Hợp tác Đức
DEUTSCHE ZUSAMMENARBEIT

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Economic Affairs SECO

Implemented by
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Vì Đồng Bằng Sông Cửu Long

Innovative temporary dam

A solution for coping with drought and salinity intrusion in the Mekong Delta

1. Context

As a result of both natural and unintended anthropogenic processes, the Mekong Delta is experiencing more severe droughts and salinity intrusions than ever before, causing increasing amounts of damage.

Severe impacts of drought & salinity intrusion

	Dry season 2015-2016	Dry season 2019-2020
Provinces declared emergency status	10/13 provinces	6/13 provinces
Areas of rice production affected	405,000 ha	58,400 ha
Households lacked water	210,000 households	96,000 households

In response to this challenge, provincial governments have constructed many "temporary dams" of varied designs as a measure to maximise freshwater storage for community use and production. In a drought year, around 500 temporary dams are built over the delta, each costing EUR 8,000-400,000 depending on design and size, all being financed by state budgets.

While the disaster prevention value of these "traditional" temporary dams in the delta is measurable, they also entail critical limitations and concerns, including investment cost, reusability and replicability, as well as attendant environmental and navigation impacts.

Traditional temporary dams in the Mekong Delta


Earth dam


Metal sheet dam

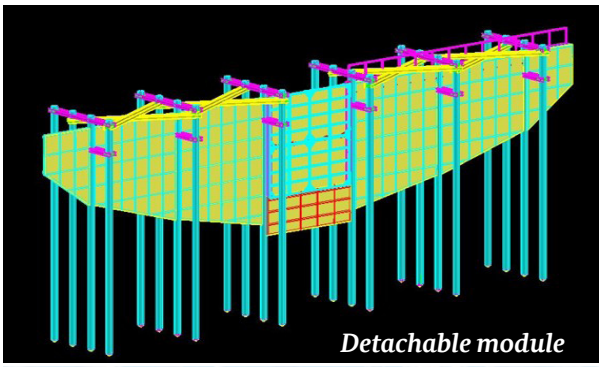
2. Our approach

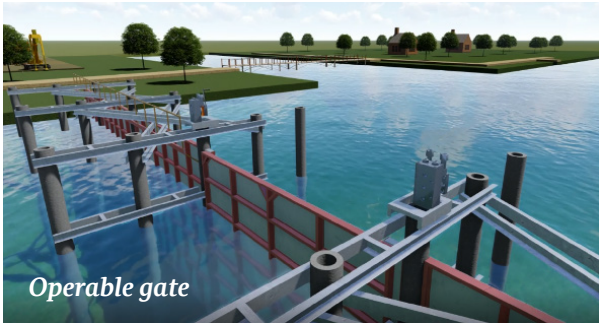
Joining hands with the Vietnamese governments to enhance the resilience of local communities, the German technical cooperation project *Mekong Delta Climate Resilience Programme (MCRP)* paves the way for an **innovative approach** to the implementation of temporary dams. This collaboration addresses both the technological and policy and institutional aspects of the problem.

Technology: The new design called "temporary dam with removable steel-plates" was introduced, with the following advantages:

- ***Environmental- and navigation-friendly***: flexible operation enables water flow and navigation when needed.
- ***Removability and reusability***: the detachable modules (comprising steel plates) allow the relocation and reuse of the dam, bringing significant cost savings.

Innovative temporary dam technology


Detachable module


Operable gate

Pilot Temporary Dam in Khanh Hoi commune, U Minh district, Ca Mau province. Photo © GIZ/ Thinh Nguyen

Local participation to actively manage and operate the temporary dam. Photo © GIZ/ Ly Minh Dang

- ***Simple structure and operation****: the valve can be opened/closed manually and easily by two people in just five minutes – making it well-suited to grass-roots level operation.*
- ***Quick and easy construction****:* a dam can be constructed and ready for use within two weeks. This is immensely helpful when local authorities need to respond quickly to emergency situations.

Policy and institution: The policy and institutional component aims at creating legal and institutional instruments necessary to engage the participation of non-state actors in the construction, management, operation, and maintenance of temporary dams, which to date have been funded completely by the government. Consequently, it helps to relieve the burden on state budgets and tap into the potential of private sector participation. This includes crucial elements of investment incentives, guidelines, and regulations:

- Risk-sharing mechanisms;
- Institutional settings of grass-root organisations;
- Mechanisms to foster the willingness and ability to pay of local people and communities.

The ownership by the direct beneficiaries, specificity of design to local contexts, and the invaluable technical contributions of the Southern Institute for Water Resources Research have been decisive factors in this successful innovation.

3. Results & Outlook

Two dams of this innovative design were constructed at "Canal 500" and "Canal Muong Chua" of Khanh Hoi commune, U Minh district, Ca Mau province. This area is situated in the furthermost downstream reaches of the Mekong River, and relies merely on rain- and ground- waters. The dams were constructed and handed over to the local authorities in February 2022 – in the midst of the dry season. They started their mission immediately as the salinity intrusion had already reached critical levels at the time. These two temporary dams currently benefit 80 households and 120 hectares of agriculture land in the two communes.

Recognizing the value and potential of this new approach, the Ca Mau Department of Agriculture & Rural Development has taken up this innovation of the temporary dam design. Furthermore, it has adopted the recommended policy and institutional measures in order to attract participation from private sector. It has developed an investment proposal for freshwater retention and exploitation infrastructure solutions in response to drought. This was submitted to Ca Mau Provincial People's Commitee for approval in 2022. The proposal has a timeframe of 2022-2025, with a vision to 2030, and has an implementation budget of 194 million Euros (of which the non-state contribution accounts for 65%). In particular, the component for completing water management units (including temporary dams) accounts for for 10.3 million Euros.

The policy and institutional recommendations are envisioned to create a solid foundation from which to replicate this innovative disaster prevention solution across the wider delta area.

The Mekong Delta Climate Resilience Programme (MCRP) is a technical cooperation project co-financed by the Governments of Germany and Switzerland. MCRP is implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH in close cooperation with the Ministry of Agriculture and Rural Development, Ministry of Construction and the 13 Mekong Delta provinces. MCRP's objective is to support the Vietnamese authorities in enhancing the climate-resilience of the Mekong Delta and its communities, thereby ensuring sustainable development in the region.

Published by
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Registered offices in Bonn and Eschborn, Germany

Mekong Delta Climate Resilience Programme (MCRP)
Environment, Climate Change and Agriculture Cluster, GIZ Viet Nam
E3-E5, 14 Thuy Khue, Tay Ho,
Hanoi, Viet Nam
T: +84 (0)24 372 864 72
E: mcrp@giz.de
I: https://mcrp.mard.gov.vn

As at May 2023

Photo credits ©GIZ

Contact Mr. Christoph Klinnert
MCRP Programme Director
christoph.klinnert@giz.de

GIZ is responsible for the content of this publication.

On behalf of German Federal Ministry for Economic Cooperation and Development (BMZ)

Swiss State Secretariat for Economic Cooperation (SECO)

In cooperation with Viet Nam's Ministry of Agriculture and Rural Development