ADB

Regional Flyway Initiative · Site Study

January 2026

RFI Priority Site · Kulen Promtep Wildlife Sanctuary (Memey River)

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Asian Development Bank

General Site Information

Country	Cambodia			
RFI Site Name	Kulen Promtep Wildlife Sanctuary (Memey River)			ID015
City/ Municipality, Province, Region	Choam Ksant, Rovieng and Kuleaen districts, Preah Vihear Province			
Geographical coordinates	14.02 N, 104.52 E		Area (has)	409,912 ha
Key species	Masked Finfoot, Sarus Crane. Giant Ibis, White-shouldered Ibis, Red-headed Vulture, White-backed Vulture, Slender-billed Vulture, Green Peafowl, Pale-capped Pigeon. Gaur, Malayan Sun Bear			
Key habitats (biomes)	Dry dipterocarp forests and broadleaved riparian forests			
Key ecosystem services	Provisioning services, regulating services and cultural services			
Key drivers of change	Deforestation and land degradation (through illegal encroachment, land grabs); wildlife hunting			
Conservation status (mark all that applies)	■	Protected Area		Flyway Network Site
		Ramsar Site		Others _____
IBA/ KBA name (and number) and other designations	Kulen Promtep Wildlife Sanctuary			
Management Stakeholders	Ministry of Environment, Ministry of Agriculture, Forestry and Fisheries, Preah Vihear provincial government (provincial department of agriculture			
With management plan?	Yes			
Project concept themes	Ecotourism, biodiversity-friendly rice agriculture, improved site management and enforcement			
Length of project	8-10 years			
Sector/s	Tourism, agriculture			
No. of potential beneficiaries	Choam Ksant, Rovieng, and Kuleaen districts have a combined census population of 136,379 across 31,033 households in 2019.			
Indigenous Peoples	■	No		Yes _____
Anticipated Implementation Risks	Increased enforcement activities arising from the project may result in increased risk of conflicts with protected area management.			
Estimated Project Budget (US$)	12,200,000			
Potential Source/s of Financing	■	Loan (to be identified)		Private Sector
	■	Grant (to be identified)		Public-Private Partnership

Table of Contents

Acronyms

ADB	Asian Development Bank
AWC	Asian Waterbird Census
CPA	Community Protected Area
CSR	Conservation Status Review
Danida	Danish International Development Agency.
DoFWC	Department of Freshwater Wetlands Conservation
DoF	Department of Fisheries
DMC	Developing Member Country
EAAFP	East Asian-Australasian Flyway Partnership
FiA	Fisheries Administration
IBA	Important Bird and Biodiversity Area
IDRC	International Development Research Council
IUCN	International Union for the Conservation of Nature
KPWS	Kulen Promtep Wildlife Sanctuary
LCG	Local conservation group
MAFF	Ministry of Agriculture, Forestry and Fisheries
MOE	Ministry of Environment
NLC	NatureLife Cambodia
NGO	Non-governmental Organisation
PDoE	Provincial Department of Environment
RFI	Regional Flyway Initiative
SVC	Sam Veasna Centre for Conservation
TESSA	Toolkit for Ecosystem Services Assessment
USD	United States Dollars
WCS	Wildlife Conservation Society
WWT	Wetlands and Wildfowl Trust

Executive summary

Kulen Promtep Wildlife Sanctuary (409,912 ha) is located in the northern plains of Cambodia close to the border with Thailand and Lao PDR and it is one of the country's largest protected areas, spanning the provinces of Preah Vihear, Siem Reap and Oddar Meanchey, abuting the Preah Vihear Protected Forest and Chheb Wildlife Sanctuary. The site comprises a complex landscape mosaic dominated by dry dipterocarp forests, strips and patches of semi-evergreen forests, and extensive freshwater wetlands and grasslands. The site was designated as a protected area in 1993 with its management authority with the Ministry of Environment. Kulen Promtep is identified as a key RFI site because it holds possibly the largest known populations of the Masked Finfoot (CR) in Southeast Asia, alongside several breeding pairs of the Sarus Crane (VU), which migrates to the floodplains of the Tonle Sap. In addition, the Kulen Promtep holds populations of at least five critically endangered, two endangered, and seven vulnerable species of mammal and bird, most notably the Giant Ibis, Cambodia's national bird. As a result of its size, Kulen Promtep provides critical provisioning and regulating services for human communities living within, and around its boundaries. Local communities are mostly dependent on the harvest of NTFPs, fishing, and rice farming for their livelihoods, although tourism contributes substantial income for many local households now due to the work of nature-based tourism developed by conservation organisations such as the Wildlife Conservation Society. Preliminary estimates indicate that the site stores 18,100,000 to 21,800,000 tonnes, while the annual carbon sequestration rate is estimated at 171,000 tonnes per year.

As a result of the increasing human population, the site is increasingly impacted by agricultural expansion, pollution, and deforestation. Runoff pollution from agriculture, forestry, and human habitation immediately impacts the site, as is illegal timber harvesting and unsustainable fishing practices along its river bodies. Land grabs and deforestation have also increasingly degraded forests within the site, while the use of monofilament gillnets harms wildlife and is predicted to affect species such as the Masked Finfoot. To address these threats, several projects have been implemented at the site over the past 20 years, including a large GEF-funded project to strengthen livelihoods for local communities (including through the 'Ibis Rice' initiative), to address deforestation and improve resource management. The Wildlife Conservation Society's Cambodia Program has also worked in the northern plains for nearly 20 years and has established a nature-based tourism initiative, which has drawn a regular stream of wildlife tourists to KPWS.

