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Strengthening Water Governance in Cambodia: Responding to Climate Risks, Altered Hydrology and Institutional Fragmentation

Cambodia Development Resource Institute (CDRI)

This policy brief is based on the results of the High-Level Policy Dialogue on Water Governance in Cambodia.

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KEY MESSAGES

- Good water governance requires transparency, accountability, participation, responsiveness, and the rule of law, ensuring water is allocated fairly, used efficiently, and protected for future generations through effective institutions and policies.
- Growing pressures, including floods, droughts, pollution, competing demands, and climate change, are intensifying risks, threatening agriculture, fisheries, public health and economic stability across communities nationwide.
- Fragmented mandates across ministries weaken coordination and enforcement, highlighting the need for stronger legal frameworks, clearer institutional roles, integrated planning, and adequate capacity and resources at both national and subnational levels.
- Inclusive participation is critical, empowering women, indigenous groups, farmers, and local communities to co-manage resources, resolve conflicts, and strengthen accountability through community-based approaches.
- Data, technology, and innovation must guide decision-making, supported by monitoring systems, open data, early warnings and context-appropriate digital tools that enhance transparency and resilience.
- Sustainable financing, private sector engagement and regional cooperation—particularly through the Mekong River Commission (MRC)—are essential to mobilise resources, expand services and collectively manage shared water risks.

1. INTRODUCTION

Cambodia has abundant seasonal water resources from the Mekong River, Tonle Sap Lake and groundwater, yet water insecurity is increasing due to governance and coordination weaknesses rather than physical scarcity. To address these challenges, the Ministry of Water Resources and Meteorology (MOWRAM) and the Cambodia Development Resource Institute (CDRI) convened the High-Level Policy Dialogue on Water Governance, bringing together government agencies, researchers, development partners and civil society organisations to identify pathways towards more resilient and inclusive management.

Discussions highlighted growing pressures from climate variability, hydropower development, sediment loss, declining fisheries and fish populations, groundwater stress and institutional fragmentation, all of which threaten livelihoods and ecosystems. Participants raised concerns around the sustainability of Tonle Sap Lake, the flows of the Mekong River and sustainable groundwater management. Participants called for stronger legal frameworks, improved coordination and transboundary cooperation. Participants suggested these could function through the MRC, as well as expanded decentralised platforms such as Technical Working Groups (TWGs), sustained investment in Water, Sanitation and Hygiene (WASH), and ecosystem restoration.

2. WATER RESOURCES IN CAMBODIA AND THEIR CHALLENGES

Cambodia's water security is shaped by the interconnected systems of the Mekong River, Tonle Sap Lake and national groundwater aquifers,

which together sustain agriculture, fisheries, energy production, domestic water supply and rural livelihoods. The Mekong River supports approximately 51 percent of regional rice production, 50 percent of fisheries output and over 10 percent of regional energy generation, highlighting its central economic role. However, increasing droughts and floods, sediment loss, reduced reverse flows and heavy reliance on transboundary flows are destabilising this system. Sediment, which has declined from 50 to 70 percent in some areas, reduces soil fertility, erodes riverbanks and weakens fishery habitats.

The Tonle Sap Lake remains Cambodia's ecological and food security heartland. As the largest freshwater lake in Southeast Asia, it produces roughly 500,000 tonnes of fish annually and contributes around 10 percent of the national GDP. Yet shorter and weaker flood pulses, habitat degradation, pollution and overfishing are reducing fish stocks and ecosystem productivity, threatening millions of livelihoods dependent on fisheries and floodplain farming.

Groundwater increasingly serves as a dry-season safety net, with an estimated 17,600 million m^3 in reserves and more than 61,700 wells mapped nationwide. Nevertheless, rapid and largely unregulated abstraction, falling water tables, salinity intrusion and limited monitoring raise sustainability concerns.

Overall, the main constraint is not physical scarcity, but governance fragmentation. Strengthened integrated water management, shared data systems, ecosystem protection, decentralised institutions, groundwater regulation and regional cooperation are critical to building climate-resilient and equitable water security for Cambodia.

3. KEY ACTIONS FOR IMPROVING WATER GOVERNANCE

The High-Level Policy Dialogue on Water Governance identified key areas for improvement in water governance in Cambodia. The meeting included multiple presentations, panel discussions and an open discussion with a question and answer session.

