

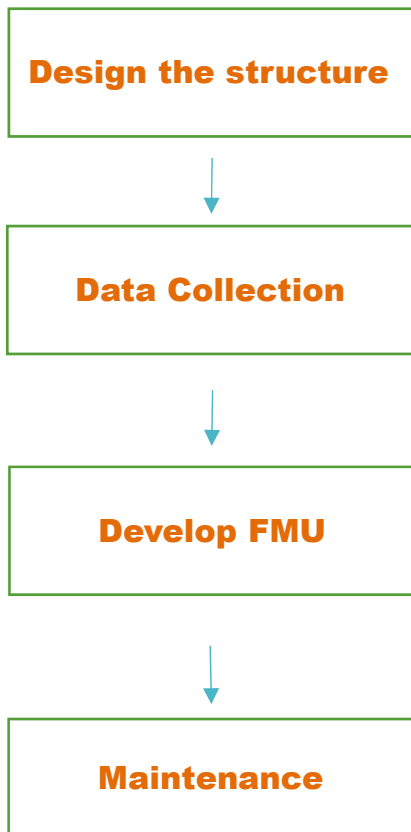
Forest Management Unit (FMU)

The Project on Capacity Development for Sustainable Forest Resource Management in Solomon Islands

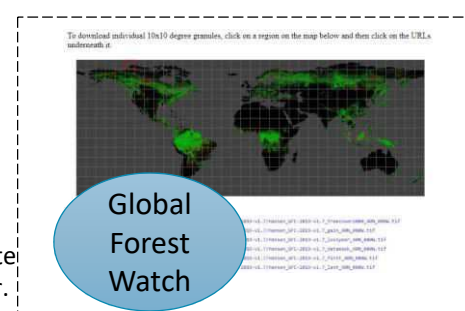
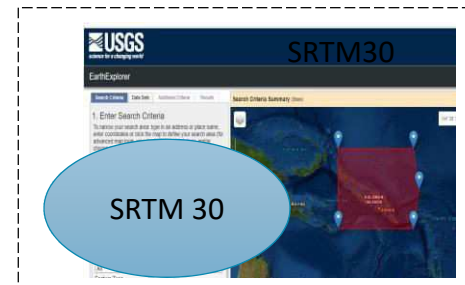
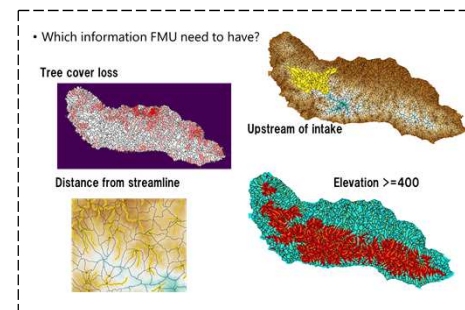
[Overview]

Solomon Islands depend very much on the forest. By far forest becomes one of the biggest income generators for the country. Moreover, most people equally rely on forest for their livelihood. However, people’s dependence and inadequate forest governance has caused deforestation to a level that is not sustainable. Commercial logging operations for instance, have been one of the major causes of deforestation. And as the population increases it also demands more forest resources consumption as well. The establishment of Forest Management Units (FMU) is one approach that needs to be considered amidst the current forest degradation in the country. This is because FMU concept can help us govern our forest much better. This may include promoting sustainable use of the forest, protection as well as conservation. And this will improve the quality of our decision making when it comes to forest management issues. FMU is a minimum unit of forest at “not too small” and “not too big” scale for forest monitoring. The small size of the watershed (5ha level) makes up the FMU in Solomon Islands. The FMU is used for monitoring and recording changes of forest with other useful forest information.

