

MOSSEL BAY MUNICIPALITY GOING GREEN



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Over the last two years, Mossel Bay Municipality has worked with the Council for Scientific and Industrial Research (CSIR) from Stellenbosch to incorporate low-cost green technology that could improve wastewater effluent quality and potentially harvest nutrients.

MOSSEL BAY NEWS - In developing regions of sub-Saharan Africa the major source of nutrient enrichment of surface water bodies results from untreated wastewater discharged into the environment.

It is estimated that in developing countries only 8% of their domestic and industrial waste is treated before being released into the natural environment.

In South Africa, a national review of wastewater treatment works (Green Drop Report, 2014) showed that more than half of South Africa's 812 wastewater treatment works were, however, not fully functional.

With increased environmental pollution from untreated or partially treated wastewater and resultant nutrient enrichment, there is a growing need for proactive remediation.



Over the last two years, Mossel Bay Municipality has worked with the Council for Scientific and Industrial Research (CSIR) from Stellenbosch to incorporate a low-cost green technology that could not only improve wastewater effluent quality but potentially harvest nutrients.

The use of green technology in the domestic wastewater industry can assist in the effective and efficient removal of nutrients and pathogens in effluents discharged from Wastewater Treatment Works (WWTWs), reducing human health risks by reducing harmful bacteria and creating economic opportunities and entrepreneurship for small agri-business development through the use of by-products.

The specific technology is a passive algae treatment system that makes use of two specific algae species in the existing WWTWs infrastructure.

When released into the sewage ponds, the algae multiply by effectively outcompeting resident non-productive species, killing E.coli bacteria and absorbing the nutrients before they can be used as potential animal feed or bio-fertiliser, after which the treated water is discharged into the natural environment.

The technology is largely a self-sustaining system, using no electricity or chemicals, and can be maintained by a semi-skilled workforce.

This technology package has been implemented in other geographical locations in the country and has attracted significant international interest.

The African Development Bank, through the African Climate Technology Centre (ACTC), funded research into the feasibility of implementing this green technology in other SADC countries.

Further work focuses on possible job creation from algae biomass harvesting.

According to DBSA (2012) the total sanitation infrastructure investment required is R73 billion, of which WWTWs account for 26% (R19 billion) for South Africa.



Researchers from the University of Malawi (UNIMA) and University of Botswana joined the CSIR and Mossel Bay Municipality representatives for a site visit to the Brandwag water treatment works as part of the African Development Bank Project, in which green technology has been implemented.

The proposed technology intervention can extend the useful life and capacity of existing pond-based treatment works, which will delay the requirement for infrastructure investment.

If we take a very conservative view, we can say that 20% of the required investment (R3.8bn) can be delayed by five years.

Thus, with the intervention implemented at 20% (~400) of the WWTW, the gained interest alone will be R1.28bn (an average saving of R3.2M at each WWTW).

The successful implementation of such a system is especially highly relevant to medium and small municipalities throughout South Africa, since more than 50% of all WWTW's are micro-sized (0.5 MLd-1).

The direct benefits to downstream users and improvement in Green Drop certification would be in addition to the direct economic value.

It is difficult to assess the benefits of sanitation services in monetary terms.

Benefits from the provision of basic sanitation, such as those implied by the Millennium Development Goals, are massive and far outstrip costs.

Benefits-to-cost ratios have been reported to be as high as seven to one for basic sanitation services in developing countries.

The green technology reduces health risk and reduces the spread of water-related diseases, since domestic unavailability of water supply in South Africa, especially in rural areas where the poverty rate is about 70% compared with 30% in urban areas, often leads to use of unsafe sources of water.

Treated domestic wastewater effluent prevents the imbalance in water and nutrient fluxes and therefore prevents the distorting of the natural hydrological and ecological regime (phosphorus of sensitive rivers)

With South Africa's growing population and current efficiency levels, the country could have a water deficit of up to 3.8 billion M3 by 2030, which is a 17% gap between water supply and demand, making the treatment and reuse of wastewater a major priority for economic growth.

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