Building upon existing and ongoing projects, the proposed interventions for Kulen Promtep focus on four components:

1. Improving site management and enforcement, including more effective patrolling of key areas and further designation of CPAs with local community groups.
2. Exploring carbon financing mechanisms to fund biodiversity conservation and community interventions.
3. Habitat restoration at sites degraded by agriculture, focusing on the restoration of riparian corridors and DDF tree species.
4. Strengthening livelihoods through sustained ecotourism capacity building in Thmat Beuy and other sites; continued scaling up of organic rice production through the 'Ibis Rice' initiative.

1. Background of the Regional Flyway Initiative

In July 2021, the Asian Development Bank made a commitment to develop a long-term Regional Flyway Initiative (RFI) in the East-Asian Australasian Flyway (EAAF) (Sovereign Project 55056-001) to protect and restore priority wetland ecosystems and the associated ecosystem services they provide in the EAAF, the most threatened migratory bird flyway globally. The Initiative is slated for implementation in nine ADB developing member countries (DMCs) in East, South and Southeast Asia: Mongolia, People's Republic of China (PRC), Bangladesh, Viet Nam, Cambodia, Philippines, Thailand, Malaysia and Indonesia. In 2023, the geographic scope of the RFI was further extended to two DMCs in Southeast Asia and the Pacific respectively, Lao PDR and Papua New Guinea.

The primary aim of the RFI is to enhance and expand the existing efforts in conserving and managing wetlands of the highest priority for migratory birds within the EAAF through innovative loan and grant financing, and at scale. Consultations and analyses over the development period help identify key interventions to strengthen the management of wetlands, enabling the implementation of nature-based solutions while strengthening biodiversity protection. Over time, the RFI seeks to leverage collaborative opportunities by developing partnerships among important stakeholders including national governments, civil society organizations, communities, regional organizations like the East Asian-Australasian Flyway Partnership (EAAFP), development agencies, the private sector, and other relevant entities.

Through the RFI Technical Assistance (TA) implemented over the RFI's development phase from 2021 to 2024, BirdLife International takes the lead in providing and coordinating technical support for development of the RFI. This is carried out in collaboration with the EAAFP and a consortium of international non-governmental organizations including Wetlands International and the Paulson Institute, as well as two universities, namely the University of Southampton, UK and the National University of Singapore. Over the development phase, the TA team undertook a site selection analysis to identify priority wetland sites in all 10 countries based on recent bird data benchmarked against internationally accepted criteria under the Convention on Wetlands of International Importance (or Ramsar Convention), EAAFP Flyway Network Sites and Important Bird and Biodiversity Areas (IBAs). The team further developed ecosystem services profiles for prioritised wetlands using a multi-pronged approach used the TESSA ecosystem services assessment tool, and data-driven modelling of water based ecosystem services and stored carbon.

In Cambodia, a total of 15 wetland sites, including several Asian Waterbird Census (AWC) count sites, were initially assessed through data analysis and expert consultation, of which 12 were short-listed for assessment based on the available (recent) data. Of these pool of sites, nine (9) were defined and identified to be RFI priority sites on the basis that they support more than 1% the flyway population of at least one EAAF migratory waterbird species. Eight (8) of the RFI sites identified are inland wetlands, most notably a cluster of sites around the Tonle Sap Great Lake, such as Prek Toal, Ang Tropeang Thmar and Boeng Tonle Chmmar. A single coastal site was identified, i.e. Koh Kapik Ramsar Site where there have been extensive surveys of its biodiversity to date, including surveys led by NatureLife Cambodia. 11 EAAF species exceeded the 1% threshold at the site level in Cambodia, with species such as the Masked Finfoot,

Greater Adjutant and Sarus Crane (ssp. *sharpii*) at their highest congregations in Southeast Asia. Other species with important populations and/or congregations in Cambodia includes Spotted Greenshank, Black-headed Ibis and Painted Stork.

2. Site profile of Kulen Promtep Wildlife Sanctuary (including Memey River)

Location: Kulen Promtep Wildlife Sanctuary is located in the northern plains of Cambodia, near the border with Thailand. It is one of the largest protected areas in Cambodia, and spans three provinces, Preah Vihear, Siem Reap and Oddar Meanchey.

Area: The Kulen Promtep Wildlife Sanctuary RFI site has an area of 409,912 ha

Altitude: Lowlands to 417 metres asl.

Geographical coordinates: 14.02 N, 104.52 E

Description of site: Covering most of Preah Vihear Province, Kulen Promtep Wildlife Sanctuary encompasses a complex mosaic of dry dipterocarp forests, semi-evergreen forests, freshwater wetlands, and grasslands. It was selected as an RFI priority site because of the presence of Masked Finfoot, which has been recorded along two densely vegetated forest streams within the sanctuary. The dry forests support a high diversity of species, including many that are globally threatened.

Site administration, management, and land tenure: Kulen Promtep Wildlife Sanctuary was designated in 1993, with the Ministry of Environment as the management authority. The Wildlife Conservation Society Cambodia Programme coordinates patrol work, enforcement operations, and biodiversity monitoring activities with the site's management team.

Social and economic values: Kulen Promtep Wildlife Sanctuary is in a remote and rural part of Cambodia where most of the local people still depend on resin-tapping, fishing, and farming for their livelihoods. The government is working with several international conservation organisations that have active programmes for the conservation of the sanctuary.

