



**Land cover and use changes: Ecosystems risk
assessment - Using red listing of ecosystems model for
application.
case studies from Sierra Leone's protected area**

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General objectives

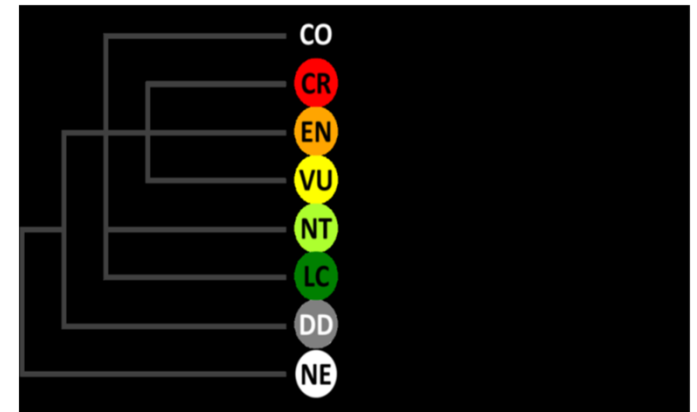
- Develop red list of Ecosystems assessment and apply it to 2 regions in Sierra Leone
- Develop a framework that will serve as a guide for the assessment of tropical ecosystem

The International Union of Conservation Nomenclature (IUCN) Red List of Ecosystems, what is it?

It's a standard criterion used in assessing the status of an ecosystem at both National and Global scales..



The assessment determines whether an ecosystem is at the brink of collapse or is faced with just minimal threat standard Guidelines to support practical implementation of categories and criteria



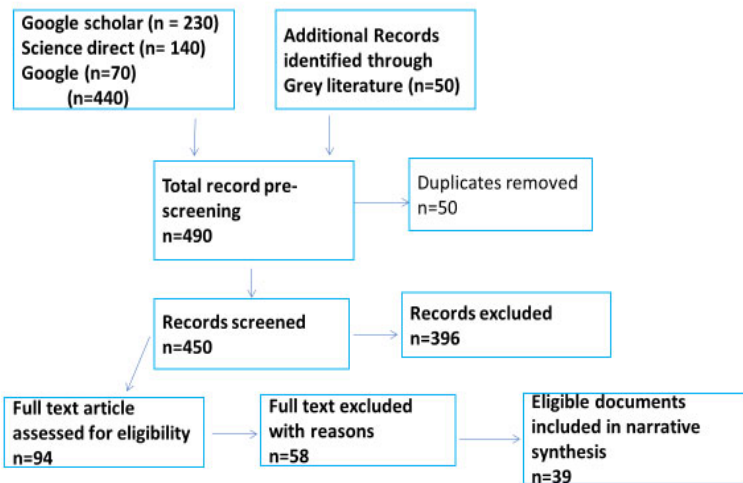
Structure of the IUCN Red List of Ecosystems categories

Redlist of Ecosystem Criterion:

- A declines in spatial distribution
- B restricted distribution
- C degradation of the abiotic environment
- D disruption of biotic processes and interactions
- E Model simulation to estimate risk of collapse

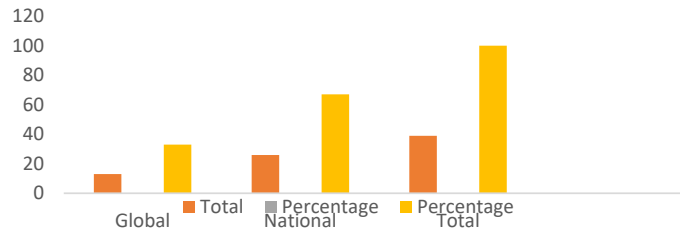
systematic review

Method

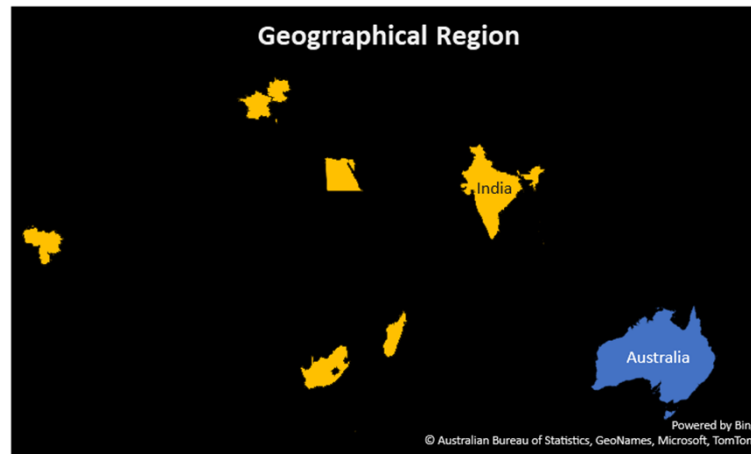
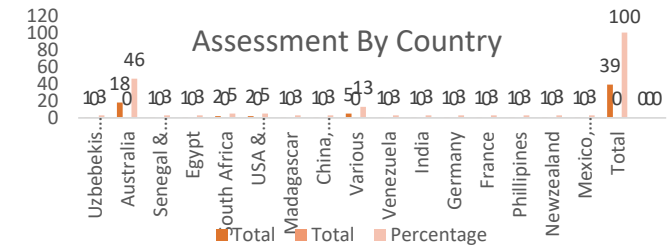


