

# Constraints data

## Natural condition layers in the PNG-FRIMS

Capacity Development Project for Operationalization of PNG Forest Resource Information Management System (PNG-FRIMS) for Addressing Climate Change

### 1. Background

Constraints data is one of the PNG Forest Resource Information Management System (PNG-FRIMS) data sets developed in the JICA-PNGFA Project. The data was sourced from legacy Forest Inventory Mapping System (FIMS). Constraints is significant information for PNG Forest Authority (PNGFA) since it defines natural conditions and constrains to logging activities. However, PNGFA, realizing some errors in the legacy data set, replaced it with a corrected data set.

To update constraints data, available and efficient data and methods were considered. Constraints data covers entire PNG and it should have enough accuracy while maintaining sufficient performance in actual use on PNG-FRIMS. The data and methods used are shown in section 3. Constraints layers in PNG-FRIMS were updated in December 2016.

This data set is mainly used to plan, control and monitor logging operations to assist in forest management decision-making.

### 2. Constraints Definition

The criteria for each constraint are defined in FIMS as described below.

Layer	Description
Altitude	land over 2400m altitude.
Slope (Extreme)	land with over 30 degree dominant slope.
Slope (Serious)	land with dominant slope of 20-30 degrees and sub-dominant slope over 30 degrees and with high to very high relief.
Mangroves	land covered by mangroves.
Inundation (Extreme)	land permanently or near permanently inundated extending over more than 80% of the area of that land.
Inundation (Serious)	land permanently or near permanently inundated extending over 50-80% of the area of that land.
Karst	land with polygonal karst landform.

Note: PNG Logging Code of Practice allows that selection logging in PNG may be practiced in forest areas which are not excluded by the following criteria:

- slope steeper than 30 degrees
- in areas of high relief on slopes steeper than an average of 25 degrees
- permanently inundated land
- limestone country (karst)
- mangrove areas

### 3. Method on update of Constraints data

Constraints data was updated by the method shown in the table below.

