

Can Indonesia solve climate and environment problems together?

Co-benefits in Brief

The Case of Waste Management in Palembang, Indonesia



Indonesia's rapid economic growth has produced a number of unwanted side effects. From a climate change standpoint, it has led to an increase in greenhouse gas emissions. The source of these GHGs, energy production, has also led to increased air, water, and waste pollution. By taking a holistic approach to tackling climate change, Indonesia could both mitigate GHGs while also confronting other important developmental needs such as improving air and water quality and achieving better waste management – This is known as a co-benefits approach. Japan and Indonesia have been pursuing a co-benefits approach in Indonesia since the environmental ministries of both governments signed a joint statement in 2007 agreeing to do so.

This “Co-benefits in Brief” memo – a byproduct of this cooperation – focuses on a study conducted for a slaughterhouse in the city of Palembang to examine the potential for any co-benefits, and the issues surrounding the feasibility of these benefits, when it comes to processing cattle. The slaughterhouse in Palembang has become a major source of air and water pollution due a lack of treatment facilities. There is also a pervasive noxious odor. Most important from a climate change standpoint, the site generates significant methane emissions – a GHG with 23 times more global warming potential than carbon dioxide (CO₂). By installing methane recovery devices and wastewater filters that sort and reduce waste volume, the site could both improve its GHG footprint and bring co-benefits to the local residents by reducing air and water pollution. While existing Indonesian policy frameworks allow for the realization of these co-benefits, there are currently formidable cost barriers.

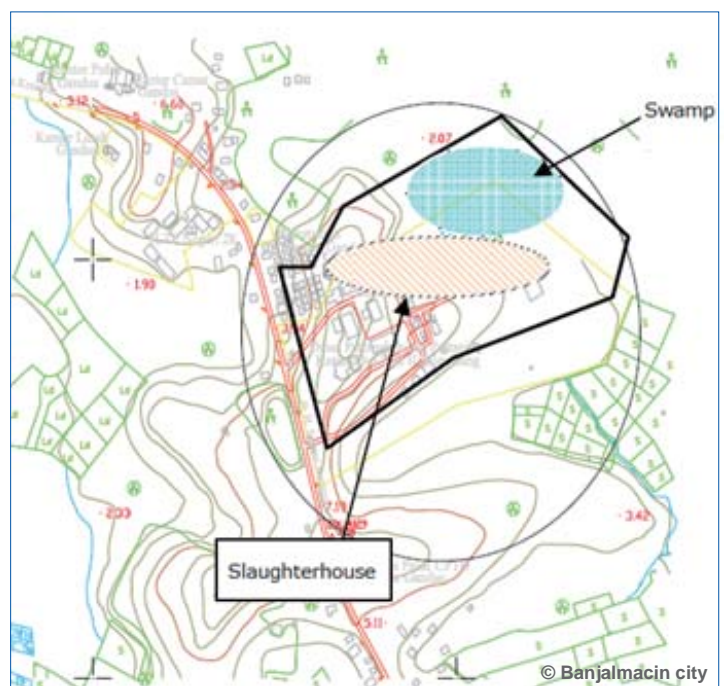
This brief begins with background on waste management in Palembang, and then turns to current policy frameworks that can support the implementation of measures needed to realize organic waste and waste water co-benefits.

Background

Map of Palembang



Map of the the slaughterhouse





Settling tanks

Palembang is the capital of the Indonesian state of South Sumatra located in the southern part of Sumatra Island. The 400-square-kilometer island is divided into 16 prefectures and 107 villages, with an overall population of 1,338,793 as of 2005. The slaughterhouse, located in a suburb of Palembang, is made up of eight slaughtering facilities. It is managed by the agriculture department of the city and rented and operated by different companies. Between 13,000 and 15,000 cattle are processed annually by the slaughterhouse – a number that is estimated to grow sharply as cattle imports from Australia rise.

Around 3,000 low-income residents live near the slaughterhouse and suffer from poor water sanitation due to a lack of treatment and infrastructure, as well as pervasive odors. Only three settling tanks are tasked with filtering the wastewater from all the slaughtering facilities. These tanks do not have aeration or chemical-feeding devices installed and thus rely on natural sedimentation. Right now one of the tanks is not even being used because of all the accumulated waste. Meanwhile the other two are not functioning at full capacity. Even worse, some wastewater is directly disposed into the nearby swamp without going through the settling tanks at all. This elevates the risk of hazardous substances leaking into the river, especially during the rainy season.



