Greater Mekong Subregion Core Environment Program
Established as a regional center of excellence on strategic planning, policy and regulatory frameworks
  • National environmental, biodiversity, pollution control strategies, regulatory framework for environmental safeguards
  • Performing over ten Strategic Environmental Assessments in key development sectors

Knowledge management, decision support and best practices
  • Spatial planning, ecosystem service valuation, climate vulnerability assessment, industrial pollution projection

Stimulating environment and climate investments (more than US$ 100 million)
  • Biodiversity Conservation Corridors Project (Including FIP, PPCR and GEF add-ons), and
  • Green Freight Initiatives
Policies, planning and safeguards

• Led the application of SEAs (10 SEAs)

• Contributed monitoring and managing industrial pollution in CAM, LAO, and MYA Myanmar

• Assisted Viet Nam in reviewing its national PES scheme (M&E framework)

• Built capacity land use change modelling and spatial multicriteria assessment

• Developed EIA procedures, technical guidelines, national environmental quality standards, and sector specific guidelines in Myanmar.
**Application of SEA in PDP, Viet Nam**

**Generation Mix of Viet Nam’s Original and Revised Power Development Plan 7 (Megawatts)**

<table>
<thead>
<tr>
<th>Generation capacity 2030</th>
<th>PDP 7</th>
<th>Revised PDP 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>77,160</td>
<td>55,252</td>
</tr>
<tr>
<td>Natural gas and oil</td>
<td>17,465</td>
<td>19,078</td>
</tr>
<tr>
<td>Hydropower and pumped storage</td>
<td>21,125</td>
<td>21,871</td>
</tr>
<tr>
<td>Other renewable energy (including small hydro)</td>
<td>4,829</td>
<td>27,199</td>
</tr>
<tr>
<td>Nuclear</td>
<td>10,700</td>
<td>4,600</td>
</tr>
<tr>
<td>Imported</td>
<td>6,109</td>
<td>1,508</td>
</tr>
</tbody>
</table>

- Major cut in coal-fired power generation and a seven-fold increase in the amount of renewable energy.
- Reduce greenhouse gas emissions 100 million tons of CO2 equivalent a year by 2030.
- Saving of about $1 billion a year, based on the price of $10 a ton of CO2 equivalent price used in the revised PDP7.

PDP = power development plan.
Green freight initiative

Tested and proved the cost effectiveness of fuel efficiency technologies and eco-driver training to reduce carbon dioxide and other emissions from road freight in LAO, THA and VIE.

- Supported 60 SME freight companies
- Forty driver instructors trained
- 300 truck drivers trained on eco-driving and maintenance
Building climate resilience

- Built climate change knowledge partnerships among regional development organizations.
- Strengthened national capacity to assess climate change vulnerability and use participatory approaches to identify adaptation solutions.
- Eco-system based climate change adaptation promoted (guideline tested led by WWF).
- Assessed the potential of climate risk financing mechanisms and mix of climate financing risk mechanisms recommended (contingency fund, catastrophic fund, and micro-insurance).

Climate change adaptation roundtable

Developed guidelines for assessing climate change vulnerability in watersheds.

- GMS Environment Operations Center
- Food and Agriculture Organization of the United Nations
- Institute for Global Environmental Strategies
- Mekong Region Futures Institute
- International Union for the Conservation of Nature
- Southeast Asia START Regional Center
- Stockholm Environment Institute
- Thailand Environment Institute
- UN Environment
- USAID
- United States Forest Service
Landscapes and livelihoods

• Successfully introduced the biodiversity corridor approach in the GMS, leading to the better protection and management of more than 2.6 million hectares of habitat in five countries

• Leveraged more than $100 million in additional investments for biodiversity conservation and poverty reduction, including $94 million through the ADB–supported Biodiversity Conservation Corridors Project
Cooperation on transboundary landscapes

- PRC is collaborating with LAO, MYA and Viet Nam through regular exchange visits and several MoUs

- Cambodia and Thailand signed a memorandum of understanding to collaborate on adjoining areas of the Eastern Forest Complex and the Cardamom Mountains in 2018

- 3-rounds of Transboundary Landscape Forum held since 2015

- 2 TBL strategies prepared

- Piloted web geographic information system (GIS) combined with the field computer tablet for forest patrol groups to strengthen PFES monitoring in Viet Nam
Building a knowledge hub

The GMS Information Portal

http://portal.gms-eoc.org

82 CEP publications and 6 films produced

50 statistics
200 publications
10 tools
28 GIS datasets
1500+ news items
400+ environment event listings

Phase II: 40

Strengthened the environmental management capacity of 19,000 plus stakeholders through more than 500 subregional and national knowledge events. (Phase II: 250 regional and national knowledge events for more than 12,000 participants)
Lessons learned

- Programmatic approach has enabled the CEP to remain flexible and responsive—however it risks taking on a large number of small initiatives with less impact.

- More on-the-ground projects is needed to demonstrate impact and scalability.

- CEP should put more emphasis on incubating bankable projects, de-risking investments, conduct environmental and climate risk assessment on investments, and mobilizing public-private partnership.

- Create enabling policy environment to mobilize private sector investments.

- Continue capacity building and knowledge sharing activities.

