

*Enhancing the resilience and productivity of rainfed dominated system in Lao PDR through sustainable groundwater use*

## Component 4— Groundwater governance, including a review of existing agricultural strategies within the broader context of water-land-energy nexus

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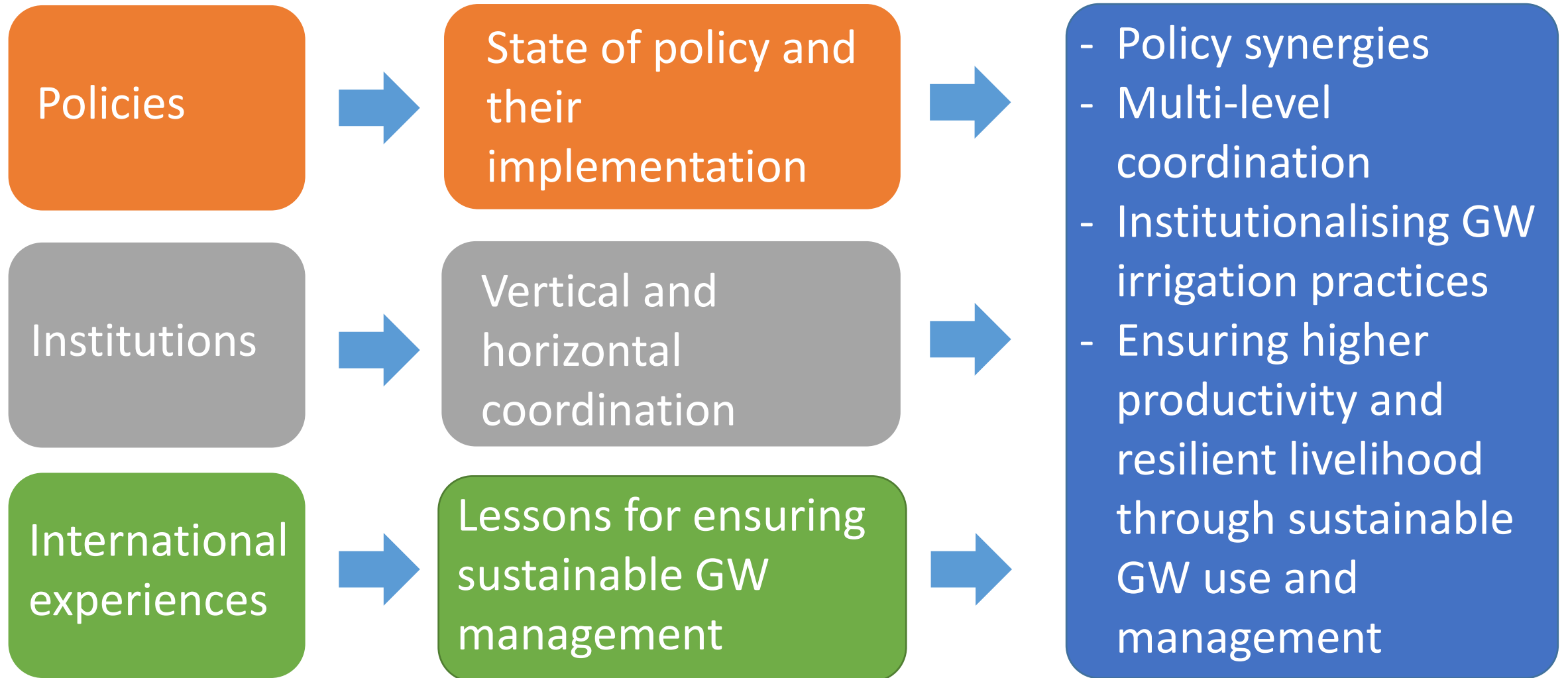


Australian Government

Australian Centre for  
International Agricultural Research



# Overall framework of the study



# State of the Policies relevant to groundwater

- Existing policies, strategies and plans on water resources do not address groundwater management specifically and adequately;
- No systematic management of groundwater resources
- No groundwater governance scheme at all levels (national, provincial and community)
  - ➔ Ad-hoc / on-site base management by different actors
  - ➔ if proper assessment is done especially on quality, more developers/users of drinking water would be willing to use more groundwater
  - ➔ Growing interest to groundwater as a stable source because of unusual climate condition

