

## CASE STUDY

### Towards a Framework for Implementing National level Inter-linkages through Sustainable Development Goals (SDGs): “Review of tools to link the drivers and benefits of Forest Cover in Malaysia”

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The Sustainable Development Goals (SDGs) implementation is required to be taken as an integrated package with the goals and targets indivisible from each other. The Global Sustainable Development Reports (GSDR) demonstrates the use of an integrated approach that looks at clusters of strongly interlinked issues rather than integrated assessments as a whole. But how do we coherently assess these inter-linkages, synergies and trade-offs for SDGs implementation of which are credibly based on scientific evidence, relevant to policy and legitimate in terms of its process?

This case study reviewed the current approaches utilized to implement the inter-linkages in the context of the SDGs. These approaches are then applied in the context of implementing inter-linkages of the drivers and benefits of forest cover in Malaysia. The results demonstrate that by using a combination of existing approaches such as scoring of interaction of the SDGs by ICSU (Nilsson, et al., 2016), issue mapping through network analysis, and subsequently verified by basic scientific methods to infer causalities, clusters of strongly inter-linked issues at the national level, such as the Forest-Climate-Resilience nexus can be identified.

In addressing the implementation of identified inter-linkages, and in particular, the institutional dimensions, a fragmented and siloed approach to address the Forest-Climate-Resilience nexus is found with various mandates and responsibilities across multiple government agencies. In conclusion, approaches that go beyond normative organizational arrangements and processes in particular are argued to be of importance, with dynamics of actor configurations and the understanding of intermediary functions such as through orchestration deserving special attention.

To address inter-linkages in social-ecological systems, an inherently complex adaptive system, many scholars in science and society studies have debated the need to not only expand more knowledge, but also produce more usable knowledge (Clark et al., 2016; Clark & Holliday, 2006; Jordan, 2008; Lang et al., 2012). Yet usable knowledge alone is proven to be insufficient for cooperation or coordination where implementation will require effective institutions ( Haas, 2004). This review and application of tools to address inter-linkages is thus divided in three areas – usable knowledge for identifying issue linkages through policy coherence tools and scientific tools, and institutional coordination to implement inter-linkages.

## An approach to address inter-linkages

### I. Scoring of interactions as a policy coherence tool

Goal	Target	Score	State of Knowledge & Gaps
Goal 6 Water	6.5 Integrated water resources management	3	Malaysia's water river basins are situated in biodiversity hotspots (See National Physical Plan)
Goal 13 Climate Change	13.2 Climate change policy	3	LULUCF a key component of climate change measures in Malaysia (see National Communication to UNFCCC and NRE 2015)
Goal 6 Water	6.3 Water pollution	2	Forest cover effective to prevent erosion, associated with a higher sediment concentration in runoff and with siltation of watercourses (Calder 2007)
Goal 1 Poverty	1.5 Resilience and vulnerability to extreme events	2	Indications that annual floods are worsening due to climate change and illegal deforestation though further research required (Bradshaw et al 2017)
Goal 11 Cities	11.5 Disasters, including water-related disasters	2	Indications that annual floods are worsening due to climate change and illegal deforestation though further research required
Goal 13 Climate Change	13.1 Resilience and adaptive capacity	2	Ecosystem based adaptation is proposed in Malaysia's Roadmap for reducing emissions (NRE 2015)
Goal 4 Education	4.7 Education for SD	1	Education for sustainable development inextricably linked to conservation of biodiversity
Goal 16 Governance	16.3 Rule of Law	1	Many policies exist in biodiversity conservation but enforcement is lacking (see SDGs report on Malaysia)
Goal 10 Inequality	10.2 Political inclusion	1	Forest dwelling communities and land and environmental rights linked to many forest clearing areas in Malaysia (Cooke 2015)
Goal 2 Agriculture	2.3 Agricultural productivity	-1	Doubling productivity and incomes would require land-use change and conversion from Permanent Forest Reserves to Agricultural land (Hezri 2014)
Goal 7 Energy	7.2 Renewable energy	-2	Bioenergy and biomass from oil palm is one of the largest share and fastest growing sector towards renewable energy mix in Malaysia (MPOB 2010)
Goal 9 Innovation & Infrastructure	9.2 Sustainable industrialization	-2	Industrial land converted from Permanent Forest Reserves proposed (see National Physical Plan)

Table 1. Usable Knowledge: Scoring of interactions as a policy coherence tool [1]

### II. Issue mapping to identify inter-linkages

Critical issue nodes can be identified through issue mapping and network analysis where the strength of the interaction can be visualized by the thickness of the line. The degree centrality, or in other words, the most interconnected nodes (based on number of edges) are calculated with the higher degree in darker shades. The figure 1. shows the inter-linkages of Goal 15.

