National Land Cover Change Mapping System

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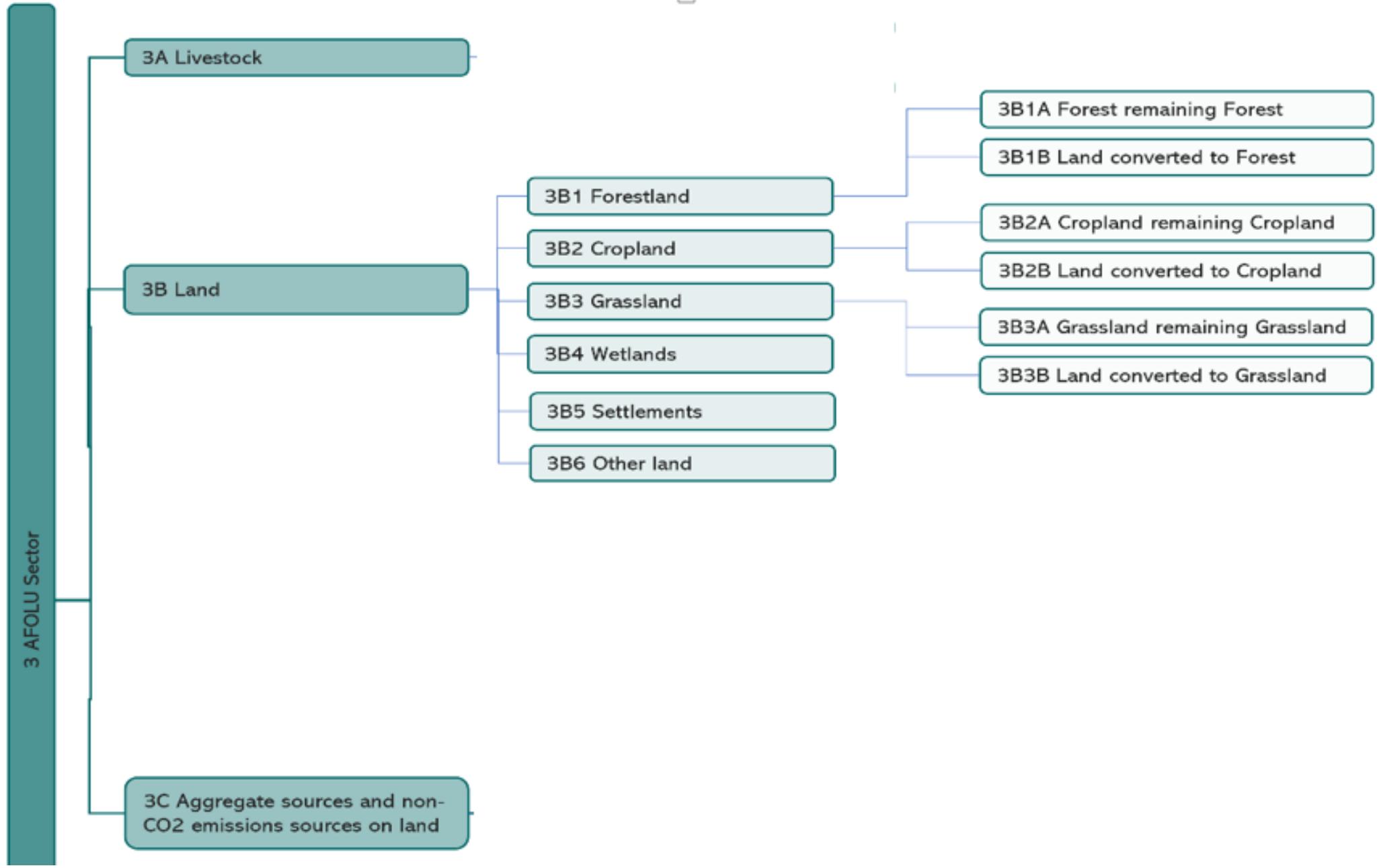
Climate Change Act 2021