3.1. Governance and institutional fragmentation

Cambodia's water challenges arise less from physical scarcity than from fragmented governance and weak institutional coordination. Despite abundant flows from the Mekong River and Tonle Sap Lake, overlapping mandates across ministries undermine coordination, enforcement, and accountability, resulting in siloed planning, duplicated investments, and limited capacity to manage cross-sector risks. Although decentralisation reforms exist, authority, budgets and technical capacity remain centralised, leaving local institutions under-resourced to address conflicts and climate impacts.

Reforms should prioritise Integrated Water Resources Management with clearer mandates, harmonised laws, and a lead coordinating body to align sectoral planning. Joint basin plans, shared data systems, and pooled financing can improve efficiency, while devolving resources and strengthening participation, transparency, and compliance will enhance accountability and build a more resilient, equitable and climate-adaptive water governance system.

3.2. Climate change and hydrological instability

Climate change is increasing hydrological instability across Cambodia and the Mekong River Basin, bringing more frequent droughts and flash floods that disrupt agriculture, fisheries and livelihoods. The weakened flood pulse of the Tonle Sap Lake—marked by reduced reverse flows and shorter inundation—limits fish migration, degrades habitats and lowers soil fertility, threatening food security for floodplain communities.

These extremes expose the limits of planning systems designed for stable conditions. Infrastructure and institutions struggle to manage rising variability, highlighting the urgent need for integrated, climate-resilient and ecosystem-based water governance supported by better coordination and early warning systems.

3.3. Ecosystem and sediment degradation

Across the Mekong River Basin, declining sediment flows—largely due to upstream hydropower dams and altered flood regimes—are degrading ecosystems and reducing agricultural productivity. Sediment loss weakens soil fertility, accelerates erosion, and diminishes floodplain habitats vital for fisheries and farming. Simultaneously, habitat destruction, flooded forest decline and pollution further disrupt aquatic ecosystems. These impacts are especially severe in the Tonle Sap Lake, where reduced reverse flows and shorter inundation periods threaten the lake's productivity and its estimated half-million tonnes of annual fish catch.

Participants stressed that ecological decline directly increases economic and social vulnerability. Falling fish stocks and declining soil quality reduce incomes, food security, and resilience for floodplain communities dependent on fisheries and rice cultivation. Addressing these risks requires protecting sediment connectivity, restoring habitats, strengthening monitoring systems and integrating ecosystem safeguards into basin planning and dam operations to balance energy development with long-term livelihoods and sustainability.

3.4. Groundwater stress and regulatory gaps

Groundwater is becoming a vital dry-season water source in Cambodia as surface flows from the Mekong River and Tonle Sap Lake decline. Households rely on wells for domestic use, and farmers depend on groundwater for irrigation, but rapid expansion of pumping has outpaced governance and technical oversight. Monitoring remains limited, recharge rates are poorly understood, and data gaps hinder

Figure 1: Water resources of the Mekong River, Tonle Sap Lake and groundwater in Cambodia

Source: Compiled from presentations by speakers from the MRC, the Tonle Sap Authority, and MOWRAM at the *High-Level Policy Dialogue on Water Governance* in Cambodia in Phnom Penh on 20 November 2025.

sustainable planning. Weak regulation and minimal licensing further increase the risk of over-extraction.

In coastal and low-lying areas, declining recharge and rising sea levels increase saline intrusion and water quality threats, potentially causing falling water tables, higher costs and long-term depletion. Strengthening groundwater sustainability requires expanded monitoring, clearer regulations, controlled abstraction, protection of recharge zones and integration into national water planning to ensure groundwater remains a reliable climate buffer.

3.5. Water, sanitation and hygiene (WASH) inequalities

Access to safe water, sanitation and hygiene remains unequal across Cambodia, with the greatest gaps in rural, remote and floating communities around the Tonle Sap Lake and Mekong River floodplains. Many households rely on untreated or seasonal water sources and lack adequate sanitation, increasing exposure to waterborne diseases and undermining health and productivity. Climate variability worsens these risks, as floods contaminate supplies and droughts limit access.

Women, children and marginalised groups bear the heaviest burden. Addressing these inequalities requires targeted investment in climate-resilient WASH infrastructure, improved hygiene education, decentralised services and stronger integration of WASH into broader water governance and watershed planning.