[Method]



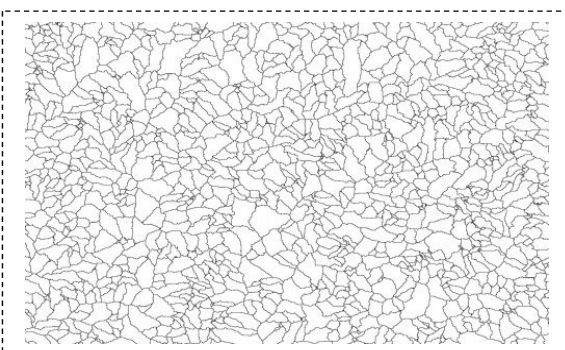
- The FMU structure was design based on the its purpose of creation. Especially forest information in Solomon Islands is important component in this case
- Before creating the FMU, it is vital to identify the appropriate data. In this case, right data to develop the FMU was identified from reputable sources. Some of the data collected for this are from the SRTM30 from the USGS sites, the Global Forest Changes (Hansen Treecover & Treeless year, Hansen Gain & Hansen Datamask). Besides that other data were collected from available base maps provided by MoFR
- After the data collection, FMU data will then be processed using appropriate software.
- QGIS was used to process the raw data in order to create all the FMU requirements.
- After the completion of FMU, it is important to update with collected dataset, which will change year by year.



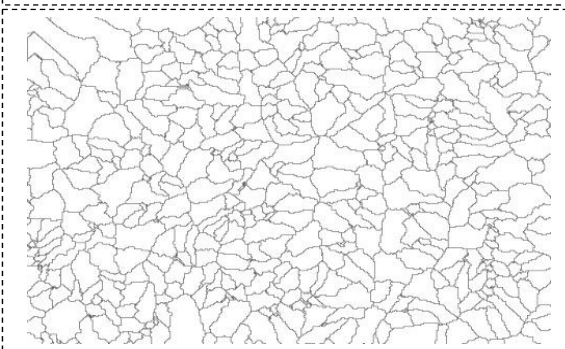
[Data Structure]

The Forest Management Units (FMU) was created for all the provinces in Solomon Islands. However, Guadalcanal was used as an example for this explanation. FMU comprised of Three level of Watershed boundary.

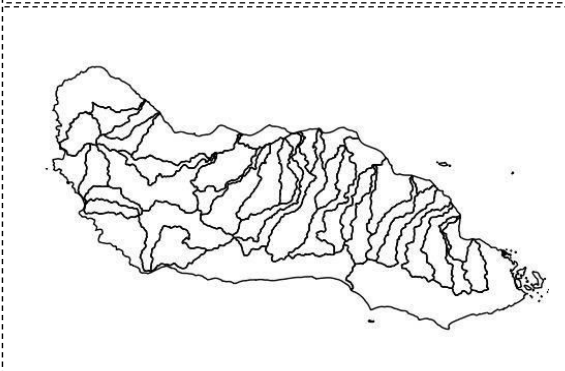
5 hectare level



100 hectare level



5000 hectare level



What are different types of FMU sizes?

The smallest FMU unit is 5ha; which is then followed by 100ha, 500ha and 5000ha. They are useful for different monitoring levels

What is a Forest Management Unit?

A FMU is a manageable and controllable unit of areas covered by forest. This unit is also properly demarcated. Each unit or multiple units can be allocated for specific purpose such as wood production or conservation biodiversity

Some types of FMU developments.

FMU plays vital roles in many changes or developments that happen in our forest.

Utilization of FMU

Conservation: is one of them, which deals with conserving our forest, rivers, wild life biodiversity and other important natural features of the environment.

Protection: This is where we manage flooding, erosion or soil fertility. Regulate water or control other natural phenomenon.

