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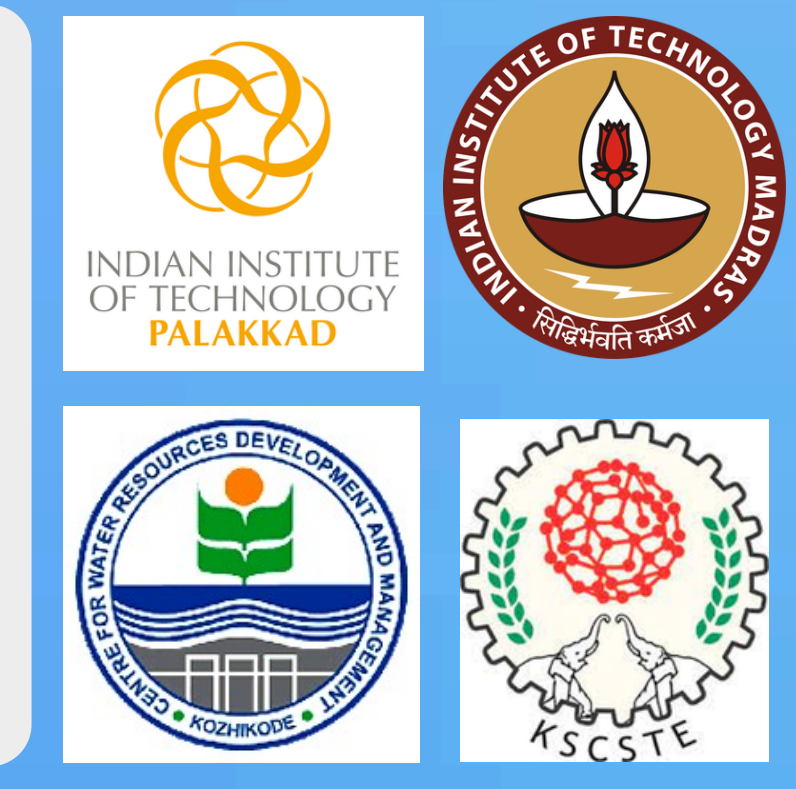
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Introduction

- UNSPF 2030: Calls for stronger action on forest degradation.
- FAO: Forest degradation is increasing globally and is now outpacing deforestation.
- FAO: Need robust methods to quantify forest degradation.
- Climate change: Must be included in assessments since it intensifies forest degradation drivers.
- Approach: Holistic and comprehensive frameworks are essential.

Gaps

- Need to move beyond “naturalness” concepts.
- Adopt level-2 ecological integrity with ‘new normals’ or ‘shifting baselines’.

