

Zoning and land development limitations

Challenge: Too much water

Adaptation response: Riverine flood protection

Description

Zoning and land development limitation is a management based adaptation approach that aims to minimize flood impacts on people and infrastructure. This approach divides urban areas into zones with varying degrees of development restrictions depending on flood-risk level. Construction or reconstruction is often prohibited in high-risk areas, for example floodplains, while in other areas restricted development is permitted, given certain building regulations are followed. These regulations address flooding impacts and resilience, thus ensuring buildings are constructed to withstand or adapt to flood events. Examples include requiring flexible buildings and infrastructure and setting minimum floor heights. Apart from reducing the risks and impacts of floods, zoning has a number of environmental benefits that can improve freshwater ecosystem resilience, which in turn makes it less likely to flood in the future.

Implementation

The initial implementation step is a flood risk assessment and risk zone mapping. This typically includes meteorological data and historical data on flood events. It is important that policy makers are involved in the planning process from the very beginning as zoning and development restrictions may conflict with existing policies or area development plans. In addition to urban area residents, other stakeholders include environmental experts, disaster management teams, landowners, and local businesses. The plans and risk maps should be shared with local citizens. Implementation may require compensation to local landowners.

Environmental Benefits

- Avoids construction in areas with important environmental value. Improves ecosystem resilience by reducing construction activity on natural floodplains.
- Reduces the urban heat island effect due to minimizing of paved areas.

Socioeconomic Benefits

- Reduces the risks and potential impacts of flooding events on people and businesses. Also prevents land development in particularly vulnerable areas.
- Helps incorporate climate change adaptation and mitigation plans into local planning initiatives and long term planning processes, thus raising climate change impacts awareness.

Opportunities and Barriers

Opportunities:

- Important climate change adaptation benefits
- Reduced land development can improve resilience of local ecosystems and increase ecosystem service delivery to communities
- Relatively low capital investment and operational costs
- Restricted development zones can be developed for recreation

Barriers:

- Limited land development and investment opportunities can lead to significant economic loss

- Land development restrictions may conflict with existing policies, requiring changes in existing regulations and building codes that could be time consuming
- Land development restrictions may need to be negotiated with private land owners

Implementation considerations*

Technological maturity:	3-5
Initial investment:	1-5 (depending on the current or intended use of land)
Operational costs:	1-2
Implementation timeframe:	2-4

* 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.

Climate Change Adaptation Technologies for Water

A practitioner's guide to adaptation technologies for increased water sector resilience

WATER ADAPTATION TECHNOLOGY BRIEF

UN Environment-DHI Centre
on Water and Environment



CTCN
CLIMATE TECHNOLOGY
CENTRE & NETWORK

UNEP DTU
PARTNERSHIP

Sources and further information

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