Part 7 (30) Sector-based collection of data and information needed to estimate emissions and emissions reduction data
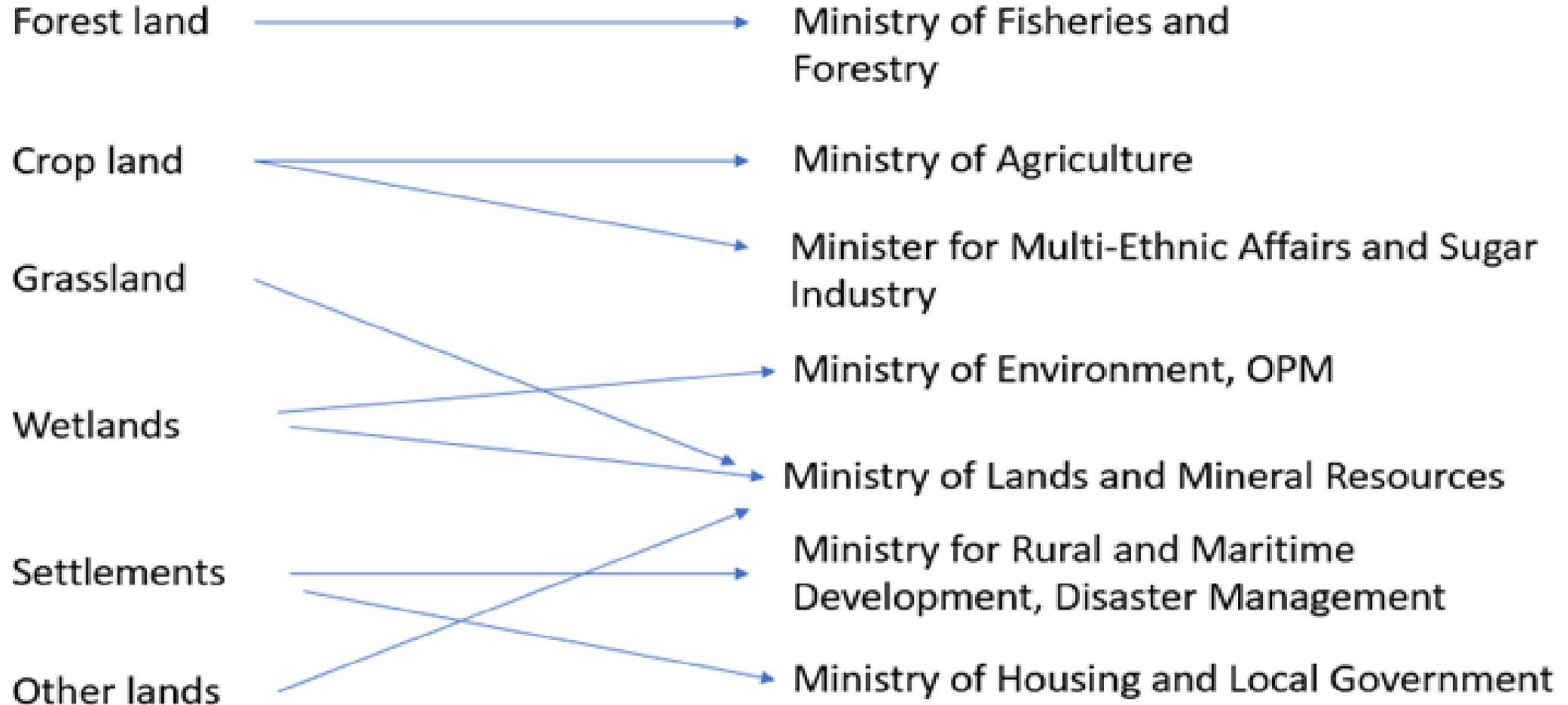
- The PS's must biennially estimate and compile data related to emissions and emissions reductions activities from within their portfolio and submit it to the Committee (National Climate Change Coordination Committee (NCCCC) (12)).

-the PS's responsible for Agriculture, Forestry and Other Land Use in relation to the Agriculture, Forestry and Other Land Use sector.