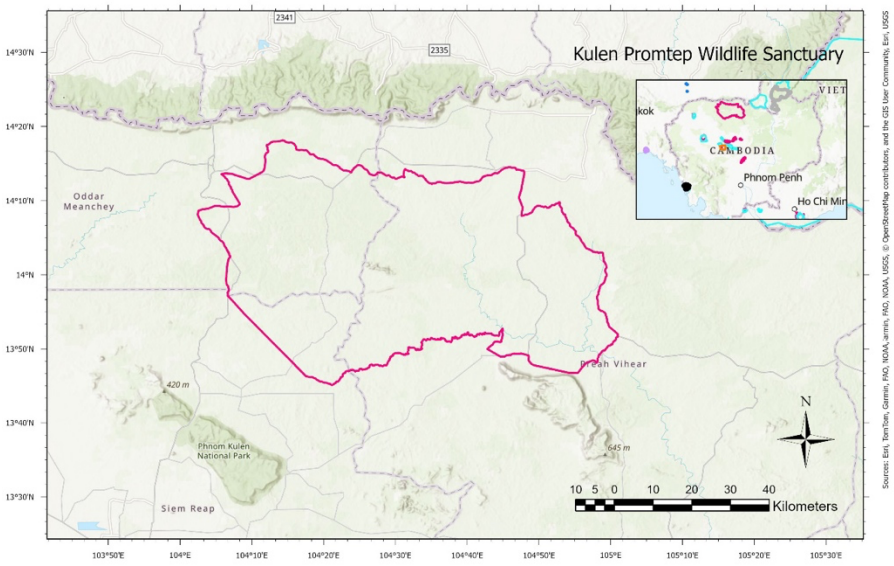

Figure 1. Boundary of Kulen Promtep Wildlife Sanctuary (in black); inset map shows the location of KPWS in Cambodia. (Map: Yong Ding Li)

3. Biodiversity value of Kulen Promtep Wildlife Sanctuary (Memey River)

3.1 Key habitats

The site comprises a complex landscape mosaic dominated by dry dipterocarp forests, strips and patches of semi-evergreen forests, and extensive freshwater wetlands and grasslands. It was selected as an RFI priority site because of the presence of Masked Finfoot, which has been recorded along two densely vegetated forest streams within the sanctuary. The dry forests support a high diversity of species, including many that are globally threatened.

3.2. Importance of the Kulen Promtep Wildlife Sanctuary for migratory waterbird species

The RFI analysis for Kulen Promtep Wildlife Sanctuary used a population estimate for Masked Finfoot at this site by Chowdhury et al. (2020). This estimate exceeded the Conservation Status Review (CSR1) 1% population threshold for this migratory waterbird species (Table 1), and the CSR1 score for Masked Finfoot provided the overall site score. Kulen Promtep also supports a breeding population of the Sarus Crane (ssp. *sharpii*), which are known to migrate and winter at another (RFI) wetland, Ang Tropeang Thmar in the north-west fringe of the Tonle Sap (van Zalinge et al. 2023), although it is unclear how many birds nest within Kulen Promtep.

Table 1. List of migratory species (based on the EAAFP list of species) with globally significant congregations in Kulen Promtep Wildlife Sanctuary.

Species name	IUCN	Average count	CSR1	CSR1 score
Masked Finfoot *Heliopais personatus*	CR	14	3	4.7

3.3. Other notable biodiversity

Kulen Promtep Wildlife Sanctuary was originally set up to protect the Critically Endangered, and possibly extinct Kouprey *Bos sauvelli* (CR) and is one of them most important protected areas in Cambodia's northern plains.

The dry dipterocarp forests, riparian (broadleaved) forests and associated seasonal wetlands (or *tropeang*) support numerous globally threatened and threatened bird species including; White-shouldered Ibis *Pseudibis davisoni* (CR), Giant Ibis *Thaumatibis gigantea* (CR), White-winged Duck *Asarcornis scutulata* (EN), White-rumped Vulture *Gyps bengalensis* (CR), Slender-billed Vulture *Gyps tenuirostris* (CR), Cinerous Vulture *Aegypius monachus* (NT), Asian Woolly-necked Stork Ciconia episcopus (NT), Pale Capped Pigeon *Columba punicea* (VU), Indian Spotted Eagle *Clanga hastata* (VU), Lesser Adjutant *Leptoptilos javanicus* (NT), Great Slaty Woodpecker *Mulleripicus pulverulentus* (VU), White-rumped Falcon *Neohierax insignis* (NT), Alexandrine Parakeet *Psittacula eupatria* (NT), Blossom-headed Parakeet *Psittacula roseata* (NT), Red-breasted Parakeet *Psittacula alexandri* (NT), Green Peafowl *Pavo muticus* (EN), Coral-billed ground cuckoo *Carpococcyx renauldi* (VU), Sun Bear *Helarctos malayanus* (VU) and Gaur *Bos gaurus* (VU).

4. Ecosystem services

4.1. Ecosystem services provided by Kulen Promtep Wildlife Sanctuary (Memey River)

The Kulen Promptep area overlaps with diverse habitats, providing valuable provisioning, regulating and cultural ecosystem services (Figure 2). The results from the RFI workshop[1] highlights the top ecosystem services provided by the site, emphasising their essential and non-substitutable nature (Table 2). Provisioning services, particularly fresh water and food provision, benefit communities both within, adjacent to, and, in the case of fresh water, distant from the site. Regulating services such as air quality regulation, flood hazard regulation, and water purification and waste treatment are crucial for the local and adjacent communities. Flood hazard regulation also benefits distant communities.

