Introduction: Environment Sector

- Cross-cutting sector in PDNAs
- Key issues typically include:
  - Forestry
  - Protected areas and biodiversity (sensitive ecosystems including wetlands)
  - Landslides and severe erosion (non-agricultural areas)
  - Hazardous substances & chemical pollution incidents (water quality, land contamination)
  - Disaster waste (debris)
  - Environmental governance
- High-profile with climate-induced disasters and major conflict impacts
- Increasing environmental economic valuation
- Yet, environment L&D and needs assessments remain largely underestimated
## Pakistan floods PDNA (2022)

<table>
<thead>
<tr>
<th>Relatively modest figures</th>
<th>Environmental Recovery needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damages: USD 18 million (USD 14.4 billion)</td>
<td>USD 160 million (USD 15.9 billion)</td>
</tr>
<tr>
<td>Losses: USD 29 million (USD 12.7 billion)</td>
<td>Five-year environmental recovery strategy aligned with the “Living Indus Initiative” with an estimated cost of USD 1.8 billion</td>
</tr>
<tr>
<td>Forestry: ~60% of environmental damages, and almost 99% of losses.</td>
<td>Three main components:</td>
</tr>
<tr>
<td>Sindh Province accounts for 77% of total forest damages.</td>
<td>- ecosystem-based adaption for integrated flood risk management (USD 805 million)</td>
</tr>
<tr>
<td>Landslides/soil erosion: ~29% of environmental damages.</td>
<td>- pollution reduction and waste management (USD 670 million)</td>
</tr>
<tr>
<td>Protected areas account for around 11% of overall damages</td>
<td>- strengthening environmental governance (USD 358 million)</td>
</tr>
</tbody>
</table>

## Ukraine Rapid Damage Needs Assessment V2.0 (2023)

- Forest fires are considered as the principal source of war-related environmental damage at USD 1.5 billion
- Fire damage bulletins from GFMC Ukraine were used to estimate the extent of damage.
- Damage is calculated based on value of growing stock ($\text{m}^3$) and damage to roads
- Losses: inaccessible forest due to mines and ecosystem services valuation
- Losses: area burnt x unitary global value (Carbon price and tax rate for PM$_{2.5}$), *but not included in loss tables.*
Kakhovka dam breach PDNA (2023)

- Impacted forested area was analyzed using satellite imagery by FAO and overlayed with extent of flooded area (UNOSAT vs. ESA World Cover baseline). All flooded forest considered lost.
- Global Unitary value was used for five ecosystem services including: recreation; hydrological services; habitat protection for biodiversity; non-wood forest products; and greenhouse gas removal to estimate the annual ecosystem losses. (i.e. damaged Area (ha) X Global Unitary Cost)
- Affected areas for wetlands of international importance were estimated using satellite imagery analysis by UK FCDO
- Global unitary cost is used to calculate the annual per hectare ecosystem services provided by each type of wetland
- Value of losses estimated at USD 6.4 billion (58% of all losses)
- Impact on the ecosystem services is estimated based on experts judgement

Challenges and Lessons

- Damage and losses significantly underestimated due to time limitations, access constraints, paucity of environmental data and inherent challenges in estimating ecosystem services. Limited environmental monitoring and reporting capacities and resources
- Recommendations for more assessments, investigations and capacity building to fill data gap
- Loss valuation largely based on modelling and assumptions, difficult to validate
- Premium on building back better is generally too limited to make a significant difference
- Need to link-up with existing national action plans and initiatives
Recommendations / Opportunities

- Earth observation and machine-based data analysis
- Bottom-up approaches for data collection (with NGOs, citizen science)
- Partnerships and wider stakeholder consultations (coordination capacity)
- Reference value costs to be used with care
- Re-examining PDNA expectations (more realistic)

Thank you for the attention!

Save the Date!

UNEP/UNDRR Consultation Workshop on Review of PDNA Environment Module

Hybrid Event
Geneva, 7-8 December
### SECTOR OVERVIEW OF DAMAGE AND LOSSES – Preliminary Estimates

<table>
<thead>
<tr>
<th>Province</th>
<th>Protected Areas (acres)</th>
<th>Forestry (acres)</th>
<th>Landslides/soil erosion (acres)</th>
<th>Damages (PKR million)</th>
<th>Losses (PKR million)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balochistan</td>
<td>296</td>
<td>1,002</td>
<td>833</td>
<td>669</td>
<td>116</td>
<td>786</td>
</tr>
<tr>
<td>Khyber Pakhtunkhwa</td>
<td>6,370</td>
<td>5,400</td>
<td>n.r.</td>
<td>346</td>
<td>515</td>
<td>862</td>
</tr>
<tr>
<td>Punjab</td>
<td>n.r.</td>
<td>1,538</td>
<td>n.r.</td>
<td>461</td>
<td>324</td>
<td>785</td>
</tr>
<tr>
<td>Sindh</td>
<td>60,759</td>
<td>400,000*</td>
<td>1,816</td>
<td>5,468</td>
<td>7,284</td>
<td></td>
</tr>
<tr>
<td>Gilgit Baltistan</td>
<td>n.r.</td>
<td>n.r.</td>
<td>545</td>
<td>645</td>
<td>n.r.</td>
<td>645</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6,666</strong></td>
<td><strong>70,799</strong></td>
<td><strong>401,419</strong></td>
<td><strong>3,938 (USD 18 million)</strong></td>
<td><strong>6,434 (USD 29 million)</strong></td>
<td><strong>10,362 (USD 47 million)</strong></td>
</tr>
</tbody>
</table>

* Further assessment required to characterize damage

Note:
- Damage and losses significantly underestimated due to the paucity of environmental data and inherent challenges in estimating ecosystem services.
- Full extent of damage to forest, biodiversity, land and pollution cleanup is yet to be fully accounted and requires more detailed investigations.

© UNDRR – United Nations Office for Disaster Risk Reduction