- National Socioeconomic Development Plan (7<sup>th</sup> for 2011–2015 and 8<sup>th</sup> for 2016–2020) and Vision to 2030, Agriculture Master Plan 2011–2015, and the Strategy for Agricultural Development 2011–2020
- The Law on Water and Water Resources of 1996 (to be succeeded by New Water Resources Law), The Prime Minister Decree of 2001 on Implementation of the Law on Water and Water Resources , National Water Resources Strategy (now to 2025) and Action Plan (2016–2020).
- Electricity Law (1997, 2010), Power System Development Plan (2004), National Policy on Sustainable Hydropower (2006), Renewable Energy Development Strategy (2010)
- National Adaptation Programme of Action to Climate Change (2009), The National Strategy on Climate Change (NSCC), Climate Change Action Plan of Lao PDR for 2013–2020, The Climate Change and Disaster Law (expected in 2017), Intended Nationally Determined contributions (INDCs) ;

..... and more others

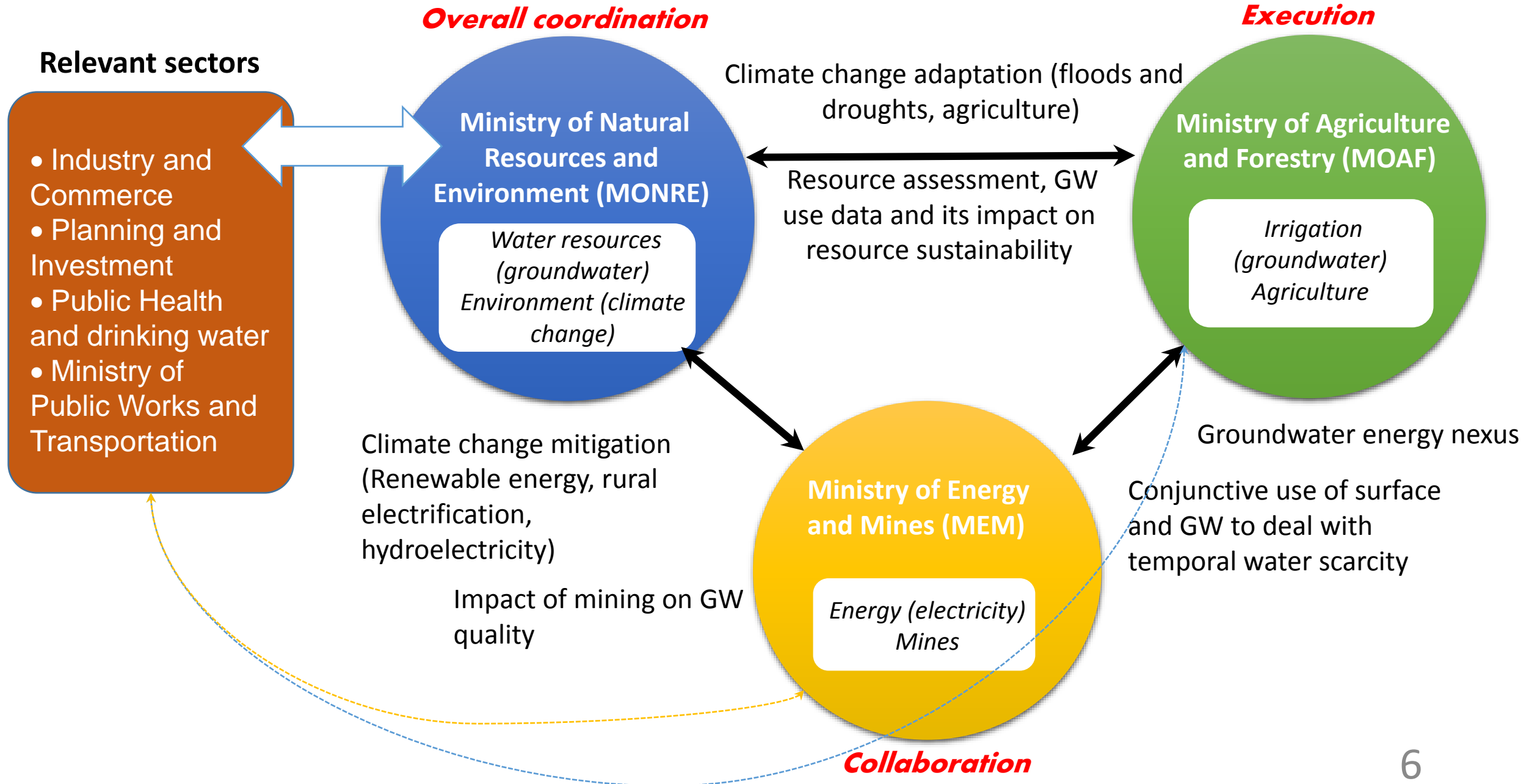
## Recent progress on groundwater policy and institutions

