

# Tackling flooding in Bangladesh in a changing climate

## Annex:

### 1. References

### 2. Bangladesh's flood-related policies and plans

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# 1. References

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## 2. Bangladesh's flood-related policies and plans, 1961–2050

Policy or plan	Year	Aim and activities
Coastal Embankment Project (CEP)	1961–1978	<p>Following devastating floods in the 1950s, structural measures were implemented to increase crop production in coastal areas by restricting tidal flooding and therefore shielding land from saline intrusion. The CEP initially created 108 polders. More were added in later projects and since 1961 over 600 FCDI (Flood Control, Drainage and Irrigation) projects have been implemented, including embankments, drainage structures, dams, barrages and pumping systems.</p> <p><i>Criticisms and unintended consequences:</i> In some cases embankments were linked to increased frequency of flash floods in coastal areas, drainage congestion due to silt accumulation and increased salinity in soil and water.</p> <p>Many structures built during the CEP were damaged over the years, particularly by the cyclone in 1991.</p>
Flood Action Plan (FAP)	1990–1995	<p>The FAP was aimed at minimising the extent and damage of river floods. The severe floods of 1987 and 1988 demonstrated the need for a comprehensive long-term solution. The plan improved the drainage problems of previous built structural measures, and it acknowledged the important role of people's participation.</p> <p><i>Criticisms and unintended consequences:</i> The FAP mainly proposed conventional methods such as building embankments along major rivers. Bangladesh's exposure to damaging floods increased in the decades following the FAP due to demographic and economic changes, but also because of the ineffectiveness of the embankments.</p>
Bangladesh Coastal Embankment Rehabilitation Project (CERP)	1995–2003	<p>Under the CERP, polders were reconstructed, strengthened and heightened.</p> <p><i>Criticisms and unintended consequences:</i> Polders are worsening the impacts of sea level rise for Bangladesh's islands because they lead to elevation loss of already low-lying areas.</p>
National Water Policy	1999	<p>This policy was designed to give direction to all water sector-related agencies and institutions in Bangladesh. Six main objectives were set to ensure sustainable water management. Issues of surface and ground water development were addressed by proposals such as institutional changes and the creation of a legal and regulatory environment for decentralised water management.</p> <p><i>Criticisms and unintended consequences:</i> The policy has been criticised for not addressing future climate change challenges sufficiently.</p>
National Water Management Plan (NWMP)	2001	<p>The NWMP is a framework plan addressing water management and proposing short-term, intermediate and long-term directions. The plan was prepared following several FAP studies and a review of the national water policy. The NWMP gave priority to small-scale flood protection projects over large-scale ones. Eighty-four programmes were outlined for different ministries to implement. The plan proposed actions including reclaiming land from sea and rivers,</p>

		<p>providing protection in designated flood risk zones, developing flood-proofing systems, managing rivers for multiple uses, and desilting watercourses to improve drainage.</p> <p><i>Criticisms and unintended consequences:</i> While the NWMP suggested a shift to inclusive water management, the focus remained on flood control, drainage and irrigation methods which lacked the participation and knowledge inputs of local people.</p>
<b>Integrated Coastal Zone Management Plan (ICZMP)</b>	2002–2005	<p>This plan set priorities for building capacity and achieving sustainable coastal development in Bangladesh through an approach that integrated findings from the biological, physical and political sciences. Providing safety and protection and mitigating natural disasters were main priority areas. Flood-related projects included rehabilitation of coastal embankments, and flood control and drainage.</p> <p><i>Criticisms and unintended consequences:</i> The ICZMP has been criticised for falling short of its promises, as illustrated by technical interventions that are poorly adapted to the characteristics of Bangladesh’s coastal areas, for example.</p>
<b>National Adaptation Programme of Action (NAPA)</b>	2005; updated 2009	<p>The NAPA was prepared following COP7. It attempts to incorporate responses to climate change into the overall objectives and development plans of Bangladesh. The programme’s flood relevant projects include coastal afforestation, capacity building for integrating climate change at different levels of water management institutions, constructing shelters and information centres, developing ecosystem-specific knowledge on adaptation to climate variability, including indigenous knowledge, and promoting research on resilient crops for future adaptation.</p> <p><i>Criticisms and unintended consequences:</i> The programme was criticised by stakeholders for insufficiently addressing the impacts of climate change on the country. The NAPA was updated in 2009, building on new findings on climate impacts and vulnerabilities, but is seen by some to be focused on international policy and financial incentives rather than domestic political will. The project-based approach also fails to address adaptation comprehensively.</p>
<b>Coastal Development Strategy (CDS) and Coastal Zone Policy (CZPo)</b>	2006; 2005	<p>The CDS, which addresses economic growth and poverty reduction while taking environmental management and equity into account, focused on developing a coastal land use plan and implementing the coastal zone policy. The mitigation of natural and man-made hazards and preserving coastal ecosystems are key goals of the strategy which suggests interventions such as strengthening and rehabilitating sea dykes, building multi-purpose cyclone shelters, and integrated management of coastal water infrastructures.</p> <p><i>Criticisms and unintended consequences:</i> Both the strategy and policy have been criticised for their poor implementation.</p>
<b>Bangladesh Climate Change Strategy and Action Plan (BCCSAP)</b>	2008; updated 2009	<p>In support of the Bali Action Plan of COP13, a strategy to coordinate activities addressing climate change was designed: the BCCSAP. This Plan includes programmes based on six pillars of intervention: food security, social protection, and health; comprehensive disaster management; infrastructure such as coastal and river embankments; research and knowledge management; mitigation; and capacity building and institutional strengthening.</p> <p><i>Criticisms and unintended consequences:</i> The plan is said to lack public engagement and participation. Some critics have found that</p>

