

Urban Health Initiative

a model process for catalysing change

Solid waste management, air pollution and health

Waste management options such as recycling, composting, incineration and landfill impact health and well-being in profound ways, particularly for people who work directly with waste or live and work around waste sites.

Sustainable solid waste management and health

Rapid urbanization across the developing world has overwhelmed the capacity of many cities to provide adequate services to their citizens, leading to daunting sustainability challenges. With waste generation rates rising globally, solid waste management (SWM) is a recurring theme in the Sustainable Development Goal (SDG) targets:

- **SDG 11.3:** enhance inclusive and sustainable urbanization and capacities for participatory, integrated and sustainable human settlement planning and management;
- **SDG 12.4:** achieve environmentally sound management of chemicals and all wastes throughout their life cycle;
- **SDG 12.5:** substantial reduction of waste generation through prevention, reduction, recycling and reuse.

From 2000–2012, waste generated in cities more than doubled, from 680 million tonnes to 1.3 billion tonnes per year, and is expected to nearly double again to 2.2 billion tonnes by 2025.¹

¹ Waste: mitigating short-lived climate pollutants from the municipal solid waste sector. CCAC, 2015 (www.ccacoalition.org/en/initiatives/waste, accessed 13 April 2021).

Sustainable solid waste management is an essential service, which protects public health, promotes hygiene and recycling, and reduces waste, emissions and residuals.

From generation, transportation and final disposal, SWM is associated with air pollution exposure patterns that can increase the probability of adverse birth outcomes, specific cancers and respiratory diseases – particularly for people directly or indirectly involved in waste management or who live near waste sites.

Health, economic and climate co-benefits of greening the waste sector

Promoting more sustainable practices in waste management offers an opportunity to develop more equitable health and occupational policies concerning informal sector workers, including children, women and older people, engaged in waste collection and recycling.

Better public health, as well as a reduction in greenhouse gases and short-lived climate pollutants, can be achieved through improved practices of waste management globally.

PILOT PROJECT

SUSTAINABLE WASTE MANAGEMENT FOR HEALTH IN ACCRA, GHANA

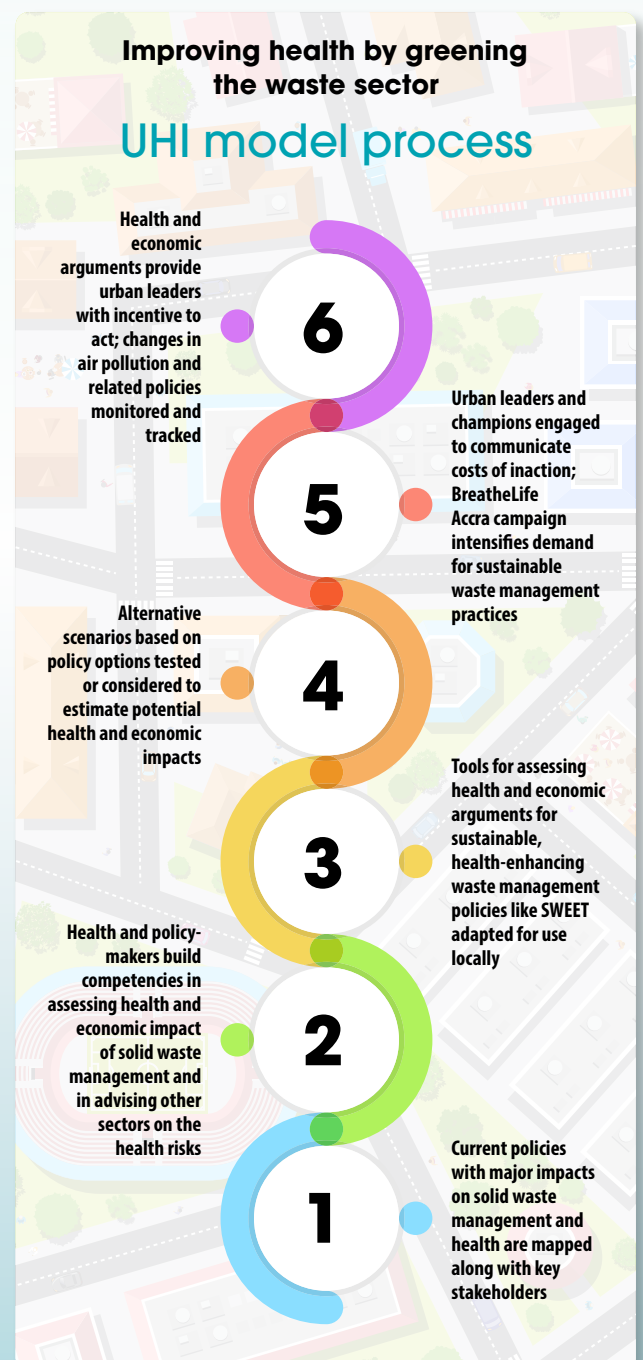
The Urban Health Initiative (UHI) process in Accra assessed the health impacts and potential health and economic co-benefits of SWM practices through: capacity building; knowledge exchange at local and international levels; review of data and existing policy scenarios for SWM plans and their health impacts; and developing policy suggestions for improvements at neighbourhood level, paying particular attention to socioeconomic inequalities within the study areas.