- Establishment of Groundwater Management Division of the Department of Water (GMD-DWR) Resources under MONRE;
- New Water Resources Law, National Water Resources Strategy and Action Plan has clearly identified the need of groundwater management
- National Groundwater Action Plan is meant to formulate and implement regulations and groundwater management planning and strengthen groundwater management capacity;
- National Natural Resources and Environmental Strategy to 2025 and the Vision to 2030 provides a vision and strategic direction and also mentions about groundwater management

## Recent progress on groundwater policy and institutions

- Recent policies and action plans are comprehensive and addresses major requirements for regulating and managing groundwater such as legislative, resources assessment and conservation, information management, stakeholder participation (community, end-users), capacity building and training etc.
- This is a significant development for progressing towards a formal groundwater governance.
- However, there is a significant capacity gap among the institutions (such as GW Management Division) to implement action plans and fulfil their mandates effectively.
- The new GW management Division management and Department of Irrigation (DOI) have **a limited experience on groundwater irrigation**;

# Potential institutional coordination for GW irrigation



# Potential priorities/roles of the key organizations

- GW Division, MONRE
  - ✓ As mandated, with the help of its other affiliated institutions such as National Resources and Environment Institute (NREI) and other non-government actors and research institutes, **act as the lead organization** to ensure sustainable use and management of GW
  - ✓ Coordinate with line ministries dealing with (or affecting) groundwater resources;
  - ✓ Provide technical supports on GW resource assessment to DOI
- Climate Change, MONRE
  - ✓ Mainstream groundwater in its mitigation and adaptation actions plans
- DOI, MOAF
  - ✓ Act as **the main executing body** to implement groundwater development and management activities;
  - ✓ Improve its technical capacity to implement and administer agricultural groundwater development and use
  - ✓ Use existing institutional and technical expertise as a means to promote and upscale GW irrigation, including, the formation of community groundwater user group
  - ✓ Implement water efficiency measures

# Potential priorities/roles of the key organizations

- Agriculture, MOAF

- ✓ Provide profitable alternatives to use GW through innovative agricultural practices preferably through existing Good Agricultural Practices (GAP) such as organic farming, cash crops;
- ✓ Coordinate with GW Division-MONRE for the prevention of GW contamination caused by the use of agro-chemicals (fertilizers, pesticides, herbicides)
- ✓ Extension and marketing support to enhance farmers' capacity to grow and sell products profitably

- Energy, MEM

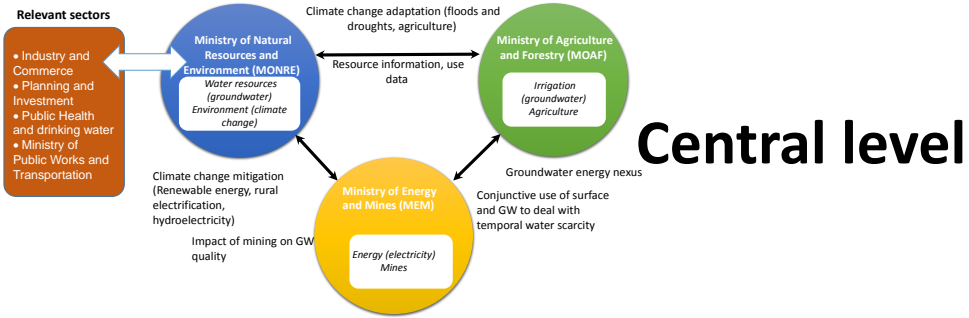
- ✓ Affordable and reliable energy supply for GW irrigation
- ✓ Coordinate with DOI to implement conjunctive use of surface (especially regulation of hydro-dams) and groundwater not only ensure year-round availability of irrigation but also efficient use of energy and collection of electricity fees