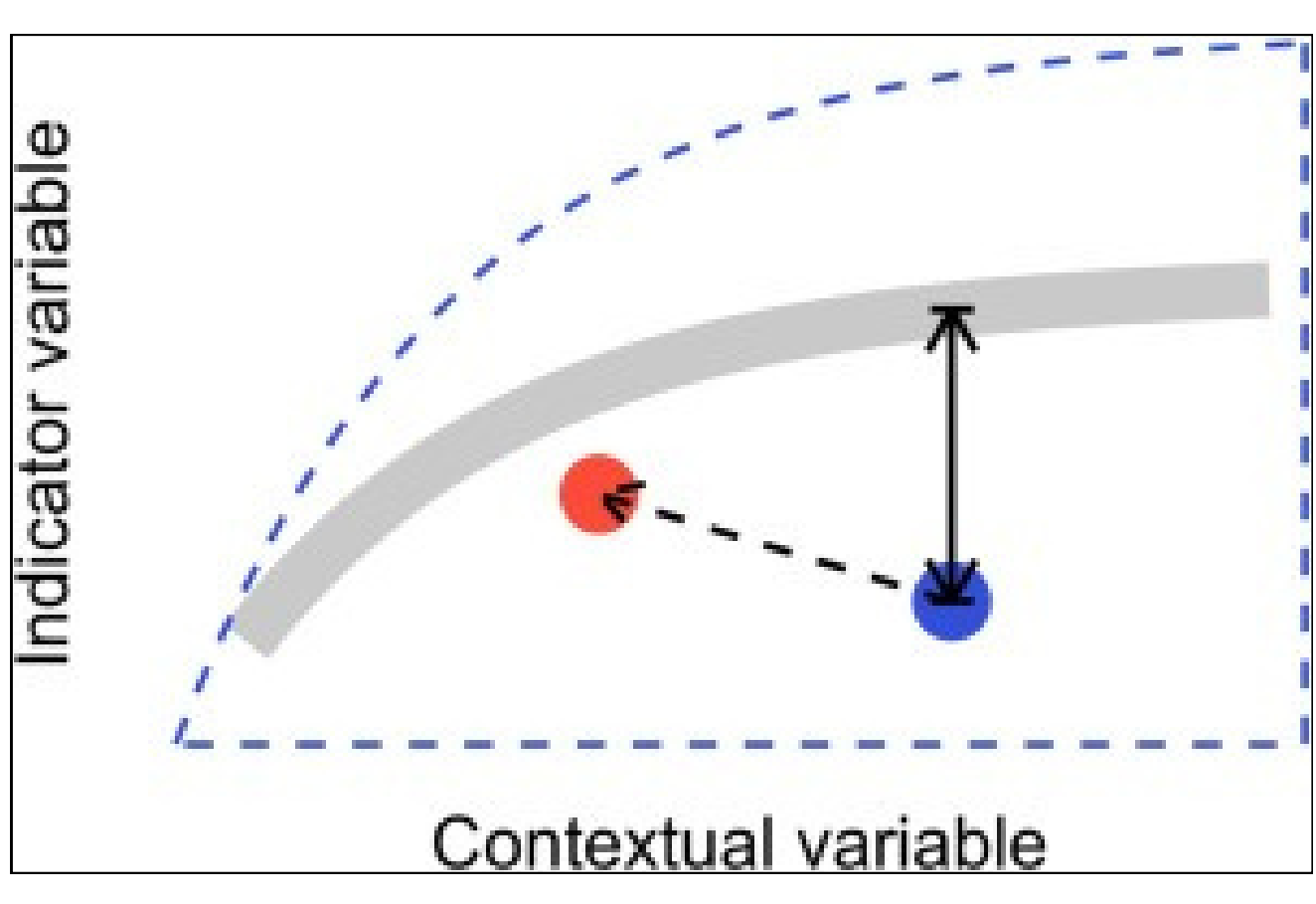


Figure 1: Level-2 ecological integrity concept. (Martin and Proulx., 2020)

- Address degradation as both ‘process’ and ‘state’.
- Track current condition, critical stages and temporal changes of forest degradation.
- A globally applicable, integrated assessment unit of forest degradation is needed for monitoring.

Key Considerations

- ‘Water Budget’ controls the resilience of any ecosystem restoration.
- Important to analyse the changes in forests using hydrological units as base assessment units.

Methodology

- Developed a Forest Landscape-Ecosystem Integrity Degradation assessment Framework (FLID Framework).
- It integrates six forest integrity criteria and multiple associated indicators and evaluators, each representing critical forest characteristics.

