



FLOOD LABEL GHANA

Measure Booklet

*Piloted with the
University of Cape
Coast*



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FLOODLABEL Form

Recommendation of measures

Behavioural measures

- Emergency Response Plan + Emergency bag
- Valuable objects in flood-prone rooms

Recommendation of measures

Flood protection measures

- Barrier-system + Measures for doors and windows
- Water drains away from house
- Raised electrical- and telecommunication connections

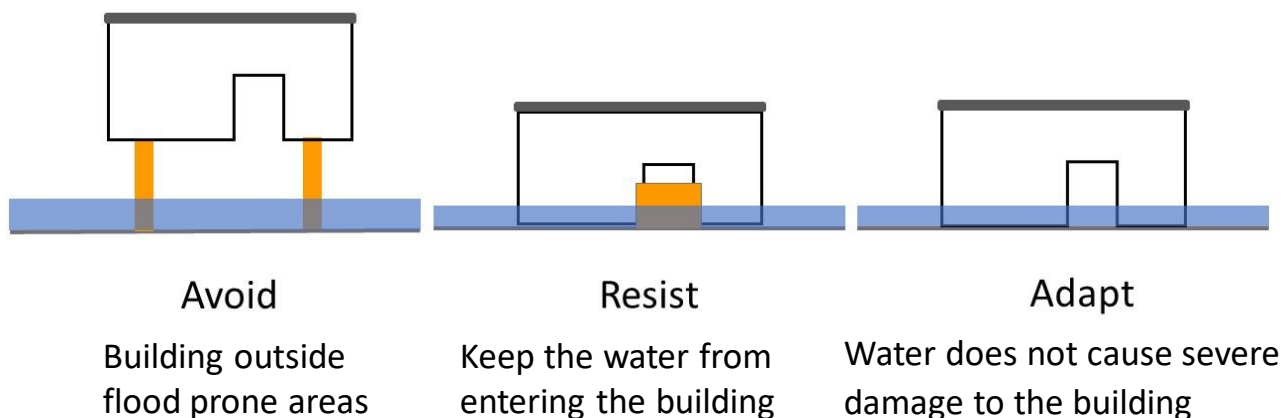


Introduction

Because of climate change floods and heavy rain events will occur more frequently. For communities to become more resilient, large-scale infrastructure measures must be complemented by precautionary measures of the residents. This means construction methods, structural measures and behavioural patterns.

The FLOODLABEL_{GHANA} provides information about the hazards and vulnerability. This booklet contains more information on the measures recommended by the expert.

Mainly, there are three strategies for flood protection: avoid, adapt and resist.



The most effective way of flood protection is to avoid flood prone areas. However, this strategy cannot be applied to existing buildings and furthermore heavy rain could occur everywhere and thus affect every house. The strategies resist (keep the water from entering) and adapt (avoiding damage from flooding) can be used in parallel. In addition to the strategies already mentioned, behavioral precaution is essential. Setting up an Emergency Plan helps to think through and organize the necessary steps or tasks and thus helps to avoid stress and mistakes in case of emergency.

Major infrastructure and housing measures should also be complemented by further improvements in the undeveloped spaces, such as increase of infiltration. At the end of this booklet, different ways of further contributing to resilience are presented.

No. 1

Emergency response plan

Emergency Response Plan for homeowners

Flooding is possible		Flooding is expected		★ FILL IN YOUR TRIGGER FOR THE NEXT LEVEL
LONG-TERM TASKS	★	WARNING	★	FLOODING
CHECK EVERY YEAR	PREPARATION	PREPARATION	PREPARATION	COPING
<input type="checkbox"/> INFORMATION ABOUT FLOOD RISK		<input type="checkbox"/> CHECK FORECASTS		<input type="checkbox"/> CHECK FORECASTS/ GAUGE HEIGHTS
<input type="checkbox"/> IDENTIFY WEAK POINTS		<input type="checkbox"/> CHECK GUTTERS & DRAINAGE		<input type="checkbox"/> SET UP TEMPORAL FLOOD PROTECTION MEASURES (SHIELD, SANDBAGS,...)
<input type="checkbox"/> STORAGE OF EMERGENCY SUPPLY		<input type="checkbox"/> REARRANGE SENSITIVE OBJECTS (CAR, ELECTRIC DEVICES, FURNITURE,...)		<input type="checkbox"/> IF POSSIBLE: CHECK THE PERFORMANCE OF THE PROTECTION MEASURES
<input type="checkbox"/> IDENTIFY SAFE PLACES & ESCAPE ROUTES		<input type="checkbox"/> EVACUATE CHILDREN, PERSONS IN NEED OF ASSISTANCE AND -IF NECESSARY- YOURSELF.		<input type="checkbox"/> INSIDE: EMERGENCY CALL:
				<input type="checkbox"/> OUTSIDE:

Developed by:



Preparing an emergency response plan will help thinking through all the details that will demand attention as the floodwaters approach. Before, during and after the event there are many tasks to be done which demands coordination in a hectic and agitated situation which is difficult to pursue without a plan. This is a project for the whole family. The family should write down a plan together so that everyone understands it. And having the plan written helps people remember what to do when everyone is in a hurry and nervous due to an approaching flood.

The emergency response plan depends on the type of flood hazard, status of technical flood protection, available local warning procedures and the estimated warning time. The response time may be a couple of hours or even days for larger rivers and less than an hour for smaller rivers. In the latter case people might only have enough time to evacuate the house. In some extreme cases of flash floods, no warning time is available at all. Depending on the local characteristics, the triggers should be considered setting up emergency response plan.

Emergency Response Plan for homeowners

Flooding is possible

LONG-TERM TASKS

CHECK EVERY YEAR

INFORMATION ABOUT FLOOD RISK

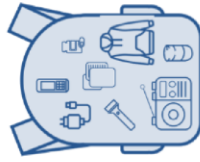


IDENTIFY WEAK POINTS



CHECK GUTTERS & DRAINAGE

STORAGE OF EMERGENCY SUPPLY



IDENTIFY SAFE PLACES & ESCAPE ROUTES



Flooding is expected

WARNING

PREPARATION



CHECK FORECASTS



SET UP TEMPORAL FLOOD PROTECTION MEASURES (SHIELD, SANDBAGS,...)



REARRANGE SENSITIVE OBJECTS (CAR, ELECTRIC DEVICES, FURNITURE...)



EVACUATE CHILDREN, PERSONS IN NEED OF ASSISTANCE AND - IF NECESSARY - YOURSELF.

★ FILL IN YOUR TRIGGER FOR THE NEXT LEVEL

FLOODING

COPING



CHECK FORECASTS/ GAUGE HEIGHTS



IF POSSIBLE: CHECK THE PERFORMANCE OF THE PROTECTION MEASURES

INSIDE:



WARNING

OUTSIDE:



EMERGENCY CALL: _____




Developed by:

Flood Competence Center
Hochwasser
Kompetenz
Centrum e.V.

PARADES

UNIVERSITÄT
DUISBURG
ESSEN
Faculty of Education
and Research

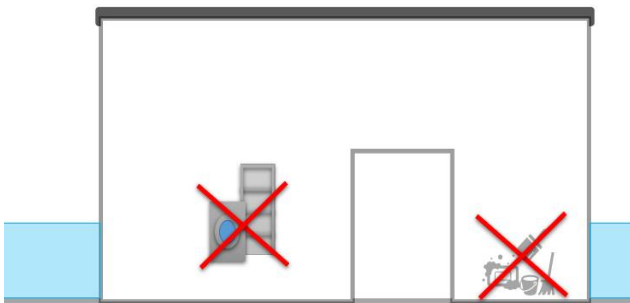
Emergency bag	No. 2
	
<p>i</p>	
<p>The emergency bag shows examples of items that should be on hand in the event of a flood or other emergency, such as important documents, food, water and emergency communication equipment.</p> <p>The bag can be grabbed and the building evacuated immediately because all the necessary items have been safely packed in advance.</p> <p>In this way, the emergency bag not only provides assistance immediately after the event, but also creates a calmer evacuation situation at the moment of entry.</p>	



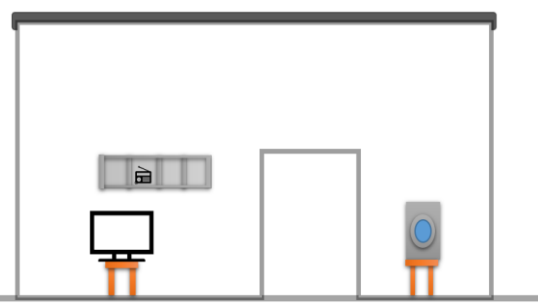
Valuable objects in flood-prone rooms

No. 3

a)



b)



a)

Valuable objects that could be severely damaged by a flood should be removed from rooms at risk of flooding. It is important to keep documents or objects that have sentimental value. If flooding is expected, rooms that could potentially be affected by flooding should be emptied in advance.