- Mines, MEM

- ✓ Coordinate with GW Division-MONRE to prevent the negative impact of mining activities on GW resources



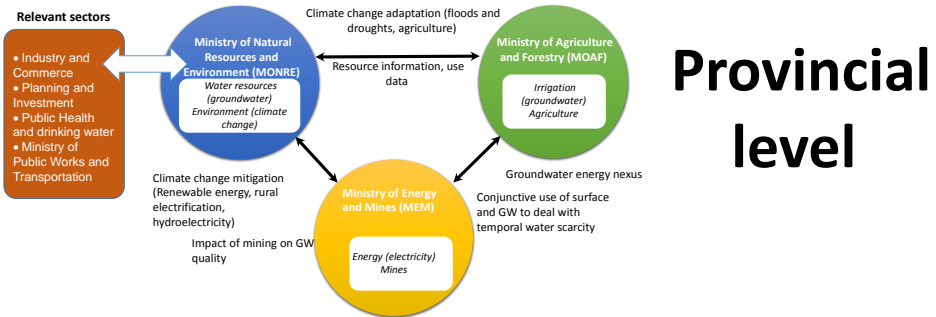
# Institutional coordination



Updates of plans, actions and outcomes for better coherence and inclusive decision making.

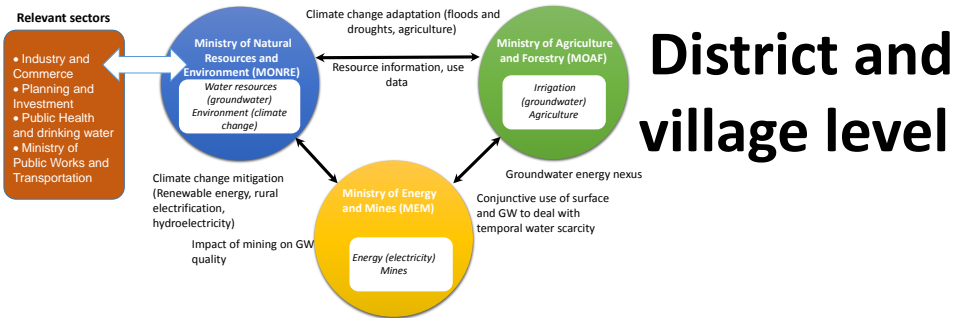
Update about the policies, plans, decisions and encourage decentralize decision making at the provincial level

Coordinate among line ministries to introduce new policy instruments such as water pricing, energy pricing, CC mitigation-adaptation synergies etc



Act as a mediator to communicate information and decisions from central to district and district to central levels

Encourage decentralized decision making at the district and local level



Create a collaborative environment to enhance synergies between GW irrigation and agricultural practices (agronomy, harvesting, marketing etc.)

Act towards creating enabling environment for institutionalizing GW irrigation and other agricultural practices

Feedback and requests  
Services, support, and decisions

# International experiences

- International experiences on groundwater use and management provide a valuable lesson to Lao PDR, which is at its early stage of groundwater development:
  - Speed-up the progress of institutionalizing groundwater irrigation and avoid the time spent to learn from its own experience;
  - Stop repeating the potential problems that was observed in other countries
  - Adopt good lessons

# Lessons to avoid

Lessons	Characteristics	Implications for Lao PDR
<b>Uncontrolled development of groundwater</b>	<p>A common phenomenon that was observed not only in irrigation but also in other use categories such as water supply, industries across groundwater dependent countries.</p> <p>Resulted into a vicious cycle of exploitation and resource depletion</p>	<p>Less likely at present condition. But without appropriate policy and legal backing and their implementation, potential increase in the use of groundwater in future might lead to such an anarchic situation</p>
<b>Unsustainable energy subsidy</b>	<p>India is a good example, where a politically popular policy of flat rate of electricity not only cost expensive for the state electricity authority but also resulted in excessive exploitation of groundwater resources</p>	<p>Highly likely considering government plans to increase coverage of electricity and existing issue with the accumulating unpaid electricity bills of the existing surface water irrigation system</p>
<b>Underdevelopment of groundwater resources</b>	<p>Underdevelopment of groundwater is also not desirable because it will be against the broader interest of country's agricultural development, poverty eradication and climate change adaptation. Lack of access to electricity, high cost of operations, and management of infrastructure (pumps), and market access were common barriers in Nepal, where groundwater use is still below the government target</p>	<p>Reflects the present condition in Lao PDR, except that there are no government policies or programs in place to promote groundwater irrigation. Government has an important role in facilitating uptake of groundwater irrigation by designing effective policies and programs to ensure a viable groundwater irrigation.</p>

