



Flood and Disaster Risk Management

An Integrated Approach to Flood Resilience

Turning Floods into Opportunity

Floods are among the most destructive and frequent natural hazards in the world, yet they also carry enormous potential as a resource. GOPA MetaMeta works at this intersection: turning flood risk into resilience, and floodwater into opportunity.



Flooded village in Fogera, Amhara

We develop integrated strategies spanning land use planning, flood control, preparedness, response, and recovery, including flood buffer zones, community defense infrastructure, early warning systems, flood protection and investment guides and multi-year resilience programmes. We transform floods into socio-economic assets through flood-based systems supporting agriculture, livestock, groundwater recharge, and flood buffering, integrated within landscape-level water management.

We ensure continuity of protection across all disaster phases, from pre-flood preparedness and emergency response coordination to post-flood recovery. Feasibility studies, hydrological and hydraulic assessments, risk analysis, institutional strengthening, and adaptive management combine to safeguard critical infrastructure and livelihoods over the long term.



Flood management structure in the Gash spate irrigation system, Sudan



Closing the bund after the field has filled with spate water in Sindh, Pakistan

Effective flood management depends on strong coordination. We build this across communities and all actors, ensuring preparedness and resilience are continuously assessed and strengthened across flood risk awareness, infrastructure, communication, and social cohesion. GIS and remote sensing-based analysis, village and hazard mapping, participatory surveys, and scoring systems give decision-makers the evidence they need to act.

We are also founders of the Flood-Based Livelihoods Network (www.floodbased.org), a global platform for innovation, knowledge exchange, and investment programmes advancing water management and socio-economic development in flood-prone areas.

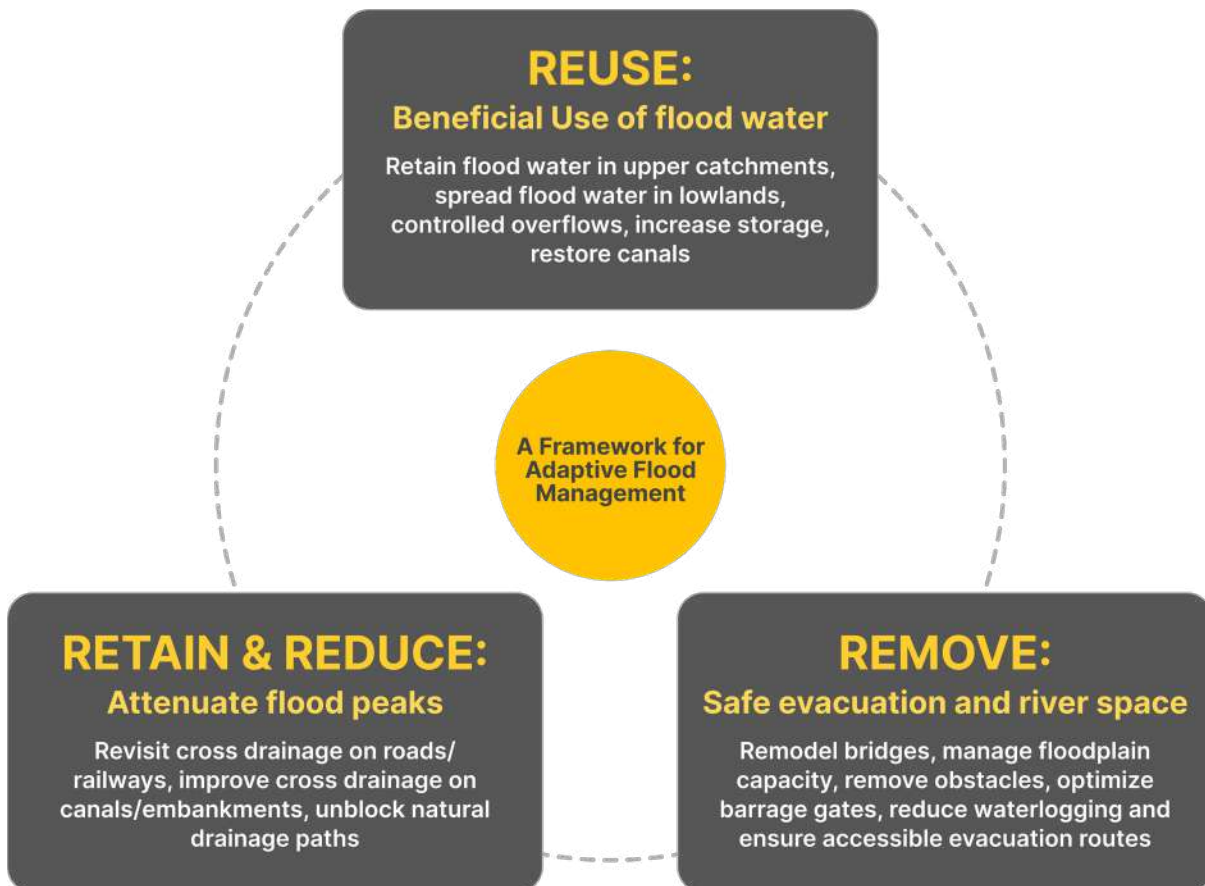


Flooded village in Fogera, Amhara



Discussing flood preparedness with the community in Atbara, Sudan

To link community preparedness with system-level resilience, we apply the Reuse, Retain and Reduce, and Remove framework. This provides a structured approach to evaluate and plan interventions across basins and communities, connecting local preparedness with system-wide interventions to ensure communities can anticipate floods, optimise water use, and strengthen recovery capacity.



