



## Urban Agenda Platform

The global platform for sharing progress, action and knowledge on the implementation of the New Urban Agenda to achieve sustainable urban development.

# Mariannhill Landfill Conservancy

Partner	Siyenza Engineers
Region	Middle East and North Africa
Sustainable Development Goals	Goal 11 - Make cities and human settlements inclusive, safe, resilient and sustainable

## Summary

The United Nations Agenda 21 observed that waste management is among the issues of greatest concern to the global community. It sets out objectives and activities aimed at minimizing waste, maximizing environmentally sound recycling and promoting safe waste disposal and treatment. There are two land uses which often battle to obtain new land amidst the developmental pressures of urbanisation: land for conservation purposes and land for new waste disposal sites.

## Background and Objective

**SITUATION BEFORE THE INITIATIVE BEGAN** The EMA contains over a third of the KwaZulu -Natal province population and the municipality has to dispose of waste within this area. The normal route was to have a foul smelling landfill that was a health hazard and an eye sore to settlements close by. The landfill was a compromise between environmental and waste management goals. **ESTABLISHMENT OF PRIORITIES** The main priority was to ensure that no pollution of the environment occurred and to save on costs the Plant Rescue Operation was started immediately. Odours were problematic and gas extraction by means of a Sequential Batch Reactor was utilised in the leachate treatment process to curtail the escape of gas which was a major contributor to the odour plume. Finally an educational facility was established to educate people about waste management. **FORMULATION OF OBJECTIVES AND STRATEGIES** Initially the objective was to change the attitude of the community and the Environmental Non-Governmental Organisations (NGOs) as the Mariannhill site would be operational for some 25 years. A strategy was devised whereby one on one meetings were held with the affected communities and NGOs. Via this dialogue the concerns of the communities and the Environmental NGOs were identified. Research was then conducted as to determine solutions. The results of the research led to the establishment of the priorities. Where the municipality did not have the expertise, consultants and contractors were appointed. **MOBILISATION OF RESOURCES** The Mariannhill Landfill Conservancy project was driven by the Cleansing and Solid Waste Branch of the eThekweni Municipality, under the leadership of the Deputy Head, John Parkin and was made possible through 'Carbon Finance,' which is channelled through the World Bank's Prototype Carbon Fund (PCF)—a public-private partnership with participants from several countries worldwide. Enviro UK did some consulting for Mariannhill on leachate treatability. The Provincial Ezemvelo KwaZulu -Natal Wildlife Board was responsible for granting Mariannhill its conservancy status and guided this process. Other stakeholders include the Wildlife and Environment Society of South Africa, the Mariannhill Landfill Monitoring Committee, Mariannhill Monastery, Siyenza Engineers and the Ratepayers Association who provided input and voiced their concerns during the planning and implementation stages of the Mariannhill Landfill Conservancy initiative.

## Actions and Implementation

The main obstacle encountered by the Mariannhill Landfill Conservancy arose while the site location was being selected. A lot of negative energy was directed at the determination of a site for the landfill because of landfills' association with foul smells and pollution. Initially, the Council, environmental Non Governmental Organisations and the community were in conflict about the location of the landfill. Via public meetings the tension was resolved, and in 1996 the infrastructure for the landfill

## Outcomes and Impacts

The Mariannhill Landfill Conservancy receives 450 tonnes of general municipal waste per day from the Pinetown, Westville, Queensborough, Kloof area. This represents about 15% of the EMA's total waste. What is unique about this landfill is that it is environmentally friendly, so much so that it has achieved Conservancy status. This has resulted in the establishment of several 'cells' that hold waste, while the vegetation that is removed is placed in a large holding nursery called the Plant Rescue Unit. This provides indigenous vegetation for the rehabilitation of the peripheral 'buffer zone' areas of Mariannhill, as well as for the ongoing rehabilitation of the Bisasar Road Landfill Site. In fact, PRUNIT growth has realised the low cost remediation of several defunct 'dumps' throughout the eThekweni Municipal Area, while saving the municipality significantly on rehabilitation costs. The leachate content of the landfill water is also reduced so that the water is reusable. This reduces the load on the municipal sewer system and allows Mariannhill to



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use effluent from the reed bed for dust control and irrigation. Mariannhill also set up a landfill gas extraction scheme which has been operational for 4 years. Mariannhill conducts weekly environmental lectures for children. Lectures are given in an open-air amphitheatre that overlooks the conservancy. Employment has been for 18 staff members and 25 litter pickers who are used on a rotational basis on all sites.