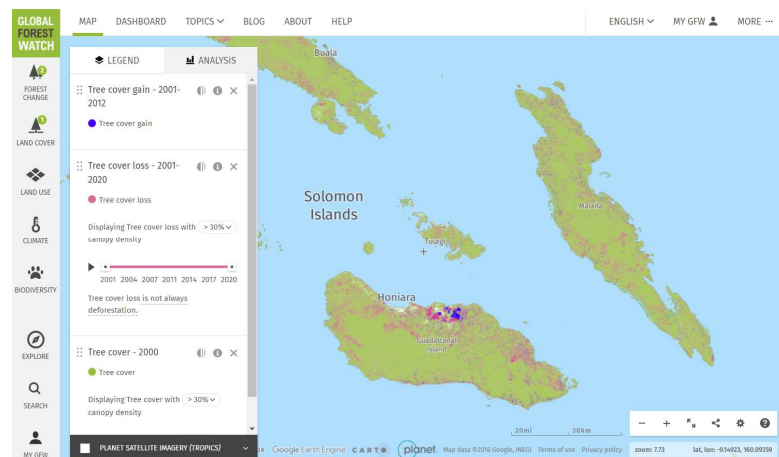
Production: One of the vital areas FMU contributes a lot is the management of resources using FMU concepts. In this our forest can be allocated with specific areas where it can be used to do commercial operations. This may include harvesting of timbers, non-timber forest products and other services like tourism and so forth.

[Main Data Components]

The Forest Management Units (FMU) has many forest information created by both domestic organization and international organization. Some of important information is introduced here

Global Forest Watch

Global Forest Watch offers “Tree cover change” information annually analyzed by Landsat imagery. FMU use tree cover gain and loss information from multiple their collection

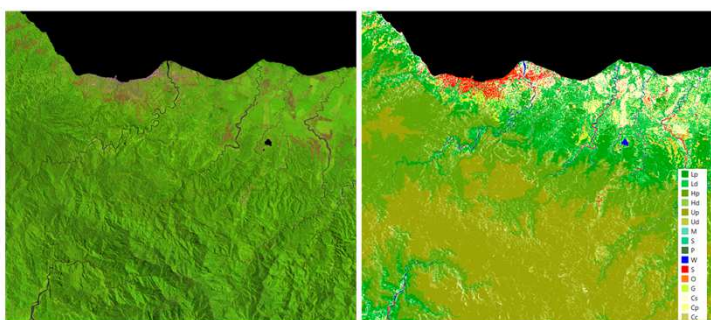


Land Cover / Forest Type information

This is the original information created by the project using Landsat 8 imagery. To make classification map, open online tool, SEPAL, is used. SEPAL allows users to harness cloud-based supercomputers and modern geospatial data infrastructures (e.g., Google Earth Engine) Collect Earth sampling points made for FRL report by MOFR were be used as the basic training data, and it was assessed. After classification map’s generation using SEPAL., the map were stratified by Forest Type using global elevation information.

Land Cover Map 2020

Stratified Land Cover Map with external global dataset



L8 mosaic image created with Sepal

Land Cover Map 2020

Code	LU	Land Cover	Disturbance
111	Lp	Lowland Forest	Primary
112	Ld		Degraded
121	Hp	Hill Forest	Primary
122	Hd		Degraded
131	Up	Montane Forest	Primary
132	Ud		Degraded
140	M	Mangrove Forest	-
150	S	Freshwater Swamp and Riverine Forest	-
160	P	Forest Plantation	-
200	W	Water	-
300	S	Settlement	-
400	O	Otherland	-
500	G	Grassland	-
610	Cs	Cropland	Subsistence
620	Cp		Palm
630	Cc		Coconut

Carbon / Biomass / Volume information

This is the original information created by the project using Overstory Height Method with (Satellite) LiDAR Data.

GEDI Global Forest Canopy Height, 2019 was used as LiDAR Data for these estimation. This is 30-m spatial resolution global forest canopy height map, which was developed through the integration of the Global Ecosystem Dynamics Investigation (GEDI) lidar forest structure measurements and Landsat analysis-ready data time-series.

<https://glad.umd.edu/dataset/gedi>.

