

# 14 | Temporary flood barriers

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## Intro

Temporary flood barriers describe pre-installed and removable flood protection systems placed at building entries, yards, pathways, or roads, among other locations. They come into use when immediate responses are needed and/or permanent flood protection measures do not suit the context-specific technical, economic, or environmental resources. The temporary barriers or floodwalls can come in the form of panels, containers, or tubes filled with earth and sand, among other fillings.

## Benefits and Risk

Although the temporary flood barriers are more affordable, of higher acceptance, and easier to install, they are also more prone to operational failure. A possible risk of temporary flood barriers can be the redirection of floodwaters which again increases the flood risks downstream of where the barriers have been installed.

## Good practice:

### a1. Flood Bags (Sandless Sandbags)

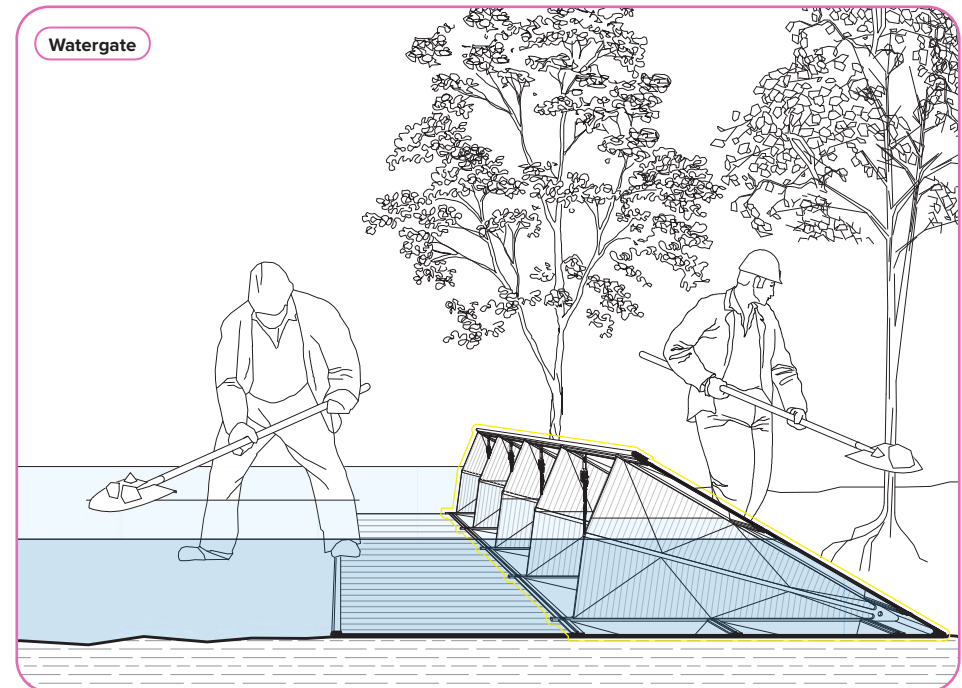
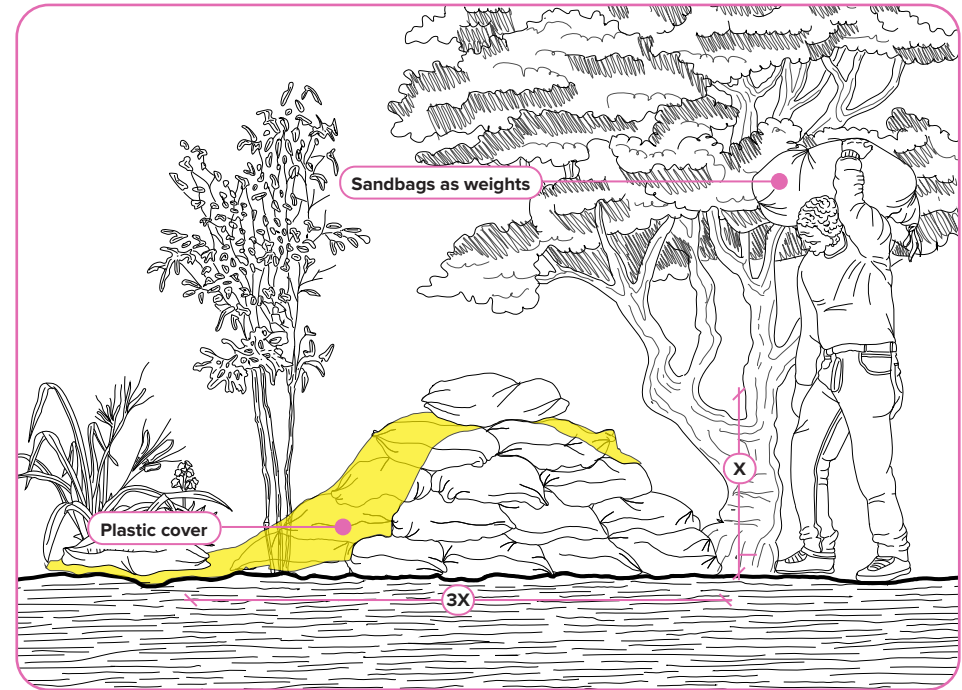
This design example introduces a small-scale and temporarily installed flood barrier with the same functions as a sandbag but less heavy and without sand filling. Before coming into use, the flood barriers are flat, compact and lightweight bags. Once they meet water, they swell up to a weight of 15 kilogram in 10 minutes. The easily stackable and degradable bags are then able to divert the water and to absorb up to 10 liters. The length of the intervention ranges from 1.5m to 5m and can be implemented in refugee camp contexts, particularly in favor of dry proofing the settlements in the face of less severe flooding. They can be left in space for up to 6 months.

