



ADAPTATION FUND

PRE-CONCEPT FOR A REGIONAL PROJECT/PROGRAMME

PART I: PROJECT/PROGRAMME INFORMATION

Title of Project/Programme:	Groundwater resources in Greater Mekong Sub-region: Collaborative management to increase resilience
Countries:	Cambodia, Lao PDR, Myanmar, Thailand, Vietnam
Thematic Focal Area:	Transboundary water management
Type of Implementing Entity:	MIE
Implementing Entity:	UNESCO
Executing Entities:	National Agencies, CCOP, IWMI, IGRAC
Amount of Financing Requested:	US\$ 4,542,250

Project / Programme Background and Context:

Groundwater in the Greater Mekong Sub-region: The countries of the Greater Mekong Sub-region (GMS – Cambodia, Lao PDR, Thailand, Myanmar and Vietnam) have abundant surface water resources that includes some of the largest rivers in Asia: the Mekong discharges around 475 km³ annually, and the Ayeyarwady around 400 km³. All GMS countries are vulnerable to the adverse effects of climate variability and climate change; flooding and heavy monsoon rains are common but the region also experiences a (prolonged) dry season with pronounced and frequent water scarcity. Even though surface water is abundant, major shortfalls occur spatially (particularly in lowlands and plains) and temporally (during the dry season). These structural water shortages are normally met with supply from groundwater (GW). The GMS countries have a total population of about 240 million people; a considerable number are low-income groups and urban/rural communities that depend on easily accessible, reliable, good quality and low-cost GW for their domestic use and agrarian-based livelihoods. GW use is increasing as drilling and pumping costs have become more affordable and will continue to do so in coming years for a variety of reasons that include meeting Sustainable Development Goals, adapting to climate change, achieving food security and livelihood enhancement. The long terms impacts from increased GW use on domestic, irrigation and industrial supply security and resource sustainability in general remain unclear.

Climate variability creates a more uncertain dimension for water availability and to address this GW is being more heavily relied upon as a coping strategy since it is better buffered to climate shocks than surface water. For example, the current El Niño-related drought in Thailand leads to emergency measures involving the drilling of 900 wells for irrigating parched rice fields with unknown longer term consequences.

The expansion of irrigation, land use changes (deforestation) in the highland areas, increase of domestic and industrial use in expanding cities of the GMS may result in significant depletion of GW resources in future, leading to reduced water availability, higher pumping costs, saltwater intrusion in coastal areas, and loss of ecosystem services. These effects will be exacerbated by the impacts of climate change, further increasing demand and potentially reducing recharge throughout the GMS. The full impacts of climate change on GW availability are likely to be complex and require further investigation.

The absence of a sizeable community and cooperative network of GW experts in the GMS severely hampers addressing these issues, in particular in Myanmar, Lao PDR and in Cambodia, where local capacity in the technical and non-technical aspects of groundwater management are very limited. Regional cooperation in the ASEAN Economic Community offers an opportunity to tackle these challenges. Specifically, the project aims to enhance and utilize the resilience potential of improved and regionally coordinated GW management and demonstrate that it can provide effective tools and capacities to reduce vulnerability.

Knowledge/information gaps: There is limited information and knowledge on GW resources of the GMS, in particular the kind of insight required to deal with pressing issues, such as:

- Extent and/or characteristics of shallow and deeper aquifer systems, including GW reserves in aquifer systems in the GMS, existing and potential water quality threats.
- Current GW abstraction for various uses; future demand scenarios for irrigation, urban/rural water supply.
- Relationships between recharge in highland (upstream) areas and resource potential in lowland (downstream) areas. This includes several important transboundary systems. Climate change and land use changes will affect these delicate balances in supply and demand.
- Sustainability (in view of increasing abstraction) and vulnerability of riparian GW resources to climate change induced changes in precipitation and changes in river flow regimes (natural or anthropogenic).

To better understand the GW resources in the GMS, their vulnerabilities and resilience potential, detailed hydrogeological and geophysical investigations are required. GW monitoring networks are absent but urgently needed to monitor and track the resource status and trends, and for developing and using regional GW information systems and flow models. These regional GW models and information tools will help manage resources and support the introduction of resilience measures.

