



# QUY NHON



## BACKGROUND

Quy Nhon is the economic, political and scientific centre of Binh Dinh Province. It is a port city that provides an important connection to sea and land transport for the south-central region. Historically, the city's main industries have been fishing and agriculture, but there has been a recent shift towards service industries. The city is also promoting its tourism sector, which

has so far been hampered by the pollution of the sea. Pollution results from the discharge of untreated wastewater and other waste products directly into the sea.

## SOLID WASTE MANAGEMENT IN QUY NHON

The cost for solid waste management consumes a substantial part of the city's budget. Improving wastewater treatment and solid waste management would enable the local economy to grow and at the same time respond to the needs of citizens for improved sanitation and environmental conditions.

Quy Nhon generates approximately 195 tons of waste per day, and 80 per cent of that waste is organic. Citenco is collecting waste from 95 per cent of inner wards and has an expansion plan that will increase the collection area to 100 per cent of the inner wards. However, some peninsula and island communes still lack solid waste collection and management. Approximately 178 tons of waste per day are collected and taken to the Long My landfill. The Long My landfill does not fulfil the criteria of a sanitary landfill and lacks a wastewater treatment system. A current World Bank project is looking into improving the landfill structure.

Since 2008, Quy Nhon has had a large-scale composting plant at the Long My complex, which was built with Belgian technology and financed through a loan from the Belgium Government. The planned capacity for composting is 250 tons of waste per day. The plant, however, has never operated at full capacity. It began treating about 80 tons of waste per day, but due to the absence of source separation, the plant was ineffective. To mitigate those problems, the plant began treating only waste from markets and now operates at 17 per cent of its planned capacity. The compost is sold to local farmers, but the quality of the compost is rarely tested. Nonetheless, there has been a demand for the compost. In Binh Dinh Province, most farmers recognize the damage that a lack of organic ingredients in the soil causes, and they also understand the benefits of using compost in farming. Most farmers do not compost but use cow manure or organic waste in their farms.

### CITY FACTS

POPULATION	271,248
TOTAL WASTE GENERATED	195 tons/day
ORGANIC WASTE	80%
TOTAL WASTE COLLECTED	166 tons/day

## COMMUNITY NEEDS AND PRIORITIES

The majority of the residents in Quy Nhon are satisfied with the current collection service but prefer collection from the house rather than from collection points. In a survey conducted by Citenco with the financial support of ESCAP, residents raised some concerns about the time of collection and the cleanliness surrounding the collection points. Residents also reported that they would prefer not to separate their waste, although if they were provided with two containers, they would be willing to do so.

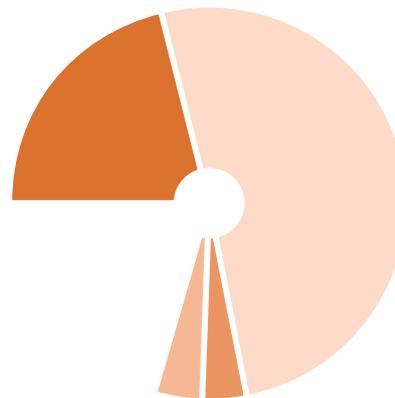
Environmental priorities in the inner wards and the peninsula communes vary. Whereas residents in the inner wards rate water and sanitation as a priority, the residents in the communes prioritize solid waste management. There is a clear link between the prioritization of solid waste management and the degree to which current solid waste management services are meeting the communities' needs.

## NHON PHU IRRC

In 2007, a pilot integrated resource recovery centre began operating in the Nhon Phu ward of the city, under the management of an agricultural cooperative. The plant experienced severe damage from several typhoons in 2009 but is now operating at full capacity (1 ton per day) and making a small profit. The IRRC employs six workers who daily collect waste from 699 households and two small markets.

The plant experienced several challenges in the beginning and has since tried to overcome them and improve operations. Initially, for instance, it was difficult to mobilize the community. Many households were not willing to pay for the collection service or to separate their waste. Due to the lack of that initial participation from the community, the IRRC experienced financial problems. It was also difficult to sell the compost that had been produced because of a lack of promotional activities and marketing for the compost. The compost in time has gained the appreciation of the farmers, and the demand for the compost is always more than the supply.

When Nhon Phu was selected as the pilot area for the project, community discussions centred on how to operate the plant and how it could contribute to creating employment opportunities for the poor in the area. The various involved parties, including the People's Committee at city and ward levels, decided that the management of the plant would be given to the farmer's cooperative. This meant that the IRRC workers were not former waste pickers but farmers. When they began working at the IRRC, they expressed dissatisfaction because they felt that the work was low paid, dirty and of low social standing. To mitigate this problem, the IRRC managers introduced motorized collection carts and more vigorous initiatives to ensure sorting at source. The experience from Nhon Phu has underscored how crucial it is that workers have previous experience in waste management and that waste separation programmes cannot be a "one time only" event but should be a continuous effort that includes a variety of parties (government and community leaders) promoting the practice.



COMPOSITION OF MUNICIPAL WASTE



With financial assistance from ESCAP, the plant is now being upgraded to better cope with typhoon storm and to provide better facilities for sorting and storing recyclable material, which will contribute to increasing the workers' income. Through the new ESCAP-funded IRRC project, the management has improved, which is expected to increase the efficiency of the centre.



## CAPITALIZING ON CARBON CREDIT FINANCING

ESCAP, Waste Concern and the Quy Nhon People's Committee initiated the process for a Clean Development Mechanism project at the composting plant in the Long My landfill complex. The Long My project will treat biodegradable waste from vegetable markets and restaurants of Quy Nhon city as well as segregated household waste. On average, it will divert approximately 90 tons per day away from the landfill. By changing the technology used, from open window process to static pile, with forced aeration under cover and including source separation in the process, the composting plant can treat more organic waste. With the additional revenue from the CDM process, the compost plant's processing capacity will be expanded to 90 tons per day. Its operation will be made sustainable by covering the installation and operating costs through the sale of compost and the revenue from the CDM. With the financial support from carbon credits, the project aims to demonstrate that the carbon credit financing mechanism can catalyse environmentally sustainable and financially viable waste management practices.