Agenda Item 4.d.i

Assessing forest damage/disturbance in the UNECE region

- Main results of the project

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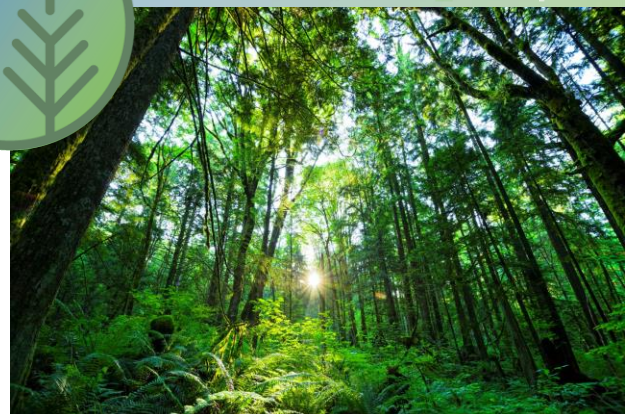
Third (32nd) meeting of the "UNECE/FAO Team of Specialists on monitoring sustainable forest management" – 30 May 2023, Geneva



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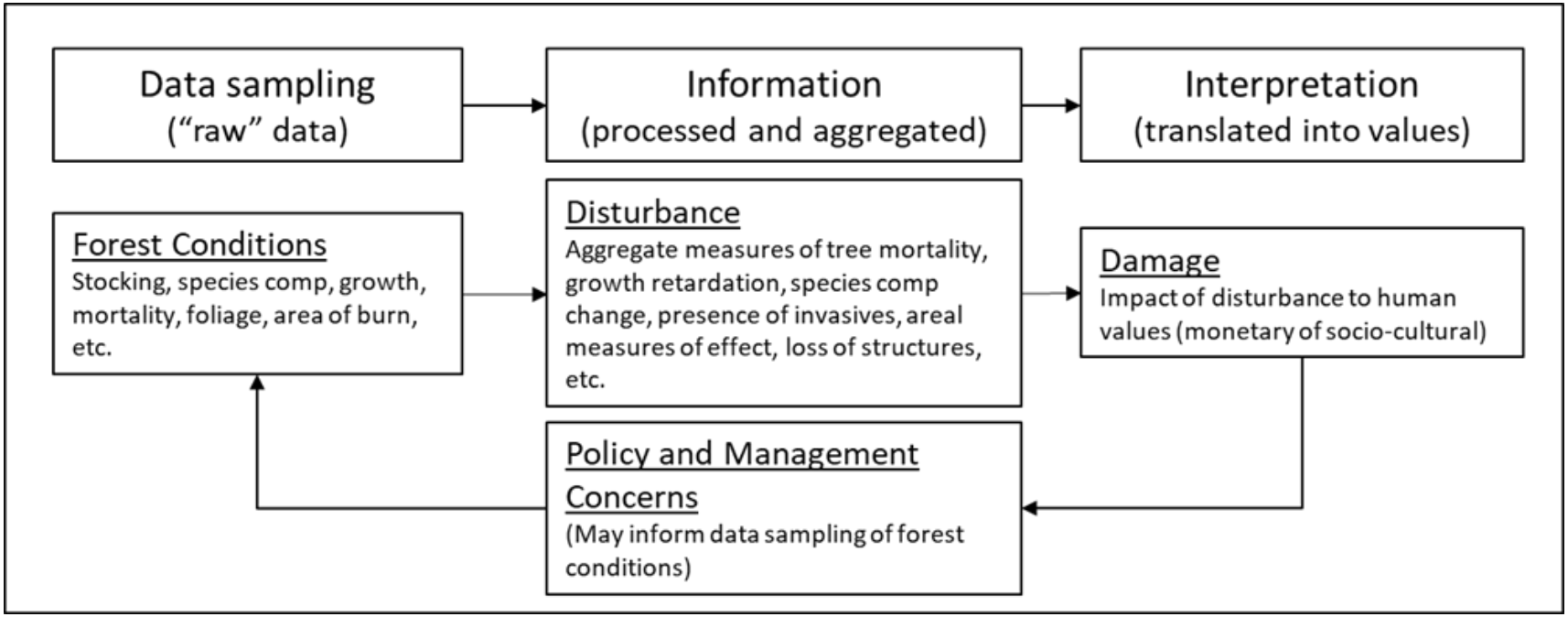
Conceptual foundations for forest damage and disturbance reporting in the UNECE

- **"Disturbance" and "damage" are often used interchangeably BUT disturbance is value neutral; damage relates to negative impacts to human values**



Disaster - great damage overwhelming available local resources for response

Forest damage/disturbance ≠ Forest health/vitality

Conceptual foundations cont.

