



ATLAS USE CASE: IRRIGATION INFRASTRUCTURE PLANNING

Cambodia Mekong Delta Digital Atlas - CAM-MeDiA

1. Irrigation infrastructure planning in the context of climate change

Much of Cambodia's agricultural productivity is constrained by dependence on rainfall, with agricultural areas mostly disconnected from the existing irrigation network of canals.

Some 80% of total national rice production is derived from the wet season crop (FAO 2016). The lack of irrigation system capacity across much of Cambodia means that more than 95% of land used to grow rice during the rainy season remains uncultivated during the dry season (Erban & Gorelick 2016). Drought poses a critical hazard to the agricultural sector. The FAO describes the economic consequences of drought in rebuilding livelihoods and protecting lives in Cambodia as substantial (Inter Press Service 2016).

Studies indicate future climate change will lead to intensified agricultural drought in the southern part of the Mekong Basin and flooding across the entire basin (Evers & Pathirana 2018).

An understanding of the provision of irrigation capacity to support agricultural production is central to the mandate of MOWRAM. In support of this aim, the **Cambodia Mekong Delta Digital Atlas (CAM-MeDiA)** enables the visualization of existing and future planned irrigation canal infrastructure within the context of climate change.

The Atlas enables users to overlay and assess irrigation infrastructure of the Cambodia Mekong Delta in relation to future projected climate change variables (mean change of maximum temperature and mean percentage change in precipitation), and projected future drought and flood.

“*The digital Atlas seeks to improve understanding of the potential consequences of future climate change on infrastructure assets, agriculture and natural ecosystems of the Cambodia Mekong Delta.*”