Intergovernmental Panel on Climate Change (IPCC-2006) AFOLU Sector

3 AFOLU Sector

3A Livestock

3B Land
- 3B1 Forestland
  - 3B1A Forest remaining Forest
  - 3B1B Land converted to Forest
- 3B2 Cropland
  - 3B2A Cropland remaining Cropland
  - 3B2B Land converted to Cropland
- 3B3 Grassland
  - 3B3A Grassland remaining Grassland
  - 3B3B Land converted to Grassland
- 3B4 Wetlands
- 3B5 Settlements
- 3B6 Other land

3C Aggregate sources and non-CO2 emissions sources on land

IPCC Land Use Classes Alignment with Line Ministries

Forest land → Ministry of Fisheries and Forestry

Crop land → Ministry of Agriculture

→ Minister for Multi-Ethnic Affairs and Sugar Industry

Grassland

→ Ministry of Environment, OPM

Wetlands

→ Ministry of Lands and Mineral Resources

Settlements → Ministry for Rural and Maritime Development, Disaster Management

Other lands → Ministry of Housing and Local Government

Proposed Elements:

1. Unified classification system (IPCC classes)

2. Remote sensing–based mapping component

3. Complementary visually-interpreted, sample-based component

4. Data warehousing and sharing via web portal
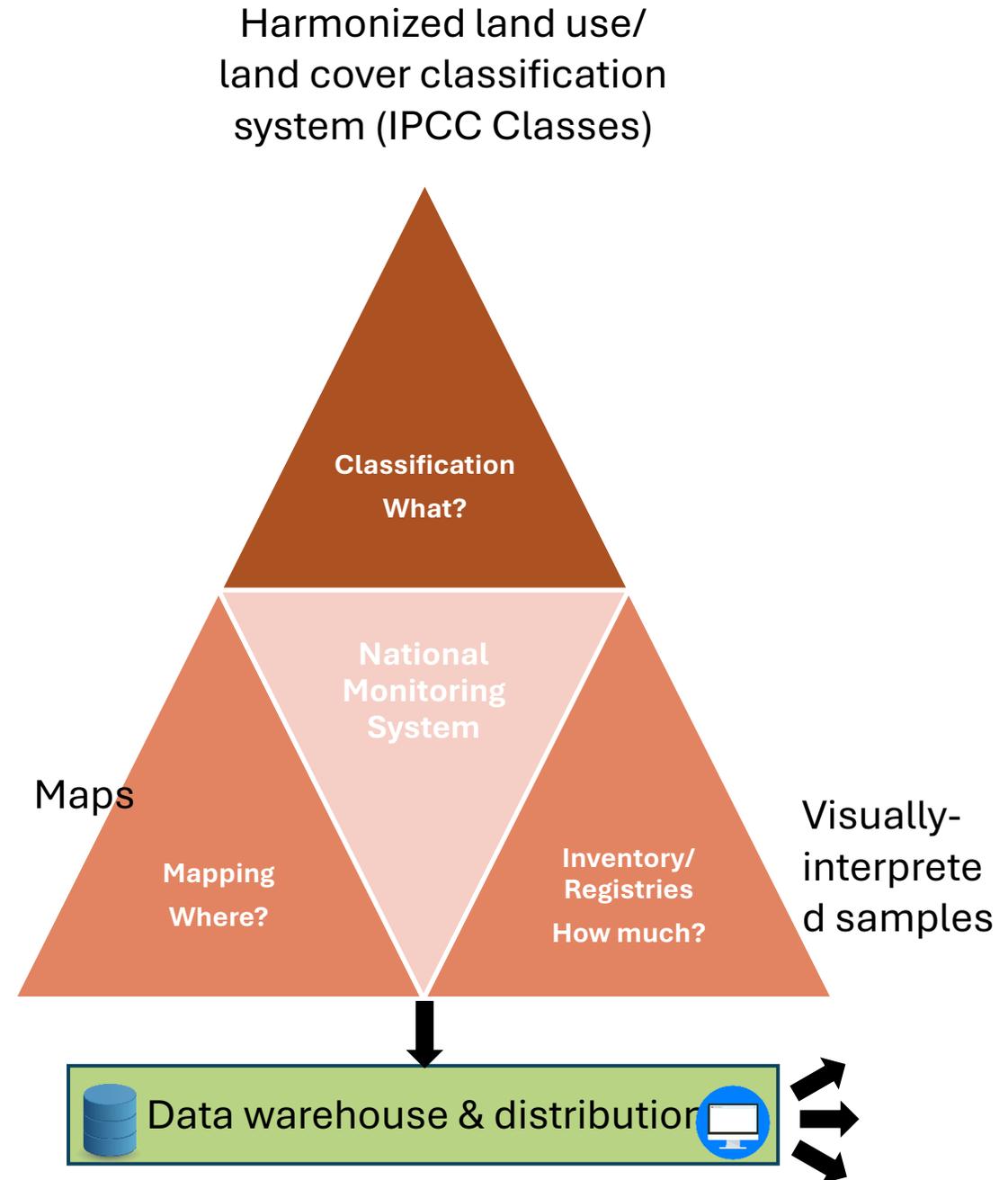
What will it look like

2016 (rows) to 2017 (columns) km^2	Other	Wetland	Forest	Settlement	Cropland	Grassland	TOTAL
Other	15.2	1.0	0.3	0.4	1.0	1.9	**19.8**
Wetland	0.4	46.7	0.1	0.0	0.0	0.0	**47.3**
Forest	0.1	0.6	41.2	0.0	3.1	7.3	**52.4**
Settlement	1.6	0.0	0.9	10.0	7.7	4.3	**24.5**
Cropland	2.9	0.1	10.4	6.7	124.8	8.7	**153.5**
Grassland	0.9	0.0	18.7	1.0	4.4	286.4	**311.4**
TOTAL	**21.0**	**48.6**	**71.7**	**18.1**	**140.9**	**308.6**	

Data from: Davies, K. 2021. Draft Landcover Transitions in the Ba Catchment 2016 – 2020. University of Sydney, School of Geosciences.

Achievements so far

Cabinet endorsement

Trainings received for capacity building:

- DEP (March 2024) by SPC
- GEE (April 2024) by USFS
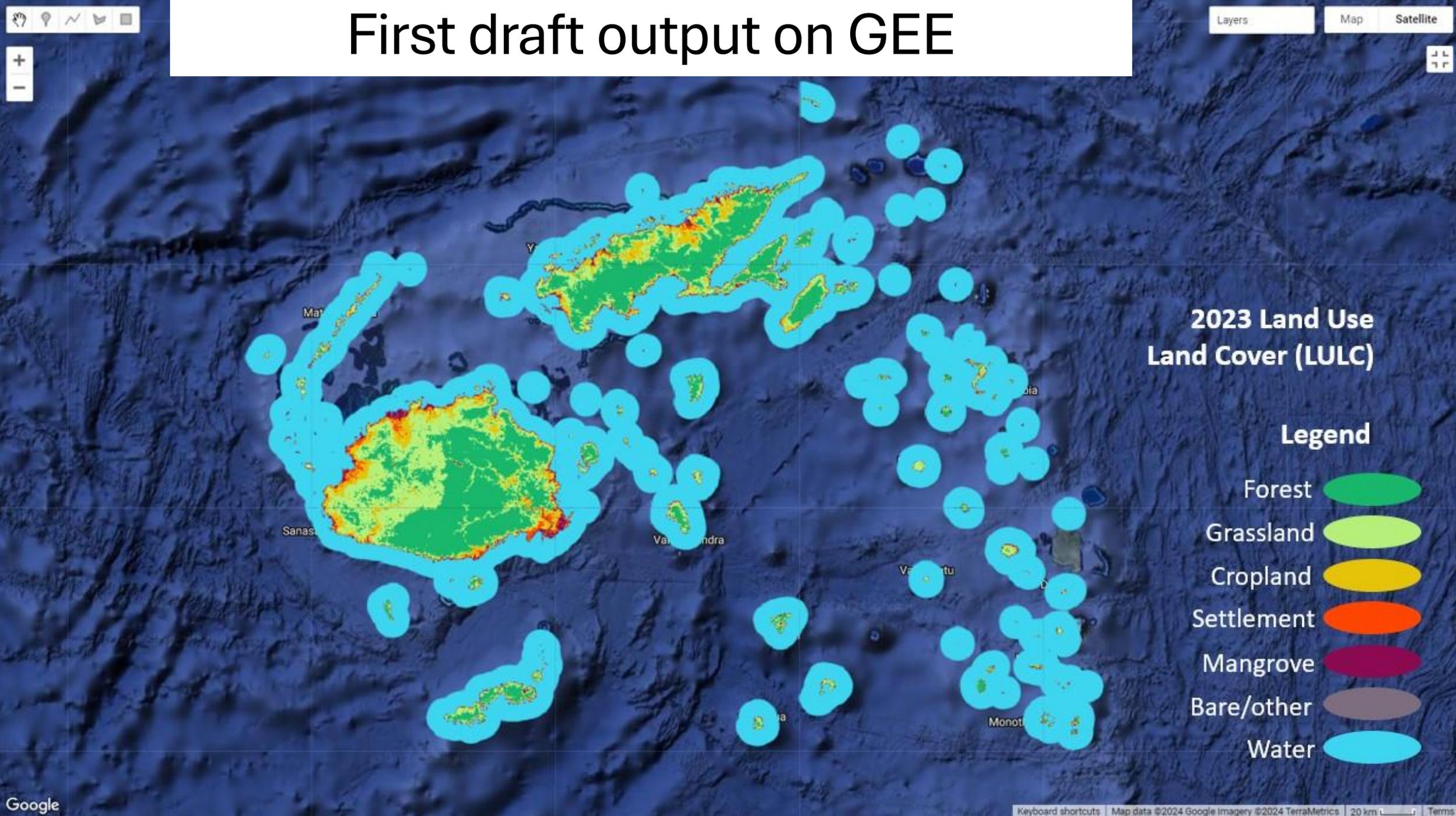- SEPAL (May 2024) by FAO

