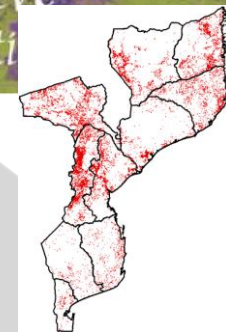


K&C Phase 4 – Final Report

*National Forest Monitoring System For REDD+ in
Mozambique*

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Ministry of Lands, Environment and Rural Development
Mozambique*



Results and significant findings

Activities overview of RS of 5 years JICA project

- Detection of deforestation areas at national level and forest cover
- Evaluation how to make the use of the methodology



- Ground survey for validation of the deforestation and linear value

2016

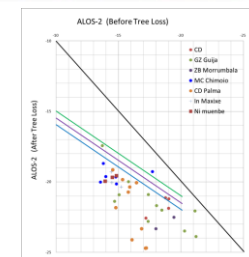
2017



2015

- Visual and Automatic detection of deforestation

- Evaluation of the linear value
- Analysis of precision
- Water body and water strim Masking



2014

- Understanding of IR characteristics
- Detection test of deforestation

2013

- Theory study
- Radar images acquisition



Basic training on IR

Training on job in Moz. and Jp. on IR



Applied Practical training on IR

Training in Japan in applied areas analysis

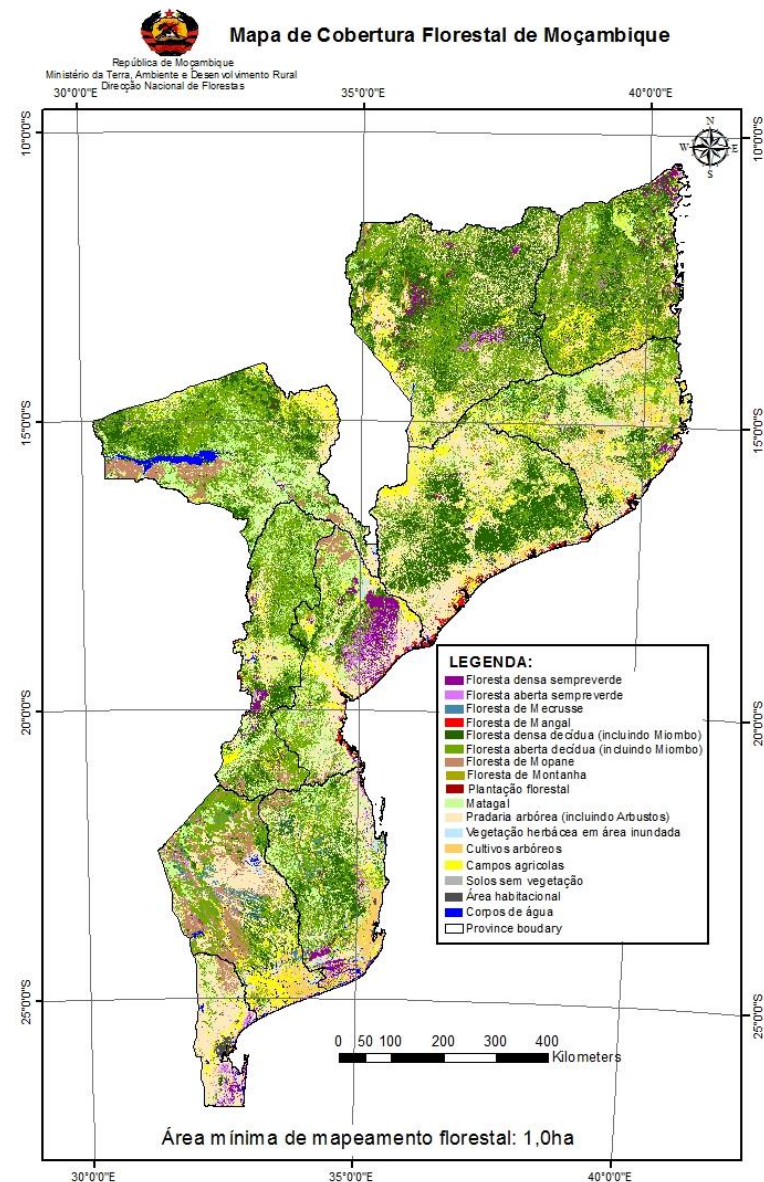
Results

Base map of the forest cover (2013)

Deforestation rate (2003-2013):
0.79%/year with 34 Million ha of
forest cover? (NFI, DINAF 2018);

**Supported by JICA and technical
assistance of JOFCA & KOKUSAI
KOGYO CO, LTD** within 5 years
project, and PASCO Japan;

Support JAXA in K&C#4 initiatives
providing de ground truth.