[1] Asian Development Bank. (2023, September 13-14). Cambodia: Wetland Ecosystem Services Workshop [Workshop]. Phnom Pehn, Cambodia. https://events.development.asia/learning-events/cambodia-wetland-ecosystem-services-workshop

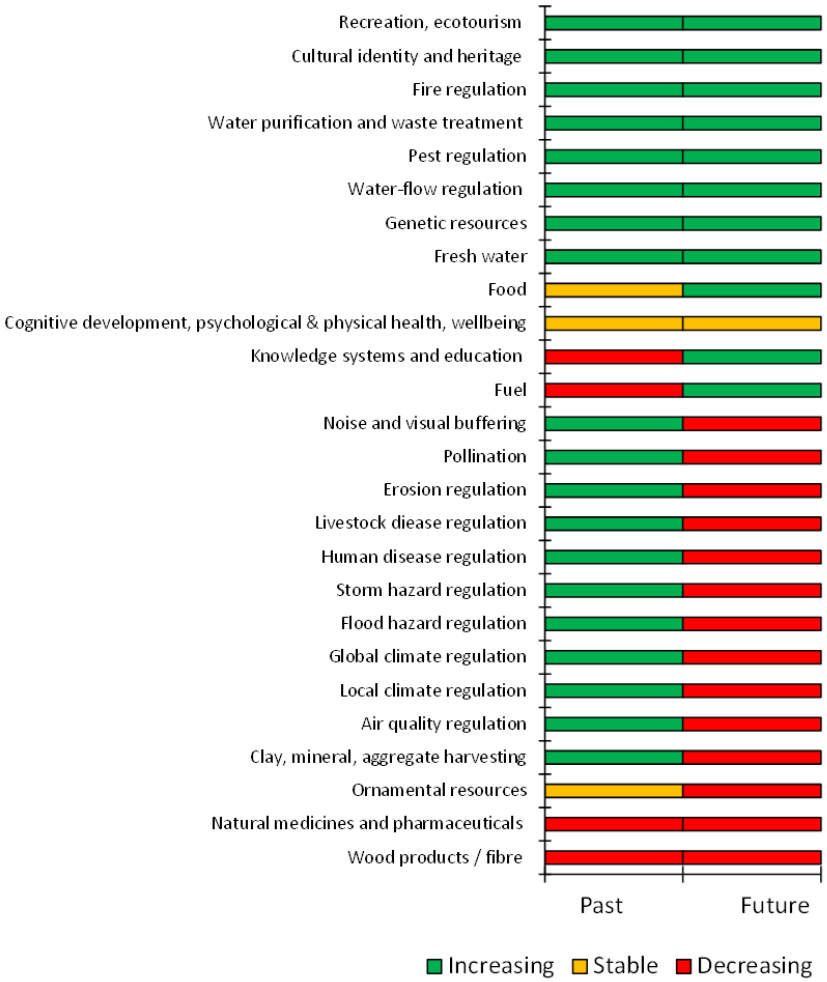

Figure 2. List of ecosystem services provided by Kulen Promtep Wildlife Sanctuary (Memey River), as identified through stakeholder consultation at the Regional Flyway Initiative workshop.

Table 2. List of top ecosystem services provided by Kulen Promtep Wildlife Sanctuary (Memey River).

Ecosystem services	Essential or non-substitutable	Benefits to communities			Change	
		Within the site	Adjacent to the site	Distant to the site	Past	Future
Provisioning services						
Fresh water	Yes	✓	✓	✓	Increase	Increase
Food	Yes	✓	✓		No change	Increase
Regulating services						
Air quality regulation	Yes	✓	✓		Increase	Decrease
Flood hazard regulation	Yes	✓	✓	✓	Increase	Decrease
Water purification and waste treatment	Yes	✓	✓		Increase	Increase

4.2. Global climate regulating services

Based on the look-up values from IPCC (2006), the amount of carbon stored in Kulen Promtep Wildlife Sanctuary is estimated to range from 18,100,000 to 21,800,000 tonnes, while the annual carbon sequestration rate is estimated at 171,000 tonnes per year.

4.3. Flood mitigating services

The flood mitigation services provided by Kulen Promtep Wildlife Sanctuary were assessed using biophysical values only (see Table A1 and Annex 1 for details). When compared to both the average of the eight RFI inland sites and the average of all other inland wetlands in Cambodia (Table A2 in Annex 1), Kulen Promtep shows some mixed results in terms of benefits and beneficiaries:

(1) for the average green storage capacity per sq. km of wetland, Kulen Promtep is above average when compared to RFI inland sites (456 Giga Litres or GL of water per km^2 vs. 384 GL/km^2 for RFI inland sites) but slightly below average when compared to all other inland wetlands (456 vs. 458 GL/km^2);

(2) for the average population uniquely benefitting from influential green storage upstream per sq. km of wetland, Kulen Promtep is also above average when compared to RFI inland sites (87 vs. 81 people/km^2) but below average when compared to all other inland wetlands (87 vs. 110 people/km^2); and

(3) for the average built-up area uniquely benefitting from influential green storage upstream per sq. km of wetland, Kulen Promtep is below average when compared to RFI inland sites (4.20 ha/km^2 vs. 4.89 ha/km^2) but slightly below average when compared to all other inland wetlands (4.20 vs. 3.92 ha/km^2).

5. Drivers of change and their potential impacts on Kulen Promtep Wildlife Sanctuary (Memey River)

5.1. Current drivers of change and their level of impact

Stakeholders at the RFI workshop[2] identified 29 drivers of change impacting Kulen Promtep Wildlife Sanctuary, and their corresponding levels of impact on the wetland site (Table 3).

Medium-impact drivers include agricultural and forestry effluents, which contribute to water pollution and affect habitat quality. Air-borne pollutants and annual and perennial non-timber crop production further alter the natural environment. Biological resource use, such as fishing, killing, and harvesting of aquatic resources, along with hunting terrestrial animals, poses a significant threat to the site's biodiversity. Habitat clearing and household sewage or urban wastewater from outside the wetland also

[2] Asian Development Bank. (2023, September 13-14). Cambodia: Wetland Ecosystem Services Workshop [Workshop]. Phnom Pehn, Cambodia. https://events.development.asia/learning-events/cambodia-wetland-ecosystem-services-workshop

moderately affect the site. Additionally, the loss of keystone species and water extraction or diversion within the wetland site or catchment moderately alter the ecosystem's natural balance.

Table 3. Drivers of change and their potential impact on the integrity of Kulen Promtep Wildlife Sanctuary (Memey River) based on consultations with stakeholders.

