6th Annual Meeting of Low Carbon Asia Research Network

Nationally Determined Contribution of Cambodia

1-3 November 2017
(Bangkok, Thailand)

Hak Mao
National Council for Sustainable Development/Ministry of Environment, Cambodia
I. Overview of Cambodia

II. Government’s policies to address climate change

III. Key considerations for NDCs of Cambodia

IV. GHG Emissions and Reduction by Sectors

V. GHG Emissions Reduction Policies and Strategies

VI. Final Remarks
I. OVERVIEW OF CAMBODIA

COUNTRY STATUS

- Population (2017): 16 mil
- GDP growth: 7% (annually)
- Urban growth rate (annually): 2.6%
- Upper middle income country by 2030 and a developed level by 2050
- Forest cover: 73% (1960) to 47% (2016)
- Power generation by sources (2016): Hydro (44%); Coal (51%); Diesel/HFO (4%); and Biomass (1%)
- Electricity Consumption by Final Users (2016): Resid (29%); Com (49%); Ind (22%); and other (0.1%)
- Per capita emissions (0.3tCO2)

KEY CHALLENGES

- Development pressure
- Environmental degradation
- Climate change
- Sustainable lifestyle
- Human resources
- Governance/Coordination/Planning, etc.

POLICY & LEGAL FRAMEWORK

- SDGs
- Laws: Environmental Protection, Forestry, Fisheries, Land Mgt, PAs, Solid/wastewater, water, etc.
- National Forestry Policy
- Rectangular Strategy (Phase III)
- NSP on GG 2013-2030
- NSDP 2014-2018
- CCCSP 2014-2023, etc.
II. GOVERNMENT’S POLICIES TO ADDRESS CLIMATE CHANGE

- Rectangular strategy
- National Strategic Development Plan

Green Growth Roadmap and Green Growth Strategic Plan (2013-2030)

Cambodia Climate Change Strategic Plan (2014-2023)

Sustainable Development Goals

UNFCCC/Kyoto protocol

Adaptation and Mitigation

Paris Agreement

NDC towards 2030 (27% reduction compared to the BaU level)
III. KEY INDICATORS FOR NDCs

- Cambodia is not a major contributor to climate change but is the most vulnerable country

- Land-use change and forestry is a major source and sink of GHG emissions/removal while the energy sector just gradually increased

- Major sources used to prepare the NDC
  - Second National Communication;
  - Climate Change Strategic Plan 2014-2023, NAPA; and
  - National Policy on Rural Electrification by Renewable Energy, etc.
ADAPTATION

- **Agriculture:** The agricultural production system is dependent either on rainfall or on the annual flooding and recession of the Tonle Sap Great Lake.

- **Infrastructure:** the increasing occurrence and severity of floods exacerbated by climate change are resulting in high costs for the maintenance and upgrading of roads and irrigation infrastructure.

- **Forestry:** Most lowland forest will be exposed to a longer dry period, particularly forest areas located in the northeast and southwest. More than 4 million hectares of lowland forest, which currently has a water deficit period of between 4 and 6 months, will face a greater water deficit period of between 6 to 8 months or more.
**Human health:** Direct impacts include death, injury, psychological disorders and damage to public health infrastructure. Indirect impacts include changes in the geographical range and incidence of vector-borne diseases, water-borne and infectious diseases, malnutrition and hunger as a result of ecosystem disturbance.

**Coastal zones:** Coastal zone resources already face a number of pressures, including from over-fishing, over-exploitation of forest resources and mangrove ecosystems leading to increased erosion. Climate change adds to these existing challenges through sea level rise, shrinking arable land and decreasing availability of drinking water.
## MITIGATION

