

## **CASE STUDY – Aid-driven integrated waste system up-grade Tongan Solid Waste Management Project**

### **Summary**

*Tonga's main island and home of 50% of the population, Tongatapu, faced a significant waste disposal crisis. An AusAID-funded project has shown how an integrated approach can maximize the opportunities to improving the entire system. While the project is still only 50% complete, preliminary indications show it to be a model of methodology for these types of major system up-grades.*

In 2000, after years of preliminary studies and work by donors, consultants, and the Tongans, the Tongan Cabinet adopted a solid waste strategy for the main island of Tongatapu. A Cabinet Committee of the Ministers for Lands, Health, Environment, and Works was formed to over-see waste issues.

AusAid agreed to fund the Tongan Solid Waste Management Project (TOSWMP) and appointed project managers from Coffeys, an Australian consulting company. Due to the engineering focus, the project was located in the Works Department. The primary action was to replace the old dump with a sanitary landfill. Many aid-funded projects would have simply delivered a piece of shiny new infrastructure, only to see it fill prematurely & perpetuate existing problems. Fortunately, the project team saw itself as having a wider brief and set about improving systems & knowledge as well as the infrastructure.

The project team made contact with businesses who had been augmenting the government waste system, government officers and the general public. The project began scoping the system necessary to deliver a modern solid waste system to the whole island. That required a reliable and efficient collection system, improved recycling and sustainable funding. Waste characterization studies had shown that, while food scraps generally went to pigs and dogs, 50 to 70% of the waste was garden wastes. Diverting a lot of this fraction was going to be essential to maximizing the life and value of the new landfill. Other wastes, such as car bodies, that don't get shown in most studies, also needed some management attention.

A legislative review led to the drafting of a new and very flexible Waste Management Act. The Minister of Environment is responsible for waste management policy and strategic direction but the responsibility to deliver collection and recycling services and operate the landfill on Tongatapu will be through a new Waste Authority, a public company, and the Dept. of Health on the other islands. The use of an authority one step removed from the government is to try to ensure the system is run on commercial lines thereby ensuring its financial sustainability.

The Act provides for nominating new authorities and jurisdictions if the approach proves successful. For example, the growing tourist destination of Vava'u is seeing its environment and tourism income jeopardized by the impacts of the visitors. The Government could declare a new Vava'u waste authority to fund and operate the wastes that are coming from the yacht charters and whale watching visitors, if the Tongatapu experience proves successful. Thus, the chosen administrative solution can be tailored to the specific situation.

The Authority will levy a collection fee to fund the collection, recycling and disposal, ensuring the sustainability of the system when the aid monies are expended. This is the first ubiquitous charge in Tonga and is an indication of how serious the Government is about improving the situation. TOSWMP has been working with Village Women's Committees to act as both a collecting agency and a conduit of information to and from the village. The Committees will retain some monies to assist in their village maintenance and other activities. This should ensure a strong local ownership and incentive.

Meanwhile, the site of the new landfill, an old quarry, was prepared, groundwater monitoring established and the construction commenced. As the old quarry had gone down to the groundwater level, the floor was raised and to ensure that no leachate escapes, the landfill was lined with Bentofix, a bentonite clay sandwich, and a second barrier of local clay. A special cell was constructed for low-level hazardous wastes such as autoclaved medical wastes or washed biocide containers. No public access is permitted to the tipping face and a transfer system will bring containers from the surface down to the landfill cells. Recycling facilities for green wastes and containers have also been incorporated to capture these resources before they are transferred to the landfill.

The early inspections and consultations identified that the septage (septic sludges) pits at the old landfill needed to be included into the project as they represented a major source of pollution and a significant health risk to the neighbouring community. Both the project managers and the donor proved flexible enough to expand the scope and the new site incorporated secure drying beds for this dangerous waste stream. It is hoped that, once dried, the high nutrient waste can be incorporated into the composting projects.

Waste characterization surveys have shown that over 50% of the domestic wastes are garden wastes. The TOSWMP has assisted the Tonga trust, an NGO, and the Forestry Dept, to get shredders and set up what is hoped will be viable stand alone businesses selling compost to market and flower gardeners. Domestic composting is also being encouraged but the fertile Tongatapu soil mitigates the nutrient value of compost. Water retention and disease resistance will also be important in encouraging participation.

The TOSWMP project has also tried to facilitate other recycling initiatives through an economic development approach. Aluminium cans, plastic (PET) containers, and other metals are currently being recycled. Large cages have been distributed to all villages on Tongatapu and preliminary advice is that the system is workable. Gio, a local metal recycler, is going to use a NZ crusher for consolidating car bodies before shipping. The project has assisted with publicity and shipping costs for the crusher. There is a considerable legacy of possibly 5000 old car bodies in backyards etc on Tongatapu. No use has yet been found for the tyres except domestic garden ornaments.

All these measures could extend the landfill from 20 to 30 years or, looking at it another way, reduce the annual capital cost by 30% - a major saving.

The project has been characterized by a problem-solving, not specification-driven approach. Strong community inter-action has included the business players. Project

leader, John Gildea, believes that a flexible attitude from the contractors, donor and the Tongan Government, has been vital, as has the strong sponsorship by the Cabinet Waste Committee.

The hurdles that remain will be

- the willingness of the community to pay for the vastly improved waste system,
- the attitude to waste minimization once the public are paying a fixed cost,
- the quarantining of funds to ensure operation and maintenance is adequately financed.

The project represents a sensible and ordered progression from the original analysis through a targeted strategy and then an integrated up-grade of the entire system. While much of the focus is on the pivotal infrastructure of the new landfill, the inclusion of the supporting systems such as waste minimization, political support, legislative structures, community education, sustainable financing and collection systems has put the Tongan Solid Waste Project into the “best practice” class of aid-driven up-grades. Work has commenced on developing a National Solid Waste Strategy to guide both the future of the Tongatapu and outer island waste management.