# Lessons to adopt

Lessons	Characteristics	Implications for Lao PDR
<b>Participatory groundwater management (PIM)</b>	<p>Different models of PIM</p> <ul style="list-style-type: none"> <li>a) Community based GW irrigation: Andra Pradesh, India</li> <li>b) Participation based on shared interest of the users: Kohn Kaen, Thailand</li> <li>c) Participation enabled through external facilitation: Kohn Kaen, Thailand, GW irrigation Nepal</li> <li>d) Participation prompted by factors other than GW: Kohn Kaen, Thailand</li> <li>e) Participation to solve GW problems: Andra Pradesh, India; Aquifer Management Councils (COTAS), Mexico</li> </ul>	<p>-We found there are a lot of good examples of participatory approaches in Vientiane Province such as vegetable groups practicing good agriculture practices (GAP) with the help of the local agriculture office. There are water user associations (WUAs) who are in-charge of managing surface water irrigation or rural drinking water supply systems. PIM could be an effective strategy to institutionalize GW irrigation from the very early stage.</p>

# Lessons to adopt

Lessons	Characteristics	Implications for Lao PDR
<b>Demand management measures</b>	<p><b>Multiple cases (and it could also be a part of PIM).</b></p> <ul style="list-style-type: none"> <li>-Barind Multi-purpose Development Project (BMDP), Bangladesh. A water efficiency target was set for each deep tube-well. It was achieved through measures such as use of water coupons, incentives to extension workers when achieving efficiency above 60%, and covering pipelines to reduce evapotranspiration losses.</li> <li>-Water efficiency measures applied in coffee plantations in the Central Highlands of Vietnam by setting an optimum range of water use target per coffee plantation. A right combination of water application methods (such as drip irrigation), timing for irrigation, and improving the shades (to reduce evapotranspiration, regulate micro-climate, provide manure and improve quality of the coffee-beans) are applied.</li> </ul>	<ul style="list-style-type: none"> <li>- Such measures should be devised in order to reduce cost of operation, control overuse of GW, and improve productivity. Demand management measures along with other synergistic approaches such as Good Agricultural Practices (GAP) could also be considered to enhance effective use of GW.</li> </ul>
<b>Legal and regulatory measures</b>	<ul style="list-style-type: none"> <li>- Majority of GW depended countries have introduced legal and regulatory measures, although their effective implementation has remained as an important challenge. Countries such as Japan, Thailand, and some parts of China have achieve relative success in implementation.</li> </ul>	<ul style="list-style-type: none"> <li>- In other countries, legal and regulatory measures came as a response to solve serious GW problems. Lao PDR is at appropriate state to set-up and trial necessary legal and regulator measures</li> </ul>

# Recommendations....

- GW resource development, especially for irrigation, is at its infancy in Lao PDR and policy and institutional response is inadequate. Recently, interest towards its development and use is increasing due to multiple drivers (drought, cultivation of water intensive cash crops, industrial demand, and drinking water);
- Establishment of GW Division as well as introduction of GW specific laws and action plan is an important step for Lao government to systematize groundwater development and management. Next steps should focus on capacity building at all levels to implement the plans;
- International experiences are an important lessons for Lao considering that the use of groundwater is likely to accelerate in future with the growing uncertainty over water resources;
- While it is good to have a strong linkage among relevant ministries, it might increase complexities in decision making and result in inefficient coordination. It is recommended that initially, GW-Division-MONRE and DOI establish a close working level collaboration, while MEM should be involved more in the bi-lateral manner at this stage. However, with potential growth of GW uses in future, the level of MEM engagement should also be established to ensure conjunctive water management and sustainable energy supply.



# Thank you!!

With Groundwater



Without groundwater