Service offer

Strategy Development and Flood Risk Management

- Establishing flood buffer zones and retention areas
- Designing community flood defense infrastructure, including nature-based solutions like soil water conservation structures, dikes, resilient transport, and housing systems
- Implementing early warning systems, strategic crop selection and cropping calendar planning, evacuation routes, community communication networks and monitoring and feedback collection systems
- Strengthening community-based institutions such as flood committees
- Planning multi-year resilience programmes to protect livelihoods and reduce risk.

Harnessing Floods for Productive Use

- Developing flood-based irrigation systems for food and fodder production
- Designing field bunds, inlets, and overflow structures to optimise water use and reduce erosion
- Constructing guide bunds, flood channels, and flow dividers for equitable water distribution
- Integrating flood-based farming into landscape-level flood management
- Strengthening local water supply infrastructure, including ponds and shallow wells.

Practical Implementation and Operational Support

- Pre-flood preparedness, including awareness campaigns and system readiness
- Emergency response coordination and rapid response team training
- Post-flood recovery and rehabilitation planning
- Protection of critical community infrastructure and livelihoods
- Multi-stakeholder coordination to ensure effective and timely interventions.

Flood Protection, Investment Planning, and System-Level Interventions

- Feasibility studies, hydrological and environmental assessments, and risk analysis
- Designing context-relevant, cost-effective, and sustainable flood protection interventions
- Budgeting and resource mobilisation
- Institutional strengthening and community capacity-building
- Implementation oversight, monitoring, and adaptive management.
- Flood protection and investment guides

Governance, Institutional Coordination & Capacity Development

- Clarifying institutional roles and responsibilities
- Enhancing coordination across government, community, and stakeholder levels
- Aligning policies with international DRM standards
- Training government agencies and local institutions on flood risk management and response
- Developing operational guidelines, policies, and standard procedures for flood preparedness and response
- Flood protection and investment guides
- Strengthening operations and maintenance systems for flood infrastructure
- Developing training manual and extension materials.

Assessment Frameworks, Methods and Learning

- Generating actionable insights to guide decision-making and implementation across flood programs, drawing on:
 - Village and hazard mapping
 - GIS and remote sensing-based analysis
 - Participatory assessments: surveys, focus groups, and interviews
 - Scoring systems to evaluate preparedness, coordination, and knowledge

From rapid field assessments to basin-scale strategies, and from community preparedness to institutional reform, GOPA MetaMeta delivers flood risk management that links local action to system-level resilience, technically sound, locally grounded, and built to last.



Flood-prone area mapping exercise and flood risk assessment with communities and experts in Gambela, Ethiopia

Previous project examples

Project: Support in Establishing Flood Community Awareness and Preparedness

Country: Ethiopia, Sudan and South Sudan
Partnership: HKV, University of Juba
Donor: World Bank, through Eastern Nile Flood Risk Mitigation Project (ENTRO) Work Package 3
Budget: USD 346.387
Period: 02/2024 – 11/2024

The project led flood community awareness and preparedness across Ethiopia, South Sudan, and Sudan, developing flood management strategies, community preparedness plans, and local implementation frameworks. Field assessments, vulnerability mapping, and stakeholder consultations informed flood risk management plans and investment guides. The work demonstrated integrated technical and social flood risk assessment at basin scale, linking infrastructure performance with community resilience across a complex multi-country context.

Project: A Roadmap for Managing Climatic Risks in Yemen

Country: Yemen
Partnership: HKV
Donor: World Bank
Budget: USD 119.954
Period: 01/2024 – 10/2024

The project addressed significant gaps in Yemen's climate risk value chain, developing a robust Disaster Risk Management strategy supported by locally effective Early Warning Systems and a concrete action plan for sustainable impact on livelihoods and the environment. The strategy was designed for integration into Yemen's National Water Resources Management Strategy and Investment Program, ensuring long-term institutional embedding and financial sustainability.

Project: Flood-based farming extension materials development for GIZ

Country: Ethiopia (Afar and Somali regions)
Partnership:
Donor: GIZ Ethiopia
Budget: 202.487 Euro
Period: 09/2020 – 06/2023

The project developed Teaching, Training, and Learning Manuals for agricultural colleges, covering Water Spreading Weir construction, flood-based farming, and biological measures. The manuals build both technical competencies and soft skills, forming a practical resource series for scaling flood-based farming practices.