### a2. Water-Gate

The easy-to-install water-gates control flood water. To stabilize themselves, the gates use the flood's pressure. The measure is a more expensive, but reusable and lighter than sandbags. Nevertheless, the installation is likely not to withstand the same flows as sandbags and should be used especially in the upstream end of the inundated area where there is no high waterflow. The impact area of a watergate reaches from a single house to an entire area (Design 1st 2021).

### a3. Use of Low-tech sandbags in Cox's Bazaar, Bangladesh

In hilly terrain, heavy rains and flooding go hand in hand with landslides. As a result, assets need to be protected and slopes stabilized. In Cox's Bazaar, where durable solutions are not allowed, low-tech protection measures with sandbags have been prioritized to solve issues. They present a quick and cheap solution but require heavy maintenance and/or frequent replacement. Their durability depends on bags and filling materials.



## Overview of Criteria

### Type of Intervention:

Engineered, hybrid.

### Scale of Intervention:

Shelter-Plot-Block, Settlement.

### Materials:

Sand, Soil, Geotextiles, Panels (Materials vary depending on the barrier design, often fully pre-designed and ready to use)

### Environmental Impact:

Positive environmental impacts of temporary flood barriers include the decrease of erosion due to floodwater diversion or stabilizing riverbanks. At the same time, some flood barriers can contain polluted floodwaters within a limited area and minimize the spreading of contamination to further areas. On the other hand, negative environmental impacts of flood barriers can lead to the (temporary) disruption of habitats and ecosystems such as movement hindrance of species.

### Targeted Natural Hazard:

Pluvial Flood, Coastal/Riverine Flood.

### Targeted Vulnerable Assets:

Buildings, transport.

### Strategy Type:

Reduce Asset Vulnerability.

### Implementation Time:

Short (1 day - 1 month).

### Effect Duration:

Short-term (<1 year)

### Investment Costs:

Low

### Maintenance Costs (yearly):

Low (<10% investment costs)

Usually there is no maintenance involved concerning the use of temporary flood barriers

**Design 1st. (2021)**  
5 New Flood Prevention Products.  
Available online at  
<https://www.design1st.com/5-innovative-flood-prevention-products-replace-sandbags/>

**IOM UN Migration (2020)**  
Site Improvement Catalogue.  
Available online at  
<https://www.humanitarianlibrary.org/resource/iscg-site-improvement-catalogue>

**The Associated Programme on Flood Management (2012)**  
FLOOD PROOFING. INTEGRATED FLOOD MANAGEMENT TOOLS SERIES. Available online at  
[https://www.floodmanagement.info/publications/tools/APFM\\_Tool\\_15.pdf](https://www.floodmanagement.info/publications/tools/APFM_Tool_15.pdf)



## **Flood Risk in Humanitarian Settlements: Compendium of Mitigation Measures**

**Spatial Development and Urban Policy, SPUR**

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