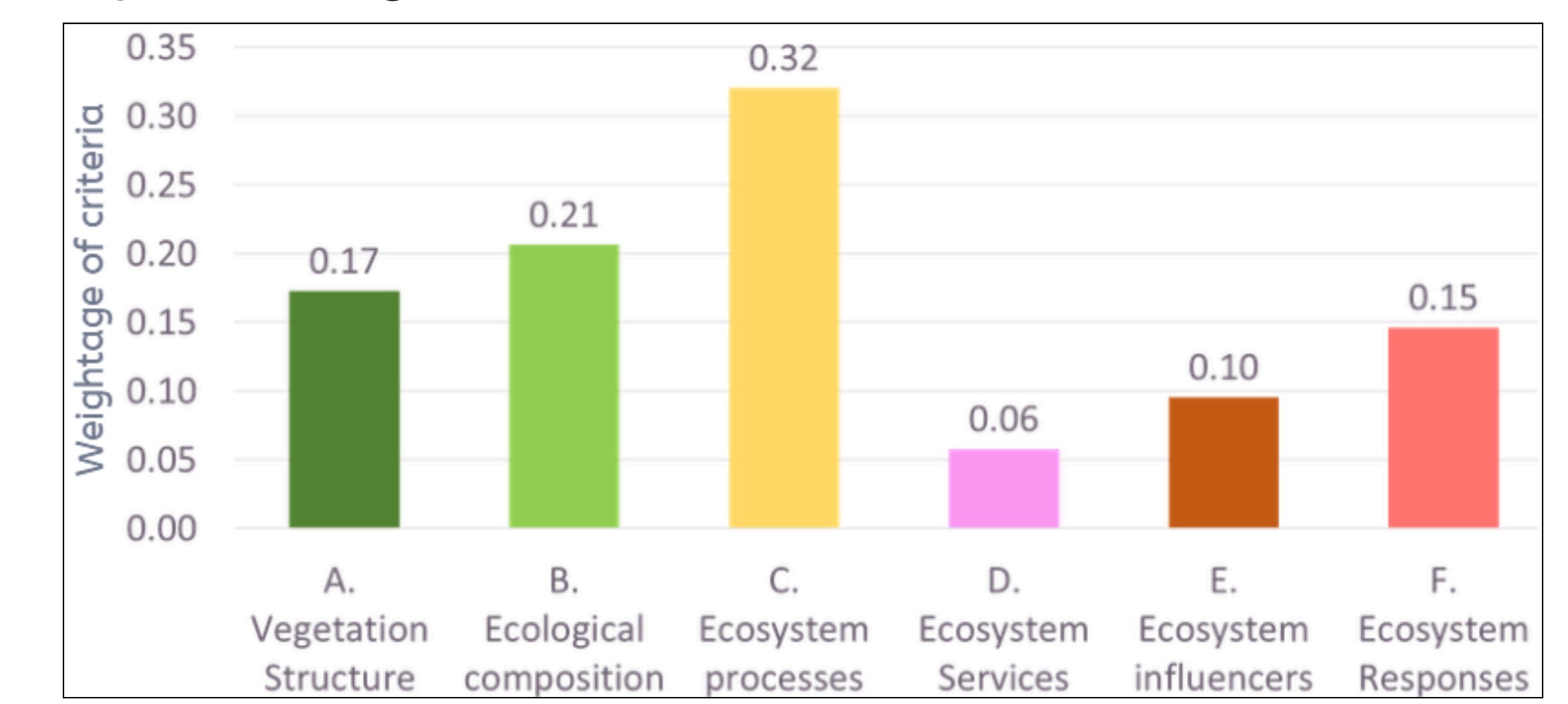


Figure 2: Criteria of forest degradation and their weightages

- AHP is employed to develop Forest Landscape-Ecosystem Integrity Degradation Index (FLID Index).
- FLID Index was used to define the stages of forest degradation and degraded state.