3000 Plot interpretations

Meeting to discuss mapping platforms
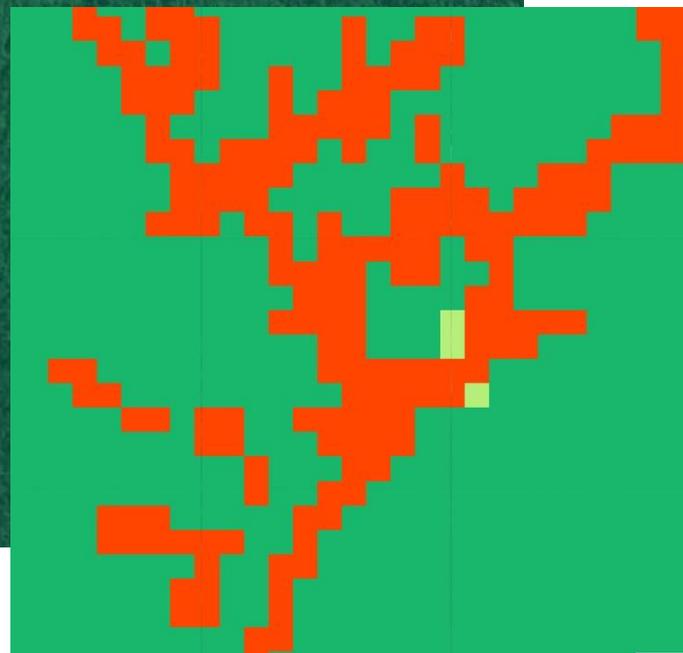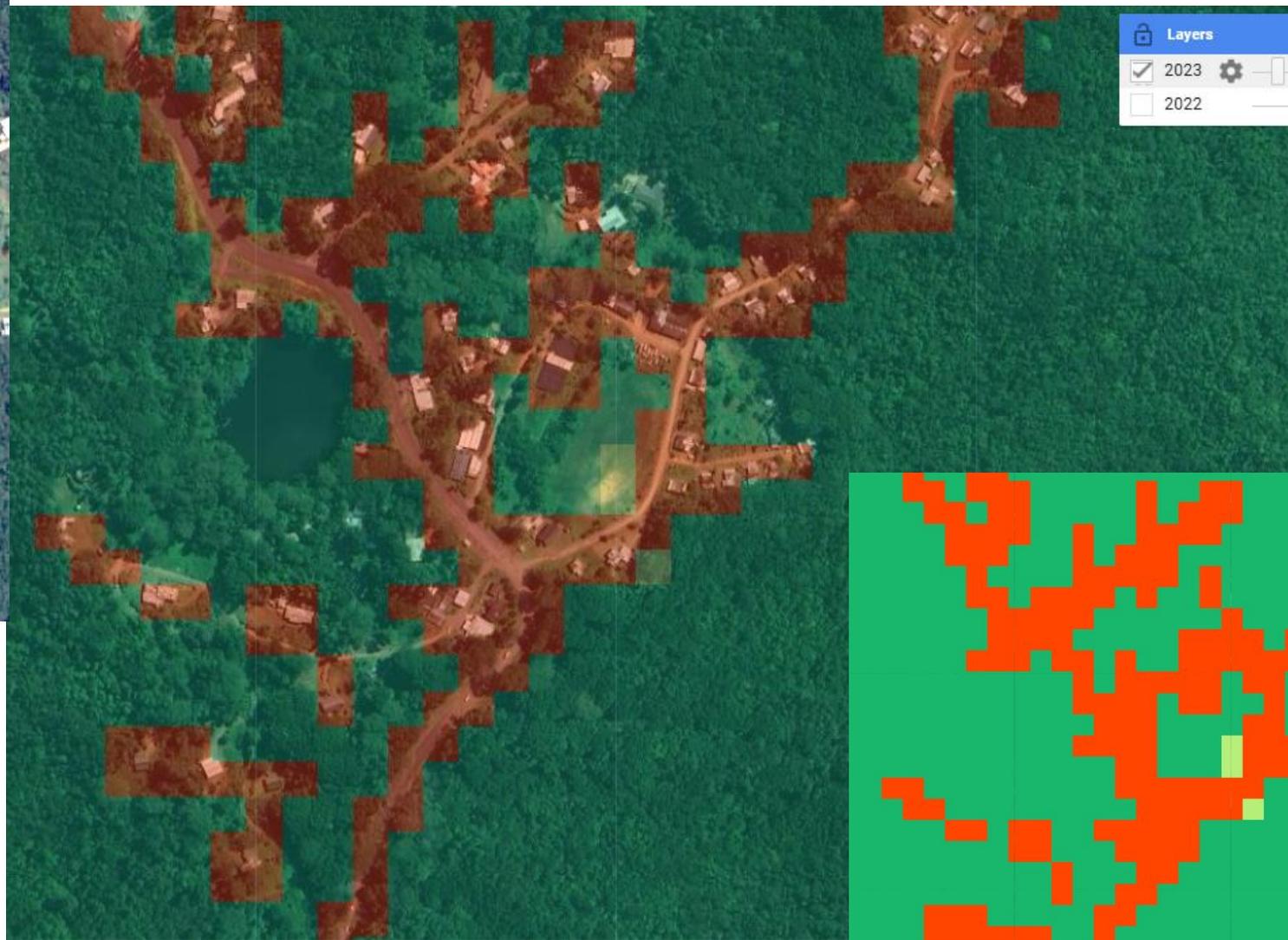
Map rare classes

