Republic of Mozambique

Ministry of Agriculture
National Directorate of Land and Forests
Department of Natural Resource Inventory

Program of Preservation of Forest In Mozambique
To Promote REDD+





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Forest techinician

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Introduction to the Country

- **Location** – Southern Africa, with Coast line at Indian Ocean and hinterland links to Tanzania, Malawi, Zimbabwe, Zambia, South Africa and Swaziland;
- **Area** ~ 799,380 Sq km;
- **Population** ~23 Millions (2007 censor),
- **Language**: Portuguese as a national language and other natives languages;
- **Climate** – Hot and humid, dry and cold seseans (Temp. 9º - 45º C);
- **Rainfall**: 500 – 900 mm/year;
- **Independent** in 1975 and end of civil war 1992 (16 years);
- **Resources** – Land, Water, Forests, Fish, Natura Gas (LPG), Mineral Charcoal, etc;
- **Institution that control Forest Natural Resource:** National Directorate of Lands and Forestry under Ministry of Agriculture,

Basic information on Forest

- Mozambique is located in a tropical region characterised by miombo forest with (semi)deciduous and evergreen forest, 51% of the country is covered by forest currently it is 40 million hectar;
  - Vegetation forest types (5 classes: Dense Forest, Opened, Mangrove, Moist open, Thicket);
  - Ecological zones (9 classes: Moist Miombo Forest, Sub-litoral moist Forest, Mosaic of costal forest, mopane forest, etc.);

- **Climate:** with two seasons, a wet and hot season from October to March and a dry and cold season from April to September;

- **Forest is defined** as area with a conopy cover >15% of coverage, tree hight > 3m and surface ≥ 0.5ha.

- **Forest area trend** is decreasing in 0.58% per year, which 220 000 ha/annual (1990-2004). Increasing in Plantation area;
  - Estimated total volume and other wooded vegetation land 1.74 billion m^3 or 36.6 m^3/ha;

- **Land** belongs to the government;
  -- DUAT (Land Utilization Right Certificate) is approved by the government.

Forest Inventories carried out in Mozambique

Year	National	Scale	Provincial	Scale
1980	Country	1:1000000		
1994	Country	1:1000000	Sofala	1:250000
2000-2005			Zambezia	1:250000
2000-2005			Inhambane	1:250000
2005-2007	Country	1:1000000	Manica	1:250000
2005-2007			Maputo	1:250000

For this work were used Landsat satellite images

Background

The country recently started readiness phase of REDD+ mechanism. (REDD+ is a prospective mechanism for the new protocol after Kyoto (under negotiation in UNFCCC) since IPCC identified that deforestation causes approximately 20% of global GHG emissions. The idea is to curb green house gas emission from deforestation and forest degradation by providing performance based benefits in a form of carbon credit.)

During the REDD+ readiness phase, each of responsible government authority will prepare for starting implementation of REDD+. To create a capacity to monitor forest cover change including deforestation and forest degradation is one of the main tasks of DNTF.

As a part of National REDD+ Strategy and National Forest Plan (NFP) under formulation, DNTF is going to start the Project for Establishment of the Forest Resource Information Platform in technical cooperation with JICA(hereinafter “the DNTF-JICA Project”) . The Platform is planned to be created under the National REDD+ Information Platform which will be a database including registration and strategy, and administration and finance.

Technical capacity development to analyse PALSAR images for monitoring forest cover change is one of the Components of the DNTF-JICA Project (Component 2). KC3 cooperation with JAXA is the key part of this Component.

