Climate risk assessment for agricultural value chains in Cambodia

Country experience with a project preparation “Public-Social-Private Partnerships for Ecologically-Sound Agriculture and Resilient Livelihood in Northern Tonle Sap Basin (PEARL)” to GCF

Webinar
Scaling up Climate Ambition on Land Use and Agriculture through NDCs and NAPs (SCALA)
7 September 2021 | 13:00-14:15 CEST
PEARL Project

Climate change impacts:
- Shorter/more intense wet season incl. flash floods
- Longer/more intense dry season incl. droughts
- Increased temperatures
- Increased pest and disease outbreaks

PEARL aims to catalyzes paradigm shift towards resilient, diversified, higher-value and sustainable agriculture

Present

BAU Scenario
- Increased crop loss and damage
- Reduced yields/farm income (esp. rice based)
- Increased food insecurity
- Little to no adaptive capacity

Future

After PEARL
- Climate resilient, diversified, and higher-value practices adopted
- Options for private sector investment increased
- Resource access and adaptive capacity increased
- Enabling environment created

NTSB smallholders’ livelihoods

Critical period ~ 2030

Rice, mango, cashew and vegetable
Climate resilience assessment

Adopted Value Chain Approach to Assess Climate Resilience

• Mapping the value chain
• Climate risk assessment and climate rationale aimed to identify climate impacts on all steps of the 4 value chains
• Identifying climate resilient interventions and investment options for climate resilient value chain transformation
Mapping the value chain

Source: FAO and UNDP. 2020

- Processes products, e.g. dried mango, mango ice cream
- Fresh mangoes:
  - Formal exports (Thailand, Korea, Singapore, China, EU, US etc.): 97,628 tonnes (10 percent)
  - Informal exports (Viet Nam and Thailand): 849,998 tonnes (90 percent)

Small retail shops, open air markets, street vendors, modern retailers/supermarkets

Mostly at small scale: dried mango, pickled mango, mango ice cream mainly for domestic market, with some for export

Wholesalers, large traders and exporters (with packing house and processing facilities to local retail or export): 60 percent sourced from producers and 40 percent from local collectors

Local small and medium collectors

Small-, medium- and large- scale producers: 327,000 households
- Cultivated area: 131,890 ha
- Harvestable area: 93,099 ha
- Production: 1.38 million tonnes

Input suppliers/shops

Input importers

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Input importers
General problems in the mango value chain (e-survey)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Yes, a major problem</th>
<th>Yes, a minor problem</th>
<th>No, not a problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate product grading or packing facilities</td>
<td>83%</td>
<td>17%</td>
<td>0%</td>
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<tr>
<td>Lack of market information</td>
<td>83%</td>
<td>17%</td>
<td>0%</td>
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<tr>
<td>Inadequate storage facilities</td>
<td>75%</td>
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<tr>
<td>Lack of investment capital or cashflow</td>
<td>75%</td>
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<tr>
<td>Product dumping</td>
<td>75%</td>
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<tr>
<td>Lack of weather forecast information</td>
<td>75%</td>
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<tr>
<td>Limited market access</td>
<td>67%</td>
<td>33%</td>
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<tr>
<td>Poor knowledge and skills</td>
<td>67%</td>
<td>33%</td>
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<tr>
<td>Low quality agricultural product</td>
<td>67%</td>
<td>33%</td>
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<tr>
<td>Poor communication between actors</td>
<td>67%</td>
<td>33%</td>
<td>0%</td>
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<tr>
<td>Insufficient processing facilities</td>
<td>58%</td>
<td>42%</td>
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<tr>
<td>Export barriers</td>
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<tr>
<td>Weak business skills</td>
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<tr>
<td>Variable or low productivity</td>
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<tr>
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<tr>
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<td>58%</td>
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<td>33%</td>
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</tbody>
</table>
Food safety problems in the mango value chain (e-survey)