Driver of change	Impact
Agricultural and forestry effluents	Medium
Air-borne pollutants	
Annual and perennial non-timber crop production	
Fishing, killing and harvesting of aquatic resources	
Habitat clearing	
Household sewage and urban wastewater from outside the wetland site	
Hunting, killing and collecting of terrestrial animals	
Loss of keystone species	
Water extraction/diversion within the wetland site or catchment	
Collecting terrestrial plants or plant products (non-timber)	Low
Drought conditions	
Droughts	
Drug cultivation	
Erosion and siltation/deposition	
Fire and fire suppression	
Garbage and solid waste	
Habitat shifting and alteration	
Cognitive development, psychological & physical health, wellbeing	
Livestock farming and grazing	
Logging and timber harvesting	
Loss of cultural links, traditional knowledge and/or management practices	
Oil and gas drilling; extraction of sand	
Recreational activities and tourism	
Research, education and other work-related activities	
Sewage and wastewater from wetland site facilities	
Shipping lanes and canals	
Storm and flooding	
Temperature extremes	
Vandalism, destructive activities or threats to staff and visitors	

5.2. Potential alternative state of Kulen Promtep Wildlife Sanctuary (Memey River) under current drivers of change

Stakeholders at the RFI workshop[3] defined the most plausible future alternative state (to 2035), and how this will translate to a net change in the cover of different types of wetland habitat types within this site (current habitat cover vs future alternative cover; Figure 3). The alternative state of the site assumes there

[3] Asian Development Bank. (2023, September 13-14). Cambodia: Wetland Ecosystem Services Workshop [Workshop]. Phnom Pehn, Cambodia. https://events.development.asia/learning-events/cambodia-wetland-ecosystem-services-workshop

will be no changes in the current drivers of change impacting the site, and the current management regime.

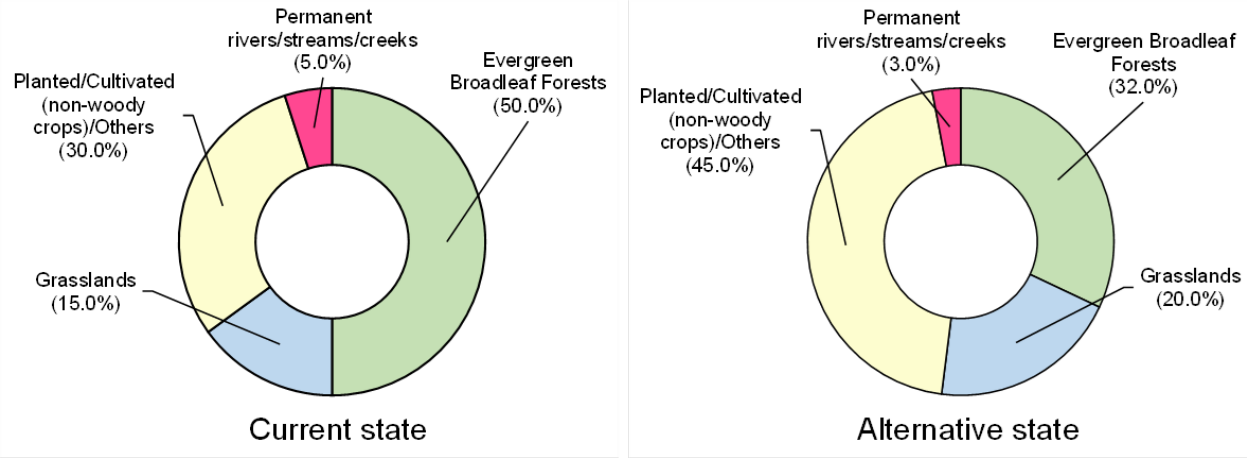

Figure 3. The proportional change in the extent of different habitat types between the current and alternative states of Kulen Promtep Wildlife Sanctuary (Memey River).

5.3. Expected changes in the ecosystem services of Kulen Promtep Wildlife Sanctuary

Stakeholders at the RFI workshop[4] documented the future trends in the provision of ecosystem services in Kulen Promtep Wildlife Sanctuary, indicating if the ecosystem services provided by this site (to 2035) will increase, decrease, or will remain stable if the current drivers of change impacting this site will continue in their present condition, with the intervention remains unchanged.

Provisioning services (freshwater use by local communities) have seen an increase in the past and are expected to continue increasing in the future (Figure 2 and Table 2). Food provision has remained unchanged in the past but is projected to increase in the future. Air quality regulation, while it has increased in the past, is expected to decrease in the future. Flood hazard regulation has experienced an increase in the past but is anticipated to decrease going forward. Water purification and waste treatment, however, have shown an increase in the past and are expected to continue rising.

In the alternative state, the loss of 36% of forest and the gain of 33% of grassland will result in a loss of stored carbon estimated to be between 5,040,000 and 6,370,000 tonnes and a decrease in carbon sequestration rate (carbon accumulation) by approximately 47,400 tonnes per year.

As presented in Table A5, a net gain of 8,200 hectares of green water habitats, including evergreen broadleaf forests, grasslands, and planted/cultivated areas, is expected to result in an effective increase of 2.1% or 9.6 Giga Litres in green storage capacity per km². This may amount to nearly 1.8 people and 0.09 hectares of built-up areas gaining enhanced flood mitigation benefits per km² of wetland.