Project / Programme Objectives:

Overall Goal/Objective: Establish a regional knowledge network for sustainable use of groundwater resources as an adaptation response to protect people, livelihoods and ecosystems in the GMS.

Specific objectives are:

- Prepare an updated GW shared aquifer inventory for the GMS countries, resource management concepts and tools, and a monitoring network for GW systems.
- Understand GW recharge processes and formulate recommendations for protection and long-term sustainable management.
- Increase participation of stakeholders by implementing principles of GW governance through 1) dialogues with GW users to assess GW use scenarios for different sectors (agriculture, industry, rural and urban domestic water supply) and 2) develop and provide appropriate information to ensure sustainable use by different user groups (agriculture, industry, domestic water supply).
- Develop and implement targeted GW vulnerability reduction measures, GW quality improvement, identification and protection of strategic GW reserves, etc.
- Capacity building and raising standards for GW practitioners across the GMS countries and initiating regional water cooperation (diplomacy).
- High level agreement on climate resilience through strategic planning for GW.

Project / Programme Components and Financing:

Project Components	Expected Outcomes	Expected Outputs	Country	Amount (US\$)
1. Resource assessment and monitoring	Harmonised regional GW resource inventory supporting regional GMS approach to address challenges of climate change and resilience; information-based policy to manage resources and further develop new GW based resilience strategies and practical interventions.	Updated and harmonised regional GW resources and shared aquifer inventory; GW vulnerability and resilience potential assessment; common GW systems monitoring network, with community of experts and on-line information systems.	Lao PDR, Cambodia, Thailand, Myanmar, Vietnam	1,000,000

2. Priority use and stakeholders	Increased participation by GW users in different sectors who are aware of resource management issues and have access to information and guidelines that support more sustainable use region-wide.	Dialogues with GW users to assess GW use scenarios for different sectors and to develop and provide custom-made practical guidelines to attain sustainable use.	Lao PDR, Cambodia, Thailand, Myanmar, Vietnam	500,000
3. Resource management, information tools and equipment	Greater resilience and sustainable GW resource use, with protection of low income and vulnerable user groups. Transboundary GW policies more robust and climate change ready.	Adequate collaborative resource management methods and tools made available, enabling information sharing, cooperation and mutual support across the GMS region. Information-based measures to align GW management with broader climate change resilience measures and surface water management.	Lao PDR, Cambodia, Thailand, Myanmar, Vietnam	1,000,000
4. Regional cooperation, coordination and information exchange.	A regionally coherent policy for climate adaptation through sustainable GW resource management; level playing field for all sectoral users in the region, efficiency gains in common approach and support tools.	A regional cooperative network is established to exchange information and collaborate in addressing further challenges from information to policy to practice.	Lao PDR, Cambodia, Thailand, Myanmar, Vietnam	500,000
5. Capacity building and training	Internal capacity in the GMS region to develop CCA policy and practical resilience enhancing interventions, to use state-of-the-art tools and work with CoP, stakeholders and vulnerable groups.	A GW community-of-practice created and equipped with the knowledge and skills to ensure technical and policy capabilities. Expert groups can tackle acute problems, GMS cooperation.	Lao PDR, Cambodia, Thailand, Myanmar, Vietnam	850,000
6. Project/Programme Execution cost				365,000
7. Total Project/Programme Cost				4,215,000
8. Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable)				327,250
Amount of Financing Requested				4,542,250

Project Duration: (*In years and months*): 4 YEARS (48 MONTHS)

PART II: PROJECT / PROGRAMME JUSTIFICATION

Climate resilience and added value of regional approach, GMS transboundary collaboration: By introducing and stimulating robust methods for resource assessment and collaborative principles for sustainable GW use, valuable water resources can be more effectively allocated for strategic and emergency purposes, thereby enhancing resilience in water supply and food production without creating undue ecosystem impacts. Climate resilience is based on the full suite of options, including limited surface water and GW, and overall use efficiency is stimulated.