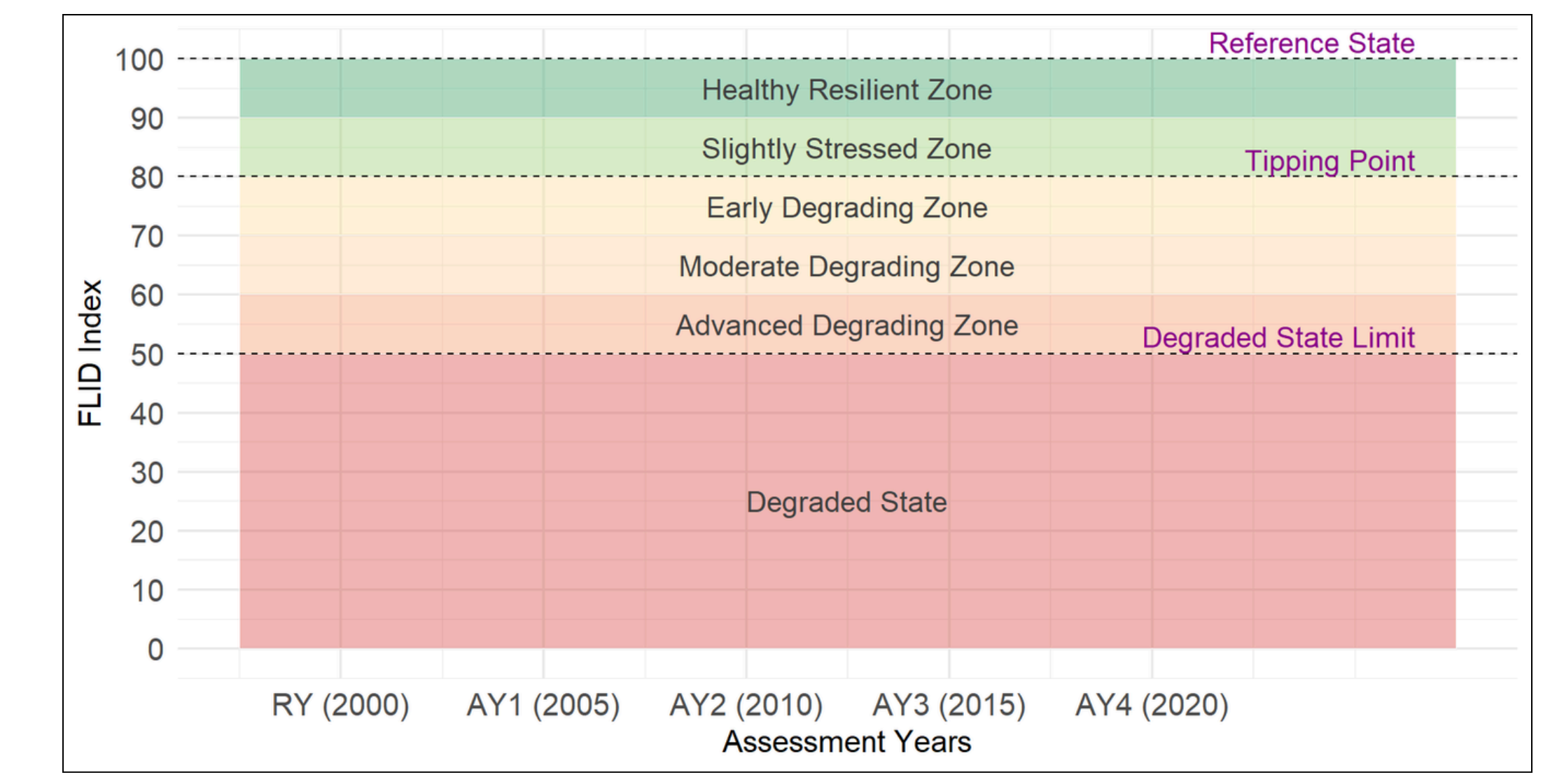


Figure 3: FLID index based forest degradation zones and state

- FLID index based forest degradation was assessed for a tropical river basin in India with ~80% forest cover.