For the further calculation, sample plots data in the project’s pilot sites were used for the modeling

[Summary]

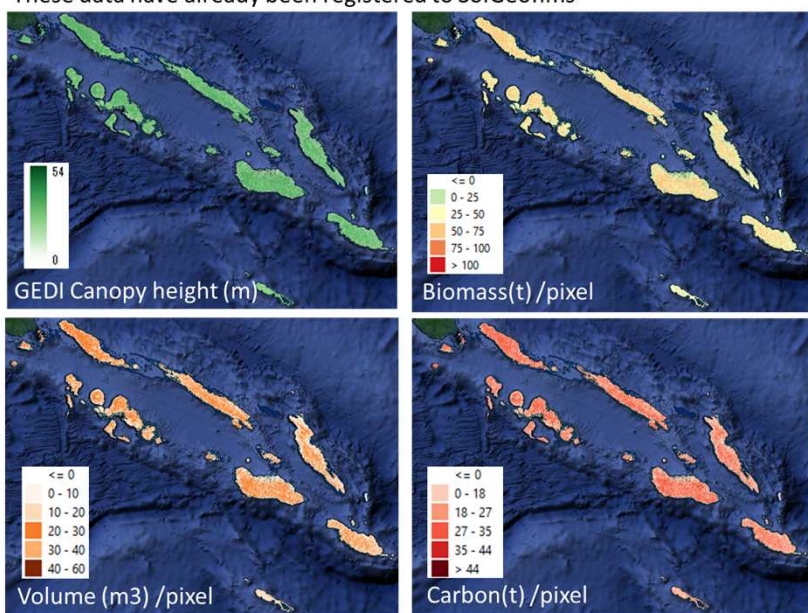
One of the biggest challenges in Solomon Islands is the unsustainable forest harvesting from foreign companies. This, however, creates the need to find ways to manage the forest. Forest Management Units (FMU) is one of the better approaches.

FMU divides the forest into several and manageable compartments where managing is easier. And in these compartments, different developments can be allocated to it.

To realize the effectiveness of FMU methods, proper regulations need to be created. These regulations will define or guide how these developments will happen in each FMU units. And by doing this, the forest will be well managed and used in a sustainable manner.

Result of Carbon/Biomass/Volume mapping of Solomon islands.

These data have already been registered to SolGeofims



[Data Classifications and Definition in FMU]

No	Field Name	Type	Length	Precision	Source
1	fid	Integer	10	0	Original
2	Province Code	String	10	0	Census
3	Province Name	String	10	0	Census
4	Ward Code	String	10	0	Census
5	Ward Name	String	30	0	Census
6	Catchment Code	String	10	0	Original
7	FMU Code	String	10	0	#2+#6
8	Area (ha)	Real (double)	10	2	Original
9	LC_Type	String	10	0	Land Cover Map Majority
10	LC Code	String	10	0	Land Cover Map Majority
11	Forest Type	String	10	0	FTM Majority
12	F_TYPE2	String	10	0	ForestType Level 1
13	F_TYPE3	String	10	0	ForestType Level 2
14	F_TYPE4	String	10	0	ForestType Level 3
15	Treecover(ha)	Real (double)	10	2	Hansen Treecover
16	Loss area (ha)	Real (double)	10	2	Hansen Lossyear
17	Loss rate (ha)	Real (double)	10	2	Hansen Lossyear
18	Gain area (ha)	Real (double)	10	2	Hansen Gain
19	Water area (ha)	Real (double)	10	2	Hansen Datamask
20	Elevation	Real (double)	10	2	SRTM30
21	Elevation \geq 400 ratio	Real (double)	10	3	SRTM30
22	Slope	Real (double)	10	2	SRTM30
23	Aspect (8 directions)	Integer	10	0	SRTM30
24	Distance(Major road)	Real (double)	10	2	Base Map
25	Distance(River)	Real (double)	10	2	Base Map
26	Volume_sum (m3)	Real (double)	10	2	Original Tree Volume
27	Volume_ha (m3)	Real (double)	10	2	Original Tree Volume
28	Carbon_sum (C-ton)	Real (double)	10	2	Original AGC
29	Carbon_ha	Real (double)	10	2	Original AGC