Settling tanks



Composting process

The noxious odors arise both before that cattle are processed and from the blood, waste, and wastewater generated during the slaughter. The slaughterhouse generates about 845 tons of waste annually. Out of this total, about 185 tons is solid waste (8 kg/head), 347 tons is stomach contents (15 kg/head), 69,462 liters is raw sewage (3 liters/head), and 92,616 liters is blood (4 liters/head). About 90 percent of the slaughterhouse waste is organic and could potentially be composted and sold for around 10,000-rupee/50 kg, however the capacity to process all this waste in such a manner is lacking

Furthermore, all this waste gives rise to about seven tons of methane gas annually, with no measures currently in place to curtail these emissions. While other slaughterhouses across Indonesia emit more methane due to their more substantial wastewater output, this figure is still large enough to be impactful on the scale of Indonesia's domestic GHG emissions. Applying the logic of co-benefits, measures could, and should, be taken to reduce this atmospheric impact while also improving the living and working conditions for nearby residents.



Irrigation canal



Outflow of wastewater

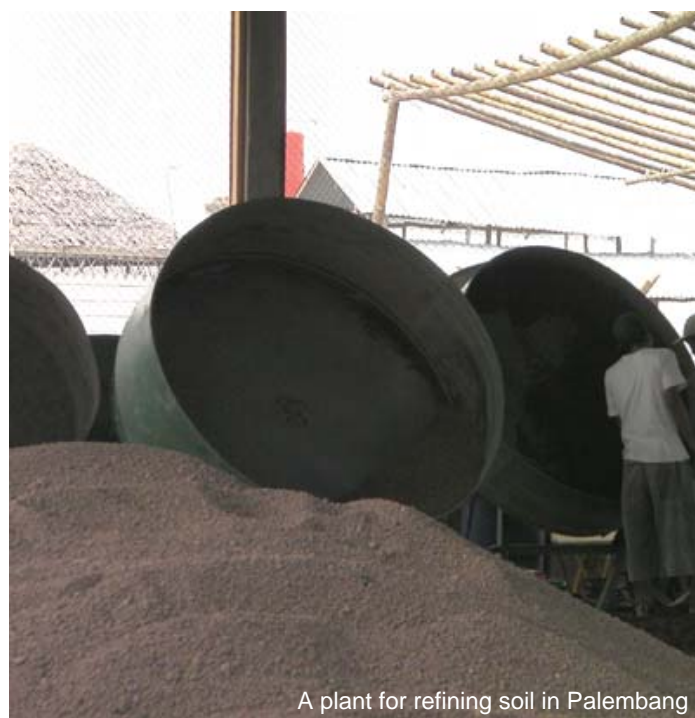
Potential co-benefits

There are a number of ways to facilitate the co-benefits associated with reducing methane emissions from the Palembang slaughterhouse. Standard improvements to the facility, for one, would help realize health and economic benefits: repairing the irrigation canal and existing settling tanks and installing tank air filters would prevent wastewater leakage and reduce odors. With more cattle likely arriving at the facility in the future, additional wastewater treatment might even be necessary. Building new walls and roofs to divide the facilities from the immediate outdoors could also avoid direct emissions of hazardous pollutants. These actions taken together would improve the overall sanitation of the facility, which would create a better, healthier and more productive work environment.

Now the GHG benefit. Using the methane generated throughout the slaughtering process at the Palembang facility as biomass gas could generate approximately 100KWh of electricity annually. As the slaughterhouse grows so could this electricity potential. Capturing this methane is a way for Indonesia to both improve the local environment and working conditions at the facility and also strive towards national climate change ambitions. In order to achieve these co-benefits, governmental intervention would likely be necessary as the needed facility improvements and devices are too costly for local governments to afford.

Existing policy frameworks and future implementations for realizing co-benefits

Even though the Indonesian government issued the “Standards of Quality of Waste Water for Slaughterhouses” in 2006, these regulations remain unobserved. For this reason, new monitoring systems need to be developed in order to ensure old regulations are followed. New regulations may also be needed, but first more research is required to better comprehend the current situation.



A plant for refining soil in Palembang

There are also some major financial and technical challenges standing in the way of realizing the co-benefits that could be achieved at the slaughterhouse. Existing facilities need to be expanded and upgraded in order to have the capacity to process all the waste that is generated. Unfortunately, the current price of composting (10,000-rupee/50 kg) indicates that the market for compost is not strong enough for the facility to economically compost waste. High initial costs also hinder the installation of methane-capturing devices. The Indonesian government could intervene and provide the financial support, economic incentives, and technical assistance necessary to promote the uptake of waste composting. The government could also provide the devices needed to improve the local environment, reduce methane emissions, and upgrade necessary equipment for other efforts relating to the sustainability of the facility.

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