First draft output on GEE
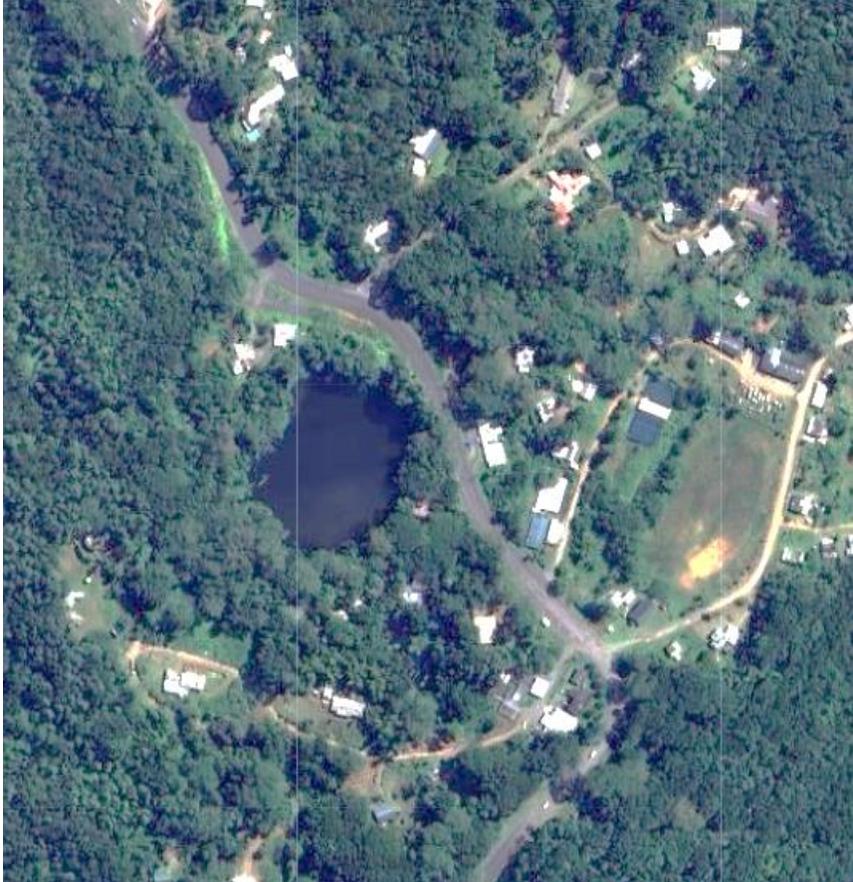
2023 Land Use
Land Cover (LULC)