<table>
<thead>
<tr>
<th>Sector</th>
<th>Priority actions</th>
<th>Reduction (Gg. CO\textsubscript{2}eq.) 2030 compared to BaU</th>
</tr>
</thead>
</table>
| Energy Industries    | - Grid connected renewable energy generation (solar energy, hydropower, biomass and biogas).  
- Off-grid electricity such as solar home systems, hydro (pico, mini and micro).  
- Promote energy efficiency by end users.                                                                                                             | 1,800 (16%)                                               |
| Manufacturing Industries | - Promote use of renewable energy and adopt energy efficiency for garment factory, rice mills, and brick kilns.                                                                                                 | 727 (7%)                                                  |
| Transport            | - Promote mass public transport.  
- Improve operation and maintenance of vehicles, and the increased use of hybrid cars, electric vehicles and bicycles.                                                                                       | 390 (3%)                                                  |
| Other                | - Promote energy efficiency for buildings and more efficient cook-stoves.  
- Reduce emissions from waste through use of bio-digesters and water filters.  
- Use renewable energy for irrigation and solar lamps.                                                                                            | 155 (1%)                                                  |
<p>| <strong>Total Savings</strong>     |                                                                                                                                                                                                            | 3,100 (27%)                                              |</p>
<table>
<thead>
<tr>
<th>Name of activity</th>
<th>Description</th>
<th>Estimated emission reductions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase forest cover to 60% by 2030, and maintaining it after 2030</td>
<td>Cambodia is striving to increase the forest cover by 60% from 57% in 2010. This will be achieved in particular through: Reclassification of forest areas to avoid deforestation: - Protected areas: 2.8 million hectares - Protected forest: 3 million hectares - Community forest: 2 million hectares - Forest concessions reclassified to protected and production forest: 0.3 million hectares - Production forest: 2.5 million hectares.</td>
<td>4.7 tCO₂eq./ha/year for up to 5 million hectares</td>
</tr>
</tbody>
</table>

**Reclassification of forest areas to avoid deforestation:**

- Protected areas: 2.8 million hectares
- Protected forest: 3 million hectares
- Community forest: 2 million hectares
- Forest concessions reclassified to protected and production forest: 0.3 million hectares
- Production forest: 2.5 million hectares.

**Implementation of the FLEGT programme in Cambodia**

The objective is to improve forest governance and promote international trade in verified legal timber.

FLEGT stands for Forest Law Enforcement, Governance and Trade. It aims to reduce illegal logging by strengthening sustainable and legal forest management, improving governance and promoting trade in legally produced timber.
REDD+ STRATEGY

- **STRATEGIC OBJECTIVE 1:** Improve efficiency of forest resource and land use management and monitoring

- **STRATEGIC OBJECTIVE 2:** Strengthen the implementation of sustainable forest management

- **STRATEGIC OBJECTIVE 3:** Mainstream forest degradation reduction, Capacity building, and Encouragement of stakeholders participation
### IV. GHG EMISSIONS AND REDUCTION BY SECTORS

<table>
<thead>
<tr>
<th>GHG emissions and reductions</th>
<th>2010</th>
<th>2030BaU</th>
<th>2030CM</th>
<th>2050BaU</th>
<th>2050CM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>830</td>
<td>2,414</td>
<td>918</td>
<td>9,889</td>
<td>2,034</td>
</tr>
<tr>
<td>Commercial</td>
<td>217</td>
<td>1,433</td>
<td>482</td>
<td>3,663</td>
<td>1,298</td>
</tr>
<tr>
<td>Industrial</td>
<td>1,173</td>
<td>7,536</td>
<td>3,926</td>
<td>23,691</td>
<td>11,136</td>
</tr>
<tr>
<td>Passenger transport</td>
<td>996</td>
<td>6,374</td>
<td>2,743</td>
<td>22,276</td>
<td>9,431</td>
</tr>
<tr>
<td>Freight transport</td>
<td>1,004</td>
<td>5,521</td>
<td>2,383</td>
<td>31,806</td>
<td>15,273</td>
</tr>
<tr>
<td>Agricultural sector</td>
<td>26,142</td>
<td>44,062</td>
<td>28,490</td>
<td>66,808</td>
<td>46,259</td>
</tr>
<tr>
<td>LULUCF sector*</td>
<td>-27,082</td>
<td>-52,826</td>
<td>-61,715</td>
<td>-52,826</td>
<td>-61,712</td>
</tr>
<tr>
<td>Waste sector</td>
<td>1,566</td>
<td>5,731</td>
<td>4,980</td>
<td>15,216</td>
<td>9,341</td>
</tr>
<tr>
<td><strong>Total (ktCO2eq./year)</strong></td>
<td>4,847</td>
<td>20,245</td>
<td>-17,794</td>
<td>120,523</td>
<td>33,067</td>
</tr>
<tr>
<td><strong>Per capita GHG emissions</strong></td>
<td>0.35</td>
<td>1.10</td>
<td>-0.97</td>
<td>5.49</td>
<td>1.51</td>
</tr>
<tr>
<td><em>(tCO2eq./person)</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* minus means carbon sink
### V. GHG EMISSIONS REDUCTION POLICIES AND STRATEGIES