Some factors of forest degradation and deforestation

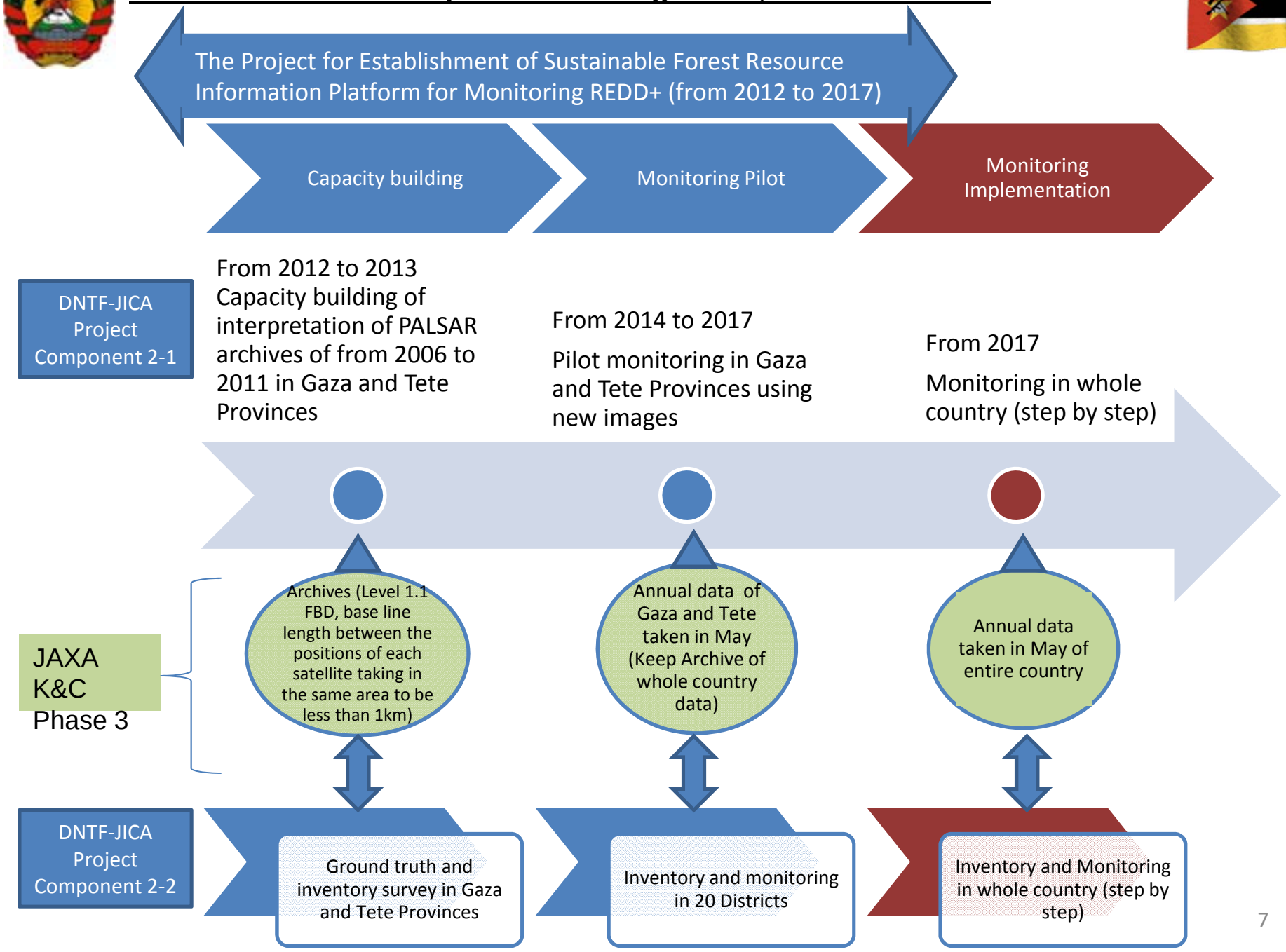
Shift cultivation

Wild forest fire

New settlements

Charcoal business

Framework of the Cooperation among DNTF, JICA and JAXA



Introduction of DNTF-JICA Project
- 4 Components -

1. Establesh and functioning Database system as information Platform of Forest resource
   1-1 Create a database in DNTF HQ GIS facility with a nationwide satellite image map product and all available forest and geographic information
   1-2 Produce forest cover and land use maps for 2 provinces (Gaza and Tete) by Remote Sensing using optical satellite images and ground truth.

2. Developed the base of MRV to sustain the forest information Platform

2.1 Develop capacity in Remote Sensing to detect forest cover changes using SAR in 2 provinces (Gaza and Tete)

2.2 Establish on the ground monitoring system and implement
- Establish inventory system in 2 provinces and each 2 target districts in the 8 provinces
- Establish the monitoring systems in each 2 districts for the 10 provinces

