

Opinion

Cost-effective strategies to reduce flooding

By Dr Bjorn Lomborg

OVER the past decades, the Accra Metropolitan Area has witnessed major development, but this growth has given rise to risks of its own.

Rapid urbanisation has caused an unplanned expansion of built-up areas such as roads, parking lots and other structures with impervious surfaces, which has led to perennial flooding.

Inadequacies of drainage systems and poor solid waste management add to this threat that is only bound to intensify in the future as climate change poses further challenges to cities and nations.

Flood risk mitigation strategy

Accra urgently needs a comprehensive flood risk mitigation strategy that includes environmental sanitation, drainage facilities and improved waste management.

Inclusive, long-term urban development planning is vital to channel water safely and prevent flooding damage for thousands of inhabitants of Accra.

But with so many areas competing for attention and public resources, how can decision makers choose the right investments?

This is what Ghana Priorities, a collaboration between the National Development Planning Commission and the award-winning think tank Copenhagen Consensus, aims to answer.

Using the approach of cost-benefit analysis, the project had 28 teams of economists study over 80 policy proposals to establish which would do the most good for every cedi spent in terms of their economic, social and environmental impact.

The results are now being published with the goal of providing fresh inputs for discussion on the best public policies to benefit all Ghanaians.

Flooding

To target the problem of flooding in Accra, Prof. Martin Oteng-Ababio and Prof. Austin Ablo from the University of Ghana and Dr Brad Wong of Copenhagen Consensus studied three interventions: the construction of retention ponds for storm water runoff, widening storm drain and a community-led solid waste management project.

Increased flooding in Accra is partly a result of the rapid expansion of sealed-off surfaces along the Akuapim Hills that reduce the absorption of water.

The study proposes the construction of two retention ponds with additional storage capacity in the middle and upstream of the Odaw basin to help temporarily store water from peak flood events and gradually release it.

This will tremendously improve the safety and living conditions of the low-income communities suffering from perennial flooding downstream.

The researchers calculated the total social costs for the ponds until the year 2050 at GH¢222 million, with part of the cost from building and monitoring, and most of the cost due to the smell and increased risk of mosquito-borne illnesses from the ponds.

However, the total benefits from reduced flood damage and less business and transport interruption reach GH¢285 million. Every cedi invested on building retention ponds would yield a benefit of GH¢1.3.

Drainage systems

Properly functioning drainage systems are crucial to flood prevention, which is why the researchers also studied the construction of improved concrete storm drains with increased capacity placed at bottleneck locations in the

western part of the Akuapim Hills.

The construction costs for the storm drains were estimated at GH¢124 million and the total costs of the intervention, including maintenance until the year 2050, would reach GH¢216 million.

This intervention would potentially lead to a 12 per cent reduction of flood damages, as well as roughly 25,000 cases of diarrhoea and two deaths

avoided every year in the communities surrounding the drains.

Overall, the benefits of improved drains are GH¢379 million, meaning each cedi produces social and economic good worth GH¢1.8.

Solid waste

The researchers finally studied an initiative to minimise the mismanagement of solid waste that blocks drains and increases flood damage through participatory processes and

community-based waste management.

The proposed model uses members of the community to collect household waste on specially designed tricycles, consolidating them at collection points for transportation to landfills or local composting stations.

The use of community members is critical to ensure proper sorting and disposal.

Areas of high waste generation such as slums and markets are identified and separated into groups of approximately 50,000 people or 12,500 households, and each camp is contracted out to a service provider who undertakes waste collection and management, including sweeping, clearing of gutters and fumigation.

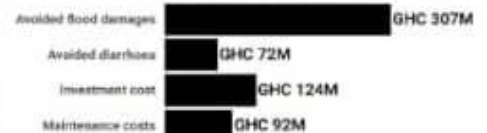
The costs of the intervention include skips and bins for each camp and ongoing operational

Solutions for reduction of urban flooding

Value for money (benefit-cost ratio)

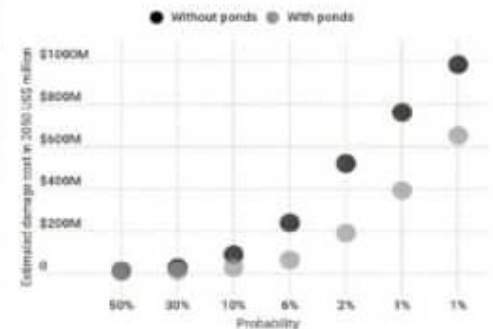


Storm drain widening costs and benefits over 40 years



Source: Researchers' calculations. Photo from researchers' field work.

Damage of simulated flood without and with retention pond



Source: World Bank (2019)

costs, amounting to around GH¢6.1 million per camp over a five-year period.

There are several benefits to this intervention, including the removal of waste, a generally cleaner environment within the community, improved health and reduced flooding.

These benefits were estimated to be equivalent to GH¢6.4 million per camp. Every cedi spent on this initiative would, thus, yield a benefit of GH¢1.1.

As economic growth increases in the metropolitan area, so does the risk of flooding, exacerbated by urbanisation and the effects of climate change.

These interventions offer policy makers a comprehensive strategy to tackle the existing hazards and prevent even greater risks in the future.

The writer is the President of the Copenhagen Consensus and Visiting Professor at Copenhagen Business School.