Groundwater resource sustainability assessment: To increase resilience and reduce vulnerability requires assessment of sustainable GW extraction rates under various current and future land use conditions; to develop with users “low vulnerability” land use and identify solutions to overcome high vulnerability cases, and also to assess impacts of the current and likely future climate change conditions on GW resources; to

create awareness of their potential depletion and develop fall-back options and water use efficiency measures that have a direct impact on the ground.

Innovative solutions to climate change adaptation (CCA); a regional approach and cost-effectiveness: The development of GW management information systems for the region will provide opportunities to introduce innovative ICT-supported data collection, information sharing and training. The programme connects to national priorities for CCA, as included in respective national CCA policy documents.

Learning and knowledge management to capture and disseminate lessons learned and suitable resilience practices: Learning, knowledge development and sharing of expertise are key elements of the program; the more advanced groups in Thailand, Vietnam will contribute to this process by helping their less advanced colleagues in Lao PDR, Myanmar and Cambodia in a dedicated community of practice (CoP).

Vulnerable groups and sustainability, sharing regional data and experience: Project preparation will include dedicated efforts to design the interaction process with stakeholders in such a way that vulnerable groups and women are prioritised. By focusing on GW conservation/sustainable use, access to water supply for households and smallholders will improve.

Positive environmental and social impacts, a balanced intervention with sustainable results: The program will mitigate environmental impacts of drought on food production, on domestic water supply constraints and importantly on environmental services provided by GW dependent ecosystems. It will also mitigate social impacts on access to low-cost domestic water supply and on rural communities' access to irrigation water for self-reliance in food production. The funding requested is allocated in a balanced way for 1) technical studies and deepening of the knowledge base, 2) dissemination and interaction with stakeholders and 3) human resources development and creation of a regional GMS community of experts.

The project will have positive environmental and social impacts: it will stimulate sustainable use of valuable natural resources and increase vulnerability awareness; it will support approaches to ensure equitable access to water for food production, domestic use and ecosystems. It will enable conservation of scarce water resources for low-income groups. By following a regional approach an international level playing field is supported as well.

Capacity building to form a GMS community of experts and address societal needs: Sustainability aspects are highly dependent on the human resources capacity dimension. With a strong focus on human resources development a new generation of better skilled and equipped GW experts will engage with pertinent challenges of the coming decades. Sustainability is also enhanced by closely linking GW resource studies to societal needs. A regional CoP will be fostered, building upon efforts previously undertaken by the project partners. This CoP will meet and share issues annually. The opportunities for regional cooperation are being strengthened by the establishment of the ASEAN Economic Community.

PART III: IMPLEMENTATION ARRANGEMENTS

Beneficiaries and stakeholders - NIEs

1. Government of Cambodia, Ministry of Water Resources and Meteorology and Ministry of Mines and Energy deal with groundwater issues in Cambodia.
2. Government of Lao PDR, Ministry of Natural Resources and Environment (MoNRE), The Natural Resources and Environment Institute (NREI) has an executive role in groundwater management.
3. Government of Myanmar, Ministry of Agriculture and Irrigation and within the Ministry of Water Resources Utilization Department (WRUD) has the role of implementing agency.
4. Government of Thailand, Ministry of Natural Resources and Environment; Within the Ministry the Department of Groundwater Resources has the responsibilities in planning, assessment, resource conservation, and regulations.
5. Government of Vietnam, Ministry of Natural Resources and Environment (MoNRE) as the coordinating Ministry for water resources management, is implementing river basin water resources management plans on a national scale that include GW. the National Center for Water Resources Planning and

Investigation (NAWAPI), has an executive role.

6. Universities and research institutions in the GMS contributing to capacity building on GW.

The collaboration will be supported by:

UNESCO: will provide all technical backstopping, facilitation with member States and processes with the Adaptation Fund.

Coordinating Committee for Geosciences Programmes (in East and Southeast Asia)(CCOP): will provide technical expertise and support local coordination and implementation along with the national partners.

International Water Management Institute (IWMI): has been at the forefront of research aimed at exploring opportunities for greater GW development for poverty alleviation improving GW governance across SE Asia. IWMI would be one of the implementing partners.

International Groundwater Resources Assessment Centre (IGRAC): is UNESCO's and WMO's GW expertise and resources centre that facilitates and promotes information and knowledge sharing required for sustainable development, management and governance of GW.