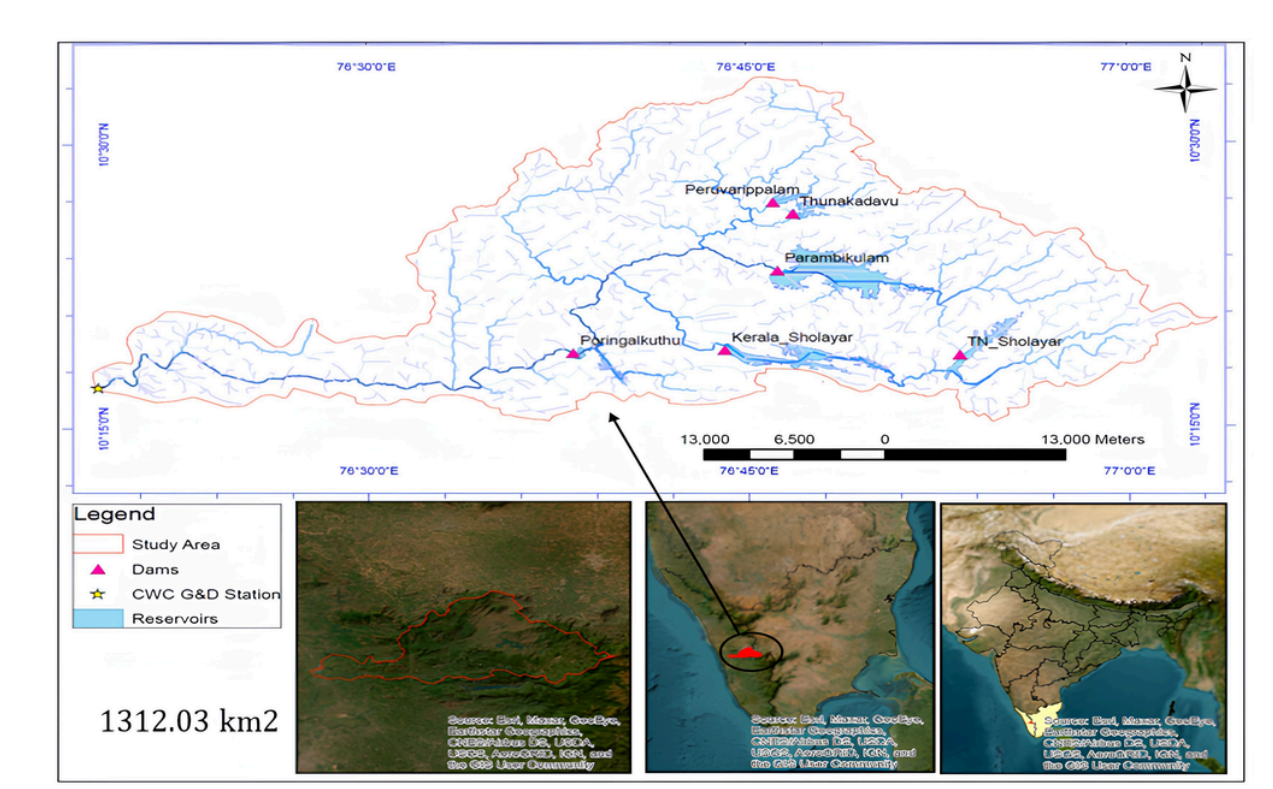


Figure 4: Study area

Results

- The year 2000 was identified as the level-2 ecosystem integrity reference year for the study area.