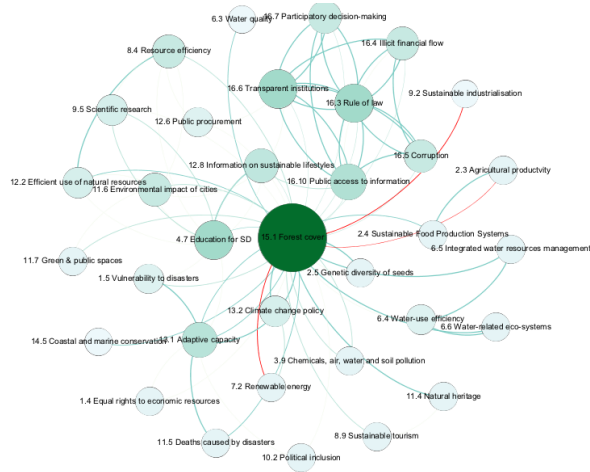


Fig. 1 Mapping of interactions on SDG 15



Fig. 2 Identification of Strongly Inter-linked Clusters

### III. Identification of strongly inter-linked clusters

The results demonstrate that: 1) Forest cover (SDG 15.1) interacts positively (both as driver and providing benefits) to a large number of targets; 2) A small number of negative drivers exist; and 3) clusters of strongly inter-linked areas can be identified, for example linkages with enabling conditions (education and governance), Forest-Climate-Resilience and links with water and agriculture.

### IV. Basic scientific tools and data

Large knowledge and information gaps exist to verify inter-linkages. For example, in researching data on forest-climate-resilience, difficulties remain where the Forestry Department Malaysia publishes forested area statistics based on land use classification, which differs greatly with satellite imagery.

### V. Institutional structure: Identification of arrangement

The institutional arrangements and responsibilities for addressing biodiversity, climate change, water and disaster management demonstrate a myriad of ministries, departments as well as coordinating councils and commissions, requiring coordination.

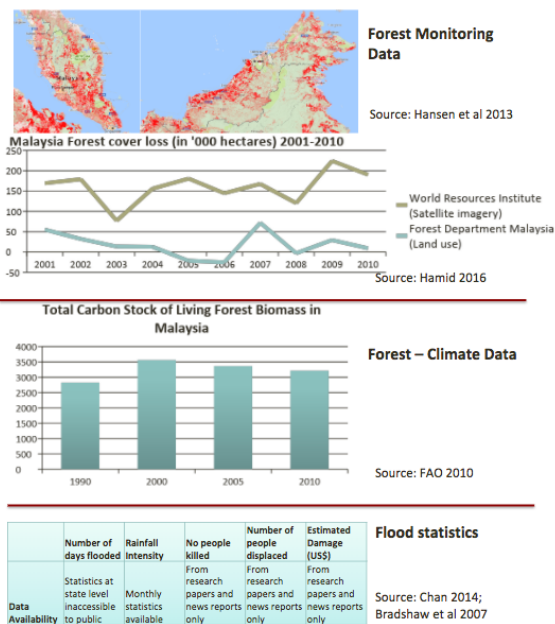


Fig. 3 Scientific tools and data analysis for implementing SDG 15.1 [2][3]