- More emphasis should be put on technology transfer and south-south and triangular cooperation.
CEP by the numbers

- 2.6 million hectares of biodiversity corridors created
- 7 transboundary landscapes
- 12 laws, policies, and plans influenced
- 6 countries
- $101 million dollars in additional funding raised including $58 million for biodiversity conservation
- 19,000+ QMS participants involved
- 500+ knowledge and training events
- 82 publications and films produced
- 3 regional learning and exchange networks established
- 2 online knowledge portals created
- 5 sectors
- 10 strategic environmental assessments conducted across 5 sectors
Thank you

For further information
(www.gms-eoc.org)
Green Technologies for Climate Action and Environmental Sustainability
Context

• Industrial Revolution 4.0

• Science and technology policies and strategies of GMS countries increasingly recognize role of advanced digital technologies to solve environmental problems

• Circular economy, water-food-energy nexus, urban-rural linkages etc. provides analytical and response framework for integrated solutions—However requires understanding of complex interrelated relationships of resource use intensity

• Transparency—key component of monitoring, reporting, and verification requirements

• Digital technologies have created opportunity to track, monitor, and inform in efficient, cost-effective, and transparent manner.
Air quality management solution

Green Horizons is a global initiative to help improve humanity's relationship with the environment, supporting cleaner air and increasing the use of renewable energy.

IBM combines the power of the Internet of Things, Big Data processing and cognitive computing to analyze environmental data from thousands of sources and create accurate, self-configuring weather and pollution forecasts. This allows city planners and utilities to model a cleaner and more sustainable future.
Robot swans for water management

A NUSwan floating on a reservoir in Singapore. (NUS Environmental Research Institute/Subnero)
Ecosystem restoration

BioCarbon provides a two sided platform to inform decisions and enable customers to act on them.
Application of Blockchains for GHG mitigation

- Decentralized and transparent record keeping of energy use and GHG emission
- Potential to become strong component of MRV requirements
Web-based GIS and computer tablets for PFES monitoring in Viet Nam

Forest patrol groups are being empowered with digital technologies
Funding opportunity: High-Level Technology Fund

**ANNEX**

### HLT LIST PER PRIORITY SECTOR for 2019 (tentative)

To ensure strategic resource allocation, eligibility for the fund will be based on a technology list determined by the sector groups and donors (updated annually).

<table>
<thead>
<tr>
<th>Energy</th>
<th>Water</th>
<th>Transport</th>
<th>Urban</th>
<th>Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate change mitigation/adaptation technology</td>
<td>Climate change adaptation (flood and drought management)</td>
<td>Technology for efficient construction methodology, and new materials</td>
<td>Desalination technology</td>
<td>MHealth technology</td>
</tr>
<tr>
<td>Criteria air contaminants reduction technology</td>
<td>Groundwater management</td>
<td>Asset management technology</td>
<td>Remote-sensing technology</td>
<td>Unique patient identifier technology and Electronic medical records system</td>
</tr>
<tr>
<td>Smart grid technology</td>
<td>High efficiency irrigation systems including fertigation and pressurized irrigation</td>
<td>New vehicle/fuel technology for reducing emissions and energy consumption</td>
<td>Sanitation technology</td>
<td>Electronic health documentation management system</td>
</tr>
<tr>
<td>Energy efficiency technology</td>
<td>Crop water productivity assessment using remote sensing images</td>
<td>Improving public transport and freight operation and management</td>
<td>Smart city technology</td>
<td>Inter-operable health management information system,</td>
</tr>
<tr>
<td>Renewable energy technology</td>
<td>Advanced data collection &amp; instrumentation including remote sensing, high-resolution rainfall radar, Lidar, mobile phone application, drones, etc.</td>
<td>Improving efficiency and safety</td>
<td>Waste-to-energy technology</td>
<td>Telemedicine, tele-radiology, tele-diagnostics and related technology</td>
</tr>
<tr>
<td>Advanced energy system planning and analytical tools</td>
<td>Water quality management (including groundwater)</td>
<td>Monitoring traffic, data management, traffic information, transport payment system and enforcement</td>
<td>Water supply and losses</td>
<td>Rapid point of care diagnostics</td>
</tr>
<tr>
<td>Waste-to-energy technology</td>
<td>Advanced hydro modeling and data management technology</td>
<td>Shared mobility and new sustainable modes</td>
<td>Waste water treatment, smart systems, asset optimization, 3D simulation etc.</td>
<td>Health and clinical decision support technology</td>
</tr>
<tr>
<td>Innovative heating and cooling technology</td>
<td>Asset management systems</td>
<td>Providing mobility as a service platform and business model</td>
<td></td>
<td>Technology supporting improved physical access to elderly and people with disabilities</td>
</tr>
<tr>
<td>Application of clean energy technology in multi-sectors (e-mobility, irrigation, etc)</td>
<td>Multi-criteria optimization of water-energy-food nexus to inform decision-making</td>
<td>Technology for traffic survey, analysis, and modeling and big data application</td>
<td></td>
<td>Climate change mitigation/adaptation technology in health facilities</td>
</tr>
</tbody>
</table>
Areas of application:

- Pollution monitoring and forecast (IoT, cognitive computing—AI)
- Early warning system for disaster preparedness (IoT, AI, web-GIS, smartphone)
- Ecosystem monitoring and restoration (e.g. Drone technology, machine learning-AI, web-GIS, smartphone)
- Green house gas monitoring and reporting (e.g. IoT, Blockchain)

Priority action for technology transfer and adoption:

- Pilot projects and action research to promote uptake of technology
- Awareness raising and capacity building on application of technology
- Legal and regulatory framework to build robust ecosystem around technologies
- Financial incentives for uptake of technologies and access to finance
Thank you

For further information
(www.gms-eoc.org)