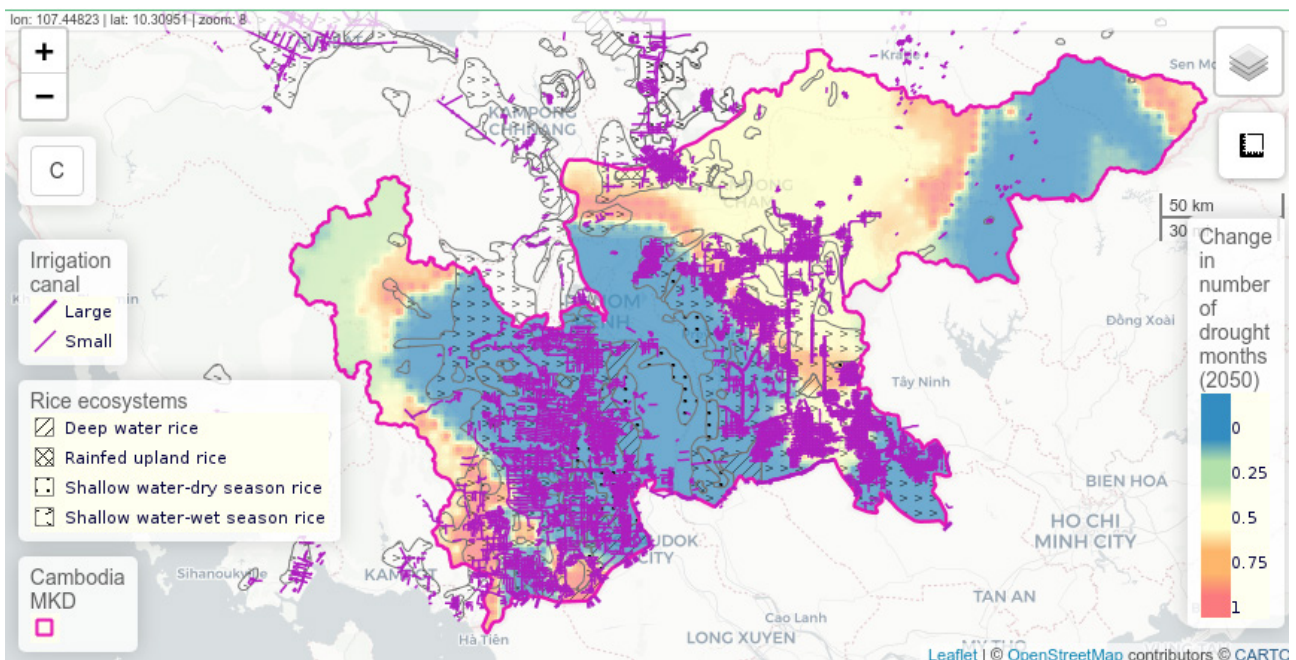


As the government body responsible for planning and management of water resources, the **Ministry of Water Resources and Meteorology (MoWRAM)** is tasked with overseeing the strategic development and rehabilitation of irrigation infrastructure across the Mekong Delta. MoWRAM's mandate further encompasses water resources monitoring, hydro-meteorological data collection and management; hydrological and meteorological research; and disaster risk management.

2. CAM-MEDIA maps

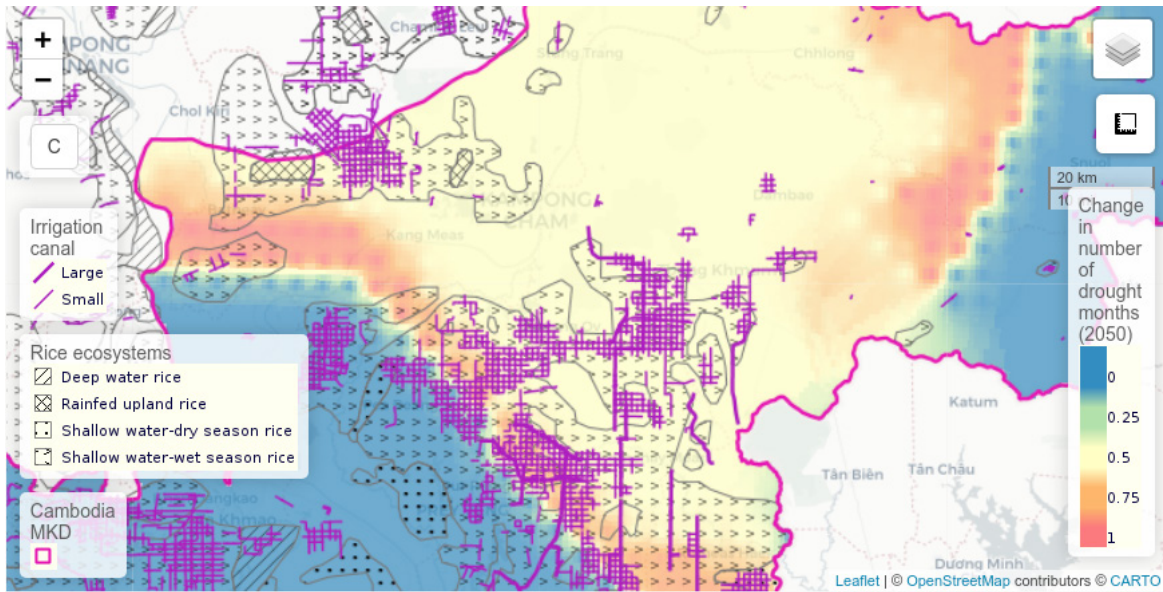
The tool can inform where investment for irrigation infrastructure might be prioritised in the context of climate change. For instance, overlaying of irrigation canals and cultivated areas on future projected changes in drought can provide insight into the extent of current infrastructure with regard to potential future hotspots of drought. For instance, where should investment be prioritized regarding canal rehabilitation and construction? Planning would also require that these data are considered alongside information on projected future temperatures, flooding, and land uses.