Legend

Forest
Grassland
Cropland
Settlement
Mangrove
Bare/other
Water

Analysis of platform

	Digital Earth Pacific	Google Earth Engine	SEPAL
Cloud-based (fast) computing	X	X	X
Size of user base (availability of assistance)	S	H	M
Access to developers on difficult issues (1-3, 1=easy)	1	1	1
Ready access to analysis-ready, pre-processed satellite imagery & existing data catalogs	1	1	1
Amount of ready access data available			
Access to Planet imagery (1-3, 1=limited)	1	2	3
Availability of training materials (1-3, 1=low)	2	3	2
Ease of use (1 = easy, 2 = moderate, 3 = difficult)	1	3	1
Coding environment	Jupyter Lab/python	Java/python	Jupyter/
Cost	0	Licensing cost in the future	0
Current usage in Fiji (1-3, 1=low)	2	1	1
Sustainability-will the platform still be fully operational (1-5, 1=low)	4	5	4
Sustainability-WG's ability to continue using it (1-5, 1=low)	5	4	4
Comfortability (usability)			

Phase 2:

Activity	Days/ person	Secretariat	Lead technical officer (1)	Senior Technical officer (1)	Assistant technical officers (2)	Image interpreters (2)	Other working group members (6)	Total Person Days
Tasks to Finalize Mapping System Development								
Review & select image processing platform	1	0.5	1.5	1	2	2	6	13
Refine the training dataset and iteratively test to achieve an acceptable	10		10	10	20			40
Finalize an approach for sample-based area estimation	0.5	0.5	1	0.5	1	1	3	7
Develop overarching SOPs for the mapping and sample-based area estimation process	7			7				7
Formalize a workflow for producing maps in SEPAL/DEP/GEE and develop detailed SOPs for mapping process	3		3					3
Develop detailed SOPs for sample-based area estimation	3		3					3
Formalize institutional arrangements and governance								0
Formalize data sharing arrangements								0
Finalize data warehousing and dissemination arrangements								0
Document objectives, methodological framework, institutional arrangements, governance, etc.	7	7						7
Miscellaneous reporting (e.g., to cabinet) and coordination	2	2						

Phase 3:

Historical Map and Data Production Prior to Standard Operations
Produce maps for a reference period
Capacity-building refresh training to working group on generating the map
Produce maps for beginning and ending of reference period
Review maps
Update training data if necessary
Troubleshooting
Publish maps
Sample-based area estimation for reference period
Establish sampling units
Refresh training on image interpretation to interpreters
Visually interpret sample units
Implement quality control
Compile & analyze data
Write report documenting the mapping and sample-based area estimation
Finalize the data
Submission of reports and data to FGIMC and CCD
Cabinet endorsement
Publish data
Miscellaneous reporting (e.g., to cabinet) and coordination

Phase 4:

Standard Operation of the Mapping System (Biennial Maps)
Biennial meeting to review outcomes and lessons learned from previous
Map production
Provide refresh training to staff generating the maps
Update training data and/or mapping methodology if necessary
Produce map
Postprocess and clean up map
Review map
Troubleshooting
Produce cartographic map (optional)
Digitally publish map
Sample-based area estimation
Establish sampling units
Provide refresh training on image interpretation to interpreters
Visually interpret sample units
Implement quality control
Compile data & analyze data
Write report documenting the mapping and sample-based area estimatio
Finalize the data
Submission of reports and data to FGIMC
Cabinet endorsement
Publish data
Miscellaneous reporting (e.g., to cabinet) and coordination

Thank you.

Questions?