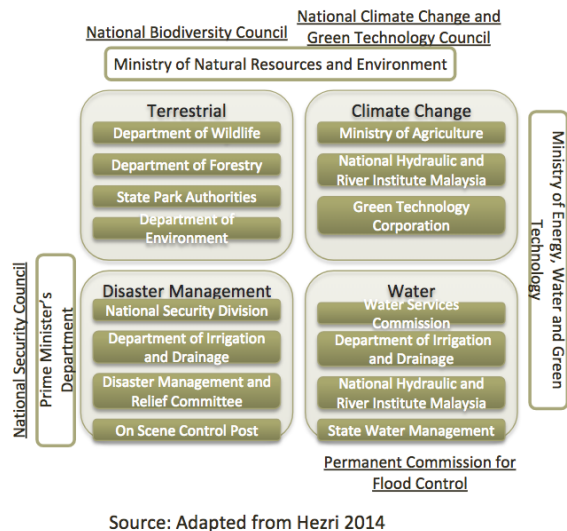


Fig. 4 Institutional Structure

## VI. Institutional coordination mechanisms: Review of mainstreaming biodiversity conservation in Malaysia

- Cognitive logic of intervention:** The National Policy on Biological Diversity (NPBD) 2016-2025 with the goal to “empower and harness the commitment of all stakeholders to conserve biodiversity” explicitly focuses on mainstreaming. In 2008 ‘A Common Vision on Biodiversity’ was produced with the aim to support the “ongoing transformation of environmental planning and management from a largely sector-based to an integrated holistic approach” (NRE 2010).
- Institutional logic of intervention:** A national steering committee acts as a coordinating platform with stakeholder input from the National Biodiversity Roundtable. A working group on biodiversity research and the National Biodiversity Centre can act as the science-policy interface. The structure provides a good starting point for policy coordination. However, while the institutional hardware and formal structures are established, the institutional software, dealing with the informal discourse and processes require further understanding (Dryzek 1996; Connor and Dovers 2004).
- Political logic of intervention:** While the Deputy Prime Minister chairs the National Biodiversity Council, forest and land is a State matter under the constitution. However, the federal government retains powers over certain provisions for forest and forestry of which has resulted in Federal-State tensions (Kathirithamby-Wells 2005).

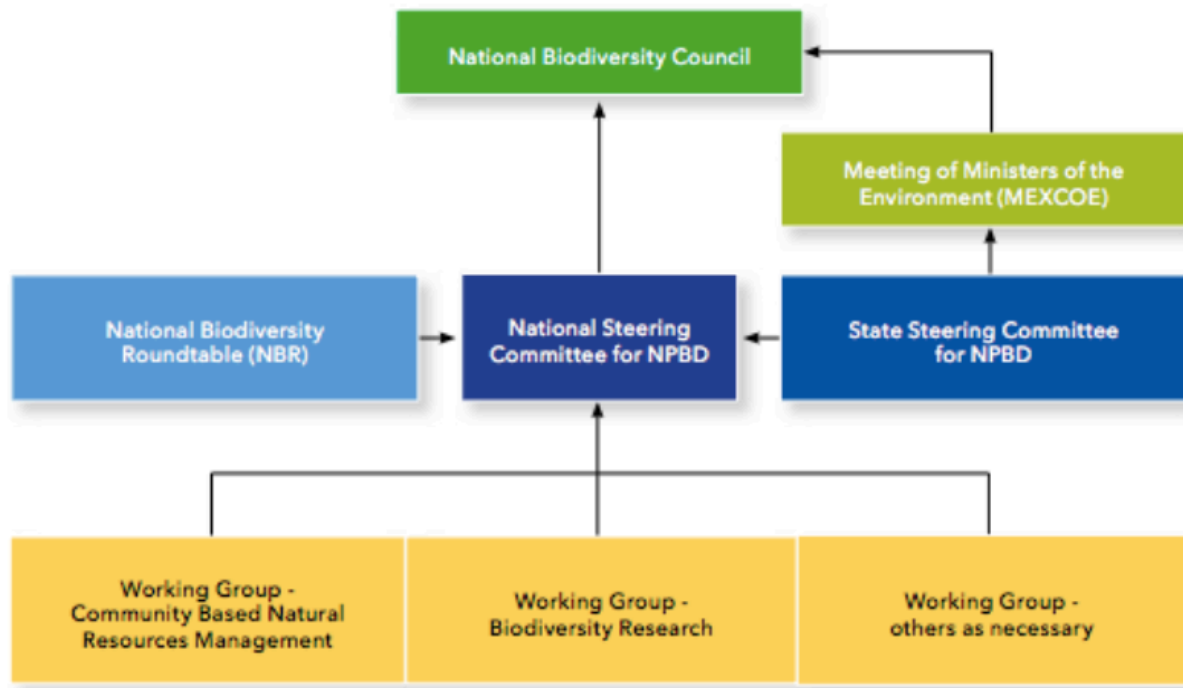


Fig. 5 Institutional Coordination Mechanisms

## VII. Conclusion and Research Proposal

- I. **Forest-Climate-Resilience Nexus:** Investigate the natural issue inter-linkages between forest-climate-resilience
- II. **Dynamics of actor configuration at the national level for SDGS implementation:** Undertake social network analysis (SNA) to study the ‘institutional software’ which includes questions on the role of experts and epistemic communities in addressing inter-linkages at the national level.

### References

- [1] Nilsson M. et al., “Map the interactions between SDGs”, *Nature* 534, 320–322; 2016
- [2] M.C. Hansen, P.V. Potapov, R. Moore, M. Hancher, S.A. Turubanova, A. Tyukavina, D. Thau, S.V. Stehman, S.J. Goetz, T.R. Loveland, A. Kommareddy, A. Egorov, L. P. Chini, C.O. Justice, J. R.G. Townshend (2013). High-Resolution Global Maps of 21st-Century Forest Cover Change. *Science*, 342(6160), pp.850-853.
- [3] COREY J. A. BRADSHAW et al., “Global evidence that deforestation amplifies flood risk and severity in the developing world”, *Global Change Biology* (2007) 13, 2379–2395.