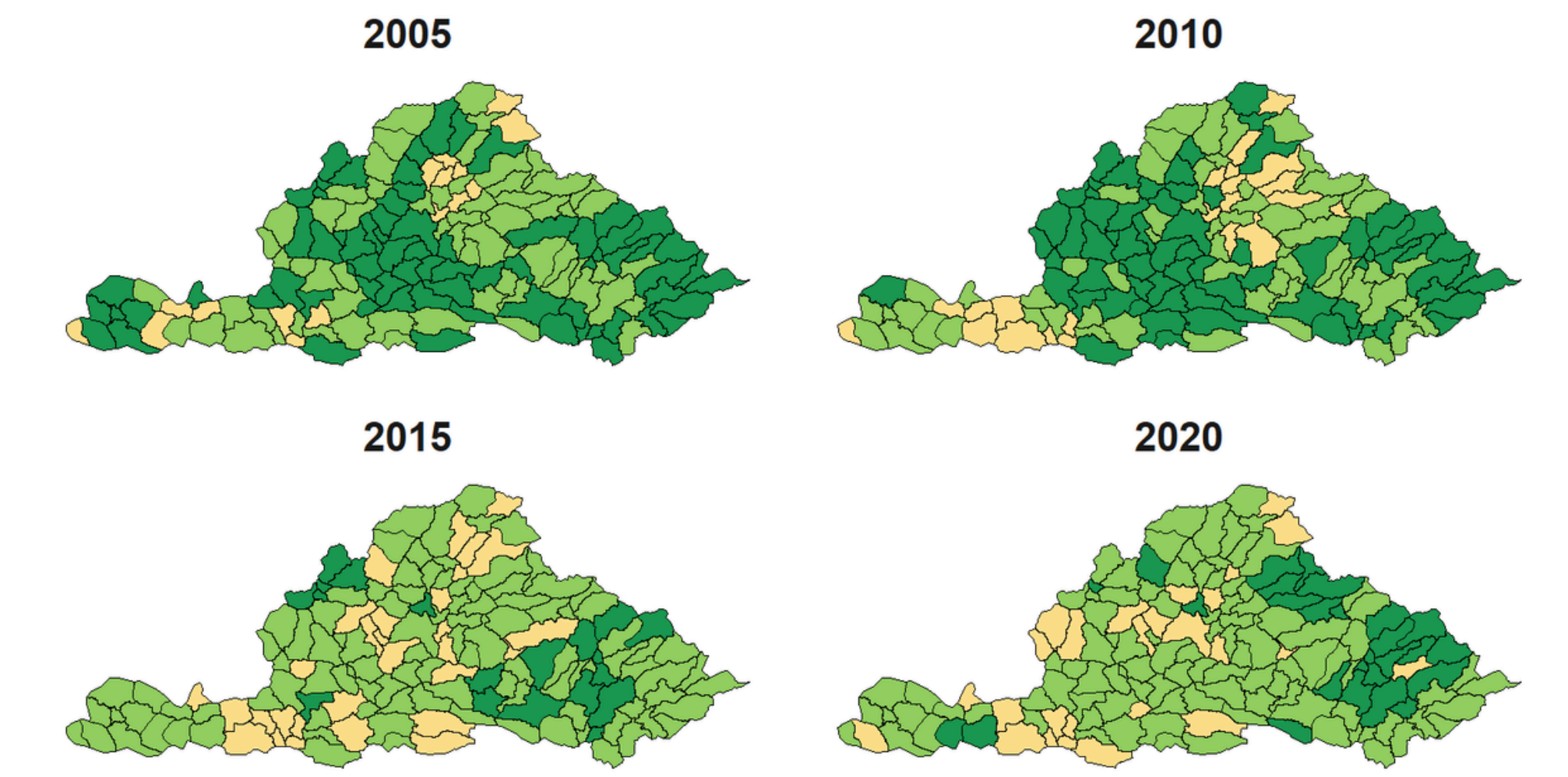


Figure 5: Degradation zone variations during 2005-2020

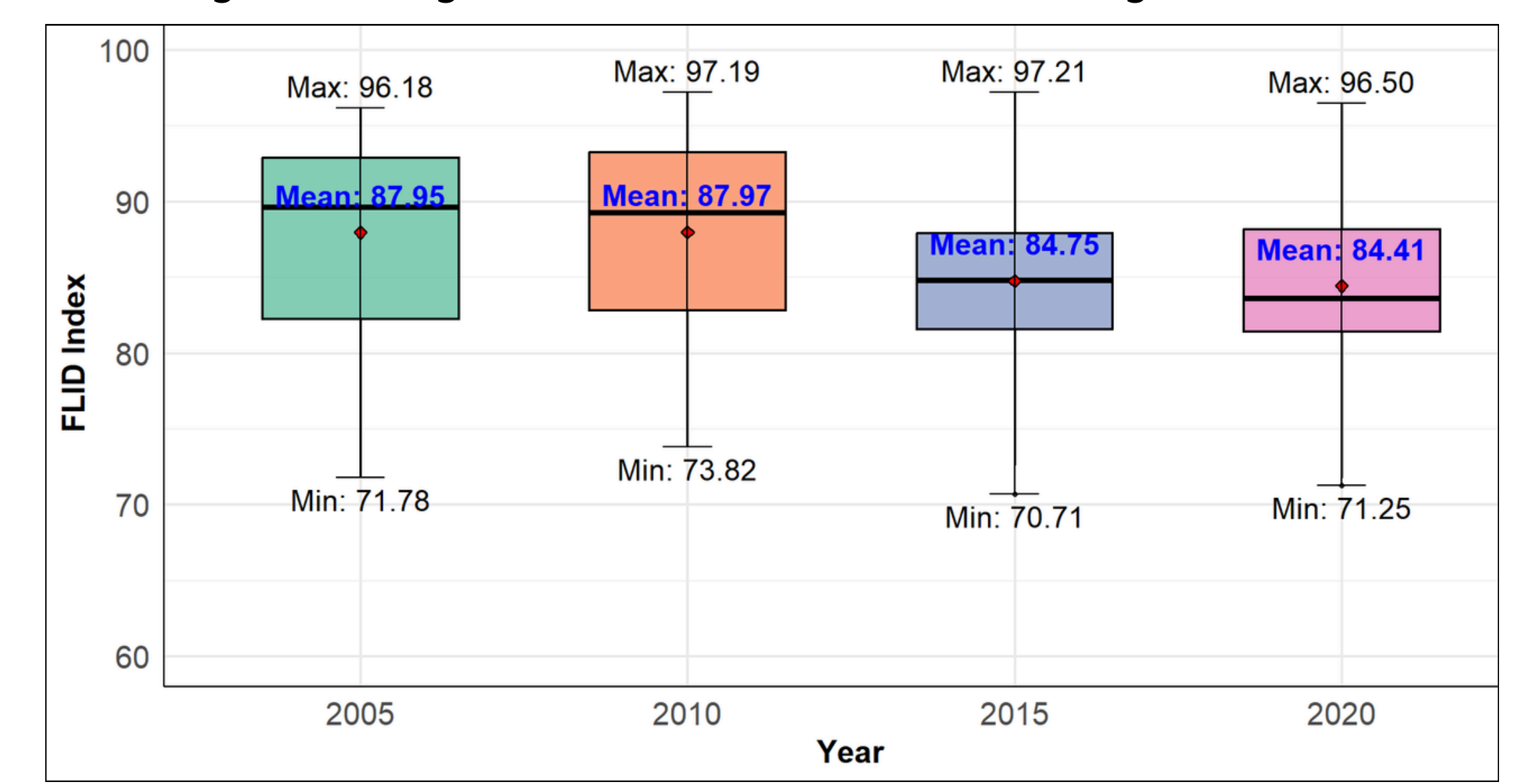


Figure 6: Box plot of FLID index variation

- The assessment results indicate that in 2005, 47% of landscape units were classified as healthy-resilient, 42% as slightly stressed, and 11% as early-degrading.
- By 2020, these proportions shifted to 18%, 65%, and 17%, respectively.
- The deterioration of ecosystem processes was contributing maximum to the degradation.