Cambodia Mekong Delta: overlaying of irrigation canal network and rice cultivation on projected changes in drought in the 2050s



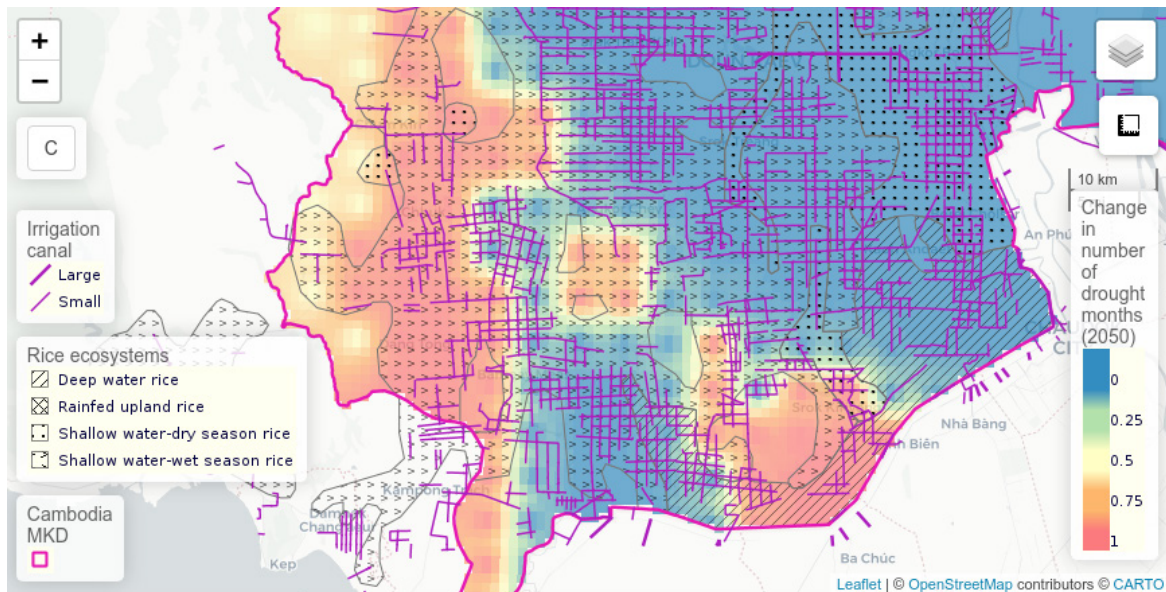
This image indicates that by the 2050s there would be prolonged drought in the central region where rice wet season rice is currently cultivated, but where irrigation infrastructure is not extensive. Orange/red areas in the drought layer (Change in number of drought months (2050)) identify which areas are projected to experience longer periods of drought in the future. By overlaying the canal network (Irrigation canals layer) and rice cultivation areas (Rice ecosystems layer), it is possible to identify where currently cultivated areas are situated away from existing irrigation infrastructure (see next images for more details).

Cambodia Mekong Delta (Kampong Cham/Prey Veng provinces): overlaying of irrigation canal network and rice cultivated areas on projected changes in drought in the 2050s.



The Atlas map viewer shows that some areas of shallow water wet season rice lack coverage by canal infrastructure. Based on consulting these data layers alone, there may be a need to consider options to sustain agricultural productivity during this season in the future, such as physically extending the irrigation infrastructure network or adopting more drought resistant crop varieties or alternative cropping options.

Cambodia Mekong Delta (Takeo/Kampot provinces): overlaying of irrigation canal network and rice cultivated areas on projected changes in drought in the 2050s



The Atlas map viewer shows prolonged drought in the future in the western side of the Cambodian Mekong Delta. Again, the question arises as to how to maintain rice productivity into the future. Adaptation options could be to extend the irrigation canal network, select more drought-resistant rice varieties, or consider other crop alternatives.

3. Bibliography

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This fact sheet is the first in a series of use cases prepared by ICEM for the World Bank under the project titled Cambodia Mekong Delta Digital Atlas (CAM-MeDiA).



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