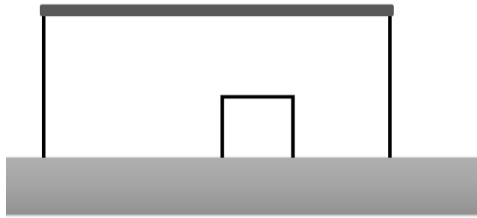
But not only valuable objects and furniture should be removed. It is also important to remove water-polluting substances from the danger zone.

b)

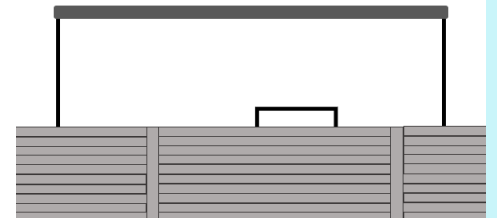
Valuable items, computers and other technical equipment should be stored in an elevated position in the event of a flood in rooms at risk of flooding. For example, these items can be stored in elevated wall shelves so that the water entering the room cannot damage these items.

In the case of heavy or bulky items that may not be able to be transported out of the rooms at risk, there should always be sufficient supports, so that they can be placed on the supports and thus survive the flood in an elevated position.

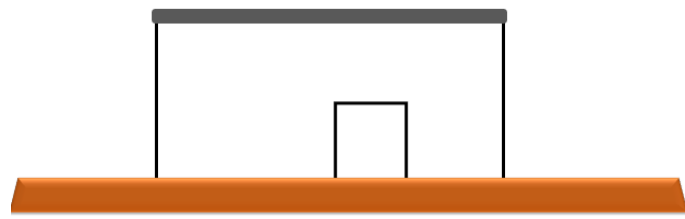
Barrier-system No. 5



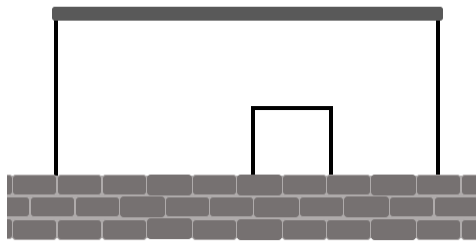
Concrete wall



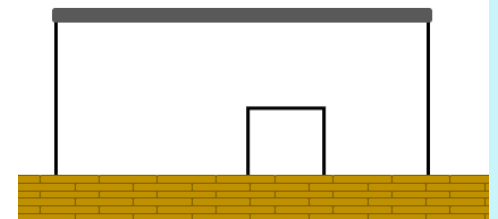
Aluminium beams



Earth wall



Stone wall



Wall from sandbags

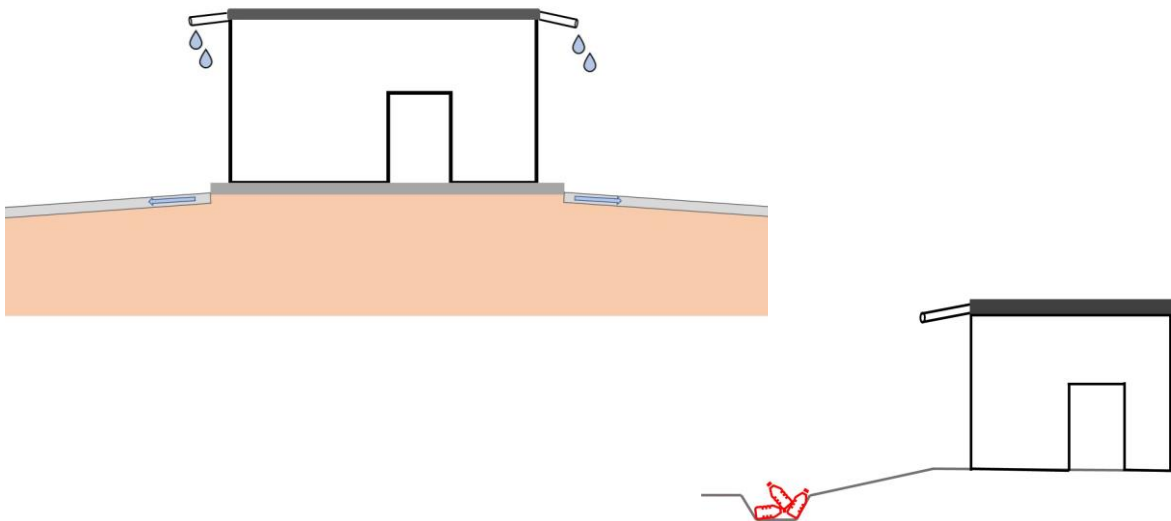