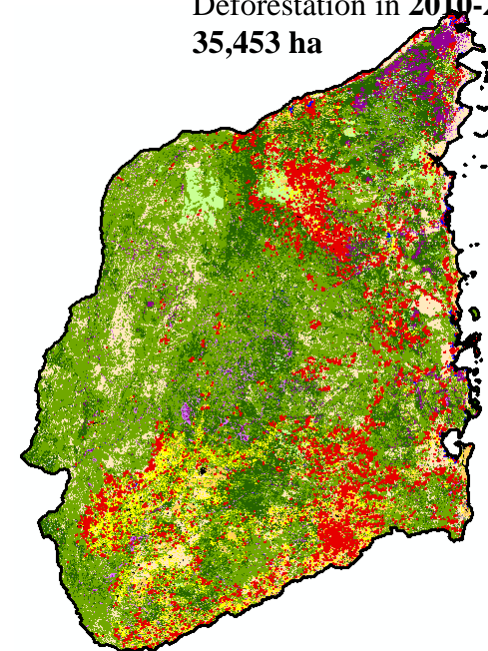


Size of deforested area by forest type (CD):

We identified the area deforested by forest type, from C. Delgado, overlapping the image with the 2008 forest coverage map.

Deforested area (ha)	(Semi-) dense ever green	Semi-open ever green	Mangrove	(Semi-) deciduous dense	(Semi-) deciduous Open	Total (ha)
1 ~ 2	279	122		1.915	3.137	5.452
2 ~ 3	202	63		1.070	1.794	3.129
3 ~ 4	119	45		657	1.171	1.992
4 ~ 5	124	48	4	501	871	1.548
5 ~ 6	97	22		388	835	1.341
6 ~ 7	91	19		368	486	964
7 ~ 8	90	8		304	240	641
8 ~ 9	43			288	400	731
9 ~ 10	47			180	238	465
10 ~	696	73		2.204	3.348	6.321
Total	1.787	399	4	7.875	12.519	22.585
% of forest cover	0,81%	0,26%	0,01%	0,49%	0,34%	0,39%

Deforestation in 2010-2013:
35,453 ha



Map of forest cover and land use 2008

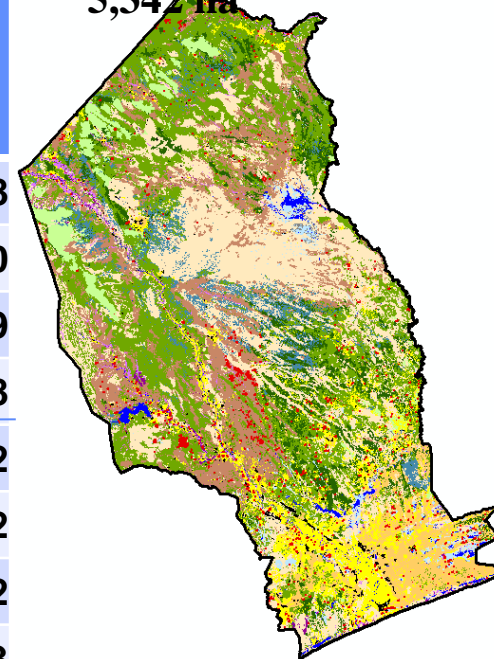
※2 years during 2008 -2010

Size of deforested area by forest type (GZ):

We identified the deforested area by forest type, from Gaza, overlapping the image with the forest cover map of 2008.

Deforestation in **2010-2013**:

5,342 ha



Map of forest cover and land use 2008

※ 2 years during 2008 -2010

Deforested area (ha)	(Semi-) dense green	(Semi-) dense ever green	Mecrusse	(Semi-) dense deciduous	(Semi-) open deciduous	Mopane	Total (ha)
1 ~ 2	31	52	16	133	370	314	918
2 ~ 3	45	36	13	56	149	162	460
3 ~ 4	17	45	10	51	123	143	389
4 ~ 5	14	23		18	50	93	198
5 ~ 6	22	16		6	33	65	142
6 ~ 7	19	7		6	13	58	102
7 ~ 8	15	7		8	30	52	112
8 ~ 9	8	25		9	9	42	93
9 ~ 10					38	57	95
10 ~	51	13		125	203	869	1.261
Total	222	223	39	413	1.017	1.855	3.770
% of forest cover	0,58%	0,21%	0,01%	0,09%	0,05%	0,17%	0,09%