Key References

Charles A. Martin., Raphaël Proulx. (2020). 'Level-2 ecological integrity: Assessing ecosystems in a changing world'. Perspectives in Ecology and Conservation. Volume 18. Issue 3. Pages 197-202. ISSN 2530-0644. 10.1016/j.pecon.2020.08.001.

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Discussions

- The FLID trajectory shows variations in forest degradation in both directions.

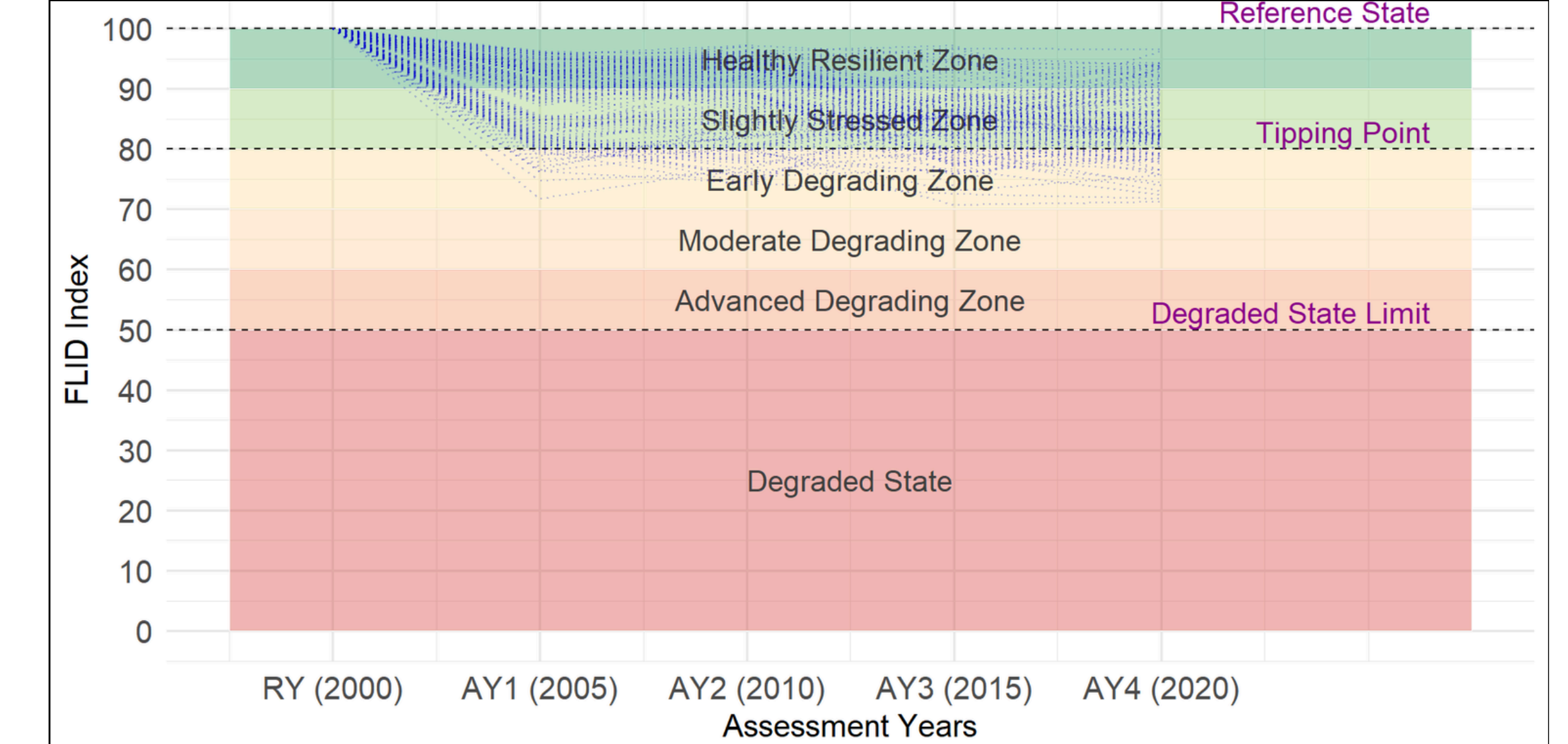


Figure 7: Trajectory of FLID index for 152 landscape assessment units

- Forest type-wise assessment shows variations in the resilience and regaining capabilities