- **Agent-centered vs. Impact-centered approach**
- **WHY do we measure d/d?**
  - **obtain information on values lost (goods, services, non-material values)**
  - **initiate targeted management responses**
  - **increase scientific knowledge**
  - **for national to global reporting incl. carbon accounting**
- **HOW is d/d measured?**

  ->ground-based observation, plot-based sampling, RS
- **WHAT is measured?**

  ->tree mortality, damaged trees, defoliation, evidence of damaging agents
- **Challenges: Complexity, causal attribution, reference values, aggregation**

Forest damage/disturbance reporting in the UNECE-region

Reporting is fragmented

- **Separate reports for: Central Asia and Caucasus, Montreal Process, Forest Europe (SoEF), Global (FRA)**
- **Different reference units: forest area affected by individual causes, total forest area affected, OWL affected**
- **Different number of causes of d/d**
- **Different data collection systems and sampling designs (NFI, dedicated monitoring systems, managerial records, stand-wise surveys)**
- **Area related data (ha) vs. tree related data (m^3)**

Survey on assessment methods applied at the national level

- 50 Survey questions elaborated by the ToS/FTS on d/d monitoring at national level and on information beyond what is so far reported to FRA
- Sent in 2021 to all 56 UNECE NCs, 39 responses covering 98% of UNECE forest area
- Current level of detail deemed insufficient, more detail of the specific d/d causes
- If more than one cause of d/d then distinguish between primary, secondary and subsequent causes
- Ranking acc. to severity of d/d regarding tree vitality
- Other reporting attributes used:

  -volume of growing stock affected

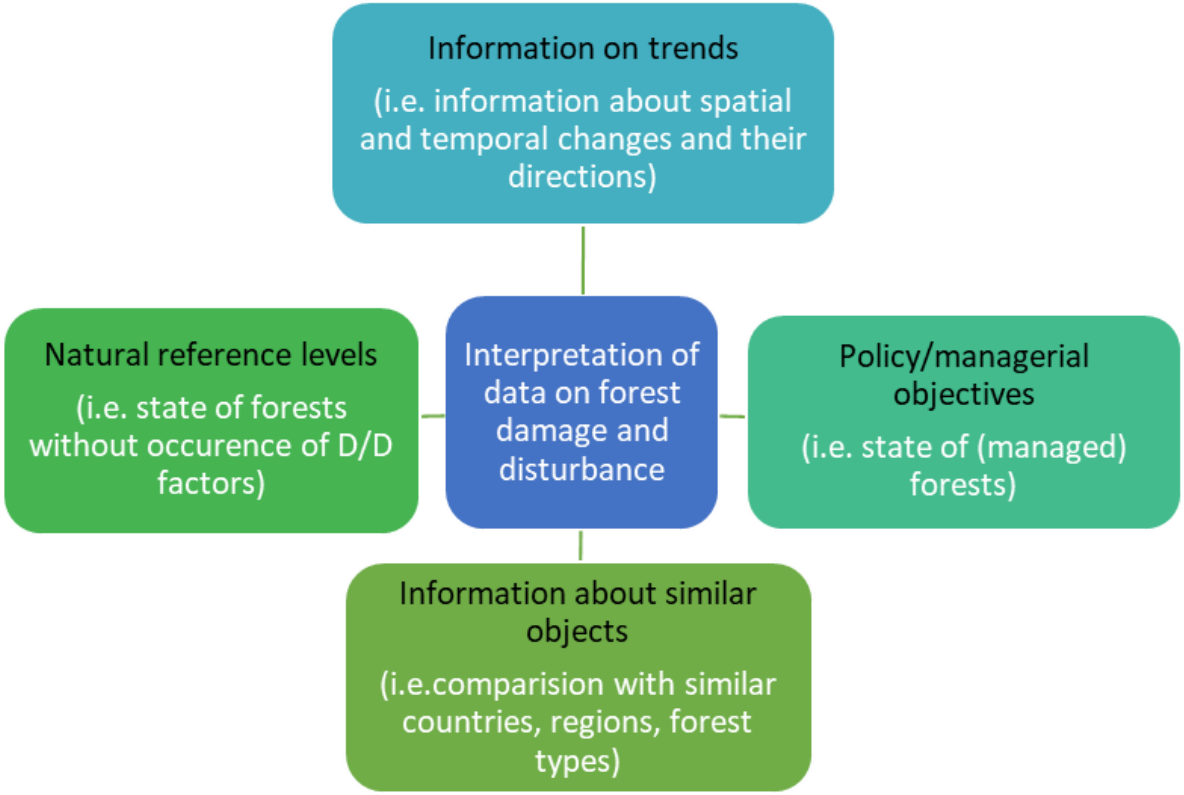
  -market value affected

FRA reporting on forest damage/disturbance – status, shortcomings, and way forward

- **From 2000-2020 betw. 40 and 49 of the 56 UNECE countries reported d/d data to FRA**
- ***Insects* top the UNECE graph in terms of *area affected***
- **In Africa, South America and Oceania *fires* top the chart**
- **Temporal resolution of national datasets varies**
- **National thresholds vary from FRA thresholds**
- **Differences in level of detail**
- **Alternative surveys on forest health within one country**

Interpreting forest damage/disturbance data

- **Purpose: extract specific information from raw data to inform decision-makers and subsequent actions**