## Sustainability and Scalability

The Mariannhill Landfill Conservancy will be operational for a total of approximately 25 years and is therefore sustainable. At the end of this period, the whole area will be either rehabilitated or partially rehabilitated, unlike most other landfills where rehabilitation would normally start at the end of the landfill's lifespan. Also, Mariannhill as a conservation area has a greater chance of functioning as a sustainable ecosystem because it is linked to other green areas. The Conservancy status of the Mariannhill Landfill is rooted in regulations and guidelines set out by Ezemvelo Wildlife. In order to maintain its Conservancy status, Mariannhill must simply continue to abide by these.

## Gender and Social Inclusivity

The landfill-conservancy model could be replicated where the need for a new landfill site is established and where conservation authorities are brought on board very early on in the process. This model is highly desirable not only because of its benefits for the environment and the community, but the cost-savings on rehabilitation, and sewage treatment to local government and the opportunity to harness valuable energy from a city's waste. The initiative has been able to show that landfill can be well managed in close proximity to domestic residents with detriment to the environment. The national government departments often quote Durban Solid Waste as the example to follow. The immediate community has also benefited as there has been less illegal dumping and once the site is closed it will be a green lung for the area. The natural wildlife has benefited as there is 50 Hectares of protected land where they can live in safely. The city and its residents have also benefited from the sale of carbon credits to the value of R50 million over the next 10 years. Assistance has been given to Johannesburg, Buffalo City, Pietermaritzburg, Howick and several other South African towns. African countries such as, Mozambique, Kenya, Uganda, Botswana have been assisted in setting up similar initiatives. Asian countries such as Iran, Malaysia and India have been assisted as well.

## Innovative Initiative

The biggest challenge was to change the mind set of those in charge. It was difficult to convince the City Treasurer and the Councillors that this was a better method when there was no similar project running to use as an example. It was believed that it was more expensive to operate in the manner envisaged. However, this has not been the case. What has changed is cash flow as some expenditure needs to take place much earlier than in the conventional method. But the benefits to the environment cannot have a price attached. Also no massive expenditure is required at the end of the life of the site as rehabilitation has continued through the life of the operation and only the final cell will have to be rehabilitate after closure. The key elements that make the Mariannhill Landfill Conservancy a success include its strong and lasting partnerships, its ability to find multiple sources of funding and the fact that it is driven by government, proving that the public sector can deliver services in an environmentally friendly manner. Mariannhill is on the cutting edge environmentalism in waste management as a result of the extensive consultations with international partners and experts in the planning and implementation stages. This initiative takes the concept of a landfill—something 'disgusting' that people tend to avoid—and turn it into a beautiful place where plants and animals thrive. The whole municipality is able to enjoy this landfill for leisure and learning experiences by spending time at the nature reserve, the bird hide, the open-air amphitheatre, or walking down one of the nature trails on-site, making Marianhill Landfill Conservancy an asset to the community rather than an eyesore.

## Conclusion

1. Africa's first Landfill Gas Clean Development Mechanism Project Earns Commendation SAICE – Civil Engineering Magazine Volume 15, pages 8-10. Date - 11/12 2007 2. Health Minister Visits Mariannhill Landfill Site The Rising Sun Newspaper Date - 7/11/07 3. Dump tops in South Africa Highway Mail Newspaper 19/10/07 4. Plant and Engineering Sunday Tribune Newspaper 14/10/07 5. Mariannhill Landfill Leads Africa in Energy Production Highway Mail Newspaper 6/04/07 6. Green Power First for Africa Metro Ezasegagasi 23/03/07 7. Mariannhill Landfill Scheme Scoops Prize Highway Mail Newspaper 9/03/07 8. Mariannhill Landfill Site Wins Awards Highway Mail Newspaper 01/03/07 9. Durban Solid Waste Wins Impumelelo Award Sunday Tribune Newspaper 25/02/07 10. Mariannhill Landfill Site Rewarded for being the "most beautiful in the world" Mercury Newspaper 22/02/07