Better plans are needed for mitigating the ecological impacts of Cambodia's Funan Techo Canal

Cambodia began constructing the 180-km-long Funan Techo Canal, the largest canal project within the Mekong Basin, in August 2024[1]. The project is intended to yield large economic benefits by providing a domestic shipping route and improving transport connectivity. There are not only concerns about the ecological effects of the canal on the region's diverse and fragile ecosystems, but also underexplored opportunities for mitigation.

The canal will traverse various habitats that include floodplains, freshwater wetlands and other riparian environments, all of which are critical for local biodiversity (Fig. 1). One of the most endangered is the Boeung Prek Lapouv wetland, which is home to the sarus crane (*Antigone antigone*). This bird species has already experienced regional declines partially due to a substantial loss of suitable habitat[2]. The new canal may further fragment and degrade vital habitat, and pose additional threats to this vulnerable species.

The ecological impacts of the canal will not be limited to habitat loss. Its operation — combined with climate change and upstream hydropower development on the Mekong River — could intensify the effects of extreme hydroclimatic events. The region is already experiencing more frequent and severe droughts, which have caused unprecedentedly low water levels in the Mekong River[3]. These climatic extremes have profound effects on the Mekong Delta's ecology and its human communities — particularly on rice production, which is critical for the livelihoods of millions of people. The canal will also alter water-level regimes. We know from existing canal networks that drainage infrastructure can disrupt natural hydroecological processes[4]. Wetlands and their flora and fauna depend on the seasonal flood, yet the extent and duration of inundation have declined in recent decades[5]. This has knock-on effects for wetland ecosystem-service provision, including carbon sequestration, water purification and habitats for fish and birds. The Funan Techo Canal is likely to exacerbate these issues and to potentially affect up to 1,300 km^2 of ecologically important floodplains. The canal, similar to others in the world[6], may increase risks of invasive species spreading into Cambodia's freshwater ecosystems. Canal networks have already been implicated in the spread of the woody shrub *Mimosa pigra* into Cambodian freshwater marshes. Lastly, the canal could cause acceleration of siltation and intensification of saline intrusion. The Mekong Delta is already vulnerable to salinization due to sea-level rise, which is expected to push saline waters 50–60 km further inland by the middle of this century[7]. The canal could amplify this problem by altering river flows and allowing saltwater to penetrate further into agricultural areas, which would undermine food security for local communities and increase socioeconomic pressures on Cambodia's rural population.

Although the Cambodia National Mekong Committee (CNMC) plans to construct three locks to regulate water flow and prevent salinity intrusion[1], the mitigation of other effects requires specific and actionable strategies.

We suggest that the Cambodian government should implement flexible water management systems that are capable of adapting to future hydroclimatic change and variability[8]. This includes integrating mechanisms to release water during critical periods, particularly droughts, to maintain wetland inundation and support aquatic environments. Cambodia's Ministry of Water Resources and Meteorology would be best placed to oversee this strategy, with contributions from the Ministry of Environment and conservation organizations, to ensure that water releases are appropriately timed and of sufficient volume to maximize ecological benefits.

It is also imperative to ensure that the management of existing wetlands is adequately resourced and supported to maintain ecological integrity and ecosystem service provision. A restoration programme could also be developed along the canal's route to restore riparian habitats and construct artificial wetlands to mitigate some of the damage caused by the canal. These wetlands could function as natural water filters to reduce nutrient loads and limit the accumulation of harmful pollutants[9]. Additionally, they could provide critical habitats for wildlife, including the sarus crane. The Ministry of Environment and local conservation groups should spearhead these efforts, and ensure that they are well-funded and supported by international conservation organizations.

Furthermore, we suggest that a long-term hydroecological monitoring programme, led by the Ministry of Water Resources and Meteorology with international institutions, is essential for adaptive management of the canal. This programme should include regular assessments of water quality, biodiversity and ecosystem health, which would enable early detection of negative effects. The active participation of local communities, universities and conservation bodies should be ensured, and there should be a focus on building capacity for local stakeholders in monitoring activities[10].

As with all major development projects, stakeholder engagement — particularly with marginalized groups — should be a core component of the canal's development and operation[11]. Cambodia's rural populations, especially minority populations and smallholder farming communities, are most vulnerable to the environmental effects of large infrastructure projects. The Cambodian government needs to establish a transparent and inclusive consultation process to ensure that local communities benefit from the canal's economic opportunities while minimizing ecological damage. It is also important to recognize the transboundary effects of the project. Vietnam has raised concerns about the canal, which highlights the need for international consultation and expanded cooperative approaches to water resource management in the region.