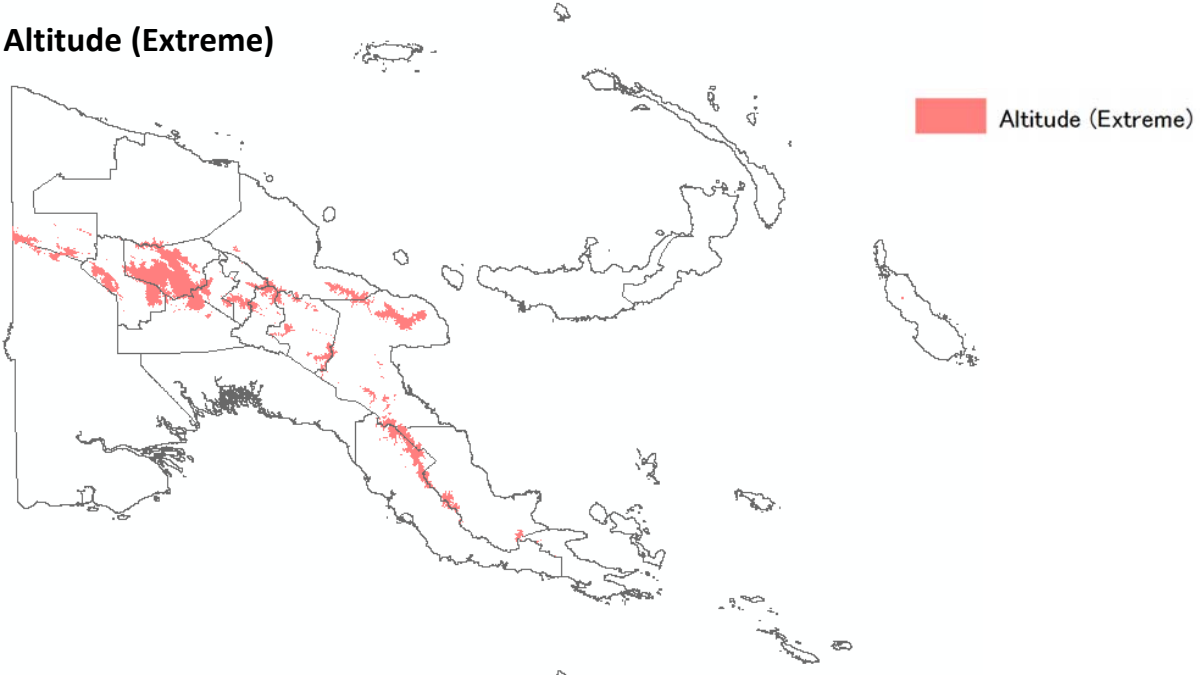
Layer	Data used	Method
Altitude (Extreme)	SRTM 30*	<ul style="list-style-type: none"> <li>- Reclassify altitude with target altitude</li> <li>- Convert to vector (simplify boundary)</li> <li>- <b>Eliminate small polygons (smaller than 10ha)</b></li> <li>- Extract (Export) only target altitude</li> <li>- Split with new provinces</li> </ul>
Slope (Extreme)	SRTM 30	<ul style="list-style-type: none"> <li>- Reclassify slope with over 30 degrees</li> <li>- Convert to vector (simplify boundary)</li> <li>- <b>Eliminate small polygons (smaller than 50ha)</b></li> <li>- Extract (Export) only polygons over 30 degrees</li> <li>-&gt;&gt; continue to next process below</li> </ul>
Slope (Serious)	SRTM 30	<ul style="list-style-type: none"> <li>- Reclassify slope with over 20 degrees</li> <li>- Convert to vector (simplify boundary)</li> <li>- <b>Eliminate small polygons (smaller than 50ha)</b></li> <li>- Extract (Export) only polygons over 20 degrees</li> <li>- Union polygons over 20 degrees and polygons over 30 degrees above</li> <li>- Split with new provinces</li> <li>- Divide into polygons over 30 degrees and 20-30 degrees</li> </ul>
Mangroves	Forest Base Map 2012	<ul style="list-style-type: none"> <li>- Extract mangrove class (Code: M, ID: 9) from the Forest Base Map 2012</li> <li>- Merge all provinces</li> </ul>
Inundation (Extreme)	PNGRIS 2008**	<ul style="list-style-type: none"> <li>- Extract target inundation class from PNGRIS 2008</li> <li>- Merge all provinces</li> <li>- Dissolve polygons</li> <li>- <b>Fill small gaps (smaller than 10ha)</b></li> <li>- <b>Remove small polygons (smaller than 10ha)</b></li> <li>-&gt;&gt; continue to next process below</li> </ul>
Inundation (Serious)	PNGRIS 2008	<ul style="list-style-type: none"> <li>- Extract target inundation class from PNGRIS 2008</li> <li>- Merge all provinces</li> <li>- Dissolve polygons</li> <li>- <b>Fill small gaps (smaller than 10ha)</b></li> <li>- <b>Remove small polygons (smaller than 10ha)</b></li> <li>- Union polygons of inundation serious and extreme</li> <li>- Simplify boundary</li> <li>- Split with new provinces</li> <li>- Divide into polygons inundation serious and extreme</li> </ul>
Karst	PNGRIS 2008	<ul style="list-style-type: none"> <li>- Extract target karst class from PNGRIS 2008</li> <li>- Merge all provinces</li> <li>- Dissolve polygons</li> <li>- Fix broken gaps</li> <li>- Split with new provinces</li> </ul>

\* Shuttle Radar Topography Mission (SRTM) 1 Arc-Second Global, <https://lta.cr.usgs.gov/SRTM1Arc>

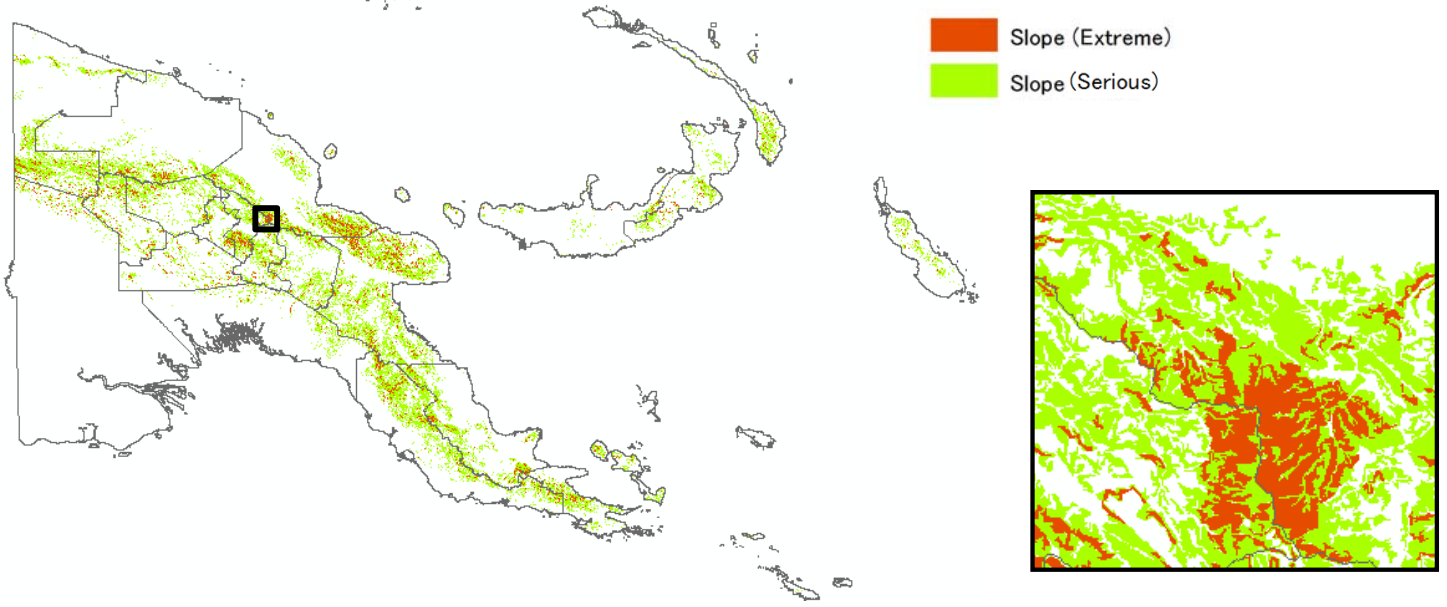
\*\* University of Papua New Guinea, 2008. Papua New Guinea Resource Information System

