

Transforming informal settlements with modern drainage solutions

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A home is more than just a shelter. It's a place where people can feel secure, healthy, and dignified.



Source: Supplied. Olebogeng Manhe, chairman of the Gap Infrastructure Corporation (GIC).

It is the foundation for social equality, participation, and work and education. South Africa has made significant progress in developing informal settlements, but some key challenges remain.

Recent flooding in the Western Cape has sparked renewed debate over how infrastructure can protect informal settlements from natural disasters. Flooding can have devastating consequences, especially for the most vulnerable among us, resulting in large-scale property damage, displacement, health risks from polluted drinking water, and even loss of life.

As climate change is likely to make extreme weather events more frequent, government and private infrastructure developers must continue to seek innovative ways to address this issue.

At the Gap Infrastructure Corporation (GIC), we consistently find, develop, and apply new technologies and construction methods that reduce flood and other weather-associated risks in every new project.

Infrastructure design that reduces flood risk

Location matters when establishing a new town, but informal settlements generally form organically with little planning or control over time, whereafter the government assumes the responsibility to develop them further. Unfortunately, numerous informal settlements are established in dangerous regions, such as below flood lines.

During periods of heavy rainfall, rivers and streams can overflow their banks, causing water to spread across these floodplains. Informal settlements also often lack the infrastructure to manage heavy rainfall and typically lack adequate drainage systems, which can lead to water accumulation and flooding.

One solution is to construct or improve nearby flood detention ponds, which are designed to absorb excess water and slowly release it back into the environment. However, special care must be taken in the design and construction of these ponds, as they can fill up quickly and potentially overflow, worsening the flooding problem in nearby areas.



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To further help manage heavy rainfall and prevent flooding, GIC often works with public partners to upgrade and modernise the drainage infrastructure in existing informal settlements.

Many informal settlements have rudimentary or non-existent drainage systems. Upgrading these systems involves installing new drains, culverts, and channels to help direct stormwater away from homes and other structures.

Minimising water accumulation

Incorporating modern drainage technologies and practices into existing infrastructure, such as constructing permeable pavements that allow water to seep through the surface and into the ground, can substantially help encourage runoff and minimise water accumulation.

Similarly, bioswales – landscape elements designed to concentrate or remove silt and pollution from surface runoff water – can be used to naturally filter stormwater before it enters the drainage system and prevent clogging.

Additionally, rainwater harvesting systems can be installed at key locations throughout an informal settlement to collect and store rainwater for later use, reducing the amount of runoff and underground water buildup.

Vegetation also plays a critical role in how water is absorbed into the earth. During rainfall, water is absorbed into the soil by plant roots, and this process helps prevent soil erosion.

Community-led solutions

By constructing purpose-built rain gardens, and encouraging and supporting homeowners to cultivate lawns, plant trees, and sustain flowerbeds outside their homes, we can significantly improve the capacity of residential areas to absorb rainwater, reduce runoff, and ultimately mitigate the risk of flooding.

Finally, participatory re-blocking is a more extreme measure that may cause fairly considerable disruption in the short-term, but can help ensure long-term sustainability.

This process involves the reconstruction and rearrangement of informal homes that have sprung up organically and in unsystematic ways. These are realigned in clusters, creating more open spaces in which municipalities can introduce the

necessary infrastructure.

Ultimately, there is a high probability that extreme weather phenomena will increase in severity over time, placing our most vulnerable communities at risk of losing everything. It falls on government and private institutions to prepare against this danger, and to protect our country's many informal settlements.

ABOUT THE AUTHOR

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