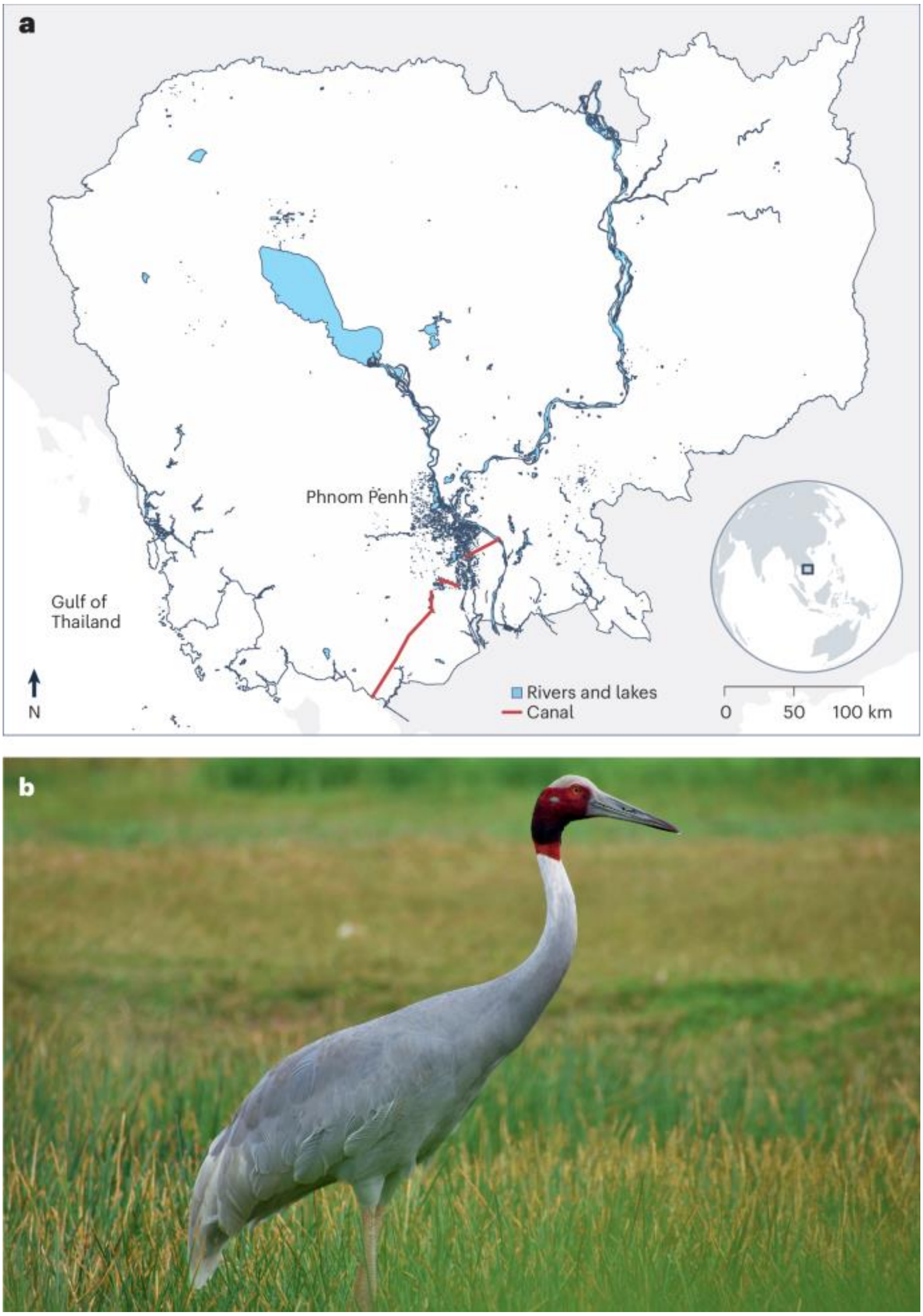

Fig 1. The Funan Techo Canal and Sarus Crane.

a, Route of the Funan Techo Canal (indicated in red), connecting Phnom Penh River Port with the Gulf of Thailand. Source: DeLorme. **b**, The endangered sarus crane (*A. antigone*), the world's tallest flying bird and a species vulnerable to habitat loss that could result from the canal's construction. Source: Eshan Chandra, Pexels.com.

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Competing interests

The authors declare no competing interests.