The project proposal preparation process and workshop are intended to assess the need/possibility to engage additional technical assistance partners (MRC, Ministries of Women's Development or similar), national partners for implementation on a local level, and essential stakeholder organisations.

Step-by-step implementation strategy

- Organise an executive project team consisting of national experts from the GMS countries, and experts from the supporting Technical Assistance partners (CCOP, IWMI, IGRAC). As MIE, UNESCO will convene a project Steering Committee.
- Develop a common view and understanding of the role that improved GW management shall play in strengthening climate resilience in multiple sectors; identify additional opportunities through transboundary collaboration; sharing information, expertise and collaborative policies for climate resilience.
- Resource assessment: common methodology to be adopted and approach to data collection/sharing; agree on protocols for sharing available data on transboundary aquifers.
- Compile various maps / information services and products available from countries/organisations and further demarcate the recharge and extraction zones and consider transboundary issues.
- Identify data gaps and need for new data; collaborative monitoring approach, initiate base-level monitoring.
- Common approach for GW resources management information system, basic functions and operations, training expert users, dissemination to end-users in the five countries.
- Raise stakeholder and public awareness on GW vulnerability through development of tailored information for sectoral users and multi-media awareness for urban and rural populations.
- Build capacity of local GW management professionals, planners and policy makers in the pertinent national government organisations.
- Consult stakeholders and develop a process of ongoing engagement with the specific actors with and interest in GW from government, donors, NGOs and the private sector.

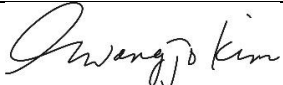
These activities collectively serve to create the environment needed to achieve positive change on the ground throughout the GMS by reducing vulnerability and increasing adaptive capacity to the impacts of climate change, including climate variability. Clear indicators to track and demonstrate these outcomes will be developed at an early project stage and monitored by the Project Steering Committee and activities adjusted as needed.

PART IV: ENDORSEMENT BY GOVERNMENTS AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government:

Cambodia: Mr. Tin Ponlok , Secretary General, NCSD/Ministry of Environment	Date: <i>10 November 2015</i>
Lao PDR: Mr. Syamphone Sengchandala Department of Disaster Management and Climate Change (DDMCC), Ministry of Natural Resources and Environment	Date: <i>23 December 2015</i>
Myanmar: H.E U Win Tun , Union Minister, Ministry of Environmental Conservation and Forestry and Chairman National Environment Conservation Committee (NECC)	Date: <i>16 December 2015</i>
Thailand: Mr. Kasemsun Chinnavaso , Permanent Secretary, Ministry of Natural Resources and Environment	Date: <i>18 December 2015</i>
Viet Nam: Mr. Tran Hong Ha , Deputy Minister Ministry of Natural Resources and Environment	Date: <i>12 November 2015</i>

B. Implementing Entity certification

<p>I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (Lao PDR and Vietnam) and subject to the approval by the Adaptation Fund Board, <u>commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund</u> and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.</p>	
<p><i>Name and Signature</i> </p> <p>Implementing Entity Coordinator: GWANG-JO KIM DIRECTOR UNESCO BANGKOK</p>	
Date: 7 January 2016	Tel. and email: +66-23918474 gj.kim@unesco.org
Project Contact Person: RAMASAMY JAYAKUMAR	
Tel. and Email: +66-2-3910577 X 163 ; r.jayakumar@unesco.org	



KINGDOM OF CAMBODIA
Nation Religion King

Ministry of Environment

N° : MoE

Letter of Endorsement by Government

10 November 2015

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

**Subject: Endorsement for Groundwater resources in the Greater Mekong Subregion;
collaborative resource management to increase resilience**

In my capacity as designated authority for the Adaptation Fund in Cambodia, I confirm that the above regional project proposal is in accordance with the Royal Government of Cambodia national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Cambodia.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by UNESCO and executed by relevant country agencies, namely the Ministry of Water Resources and Meteorology and the Ministry of Mines and Energy with technical support and coordination from Coordinating Committee for Geosciences Programme (in East and Southeast Asia)-CCOP, International Water Management Institute (IWMI), and International Groundwater Resources Assessment Centre (IGRAC).