Waste management has not kept pace with Accra's surging population and the corresponding rise in waste generation; the informal waste sector has grown rapidly because of low labour costs and weak enforcement of existing legislation.

- Accra suffers an inadequate SWM system, a source of environmental stress, despite ranking among cities globally that generate the lowest quantity of waste per capita.
- Issues concerning SWM faced by the city include: indiscriminate disposal of waste at unauthorized places, open burning, littering, inadequate service coverage and irregularities in waste collection.
- The city generates nearly 900 000 metric tonnes of solid waste annually (approximately 0.74 kg/person/day) and that is expected to double by 2030.¹
- According to the 2017 census data, most households in the Greater Accra Region (65.4%) have their solid waste collected, 17.4% is disposed through public dumping, and 14.6% of households burn all their waste.
- Waste burning is a major contributor of black carbon (BC) emissions – a significant short-lived climate pollutant. In 2020, 67 517 metric tonnes of BC were emitted, and this is projected to reach 133 561 metric tonnes in 2050 under the business-as-usual (BAU) scenario.¹
- Accra is a centre of informal e-waste recycling in West Africa, with thousands of tonnes imported from Europe. Informal recycling of this e-waste, using low-tech methods including burning off plastic to recuperate copper and other valuable metals, releases a suite of contaminants into the air, water and soil.
- Data from the Ghana Health Service 2010 indicate that 60% of the most prevalent diseases are linked to insufficient environmental sanitation.

The UHI overall performance of waste collection services in Ghana improved from 1998 with increased private-sector controls and levels of involvement, e.g. the collection rate and disposal improved from 51% in 1998 to about 91% in 2000. However, the public-private partnership model failed to sustain the initial momentum in terms of efficiency and performance, reversing the earlier gains made in urban environmental management.

¹ Mudu P, Nartey BA, Kanhai G, Spadaro JV, Fobil J. Solid waste management and health in Accra, Ghana. Geneva: World Health Organization; 2021.



A healthy city must have proper collection, treatment and final disposal of solid waste to create a safe and pleasant urban environment.

PILOT PROJECT IN ACCRA, GHANA

CURRENT POLICIES AND PLANS

The UHI mapped laws and standards covering the protection of public health, hygiene, environmental protection and discharge and ambient environmental standards. The most recent Local Government Act 936 (2016):

- Preserves and maintains the waste management districts already in existence.
- Updates the law to include “the disposal of waste on land, including the discharge of effluent into a body of still or running water” as part of the definition of “physical development”.

- Re-centralizes the “Waste Management Department” at metropolitan assembly level, removing its counterparts at municipal and district assembly levels.

In 2016, the Accra Metropolitan Authority began to integrate and modernize informal waste collection into the city’s formal SWM system to increase waste collection coverage, close illegal dump sites, and provide equitable employment opportunities. The Ghana Environmental Protection Agency oversees several initiatives aimed to improve e-waste management.

ASSESSING IMPACTS OF POLICY INTERVENTIONS

UHI adapted tools to model the impacts of policies on sustainable waste management on air pollution levels and associated health risks in Accra. Preliminary estimates of the emission scenarios of policy interventions were modelled using the **Solid Waste Emissions Estimation Tool (SWEET)** developed by US Environmental Protection Agency on behalf of the Climate and Clean Air Coalition. Modelling of different land use for some of the current landfills and dumpsites, for example, transformation into green spaces, was also considered.

The three scenarios modelled – ending waste burning, expanding composting and recycling programmes, and capturing landfill gas – were found to reduce emissions of greenhouse gases and short-lived climate pollutants compared with BAU activities (assuming a 2% annual increase in waste collection capacity). The different emission scenarios also allow population health impacts to be estimated.

BAU Scenario: Waste burning generated emissions of 195 086 metric tonnes CO₂eq in 2020. Emissions are expected to rise to 385 919 metric tonnes CO₂eq by 2050. The next largest contribution comes from landfills, with emissions of 36 020 metric tonnes CO₂eq in 2020 and 246 941 metric tonnes CO₂eq in 2050. Waste collection and transport, followed by waste handling equipment and

Method of waste disposal	Ghana (%)	Greater Accra Region (%)
Solid waste disposal		
Collected	21.9	65.4
Burned by household	19.5	14.6
Public dump	47.8	17.4
Dumped indiscriminately	10.8	2.7
Total	100.0	100.0
Liquid waste		
Discharged in open area	68.8	32.4
Discharged into drains	25.9	53.6
Septic tank	3.7	12
Discharge into sewer	0.9	2
Other	0.7	0
Total	100.0	100.0

Source: Elaboration based on census data (Ghana Statistical Service, 2019: Table 7.21, 158).