Cambodia is particularly vulnerable to climate change (World Bank 2023, Norris et al. 2024);

[4] Asian Development Bank. (2023, September 13-14). Cambodia: Wetland Ecosystem Services Workshop [Workshop]. Phnom Pehn, Cambodia. https://events.development.asia/learning-events/cambodia-wetland-ecosystem-services-workshop

- Daily temperatures are predicted to rise by 0.9-1.7 °C by 2040-2059.
- A reduction in rice crop yield of 5-10% by the 2050s due to rising temperatures
- Increased freshwater contamination due to increased flash flooding as a result of heavier rains.
- Stress on the Mekong river system and likely increased flooding (frequency and scale) by the 2050s. Greater need to maintain sediment flow and prevent salinization of the delta.
- Increased pressure on biodiversity rich areas to expand food production.
- Increased heat-stress for the human populace and ecological systems.
- Likely wetter, mainly due to increased rain in the southwest monsoon (July-October)

6. Capacity needs in Kulen Promtep Wildlife Sanctuary (Memey River)

The stakeholder consultation and analyses with government and civil society stakeholders identified at least three stakeholder groups with clear roles in the long-term sustainable management of wetlands in Kulen Promtep Wildlife Sanctuary. Table 4 summarizes the current and potential roles of these stakeholder groups in relation to the management of the Kulen Promtep Wildlife Sanctuary, based on the RFI workshop[5]. There are opportunities to strengthen patrolling and law enforcement, and natural resource protection.

Table 4. List of stakeholders and their potential roles in relation to the management of the Kulen Promtep Wildlife Sanctuary, based on recommendations from stakeholders present at the RFI workshop in 2023.

Stakeholder Group	Current role in the wetland management	Possible Future role in wetland management (in 10 years)	Capacity Development support needed to improve wetland management	Form of capacity development
Local government, KPWS management board	• Enforcing laws and managing the site • Conducting awareness campaigns and educational initiatives • Performing biodiversity assessments and restoration efforts • Implementing zonation and demarcation	• Acquire knowledge about biodiversity • Identify and document plant and animal species • Undertake the restoration of degraded land • Enhance demarcation efforts	• Patrol • SMART Patrol • Data collection and analysis • Zonation and management plan development	• Training • Workshop • Site visit

[5] [5] Asian Development Bank. (2023, September 13-14). Cambodia: Wetland Ecosystem Services Workshop [Workshop]. Phnom Pehn, Cambodia. https://events.development.asia/learning-events/cambodia-wetland-ecosystem-services-workshop

	• Establishing Community Protected Areas (CPA)	• Increase community participation and establish more Community Protected Areas (CPAs)		
Local (provincial and commune) authorities	• Participating in the protection of natural resources • Conducting awareness campaigns and educational programs for local villagers	• Foster improved relationships with site managers and local authorities • Develop a deeper understanding of natural resource protection	• Build capacity and engage in natural resource protection	• Consultation and meetings
Local communities	• Actively engaging in the protection of natural resources	• Improved engagement	• Strengthen the capacity of natural resource protection	• Training • Awareness raising Campaign

7. Opportunities for RFI interventions

7.1. Recommended Interventions

Kulen Promtep is one of the largest protected areas in Cambodia's northern plains and a key breeding site for the Masked Finfoot in the Memey River system. The site also supports a breeding population of Sarus Cranes, alongside at least 10 globally threatened bird species. Presently, Kulen Promtep faces major challenges through forest degradation and clearance, and which has resulted in increasing fragmentation of forests within the site. Fishing activities, including fishing using monofilament gillnets harm wildlife and is predicted to affect the Masked Finfoot. Over the past decade, several projects have been implemented at the site, including a large GEF-funded project to strengthen livelihoods for local communities (including through the 'Ibis Rice' initiative), to address deforestation. The Wildlife Conservation Society's Cambodia Program has also worked in the northern plains for nearly 20 years and has established a nature-based tourism initiative, which has drawn a regular stream of wildlife tourists to KPWS.

The interventions for Kulen Promtep focus on four components:

- Improving site management and enforcement, including more effective patrolling of key areas and further designation of CPAs with local community groups.
- Exploring carbon financing mechanisms to fund biodiversity conservation and community interventions.

- Habitat restoration at sites degraded by agriculture, focusing on restoration of riparian corridors and DDF tree species.
- Strengthening livelihoods through sustained ecotourism capacity building in Thmat Beuy and other sites; continued scaling up of organic rice production through the 'Ibis Rice' initiative.

Table 5. Summary of key RFI interventions proposed for Kulen Promtep Wildlife Sanctuary

Intervention	Outcome	Indicators	Cost (USD)	Timeframe	Potential Stakeholders
Component 1. Strengthening landscape management of the Kulen Promtep Wildlife Sanctuary					
Conduct a scoping study of existing interventions and threats and disturbance at KPWS, including targeted work on long-term threats (from climate change, encroachment and invasive species management).	Assessment and scoping guidance to provide basis for proposed RFI interventions.	Assessment report with key threats identified, and recommendations for improved management (e.g., supporting current interventions, or by focusing on aspects missed by previous projects) published and disseminated to key stakeholders.	100,000	1.5 years	Preah Vihear provincial government MOE MAFF KPWS management board Consultancy companies Conservation organisations ADB

Intervention	Outcome	Indicators	Cost (USD)	Timeframe	Potential Stakeholders
Strengthen and expand the capacity for site management across KPWS	Strengthened co-management for KPWS, with stronger involvement of local stakeholders (from various villages). Increased enforcement and patrol capacity, focusing on wildlife snaring, fires, land grabbing and land clearance and encroachment, with local community involvement. Conditions at ephemeral wetlands such as tropeangs maintained. Reduced incidences of forest clearances (and extent of deforestation) due to increased enforcement and patrolling.	Site management plan over short to medium-term for KPWS updated (with measures to address and mitigate fire risk during the dry season) and presented with key community stakeholders Number of implemented activities in the updated site management plan Co-management framework developed, and piloted. Number of consultations conducted to engage local stakeholders for participatory processes, to address threats to the site. Number of trained stakeholders on enforcement and patrolling. Number of reported incidents of illegal forest clearances decreased against baselines	500,000	3 years	MOE and provincial department of environment KPWS management board Preah Vihear provincial government District and commune governments CPA committees Conservation organisations Community groups (including LCGs)