- Use of uncomposted manures: 8%
- Contamination in the supply chain: 17%
- Lack of adequate farm inputs: 8%
- Microbial contamination: 42%
- Lack of regulation of inputs: 83%
- Inadequate product washing: 75%
- Lack of residue testing: 0%
- Inadequate product labeling: 83%
- Lack of product specifications: 0%
- Poor or inadequate packaging: 67%
- Insufficient product grading and sorting: 8%
- Use of unregistered pesticides or herbicides: 8%
- Unclear labeling of agricultural inputs: 83%
- Rough product handling: 58%
- Lack of residue testing: 17%
- Inadequate product washing: 42%
- Microbial contamination: 8%
- Lack of regulate of inputs: 8%
- Inadequate product labeling: 0%
- Poor communication across the value chain: 67%
- Insufficient phyto-sanitary requirements: 25%
- No accredited testing laboratories: 8%
- Limited knowledge about pest or disease management: 83%
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</thead>
<tbody>
<tr>
<td>Damaged or failed harvest</td>
<td>83%</td>
<td>17%</td>
<td>0%</td>
</tr>
<tr>
<td>Unreliable water supply</td>
<td>75%</td>
<td>25%</td>
<td>0%</td>
</tr>
<tr>
<td>Increased production costs</td>
<td>75%</td>
<td>25%</td>
<td>0%</td>
</tr>
<tr>
<td>Drought (lack of rainfall)</td>
<td>75%</td>
<td>25%</td>
<td>0%</td>
</tr>
<tr>
<td>Delays in the supply chain</td>
<td>67%</td>
<td>33%</td>
<td>0%</td>
</tr>
<tr>
<td>Unpredictable seasons</td>
<td>67%</td>
<td>33%</td>
<td>0%</td>
</tr>
<tr>
<td>Heavy rain</td>
<td>67%</td>
<td>33%</td>
<td>0%</td>
</tr>
<tr>
<td>Damaged infrastructure</td>
<td>58%</td>
<td>42%</td>
<td>0%</td>
</tr>
<tr>
<td>Higher diurnal or seasonal temperature</td>
<td>58%</td>
<td>42%</td>
<td>0%</td>
</tr>
<tr>
<td>Inaccessible roads and other transport</td>
<td>50%</td>
<td>50%</td>
<td>0%</td>
</tr>
<tr>
<td>Reduced value of the product</td>
<td>50%</td>
<td>50%</td>
<td>0%</td>
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<tr>
<td>Soil erosion or soil degradation</td>
<td>50%</td>
<td>50%</td>
<td>0%</td>
</tr>
<tr>
<td>Damaged utilities</td>
<td>50%</td>
<td>50%</td>
<td>0%</td>
</tr>
<tr>
<td>Flooding (from rain or river)</td>
<td>50%</td>
<td>50%</td>
<td>0%</td>
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<tr>
<td>Hot spells</td>
<td>42%</td>
<td>50%</td>
<td>0%</td>
</tr>
<tr>
<td>Strong storms</td>
<td>42%</td>
<td>50%</td>
<td>0%</td>
</tr>
<tr>
<td>Overloaded disaster response systems</td>
<td>42%</td>
<td>50%</td>
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<td>0%</td>
</tr>
<tr>
<td>Forest or grass wildfire</td>
<td>8%</td>
<td>92%</td>
<td>0%</td>
</tr>
</tbody>
</table>
Climate risk assessment

- Lack of weather forecast is a major problem confirmed by 75% of the participants.
- The climate risks posing major problems for mango: drought (75%), unpredictable seasons (67%), heavy rain (67%), increasing diurnal or seasonal temperatures (58%).
- The impact of climate risks on mango value chain: damaged or failed harvest (83%), increased production costs (75%), delays in the supply chain (67%), damaged infrastructure (58%), inaccessible roads (50%), reduced value of the product (50%), damaged utilities (50%).
- Extended drier and hotter periods, such as during El Nino, increases water demand and wildfire risks, as well as causes more pests (especially fruit fly and thrips)
- Increase pesticide application => food safety concern
- Changes in the rainfall intensity and duration can damage flowers (April-May) and fruit.
Key issues and possible breaking points for the mango value chain
Key measures for enhanced resilience to climate change, food safety and value addition for mango value chain

<table>
<thead>
<tr>
<th>Industry enabler</th>
<th>Producer</th>
<th>Transport</th>
<th>Processor</th>
<th>Consumer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landscape solutions (benefits outside value chain)</td>
<td>Packhouses</td>
<td>Supplier agreements</td>
<td>Product differentiation, branding and marketing</td>
<td>Minimum practices certification</td>
</tr>
</tbody>
</table>

- Professional extension program
- Farm finance advisory services
- Digital information services
- Planting material and quality cultivars
- Water management and irrigation

National policy hub (overarching)
Key measures for enhanced resilience to climate change, food safety and value addition for mango value chain

**Water management and irrigation**, together with **digital technologies**, are highly applicable to building climate resilience in the mango value chain.

**Digital technologies** provide a significant opportunity to build highly accessible information services including weather forecasting with linkage to water management and irrigation, pest and disease alerts (linked to extension and advisory services) and market data.

**Packhouses** need to be a priority for Oddar Meanchey mango, to provide postharvest aggregation and improve economies of scale for smallholders.

**Product differentiation**: Branding, packaging and certification.

**Cluster of production and supplier agreement**: Organize farmers into clusters, so they can better plan and monitor production schedules, ensuring reliability of supply and minimizing oversupply. Foster collaborative agribusiness partnerships (public-private-producer partnership- 4 Ps) through contract farming between producer groups and processors, wholesalers and exporters.
Additional assessments

- Currently **Assessing** Climate Hazards and risks, Climate Services, and Climate Resilience Practices along Food Value Chain Steps building on previous works;
- Understanding climate risks along 4 target value chains;
- The survey was targeted to key stakeholders on climate risks and potential for climate services
- **Identifying, and fine-tuning** the climate resilient interventions

<table>
<thead>
<tr>
<th>Climate Hazards</th>
<th>Climate Services</th>
<th>Climate Resilient Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flooding and Drought</td>
<td>Real-time weather forecasts</td>
<td>- Adequate harvest equipment; - Training on harvesting methods and best timing.</td>
</tr>
<tr>
<td>Pests and diseases</td>
<td>Pest and disease alerts</td>
<td>- Earlier harvest; - Work hygiene and sanitation practices; - Immediate drying techniques.</td>
</tr>
</tbody>
</table>

Harvest → Storage & Refrigeration → Processing & Packaging → Transport → Markets/retail
Thank you for your kind attention

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FAO Cambodia