		the implementation of the proposed actions was not successful and have called for a new plan to address climate change.
Coastal Embankment Improvement Project Phase-1 (CEIP-1)	2013–2022	<p>The polders introduced in the CEP were only designed to protect against tidal flooding. The CEIP-1 upgraded the polders to also provide protection against storm surges and cyclone flooding. It also aimed to improve agricultural production by reducing saline water intrusion and to improve the Government’s capacity to respond efficiently to emergencies. Social and environmental management frameworks were implemented, and the polder systems underwent environmental assessments. To tackle previous mismanagement of projects, improved supervision, monitoring and evaluation were proposed.</p> <p><i>Criticisms and unintended consequences:</i> The polders provided some protection against storms and fluvio-tidal events, but they have been linked to increasing the inundation area of flash floods, therefore exacerbating the damage.</p>
National Disaster Management Policy	2015	<p>This policy on disaster risk reduction and emergency response management sets a strategic framework and principles of disaster management in Bangladesh.</p> <p><i>Criticisms and unintended consequences:</i> There are major concerns that the policy has not been adequately implemented, attributed to coordination issues, knowledge gaps and malfunction of government agencies, among other factors.</p>
Nationally Determined Contribution (NDC)	2015; updated 2021	<p>Bangladesh’s initial NDC was submitted to the UNFCCC in 2015 for the energy, industry and transport sectors. The NDC proposed 12 million tons (5%) of unconditional greenhouse gas reduction from ‘business as usual’ by 2030 and 24 million tons (10%) of conditional reduction with international support. An Action Plan for implementation was prepared in 2018. The updated NDC submitted in 2021 calls for further mitigation actions to limit emissions. Since some adaptation actions also benefit mitigation, Bangladesh’s NDC includes adaptation priorities as well.</p> <p><i>Criticisms and unintended consequences:</i> Bangladesh’s NDC relies on natural gas as the main energy source to transition away from the higher-emission sources of oil and coal. Using gas as a ‘bridge fuel’ allows Bangladesh to cut down emissions to some degree while maintaining economic growth but has been criticised as being inconsistent with the Paris Agreement: gas consumption needs to decline to meet the goals of the Agreement. Expanding renewable energy production would enable greater emission reductions but would require vast investments in the grid system. A further criticism concerns the failure of the NDC to address loss and damage sufficiently. Considering the rising costs of climate hazards, Bangladesh’s response to climate change could be more effective by integrating loss and damage into its strategy.</p>

<b>Bangladesh Delta Plan (BDP) 2100</b>	2018–ongoing	<p>This 100-year plan aims to achieve sustainable development through adaptive delta management practices. Climate change is recognised as a significant future challenge, which highlights the need for climate mitigation commitments. Reducing vulnerability to natural hazards and building resilience to climate change are key components of the plan. Thirty-three of the 80 projects are identified as climate-sensitive.</p> <p><i>Criticisms and unintended consequences:</i> The plan has been criticised for (i) relying on solutions that have been proposed before, such as raising embankments, constructing barrages, and strengthening drainage projects; and (ii) for not sufficiently adapting the technical interventions, which come from the Dutch Delta Approach (DDA), to Bangladesh’s characteristics.</p>
<b>Coastal Embankment Improvement Project Phase-2 (CEIP-2)</b>	2021–ongoing	<p>Phase 2 of the CEIP is aimed at implementing the planned improvements on the remaining 122 polders.</p> <p><i>Criticisms and unintended consequences:</i> The CEIP-2 has been criticised for not addressing the issues that have been raised concerning structural measures such as elevation loss and increased frequency of flash floods.</p>
<b>National Adaptation Plan (NAP)</b>	2023–2050	<p>The NAP was designed to comprehensively address climate change and it includes recommendations for regional and local level solutions as well as national strategies on adaptation actions. The main aim is to reduce vulnerability to the impacts of climate change and to protect the most marginalised communities. Alongside conserving water bodies and protecting embankments, it suggests building more shelters and creating livelihood opportunities, and recommends improvements to irrigation and crop varieties to increase agricultural production. It also suggests a ‘living with floods’ approach in certain areas, e.g. by discouraging the building of houses in high-risk zones and providing water-resistant construction materials.</p> <p><i>Criticisms and unintended consequences:</i> The implementation of the NAP faces challenges including ineffective coordination, lack of transparency and lack of capacity among government institutions. Furthermore, the planned adaptation actions require large investments which need to come from the Government as well as from the international community. The ability to access global funds and the effective use of secured funds remains a further challenge.</p>