Flood-proof sanitary latrines

Challenge: Water pollution **Adaptation response:** Flood proofing for water quality

Description

Overflowing of sanitary latrines during flood events poses a serious health risk to communities in flood-prone areas. The contaminated water may infiltrate surface or groundwater sources, causing pollution and disease. Improved construction design and planning of latrines can minimize these risks. Measures include elevating latrines or lining latrine pits to reduce waste infiltration and increase stability.

Implementation

Building latrines on elevated land mounds above flood-level height records reduces inundation and overflow risks. Lining latrine-pits with solid materials (bricks, clay, cement, large rocks, etc.) in turn stabilizes the structure and minimizes the amount of liquid waste infiltrating surrounding soil and groundwater. In places with a low-lying groundwater table, permeable lining, or using no lining at all, can be more cost-effective. If the latrine lining is permeable, a thick layer of sand can be used to filter harmful contaminants. If dry land is limited, temporary floating latrines can also be built.

Soil from the pit can be used to create a mound for the latrine, which is often surrounded by a "super-structure" for privacy purposes. The super-structure is built from readily available and affordable material (e.g. wood, cement, aluminium, etc.), and is typically equipped with a simple ventilator.

Siting of latrines is also important, particularly in consideration of nearby drinking water supplies (usually from wells). To avoid contaminants from latrines infiltrating into water supplies, they are best placed directly uphill from the water source, and a safe distance apart.

Increasing public health and sanitation knowledge is an important component of successful sanitation programs. Health education increases public motivation to improve sanitation facilities, including latrines. Surveys on household and latrine distribution, water sources mapping, and groundwater table height all help identify suitable sites for new latrine construction and prioritize proofing measures. Creating a latrine management plan is equally important – particularly to avoid overuse, which increases overflow risk, and to ensure appropriate waste disposal. This requires local training on latrine management and general awareness raising.

Environmental Benefits

- Minimizes the risk of water sources (groundwater and surface water) becoming polluted with faecal waste.

Socioeconomic Benefits

- Maintains access to sanitary latrines, even during flooding.
- Protects water sources (e.g. drinking water, water for domestic use) from faecal waste infiltration, preventing health hazards that often occur during flood events.

Opportunities and Barriers

Opportunities:

- It is a relatively cheap and simple technology that can use local materials, encouraging active community participation
- Helps raise awareness on health and sanitation through direct stakeholder involvement

Barriers:

- Constructing latrines that are affordable and flood-resistant can be challenging in flood-prone areas that have a high groundwater table
- Raised latrines may prohibit access to the disabled, elderly or young

Implementation considerations*

Technological maturity:	4-5
Initial investment:	1-3
Operational costs:	1-2
Implementation timeframe:	1-2

* This adaptation technology brief includes a general assessment of four dimensions relating to implementation of the technology. It represents an indicative assessment scale of 1-5 as follows:
Technological maturity: 1 - in early stages of research and development, to 5 – fully mature and widely used
Initial investment: 1 – very low cost, to 5 – very high cost investment needed to implement technology
Operational costs: 1 – very low/no cost, to 5 – very high costs of operation and maintenance
Implementation timeframe: 1 – very quick to implement and reach desired capacity, to 5 – significant time investments needed to establish and/or reach full capacity
This assessment is to be used as an indication only and is to be seen as relative to the other technologies included in this guide. More specific costs and timelines are to be identified as relevant for the specific technology and geography.

Sources and further information

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