# 4. Updated Constraints layer

### Altitude (Extreme)



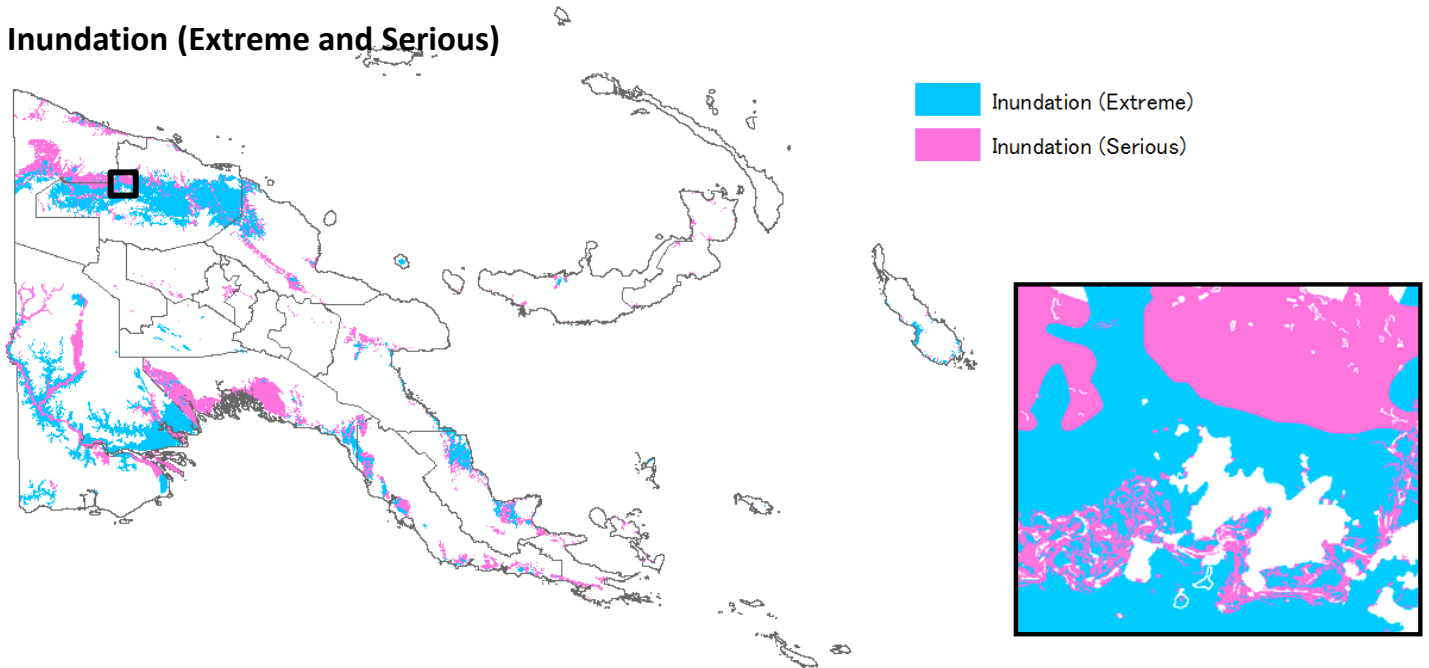
### Slope (Extreme and Serious)