The barrier system can be built in different ways and consist of different materials. To be distinguished are permanent (always present) structures like walls and temporary (built on demand) structures like sandbag dams. However, it must always be ensured that the building is protected on all sides (neighbouring buildings or terrain heights could be included) so that the water cannot reach the building from behind. In addition, the barrier must be stable - especially if the water level is high.

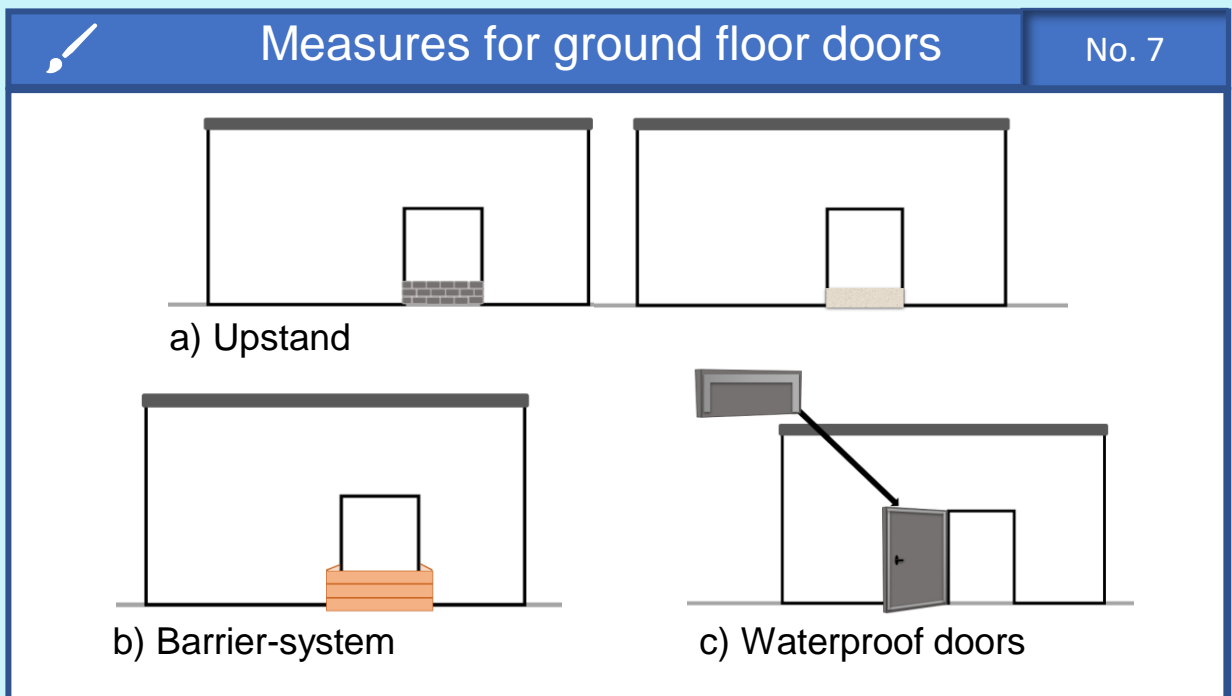


Water drains away from house

No. 6



Rainwater falling on the roof is diverted away from the house wall by spouts and then directed away from the building by rain gutters and natural slope. It should not flow towards the building or erode the foundation. Regular maintenance and cleaning is necessary to ensure that the systems are not clogged by leaves or garbage.



a) Upstand in front of ground floor door

A permanently raised threshold made of bricks or concrete (stable and watertight) prevents water from entering as long as the water height does not exceed the height of the threshold.