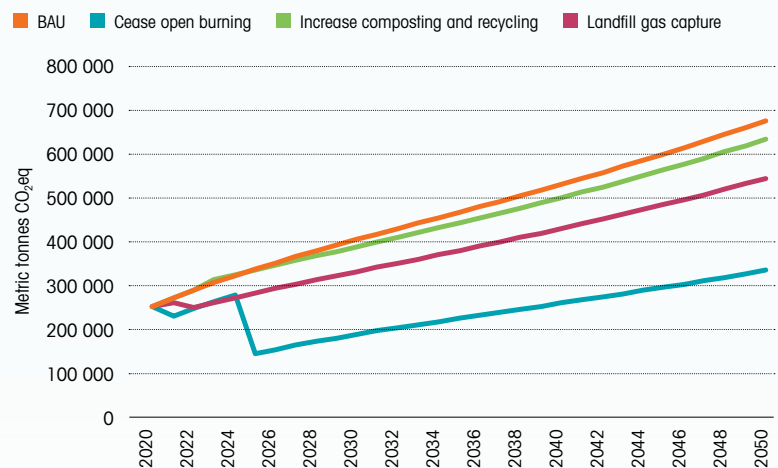
organics management, have comparatively low emissions; collectively, 12 715 metric tonnes CO₂eq in 2020 and 25 152 metric tonnes CO₂eq in 2050. Thus, to reduce BAU emissions the challenges of open waste burning and unsanitary dumps in Ghana should be addressed.

Proper solid waste management by ceasing waste burning, increasing composting and recycling and landfill gas capture can improve human health, reduce air pollution and mitigate climate change.

Alternative scenarios: Ceasing open burning leads to a reduction of 50% relative to the BAU scenario in 2050. The capture landfill gas scenario leads to a reduction of 18% compared with BAU in 2025 and 19% in 2050. Increasing recycling and composting only has a marginal effect when compared with projected BAU emissions.

In particular, **if ceasing open burning is achieved by 2030 an annual reduction of 120 premature deaths may be achieved.** Increasing composting and recycling produce important reductions in CO₂ emissions.

Total emissions by scenario (including BC, CH₄, CO₂, NO_x organic carbon)



Source: Mudu P, Nartey BA, Kanhai G, Spadaro JV, Fobil J. Solid waste management and health in Accra, Ghana. Geneva: World Health Organization; 2021.

CHARTING A WAY FORWARD FOR HEALTH, SOCIOECONOMIC AND HEALTH CO-BENEFITS FROM SUSTAINABLE SOLID WASTE MANAGEMENT

Solid waste management involves several actors with a range of responsibilities and requires responsive policies to regulate the multiplicity of activities. Policy mapping revealed that various SWM initiatives have had only marginal effects as not all stakeholders were involved, and there was poor coordination. Suggested interventions include:

Policy suggestions

- Increase cooperation and participation of the informal waste sector and general public in decisions over environmental management, and municipal SWM issues.
- Regulate urban land use, land ownership and improve urban planning.
- Increase data collection of population development to guide local and national planning.

- Consider extended producer responsibility. Perceive SWM from a circular economy perspective.

Specific activities

- Increase awareness and sensitize the general population.
- Reduce waste generation and encourage recycling initiatives.
- Facilitate programmes to ensure waste separation before and during collection.
- Improve waste treatment infrastructure and activities.
- Build political will and commitment to include health and well-being issues in SWM.
- Collect reliable waste generation data to assist with planning of waste management programmes.

Partners in action

Waste management is a cross-cutting issue, involving the environment, health and land use, among others sectors. The situation is somehow complicated by the different responsibilities and mandates attributed by law. The SWM sector in Ghana is organized collaboratively among multiple stakeholders with the Ministry of Local Government and Rural Development and the Environmental Protection Agency playing key roles as implementer and regulator, respectively.

WHO has led the UHI Accra project in collaboration with key local and international partners: the Ghana Health Service; Environmental Protection Agency; Accra Metropolitan

Assembly; UN-Habitat; and ICLEI-Local Governments for Sustainability.

The Ghana Health Service has led efforts to mobilize and build the capacity of health workers. Patient education information about the impacts of waste burning has been distributed to health facilities and health workers including community health workers, school health education coordinators and environmental health officers. School children have also been engaged in recycling and waste reduction activities in community schools.