Project: Resilience of Hydraulic Infrastructure for Flood Risk Reduction in Ethiopia

Country: Ethiopia
Partnership: Project led by CDR International
Donor: World Bank
Budget: USD 49.980
Period: 10/2023 – 03/2024

The project aimed to enhance the Government of Ethiopia's capacity for resilient flood risk reduction infrastructure, providing the baseline for the Ethiopian Flood Management Project. Led by CDR International, the assignment drew on specialist expertise in hydraulic engineering, flood modelling, infrastructure assessment, and river morphology to conduct field and remote evaluations across the Awash, Rift Valley, and Omo-Gibe Basins. Failure mechanisms including overtopping, erosion, sedimentation, and geotechnical instability were systematically analysed across dikes, bridges, embankments, and irrigation infrastructure, delivering evidence-based recommendations for rehabilitation, technical assistance, and long-term resilient investment.

Project: Knowledge Tool to Revive the Conventional Spate (Sailaba, Rodkohi) Irrigation Systems/Techniques in the Bordering Regions of Pakistan, and Afghanistan for Investments

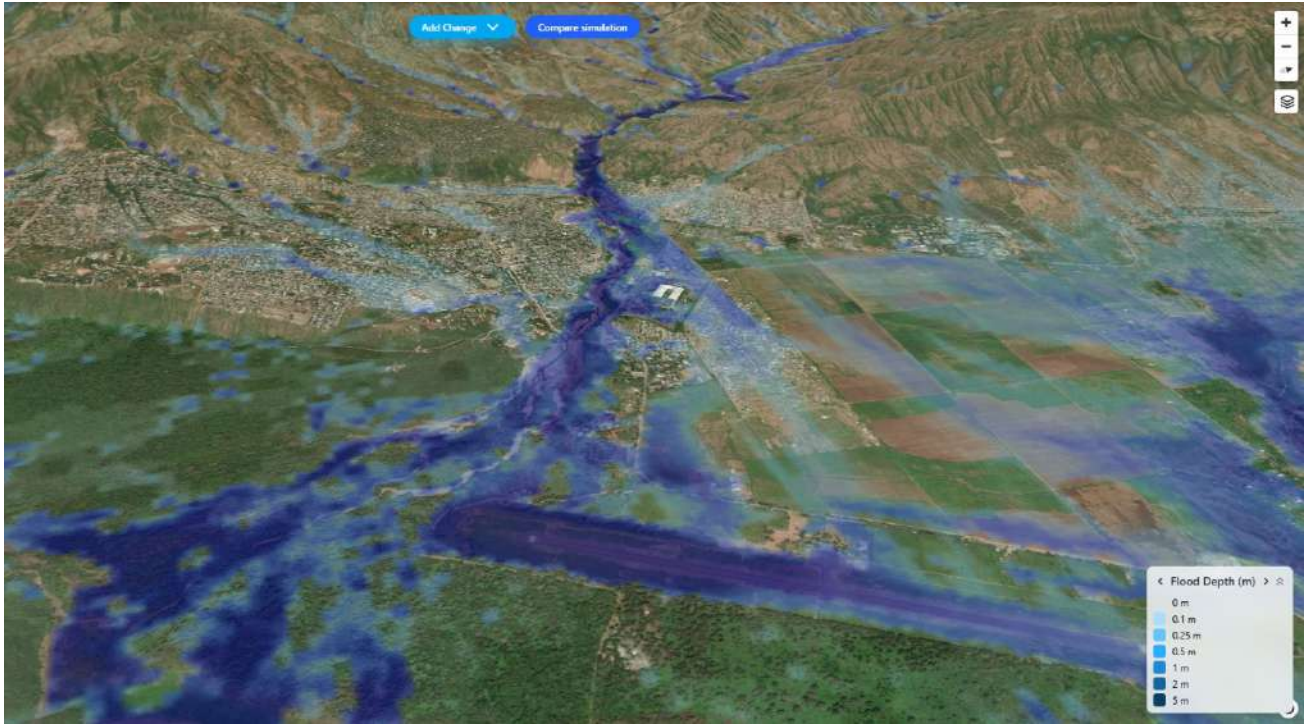
Country: Pakistan and Afghanistan
Partnership: Flood Based Livelihoods Network Foundation (FBLN)
Donor: FAO
Budget: 89.259 Euro
Period: 12/2023 – 12/2024

The project generated knowledge to inform integrated investments for the sustainable revival of resilient spate irrigation systems, delivering a knowledge tool and investment report, and a regional report on investment needs, opportunities, and potential benefits.

Project: DRRS Assignments Pakistan (4 separate assignments)

Country: Pakistan
Partnership:
Donor: RVO (Netherlands Enterprise Agency)
Budget: 145.000 Euro
Period: 2022 - 2025

GOPA MetaMeta led four assignments under the Dutch Disaster Risk Reduction and Surge Support facility in response to the 2022 floods, covering flood resilience, local preparedness, spatial planning for flood risk management, and capturing learnings on local flood resilience. Key to the assignments was the engagement with local (governmental) actors.



Result from rapid flood model by CDR International for a flood event with a return period of 5 years. Location: Arba Minch, Ethiopia



Bridge in Addis Ababa covered with debris and flood deposited silt, Ethiopia