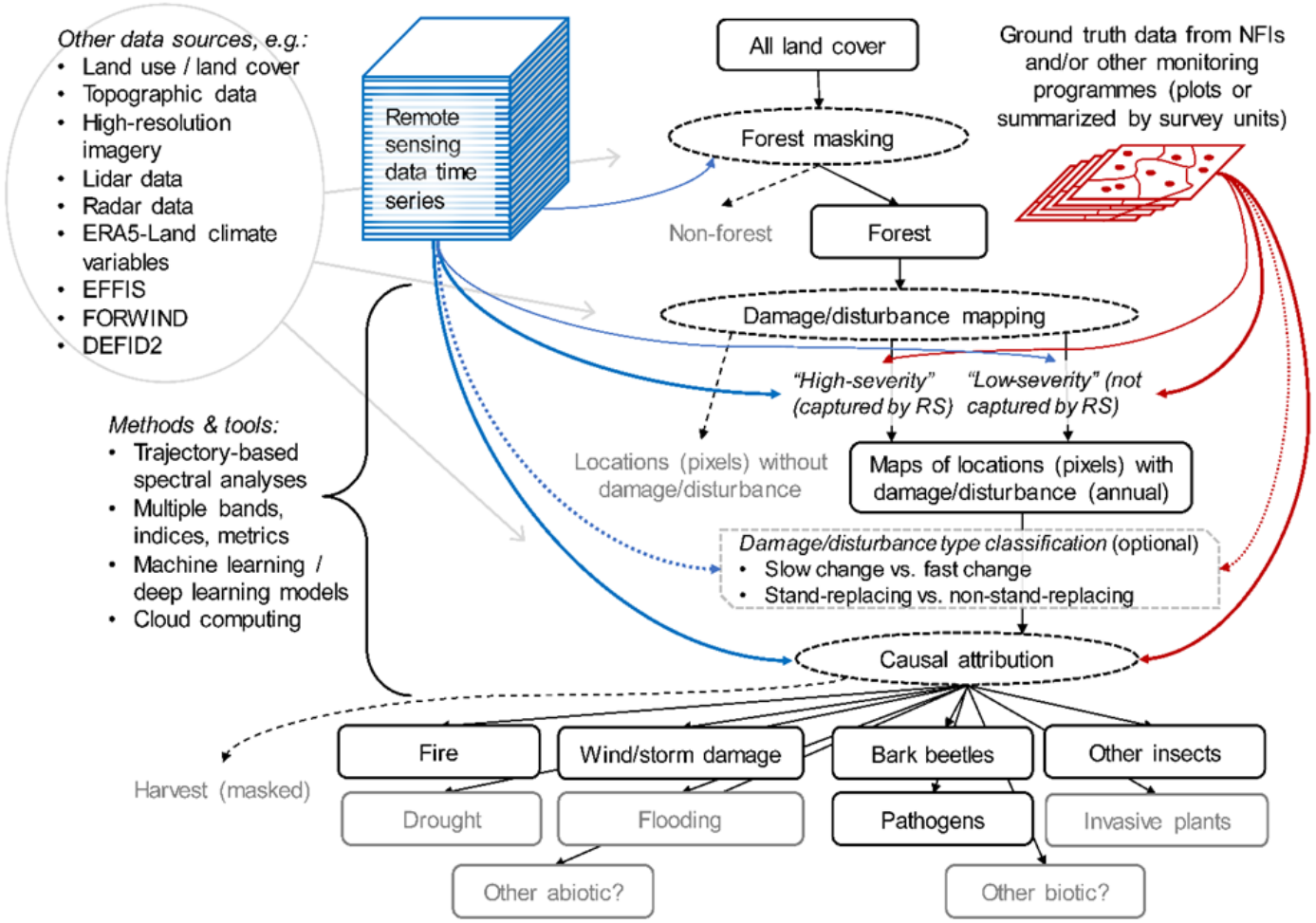
Innovative tools in line with methodologies for consistent forest d/d assessment

- **Goal: maximize compatibility and interpretability of forest d/d information for regional assessment**
- **Remote sensing as integral component**
  - **More RS data available than ever before**
  - **Major leaps in resolution, geographic coverage, types of information recorded (e.g., forest structure)**
  - **RS data usable within a shared geospatial framework**
- **But many challenges**
  - **Fundamentally, RS provides indirect measurements of forests and trees**
  - **Not all forest d/d can be observed via RS**
  - **Thus, issues of accuracy and detectability persist**

Innovative tools - How to proceed?

- **Start by mapping forest d/d occurrences**
  - **Track through time and ignore cause (initially)**
- **Enabled by technological advances in**
  - **Analytical approaches and algorithms**
  - **Cloud-computing platforms / workflows**
    - **Examples: Google Earth Engine, SEPAL platform**
  - **Artificial intelligence applications**
    - **Machine learning, deep learning**
- **Next step: causal attribution of mapped forest d/d**
  - **Relies on ancillary data**
    - **NFIs, fire info systems, insect/disease databases, many others**
  - **Attribution similarly enabled by technologies above**

Innovative tools, cont.
-Unified hybrid regional approach



Thank you

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