatment unit. The raw sewage is collected by an emptying truck from the surrounding septic tanks and then discharged into the receptacle where, with the help of a screen, the coarse matter is retained and the rest is sent to the storage tank and then to the septic tank. The primary treatment is done in this stage by decantation: the solids are found at the bottom of the tank, the fat at the surface and the wastewater (pre-treated) in between. At the exit of the septic tank, the wastewater flows into the System O)) by gravity. At the time of installation, the inlet of the System O)) was placed slightly lower than the outlet of the septic tank, thus creating a slope.



Wastewater discharged by a dump truck into a receptacle equipped with a bar screen built upstream of the System O))

DISTRIBUTION

The installation is composed of a cell of five rows spread over two levels.

The wastewater leaves the septic tank and lands gravitationally in the distribution box, which distributes it evenly among the rows of pipes.

The optimal operation of a System O)) installation depends on an even distribution of the wastewater through the rows of pipes. This is achieved through equalizers that are installed inside the distribution boxes. They have indentations that are manually adjusted during installation and do not need to be adjusted afterwards. They are the only parts that can move in the entire system.



First level: row of 3 pipes



SECONDARY TREATMENT

The wastewater circulating in the pipes is treated by the presence inside them of a bacterial biomass that assimilates the pollutants before discharging it to the filtrant sand. The latter then acts as a polish during the infiltration of this water.

The System O)) septic installation thus links water distribution, treatment and infiltration in a single activity.



ECONOMICAL ADVANTAGES

Generally speaking:

There is no electrical load as none of the components of the System O)) technology require electricity as the water flows by gravity and the treatment occurs naturally.

By using a sealed System O)) installation, the treated water is collected by a collection system and redirected to a recovery basin from which it will be used for irrigation. This saves on irrigation costs related to access to water.

The System O)) installation requires little or no maintenance because the technology has no mechanical parts to repair or replace, and there is no filtering media to replace. In addition, it does not clog. Therefore, there is no maintenance required once installed and for at least 20 years.

Specific to this case:

The use of toilets at the Daara is excessive and their septic tanks overflow every day. The only vacuum truck in the area makes more than 10 rotations per day, which costs them 40,000 CFA francs per day in fuel purchases.

Moreover, thanks to the reuse of water for agriculture, the users have been able to start vegetable crops that they will be able to consume and market. This income-generating activity creates a circular economy in this area.



ENVIRONMENTAL ADVANTAGES

The wastewater discharge is estimated at 140m³/D in the area and as mentioned above, there is no sewer system. The septic tanks are emptied with a truck. It often happens that this truck breaks down or is late in emptying; then the tanks overflow and are discharged into nature, creating major environmental damage (pollution of the water table, release of odors, presence of wastewater inside the houses, etc.). With the System O)) installation, these overflows are redirected and treated naturally and the water is reused for irrigation and landscaping.

Purification performance well below the country's standards:

- Less than 40 mg/L of DBO₅ (biochemical oxygen demand for 5 days)
- Less than 50 mg/L of Suspended solids (SS)
- Less than 2000 UFC/100ml (fecal coliforms)

*Full results available upon request



Water quality at the entrance and exit of the system



System O)) installation completed



Reuse of water for watering the green space above the facility and for irrigation