Sincerely,

Tin Ponlok
Secretary General,
NCSD/Ministry of Environment



LAO PEOPLE'S DEMOCRATIC REPUBLIC
PEACE INDEPENDENCE DEMOCRACY UNITY AND PROSPERITY

Ministry of Natural Resources and Environment (MONRE)
Department of Disaster Management and Climate Change (DDMCC)
Tel/Fax: +856-21-254350

Vientiane Capital, 23...December 2015

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: **Endorsement for Groundwater resources in the Greater Mekong Subregion;
collaborative resource management to increase resilience**

In my capacity as designated authority for the Adaptation Fund in Lao PDR, I confirm that the above regional project proposal is in accordance with the government's national and sub-regional priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in the Mekong Region.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by UNESCO and executed by Natural Resources and Environment Institute with technical support and coordination from Coordinating Committee for Geosciences Programme (in East and Southeast Asia)-CCOP, International Water Management Institute (IWMI), International Groundwater Resources Assessment Centre (IGRAC).

Yours sincerely,

Mr. Syamphone SENGCHANDALA

Designated Authority for the Adaptation Fund of Lao PDR



THE REPUBLIC OF THE UNION OF MYANMAR
MINISTRY OF ENVIRONMENTAL CONSERVATION AND FORESTRY

Ref No. 6(1)/01(I)/(3720 / 2015)

Date 16th of December, 2015

To

The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

**Subject: Endorsement for Groundwater Resources in the Greater Mekong Sub
Region: Collaborative Resource Management to Increase Resilience Proposal**

In my capacity as designated authority for the Adaptation Fund in the Republic of the Union of Myanmar, I confirm that the above national project proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in the country.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by the Ministry of Agriculture and Irrigation and executed by Water Resources Utilization Department (WRUD) of Myanmar's Ministry of Agriculture and Irrigation.

Sincerely,

Win Tun
Union Minister
Ministry of Environmental Conservation and Forestry
Chairman of the Environmental Conservation Committee
Building No. 28
Nay Pyi Taw, Myanmar

No. 0702/ 3720



Ministry of Natural Resources and Environment
92 Soi Phohol Yothin 7, Phohol Yothin Road,
Sam San Nai, Phayathai, Bangkok 10400 Thailand

18 December B.E.2558 (2015)

To: the Adaptation Fund Board,
c/o Adaptation Fund Board Secretariat

Subject: Endorsement for Groundwater Resources in the Greater Mekong Subregion; Collaborative Resource Management to Increase Resilience

In my capacity as designated authority for the Adaptation Fund in Thailand, I confirm that the above regional project proposal is in accordance with the government's national and sub-regional priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in the Mekong Region.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by UNESCO and executed by Department of Groundwater Resources with technical support and coordination from Coordinating Committee for Geosciences Programme in East and Southeast Asia (CCOP) International Water Management Institute (IWMI), International Groundwater Resources Assessment Center (IGRAC).

Yours sincerely,

(Kasemsun Chinnavaso Ph.D.)

Permanent Secretary

Ministry of Natural Resources and Environment

1818 H Street NW Washington DC 20433 USA

c/o Adaptation Fund Board Secretariat

Email: Secretariat@Adaptation-Fund.org

Fax: 202 522 3240/5



SOCIALIST REPUBLIC OF VIET NAM
MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT


Letter of Endorsement by Government

November 12th, 2015

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Support for Groundwater resources in the Greater Mekong Subregion; collaborative resource management to increase resilience.

In my capacity as designated authority for the Adaptation Fund in Viet Nam, I confirm that the above regional project proposal is in accordance with the government's regional priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in the Viet Nam.

Accordingly, I am pleased to endorse the above project/programme proposal with support from the Adaptation Fund. If approved, the project will be implemented by UNESCO and executed by National Centre for Water Resources Planning and Investigation Ministry of Natural Resources and Environment, Government of Viet Nam. 

Sincerely,



Tran Hong Ha
Vice Minister
Minister of Natural Resources and Environment