Intervention	Outcome	Indicators	Cost (USD)	Timeframe	Potential Stakeholders
Expand law enforcement patrol, with a focus on most sensitive sites for key species	Capacity for undertaking SMART patrols and wildlife monitoring (and snare removal) sustained. Snare removal efforts sustained. Improved staffing, training, resourcing and equipment for regular patrols.	Training course program on SMART patrol developed and mandated annually. Number of trained stakeholders on SMART patrols and wildlife monitoring (and snare removal). Number of patrolling equipment provided Number of patrolling units organized and supported.	100,000	5 years	MOE and provincial department of environment KPWS management board Conservation organisations Community groups (including LCGs)
Establish a stronger site protection at Memey river targeted Masked Finfoot conservation	Strengthened site protection through community protected areas established at key sites along the Memey River. Capacity of local conservation groups to undertake patrol and monitoring strengthened	Up to three (3) new CPAs established along the Memey River, with co-management mechanisms in place with LCGs. Patrolling and biodiversity monitoring training program developed. Number of trained stakeholders on patrolling and biodiversity monitoring.	100,000	5 years	Provincial department of environment KPWS management board Conservation organisations Community groups (including LCGs)
Strengthen biodiversity monitoring, with a focus on the Masked Finfoot population.	Increased awareness of Masked Finfoot, ibises and other charismatic species.	Number of awareness-raising activities on importance of preserving the cranes and the	100,000	3 years	

Intervention	Outcome	Indicators	Cost (USD)	Timeframe	Potential Stakeholders
	Improved biodiversity monitoring, with focus on the Masked Finfoot population	wetlands implemented. A biodiversity monitoring group organized Number of stakeholder groups involved on awareness-raising activities and biodiversity monitoring.			
Component 2. Exploring the feasibility of carbon financing for forest conservation in KPWS					
Assess feasibility of carbon financing for KPWS, and other forest landscapes on the northern plains	Improved understanding of the feasibility and suitability of carbon financing for key forest sites in the northern plains	Feasibility study report for carbon financing KPWS and other forest landscapes in the northern plains Number of stakeholder groups involved in consultation meetings. Investment guidelines for carbon for forest conservation drafted, presented to local stakeholders, and endorsed by government agencies.	100,000	2 years	MOE and provincial department of environment KPWS management board Preah Vihear provincial government District and commune governments CPA committees Conservation organisations
Component 3. Habitat restoration of areas degraded by agricultural activities					
Restore degraded areas within the KPWS that are disused from past agricultural activities and/or damaged by	Degraded areas within KPWS restored.	At least 150 ha of degraded lands reforested with DDF species.	100,000	8 years	MOE and provincial department of environment KPWS management board

Intervention	Outcome	Indicators	Cost (USD)	Timeframe	Potential Stakeholders
land grabs or fires, through the identification and prioritisation of degraded forest land suitable for restoration, in the wider landscape taking into account hydrology and climate predictions.					Preah Vihear provincial government District and commune governments CPA committees Conservation organisations
Strengthen the protection and maintenance of habitat corridors (e.g. riparian strips)	Vegetation buffer zones on key rivers restored, using local species.	At least 2 km of riparian strips (including Memey River) monitored and reforested with native tree species. Number of stakeholder groups involved in the protection and maintenance of habitat corridors.	150,000	5 years	
Component 4. Alternative livelihoods from wildlife-watching based tourism sustained					
Capacitate local stakeholders at key sites within KPWS, including at Thmat Beuy, on ecotourism	Increased ecotourism opportunities in Kulen Promtep Wildlife Sanctuary, with a focus on building the capacity of small-scale operators, and strengthening local cooperatives for nature-based tourism	Number of households (in Thmat Beuy) involved in nature-based tourism activities increased by 20% against baselines. Up to two training sessions a year on sustainable, nature-based tourism. Number of small-scale operators and local cooperatives	500,000	5 years	MOE and provincial department of environment KPWS management board CPA committees Conservation organisations (e.g. SVC)

Intervention	Outcome	Indicators	Cost (USD)	Timeframe	Potential Stakeholders
		on nature-based tourism organized and supported.			
Component 5. Alternative livelihoods from biodiversity-friendly, 'Ibis Rice' sustained.					
Scale-up the sustainable, regenerative rice-farming in villages within KPWS and adjacent to it, using organic and/or wildlife-friendly approaches under the 'Ibis Rice' initiative Continue training and capacity building on reduction of agro-chemicals in rice farming, and expanded use of organic fertilizers.	Organic and biodiversity-friendly rice farming expanded and upscaled in landscapes in and surrounding KPWS. Financing mechanism (for local loans and grants) sustained for local communities, and supported by key lending institutions for farmers, and marginalized communities.	Biodiversity-friendly and/or organic rice-farming as a source of local livelihood practiced and increased by 15% of baselines. At least XX% of rice farmers in and around KPWS cultivating biodiversity-friendly 'Ibis Rice'. Capacity building (and training) programmes for organic and biodiversity-friendly rice farming developed. Number of capacity-building activities implemented. Number of trained rice farmers on biodiversity-friendly and/or organic farming Number of small loans granted for marginalized communities Number of people who benefitted from the local	500,000	10 years	Ministry of Agriculture Preah Vihear provincial government District government Representatives from households' 'Ibis Rice' community groups Conservation organisations IRCC Rural development organisations Fertilizer companies

Intervention	Outcome	Indicators	Cost (USD)	Timeframe	Potential Stakeholders
		financing mechanism.			
Total investment for 10 years			**12,200,000 USD**		

7.2. Potential Financing

The estimated project cost is USD 12,200,000 over 8-10 years. This budget supports improving site management and enforcement, assessing the feasibility and suitability of carbon financing mechanisms to fund biodiversity conservation and community interventions, habitat restoration, capacity-building activities for local stakeholder groups, and strengthening local livelihoods, particularly in the practice of biodiversity-friendly and/or organic farming. Table 5 summarizes the projected budget distribution across the proposed project components.

