11 Eleveted architecture

Environmental impact	3/3
Risk protection	3/3
Durability	2/3
Affordability	2/3

Intro

A common and comparatively simple practice against flooding is to elevate the foundation of assets (e.g., buildings, latrines, entire plots, cattle sheds). Originating from indigenous knowledge, raising the ground of structures takes place through piles, landfills, or stilts. When using stilts to elevate buildings, the structural soundness is primordial, especially in areas that are prone to heavy winds, landslides or earthquakes. Proper calculation of the structural design is necessary before building on stilts. A special type of elevated architecture are amphibious constructions *(see Measure [12])*.

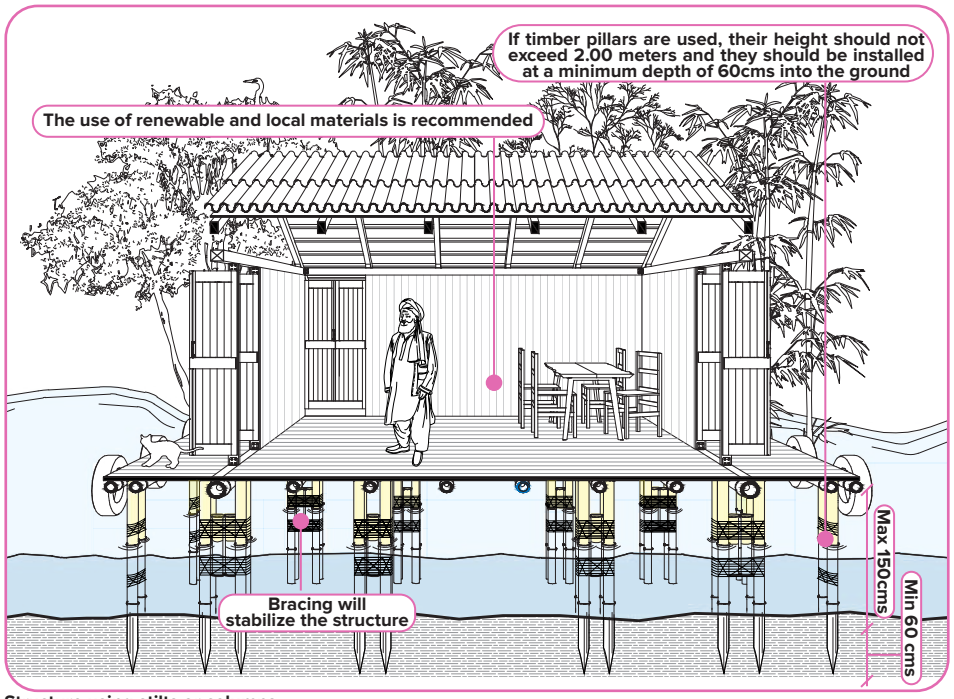
Benefits and Risk

The primary benefit of elevated architecture is the mitigation of flood impacts. In addition, raising the ground of structures can help overcome difficult terrain and site conditions, and propose additional room for storage underneath the shelter. On the other hand, elevated architecture can induce further risks by the failure of structural stability or difficult accessibility *(e.g., for people with physical impairments)*. Moreover, while elevated assets can help preserve natural water flows and ecosystems, they can equally cause the risk of depleting nature on site, depending on the type of construction.

Good practice:

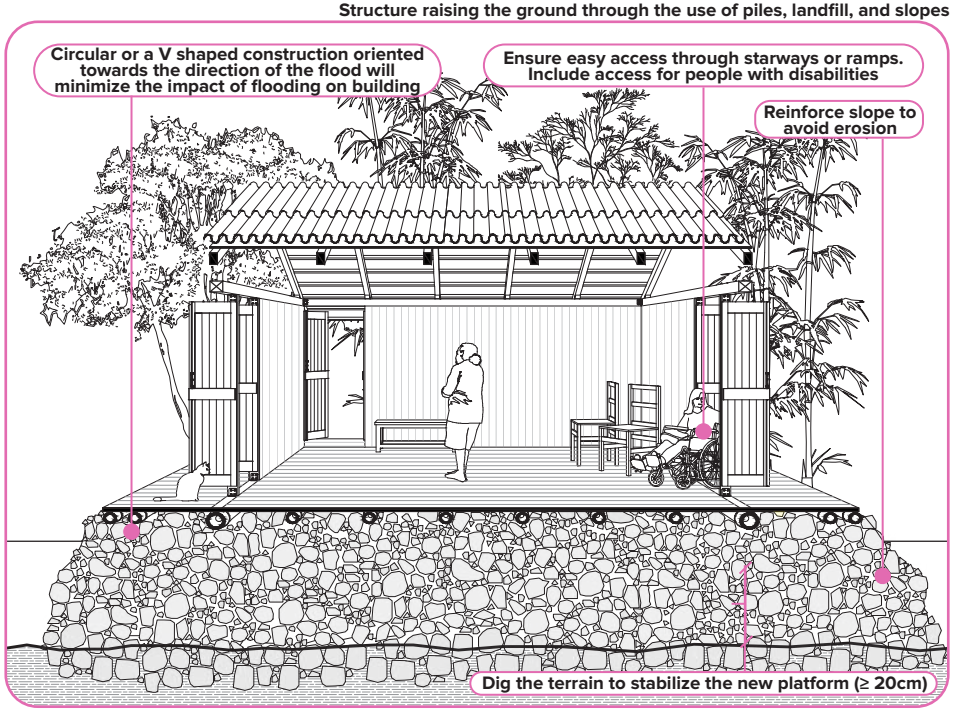
Elevation in the Mavrouni transit centre in Lesbos, Greece

Next to elevating single buildings, entire areas can be elevated. The Mavrouni transit center in Lesbos, Greece, is such an example. The center was built after the destruction of the Moria refugee camp due to fire. However, right after building up Mavrouni, one-third of the area was flooded. First, pallets were placed under the tents, which turned out insufficient to cope with the flooding. As a result, the entire area was elevated half a meter by a gravel layer. Such solutions are often very expensive, especially on a large scale, and need enormous quantities of material. Thus, they should be limited to smaller areas or avoided through an adaptation of the settlement planning.



Structure using stilts or columns

Structure raising the ground through the use of piles, landfill, and slopes



Overview of Criteria

Type of Intervention:
Hybrid.

Scale of Intervention:
Shelter-Plot-Block.

Materials:
(Selection) Wood, Sand, Soil, Clay, Timber, Bamboo, Thatch, Plastic cover.

Environmental Impact:
Environmental impacts can derive from the materials (extraction, production, transport) and energy needed for construction. In contrast to buildings on the ground, elevated constructions tend to increase the energy use for constructing structural supports, stairs, or landfills.

Targeted Natural Hazard:
Pluvial Flood, Coastal/Riverine Flood.

Targeted Vulnerable Assets:
Buildings, Technical Infrastructure.

Strategy Type:
Reduce Asset Vulnerability.

Implementation Time:
Short (1 day - 1 month), Medium (1 month - 1 year).
The implementation time comprises the site assessment, the excavation, landfill, leveling, and construction of the asset. The duration depends on the scale and complexity of the project. Unexpected issues, such as unfavorable weather conditions or logistics, can also prolong the implementation.

Effect Duration:
Medium - term (1 year to 10 years).
The effect duration of elevated structures depends on their design (e.g. built on stilts or landfills) and the local context. For example, the lifespan of landfills depends on their compaction, the quality and durability of the used materials, and how long they are able to withstand extreme weather conditions.

Investment Costs:
Medium.
Due to their more complex structure, elevated constructions can be more costly than constructions on the ground.

Maintenance Costs (yearly):
Medium (10-50%).

The Associated Programme on Flood Management (2017)
COMMUNITY-BASED FLOOD MANAGEMENT.
Integrated flood management tools series.
Available online at
https://reliefweb.int/sites/reliefweb.int/files/resources/APFM_Tool_4_e.pdf.

UN-Habitat Myanmar (2015)
Manual on Flood - Causes, Effects & Preparedness.
Available online at
https://themimu.info/sites/themimu.info/files/documents/Guideline_Flood%20Manual_UN-Habitat.pdf.

Flood Risk in Humanitarian Settlements: Compendium of Mitigation Measures

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