- Narrative systematic review
- Boolean search method was used- Combination of key words
- Endnote [Version X9.3] was used for reference management
- Rayyan QCRI was used for reference screening
- Data extraction form was created in excel

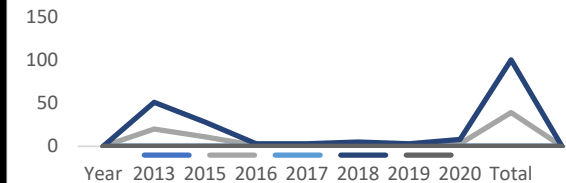
Assessment Classification



Results

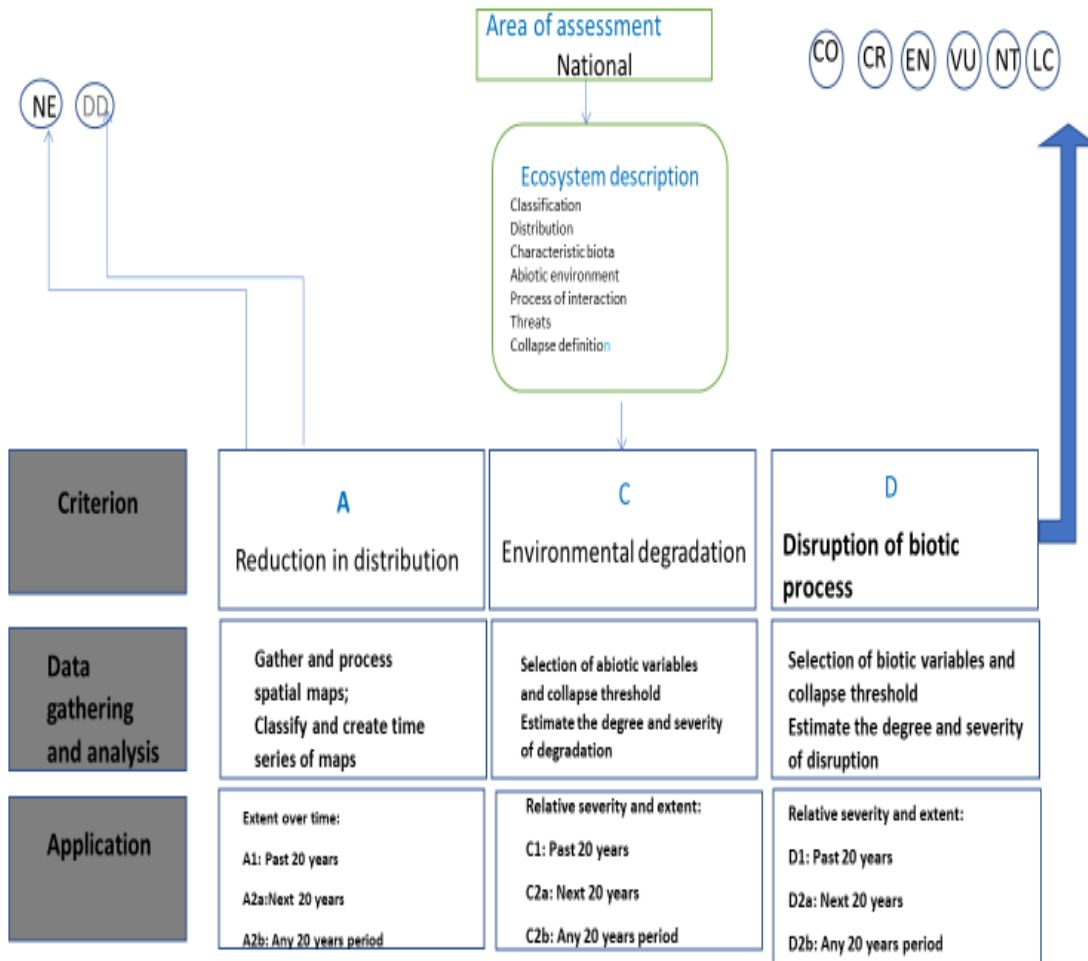


Publication Trend



- Overall, a total of 13 global (33%) and 26 National (67%) ecosystems assessment as been done
- Experimental Design was according to the IUCN standard procedure- Ecosystem classification and description
- Mostly brief classifications are been done using published and unpublished literature review with little quantitative information
- The Assessment is also biased against Criterion E because of lack of appropriate model simulation to assess the indicator risk of a particular ecosystem

Proposed Method Of Assesment



patial data on Google Earth Engine to create supervised classification under 5 livelihood activities :Agriculture, settlement, vegetation, mine and water