7.3. Proposed Institutional Arrangements

The proposed project is expected to be implemented over a period of at least eight (8) years, with main project components focusing on improved site management for KPWS (led by the Ministry of Environment) and expanding organic and/or biodiversity-friendly rice agriculture (with the Ministry of Agriculture, Forestry and Fisheries), with a focus on 'Ibis Rice'. Conservation organisations are expected to play a major role in the project by supporting project activities focused on biodiversity monitoring of charismatic species such as the Masked Finfoot, stakeholder engagement and capacity building for better management of rice agriculture.

7.4. Project Beneficiaries

Based on the National Institute of Statistics of Cambodia census in 2019, the three covered districts (i.e., Choam Ksant, Rovieng, and Kuleaen) for the Kulen Promtep Wildlife Sanctuary have 31,033 households and a combined population of 136,379.

There are indigenous communities of the Kui minority represented in the project landscape. Representatives of Kui communities and women (of all communities) will be encouraged to attend and participate fully in project meetings. Females will comprise a minimum of XX% of those who participate in all capacity building programmes for ecotourism and rice agriculture. During project monitoring and evaluation (M&E), both women and men will be provided opportunities to provide input on project successes and difficulties

7.5. Anticipated Implementation Risks

Stakeholder engagement: Proposed interventions rely on support from local communities, particularly in adopting biodiversity-friendly and organic farming practices, patrolling, and co-management. Establishing

strong stakeholder buy-in from local leaders and engagement from local communities for the proposed interventions will facilitate better implementation of the proposed interventions.

Moreover, increased enforcement activities arising from the project may also result in an increased number of conflicts related to protected area management. Integrating conflict resolution and management into training programs can better equip local patrollers to handle these situations. Conducting continuous stakeholder consultations also helps ensure a participatory process in law enforcement, patrolling, and biodiversity monitoring, thereby helping resolve potential conflicts more effectively.

Financial and Business Model: Carbon financing is a new approach for sustaining financing in the area. The potential for this through carbon markets would need to be assessed and possibly piloted, with consideration of the macroeconomic and political climate in Cambodia.

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Annex 1. Supplementary information on flood mitigation services

To further validate the identification of the top ecosystem services by means of stakeholder consultation, an expectedly essential or non-substitutable regulating service across all RFI sites, namely coastal protection and flood mitigation (i.e., storm and flood hazard regulation), was assessed based on a combination of globally available datasets supplemented by web-based tool Co$tingNature (Mulligan, 2022). Estimates for flood mitigation were spatially inferred in QGIS from a selection of metrics expressing different biophysical values modelled online by the Water World component of this tool. Equivalent data to assess monetary values similarly to coastal protection were not available for the RFI region.

The key metrics selected for biophysical values (Table A1) were the average green storage capacity, which is the volume of water stored by each square kilometre of wetland itself as well as its soil and vegetation, and the direct influence of this storage capacity on beneficiaries found downstream of the wetland, both as the average number of people and the average built-up area that are uniquely benefitting from the resulting flood mitigation (and not from other green storage found upstream).

Table A1. Contribution of the wetland habitats to flood mitigation in Kulen Promtep Wildlife Sanctuary (Memey River) based on site-level (biophysical) values inferred from Mulligan (2022) and expressed as ranges to represent the resulting uncertainty.

Influence of the wetland on flood mitigation (metrics)	**Benefit/Beneficiaries**
Average green storage capacity per sq. km of wetland in million cubic metres (GigaLitres/km2)	450 – 461
Average population uniquely benefitting from influential green storage upstream per sq. km of wetland (n/km2)	86 – 88
Average built-up area uniquely benefitting from influential green storage upstream per sq. km of wetland (ha/km2)	4.14 – 4.25

Table A2. Biophysical benefits from and beneficiaries of RFI inland wetland sites (expressed as ranges to represent the resulting uncertainty) and at the national level.

Site name	**Green storage capacity (GigaLitres/km^2)**	**Downstream population (n /km^2)**	**Downstream built-up area (ha /km^2)**
Prek Toal Core Area	486 (±29)	112 (±7)	7.19 (±0.42)
Ang Tropeang Thmor	411 (±38)	73 (±7)	3.84 (±0.36)
Boeung Prek Lapouv	448 (±37)	139 (±12)	8.40 (±0.71)
Anlung Pring	264 (±63)	0 (±0)	1.22 (±0.29)

Site name	Green storage capacity (GigaLitres/km^2)	Downstream population (n /km^2)	Downstream built-up area (ha /km^2)
Boeng Chhmar	406 (±27)	102 (±7)	6.57 (±0.43)
Chikraeng / Stoung	206 (±23)	45 (±5)	2.84 (±0.32)
Kulen Promtep WS	456 (±6)	87 (±1)	4.20 (±0.05)
Cambodia RFI average	384	81	4.89
Cambodia national average	458	110	3.92

Table A5. Key habitat types in Kulen Promtep Wildlife Sanctuary (Memey River) based on stakeholder-based assessment at the Regional Flyway Initiative workshop in September 2023.

Habitat type	Current state		Alternative state (2035)	
	Area (ha)	Cover (%)	Area (ha)	Cover (%)
Evergreen Broadleaf Forests	204956.0	50.0	131171.8	32.0
Grasslands	61486.8	15.0	81982.4	20.0
Planted/Cultivated (non-woody crops)/Others	122973.6	30.0	184460.4	45.0
Permanent rivers/streams/creeks	20495.6	5.0	12297.4	3.0
Total	409912.0	100.0	409912.0	100.0