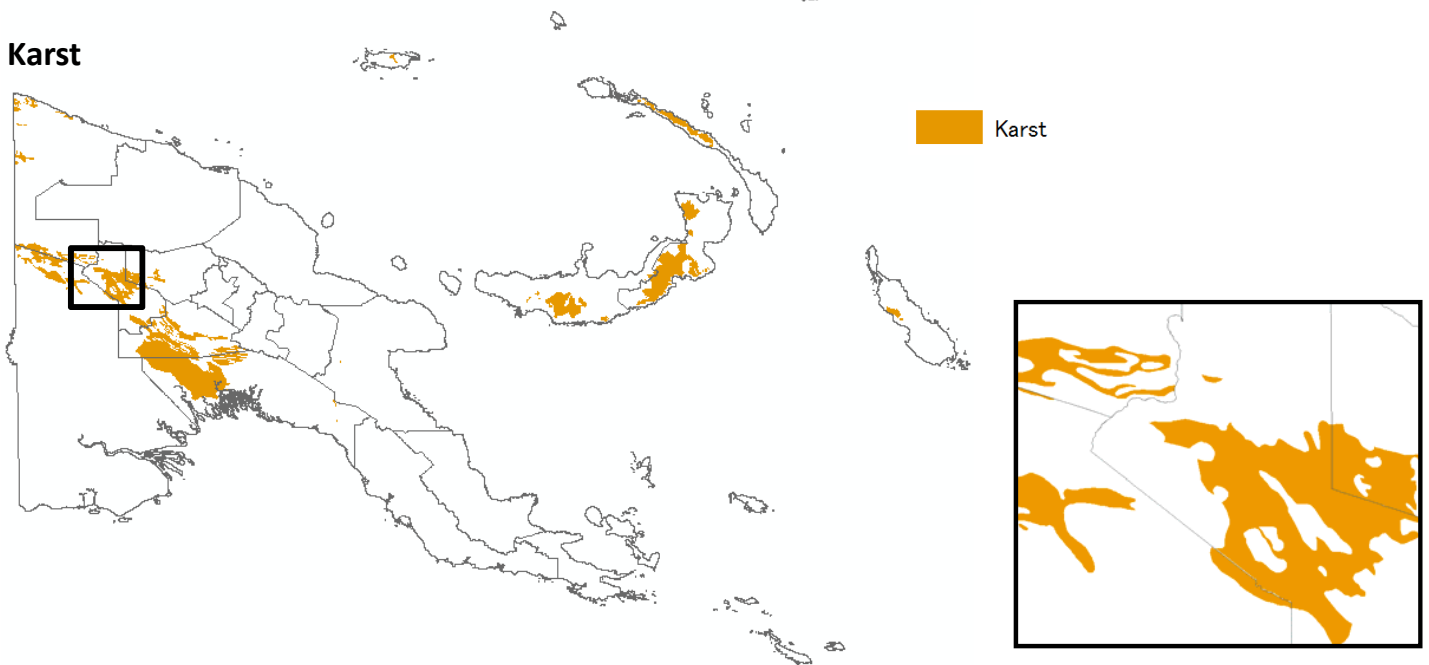
### Mangroves



## Inundation (Extreme and Serious)



## Karst



## 5. References

- McAlpine, J. and Quigley, J., 1998, 'Forest Resources of Papua New Guinea Summary Statistics from the Forest Inventory Mapping (FIM) System'. Coffey MPW Pty Ltd for AusAID and PNGFA
- Bryan, J.E. and Shearman, P.L., 2008, 'Papua New Guinea Resource Information System Handbook 3rd Edition. PNGRIS Publication No. 7.' University of Papua New Guinea, Port Moresby, Papua New Guinea
- JICA and PNGFA, 2016, '2014-2019 JICA-PNGFA Project Outline - JICA-PNGFA Forestry Project 2014-2019 Fact Sheet No.1'. Papua New Guinea Forest Authority, Port Moresby, Papua New Guinea
- JICA and PNGFA, 2018, 'Papua New Guinea Forest Resource Information Management System - JICA-PNGFA Forestry Project 2014-2019 Fact Sheet No.3'. Papua New Guinea Forest Authority, Port Moresby, Papua New Guinea

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 JICA Project Site: <http://www.jica.go.jp/png/english/activities/activity12.html>  
 Project Facebook Page: <https://www.facebook.com/jica.png.forest.monitoring/>



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