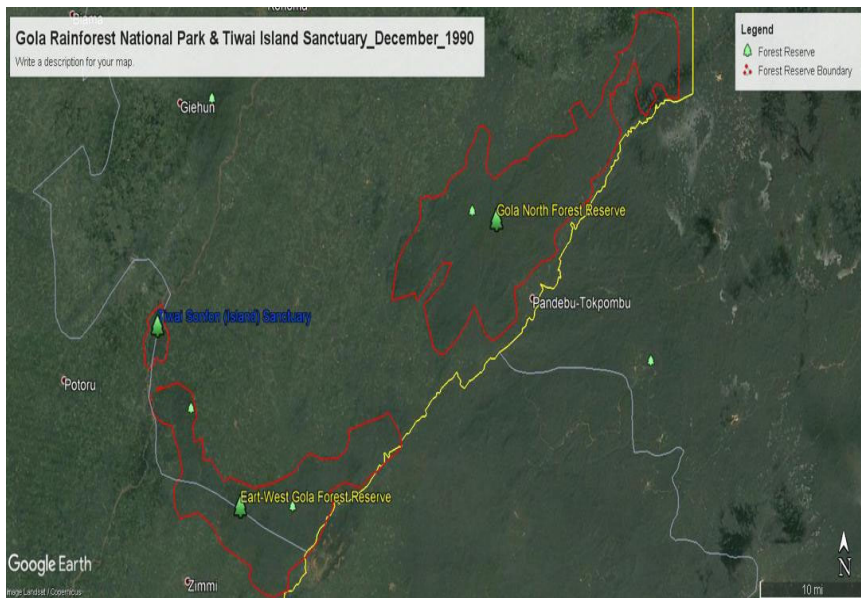
develop a conceptual model to estimate risks, probability of an adverse outcome and endpoint in decline

To estimate future decline i will include Human dimension in my research by creating social ecological model

ecosystem classification and description

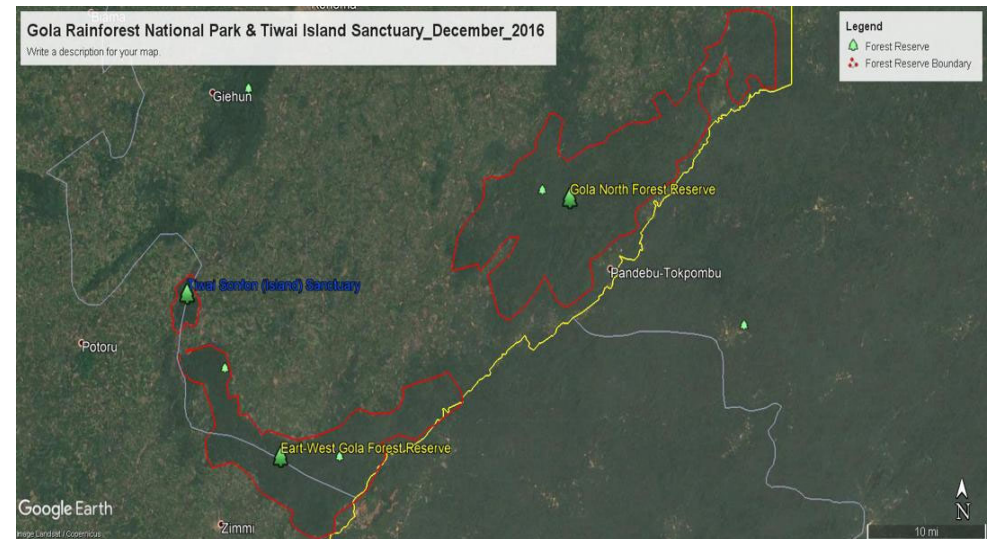
assessment of the ecosystem using the RLE Criteria

This research will be undertaken in selected protected area communities in Sierra Leone (Tiwai Island Sanctuary and the Gola rainforest national park).



Ecosystem 1 (Gola Rain Forest National Park)

Degraded forest – Forest that is partly destroyed by human activities. Native vertebrate species- Bay Duiker and Bongo. Non Native Vertebrate species Pigmy hippopotamus and Chimpanzee
 Biotic Indicator : Vertebrates that depend on trees for habitation



Ecosystem 2 (Tiwai Island Sanctuary)

Moist ever green Forest- Forest with high density of commercial trees. Canopy is taller with thick under growth. Native vertebrate species Leopard and Elephant. Non-native vertebrate species Diana monkey and Chimpanzee

Biotic Indicator: Vertebrate that DePEND on trees

Field work

Australia (University of New South Wales Sydney Exchange Programme)

I will be closely working with Dr Aniko Toth at the Centre for Ecosystem Science (CES) at University of New South Wales (UNSW) in Sydney. CES group leads an extensive global network in the evolution of the Ecosystem Risk Assessment protocol and pioneered the development of the internationally recognized Red List of Ecosystems.

Sierra Leone (Ground Truthing and Stakeholder Engagement)

I intend using the stake holder mapping strategy: using structured questionnaires and focus group discussions.

A field investigation will be conducted to provide validation data for accuracy assessment of the 2016 land cover map. 200 GPS (ground-truth data) will be coded to their respective land cover types

Kappa Statistics (index of agreement) will be used and an error matrix will be generated from which a producer's accuracy and a user's accuracy will be derived for each land cover type.



THANK YOU