Project outline and objectives

The project objective was for the Development of a Basis of Forest Resource Information Platform for Monitoring REDD+ in Mozambique and establish the terms and conditions under which the Parties will cooperate in ALOS K&C, an international collaborative project led by JAXA, for generating and disseminating thematic information on forest carbon to support environmental conventions and terrestrial carbon cycle research using ALOS PALSAR data.

For KC submitted proposal for Post-KC

Deforestation and Forest Degradation Analysis Vs Forest management in Mozambique

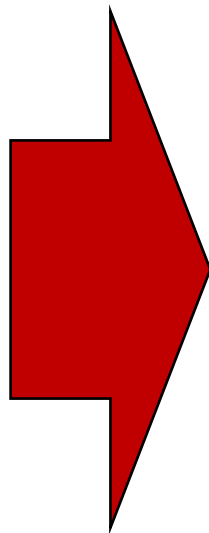
- The project objectives are to continue with analysis of drivers of deforestation and forest degradation using ALOS-2 data to support decision makers with clear results and encounter with accurate and appropriate method with least costly applicable to the tropical dry forest of country with clear parameter's highlighting what is the most applicable threshold of boundaries between deforestation and forest degradation vs forest management among many definitions that do not have clear practical scientific support in order to support decision makers in the sector of forest.

For KC members submitted proposal for
Post-KC

- The project will design and implement case studies mainly in two provinces of the country namely Gaza and Niassa provinces if necessary in some other areas with potential applicability of the outline of the project;
- The Satellite data requested from JAXA should be PALSAR AVENIR-2, ScanSAR. The amount will be defined accordingly to the selected sites accordingly to temporal the length of the project respecting the limits that will be established by JAXA.
- For the better results more different source of data will be used such as data from sentinels and other data from ALOS and with similar characteristics of ALOS data.

Relevance to the 4 K&C thematic drivers

- ☐ Carbon cycle science,
- ☐ Climate Change,
- ☐ International Conventions,
- ☐ Environmental Conservation



↓ Elaborate FRIP

↓ Allowed the country base pa which will be the Mapping and historical cover maps of ;

↓ Estimated Carbon Emission in the target areas;

↓ Conclude the 4NFI



↓ Deforestation map

↓ Scale up the implementation of REDD+ in one of the target area (2019), to establish our NFMS;

↓ Allowed the country to have FREL/FRE considering only deforestation and submitted to UNFCCC;

↓ Preparation of NDC, 2NC

Expected outcomes and deliverables

- ✓ **Enhance forest national monitoring;**
- ✓ **Up-to-date forest monitoring products;**
- ✓ **Building a relationship for forest monitoring;**
- ✓ **Contribution to existing country projects, programs, international frame works and data validation including JAXA;**
- ✓ **Ground truth data could contribute to earth science research for cal./validation and promote earth observation practically and internationally;**

Challenges?

- **Long-term effects** How to differentiate between long-term decline or persistent decline and temporal variability due to normal/good management or annual variability? How to differentiate between forest degradation and sustainable management of forest (cfr Forest code of practice? National/at logging company?)
- **Exclusion of deforestation** How to be sure that forest degradation will not be reclassify as deforestation in the future (precursor to deforestation)? (long-term reduction of carbon stocks but tree cover, height and area are not under the threshold defined for forest land). **How to define when the threshold for forest has been crossed?**
- **Loss of forest carbon stock** in forest land remaining forest land. The change should lead to a change in carbon stocks. Emissions due to forest degradation will depend on carbon stock available for release and degree/nature of the process (idem for removals);
- Forest Degradation to be considered with high, needs quantifiable and measurable/detectable thresholds within a defined time frame, be part of **the GHG inventory** (must be **human-induced**, describe **change in carbon stocks** at least), can be applied consistently in the same biome, must be possible to quantify/verify the change in dry forest;
- **Definition** of the most **precise, accurate method** considering the **consistency with the reliable results** for data comparison in the country when **forest management is being carried out**. **Full knowledge of the current ground field is needed to support Remote Sensing** ;

Thank you !!

Thank you !!

Arigato !

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Obrigado !