3.6. Data, technology, and innovation

Data, technology, and innovation are essential for effective water governance, enabling decisions based on evidence rather than fragmented responses. Hydrological, sediment, groundwater, water quality, and climate data across the Mekong River Basin and Tonle Sap Lake support forecasting, efficient resource management and ecosystem protection. Digital tools and community observations further enhance transparency and adaptive planning.

However, information systems remain fragmented and poorly shared across agencies, weakening coordination. Stronger collaboration, integrated databases, open data platforms, and science–policy partnerships are needed to translate evidence into accountable and responsive decision-making.

3.7. Decentralised and inclusive approaches show promise

Pilot initiatives across several districts demonstrate that decentralised, multi-stakeholder platforms can significantly improve water governance outcomes. In particular, district-level TWGs have demonstrated that bringing together local authorities, line departments, community fisheries, farmer groups and civil society organisations enables more coordinated, practical decision-making. By aligning irrigation management, fisheries protection, land use planning and livelihood activities on a local scale, these platforms help reduce resource conflicts, improve infrastructure maintenance and ensure that investments respond to actual community needs. Local coordination also shortens response times during floods and droughts and promotes more efficient use of limited budgets and technical resources.

Importantly, the active engagement of marginalised groups—including women, smallholder farmers and fishing communities—enhances legitimacy, accountability and equity in planning processes.

Community participation strengthens ownership and compliance with agreed rules, leading to more sustainable outcomes. These decentralised, inclusive models offer scalable and cost-effective approaches that can be replicated nationwide to strengthen adaptive, locally responsive water governance.

3.8. Transboundary cooperation

Cambodia's water security is heavily influenced by upstream developments along the Mekong River, as dams and reservoirs regulate flows, reduce sediment, and alter seasonal patterns. Because most surface water originates outside its borders, hydropower operations affect flooding, dry-season shortages, fishery productivity, and the ecological health of the Tonle Sap Lake, thereby increasing agricultural losses and livelihood risks.

Regional cooperation is therefore essential. The 1995 MRC Agreement provides consultation frameworks. However, stronger transparency, real-time data sharing, coordinated forecasting and joint basin planning are needed to manage shared risks and promote equitable, sustainable water use.

3.9. Sustainable finance and the private sector

Sustainable financing is essential for effective water governance, ensuring that policies translate into reliable infrastructure and services, including irrigation, flood protection, drinking water, sanitation and ecosystem restoration. Water investments remain underfunded, so national budgets, development partners, and private sector engagement—through public–private partnerships and stewardship initiatives—must mobilise additional resources and improve efficiency, particularly in underserved areas.

4. CONCLUSION

The High-Level Policy Dialogue on Water Governance made clear that Cambodia's water challenges are structural as well as physical. Although the country benefits from abundant seasonal flows from the Mekong River, the productivity of the Tonle Sap Lake and a growing reliance on groundwater reserves, these resources are increasingly undermined by fragmented governance, weak coordination and ecological degradation. Climate change, hydropower-regulated flows, declining sediment, habitat loss, groundwater over-extraction and unequal access to WASH services are compounding pressures on food systems and rural livelihoods. The dialogue highlighted that without stronger institutions and integrated management, these interconnected risks will continue to erode fisheries, agriculture, public health, and economic resilience, particularly for vulnerable communities living in floodplains and remote areas.

At the same time, Cambodia possesses significant opportunities for improvement. Existing decentralisation mechanisms, community-based institutions, TWGs and regional cooperation platforms provide foundations for more responsive and inclusive governance. The Dialogue emphasises that evidence-based planning, shared monitoring systems, ecosystem protection and clearer institutional mandates can improve efficiency and accountability. Devolving authority and resources to provincial and district authorities, strengthening community participation—especially among women and marginalised groups—and integrating groundwater and WASH considerations into basin planning will enable more locally tailored solutions. Equally important is enhanced transboundary collaboration, including transparent data sharing and coordinated river management, to address upstream impacts and reduce uncertainty across the basin.

Ultimately, water governance is not merely about building infrastructure, but about how decisions are made, who participates and whether development safeguards both ecosystems and people over the long term. By aligning science, institutions, communities, and regional cooperation within a coherent Integrated Water Resources Management framework, Cambodia can transform systemic vulnerabilities into resilience. Implemented collectively, the reforms identified through the dialogue can deliver reliable water supplies, sustainable fisheries and agriculture, reduced disaster risks and more equitable development outcomes—laying the foundation for a water-secure, climate-resilient future for generations to come.

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