However, if the water rises higher, it flows over the threshold and can no longer drain away on its own when the outside water level is falling.

b) Barrier-system in front of ground floor door

To prevent water from flooding the house, temporary barriers can be installed. However, this measure requires advance warning, the necessary time and the necessary manpower to install it.

Such systems can consist of sandbags, wooden boards with seals or other materials. After use, they can be disassembled and reused if necessary.

c) Waterproof ground floor door

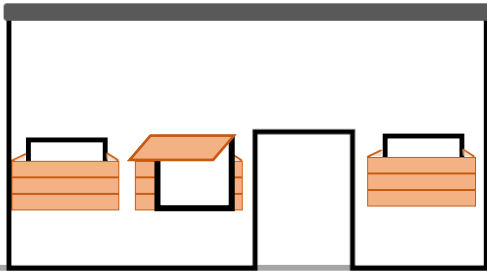
A watertight door (leaf) with a circumferential seal and an associated door frame secures the seal of the door when closed. A corresponding threshold must be provided on the floor.



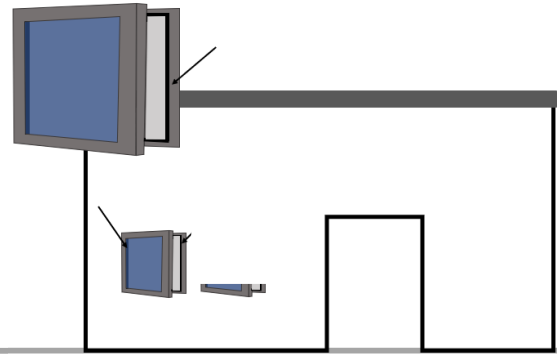
Measures for ground floor windows

No. 8

a)



b)

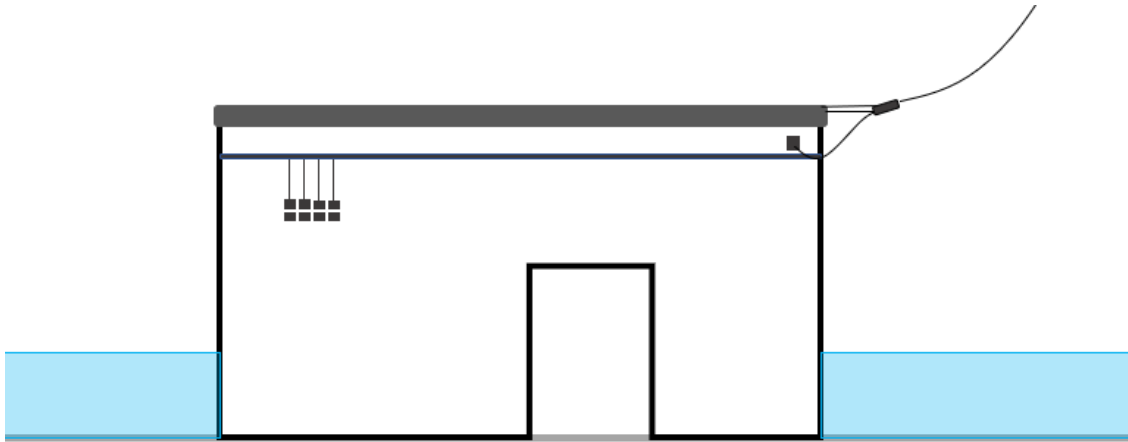


- a) To prevent water from entering through window openings, they are closed with a shield. The shield can be made of various materials such as wooden boards or metal, but it must be able to withstand the pressure of water and must be connected watertight to the house wall at the bottom and to the side. This temporary system, like the door shield, requires advance warning and manpower for installation. This system only makes sense if no other weak points up to the lower edge of the window allow water to flood the house.
- b) Waterproof and pressure-tight windows must be designed for the expected load, i.e., material and construction must withstand corresponding pressures. However, installation only makes sense if no other weak points up to the lower edge of the window allow water to flood the house.



Raised electrical- and telecommunication connections

No. 13



House connections, circuit distributors and telecommunication connections should be positioned above the highest water level.

If such installations / equipment is flooded, there is a danger to life! Fuses and circuit breakers, which should protect against electric shocks, cannot function properly.

FLOODLABEL

KNOW YOUR RISK AND PROTECT YOUR PROPERTY

floodlabel.info

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