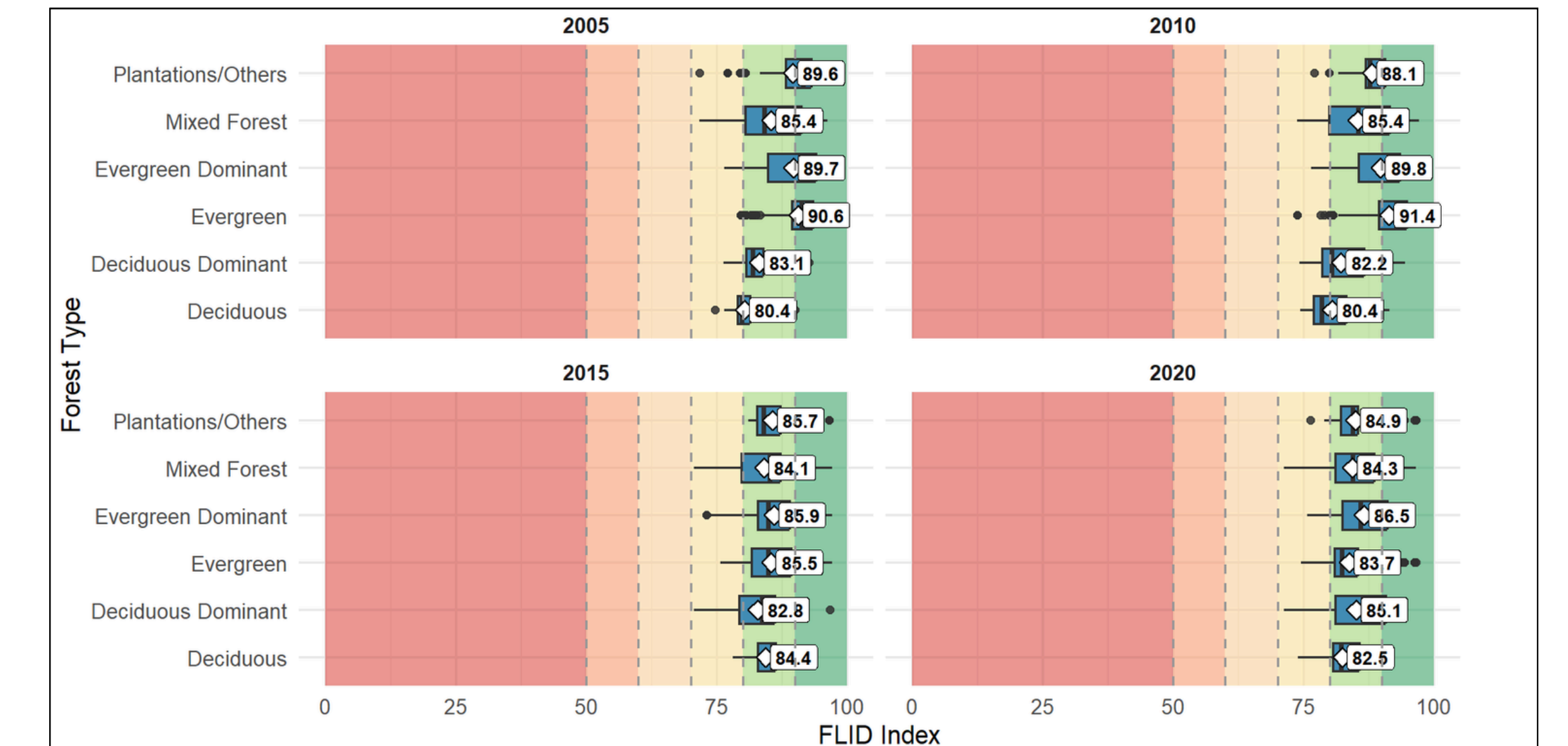


Figure 8: Forest type-wise variation of FLID index

Conclusions

- Helpful to identify critical forest integrity components for more effective and targeted forest management decisions.
- Emphasises the need for timely monitoring supported by decision support systems (DSS).

Acknowledgements

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