<table>
<thead>
<tr>
<th>Four policies and a dozen strategies</th>
<th>CODE</th>
<th>Explanation</th>
<th>GHG reductions*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>POLICY ON HARMONIZATION OF GREEN ECONOMY, SOCIETY, AND CULTURE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green good governance and human resource development (indirect)</td>
<td>GGG</td>
<td>Implementation of green institutions and youths’ participation for natural resources management/ environmental protection</td>
<td>11,409</td>
</tr>
<tr>
<td>Green tourism management (indirect)</td>
<td>GTM</td>
<td>Promotion of waste minimization and use of public transportation by tourists</td>
<td>47,246</td>
</tr>
<tr>
<td>Green financial mobilization (indirect)</td>
<td>GFM</td>
<td>Investment in natural resources protection and renewable energy</td>
<td></td>
</tr>
<tr>
<td>Green energy</td>
<td>GEN</td>
<td>Use of smart appliances and renewable energy</td>
<td>4,281 16,559</td>
</tr>
<tr>
<td>Green technologies and investment</td>
<td>GTI</td>
<td>Investment in green technologies (e.g. solar)</td>
<td>1,443 4,927</td>
</tr>
<tr>
<td>Green transportation</td>
<td>GTR</td>
<td>Introduction of energy efficiency vehicles and public transportation system</td>
<td>5,685 25,761</td>
</tr>
<tr>
<td><strong>POLICY ON GREEN ENVIRONMENT</strong></td>
<td>PGE</td>
<td></td>
<td>25,212 35,310</td>
</tr>
<tr>
<td>Sustainable forest management</td>
<td>SFM</td>
<td>Effective forest management and plantations</td>
<td>8,889 8,886</td>
</tr>
<tr>
<td>Sustainable waste management</td>
<td>SWM</td>
<td>Implementation of 3Rs principle and CH4 recovery</td>
<td>751 5,874</td>
</tr>
<tr>
<td>Green agriculture management</td>
<td>GAM</td>
<td>Introduction of midseason drainage in paddy rice and off-season incorporation of rice straw</td>
<td>15,572 20,550</td>
</tr>
<tr>
<td><strong>POLICY ON ECO-VILLAGE</strong></td>
<td>PEV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low carbon infrastructure</td>
<td>LCI</td>
<td>Designing of walkable city and modal shift</td>
<td>1,084 3,618</td>
</tr>
<tr>
<td>Green building</td>
<td>GBD</td>
<td>Introduction of green building design and construction and energy savings behaviors</td>
<td>333 1,289</td>
</tr>
<tr>
<td><strong>POLICY ON BLUE ECONOMY (INDIRECT)</strong></td>
<td>PBE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green merchant marine and sustainable coastal zone management</td>
<td>CZM</td>
<td>Effective mangrove management, protection and plantations</td>
<td></td>
</tr>
<tr>
<td><strong>Total emissions reduction</strong></td>
<td></td>
<td></td>
<td>38,039 87,462</td>
</tr>
</tbody>
</table>

*These reductions are compared to 20,245 and 120,523 ktCO₂eq./year in 2030BaU and 2050BaU, respectively.  
BaU = Business as Usual; CM = Countermeasure
VI. FINAL REMARKS

- Total GHG emissions in Cambodia are projected to increase about **4 times** in 2030 and **32 times** in 2050 from 2010;
- Per capita emissions increase from **0.35tCO₂eq./year** in 2010 to **1.10** and **5.49 tCO₂eq./year** in 2030 and 2050, respectively;
- A number of policies and strategies has been established to address climate change and to ensure sustainable development;
- The country has very high potential for GHG emissions reduction, especially from the forestry sector;
- 27% of GHG emissions are expected to reduce by 2030 compared to the BaU level (NDCs);
- Human resource development is needed to enhance research activity; and
- Mobilization of resources is needed to ensure the implementation of the proposed activities as indicated in the NDCs.