→ KC3 with JAXA

3. Create RELs/RLs for Natural Forest Resource Information Platform

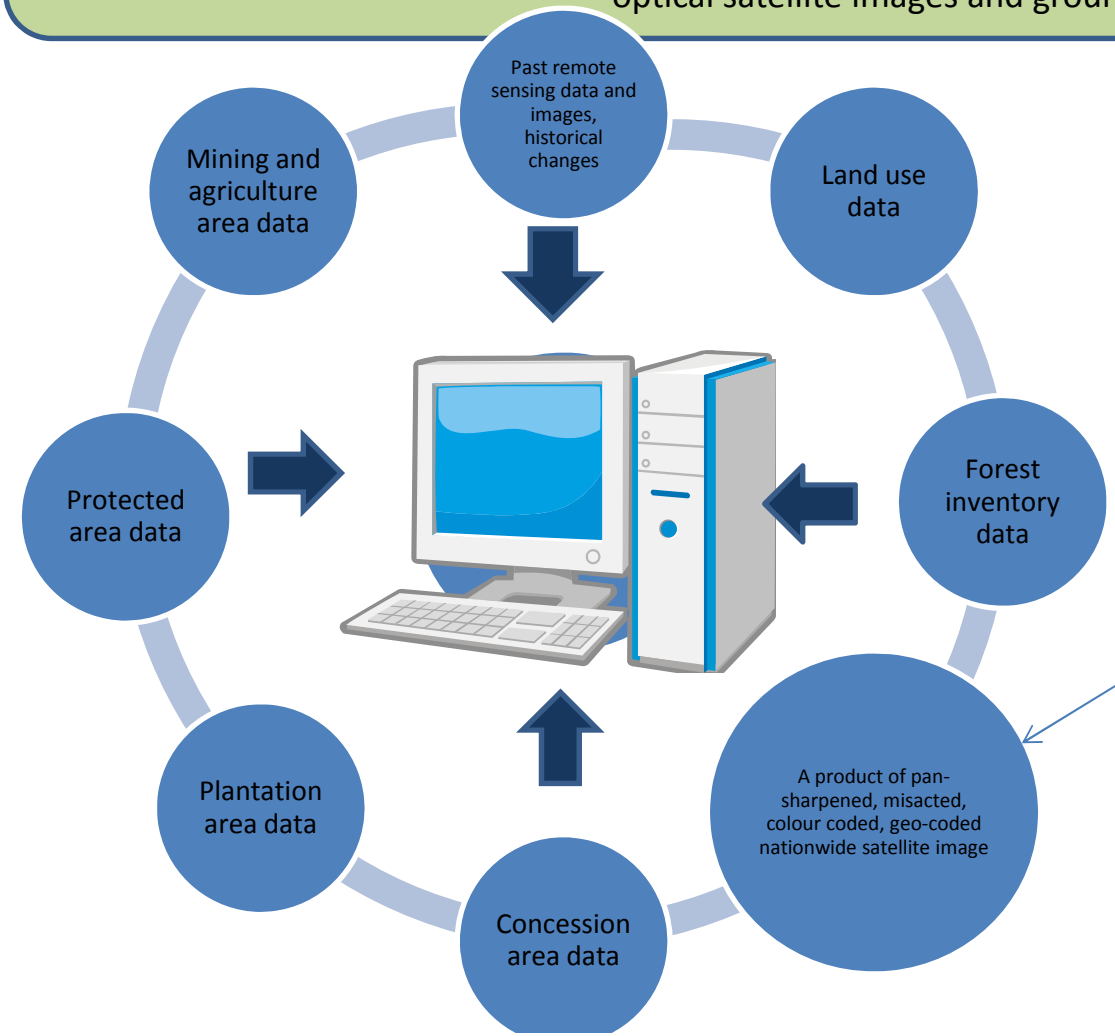
4. Prepare data sets for biomass and carbon estimation

Component 1 of the DNTF-JICA Project for the Establishment of Forest Resource Information Platform for Monitoring REDD+

1. Establesh and functioning Database system as information Platform of Forest resource

1-1 Create a database in DNTF HQ GIS facility with a nationwide satellite image map product and all available forest and geographic information

1-2 Produce forest cover and land use maps for 2 provinces (Gaza and Tete) by Remote Sensing using optical satellite images and ground truth.



Forest Information Platform in Server

Computers

Software

Purchase by Grant Aid (Forest Preservation Programmme of Japan)

GPS-GIS Database Experts

Component 2 of the DNTF-JICA Project for the Establishment of Forest Resource Information Platform for Monitoring REDD+

2. Developed the base of MRV to sustain the forest information Platform

2.1 Develop capacity in Remote Sensing to detect forest cover changes using SAR in 2 provinces (Gaza and Tete)

2.2 Establish on the ground monitoring system and implement

- Establish inventory system in 2 provinces and each 2 target districts in the 8 provinces
- Establish the monitoring systems in each 2 districts for the 10 provinces

PALSAR archives & training

KC3 with JAXA

Inventory Data

Geographic information

Forest Utilization Plan + Monitoring Plan

Deforestation/Forest Degradation Detection & Report Training (GPS, GIS)

SDAE*

GPS report

SPFFB**

Survey Report

DNTF HQ***

Check ground data with satelitte images (MODIS) and update base Map

Forest Inventory Expert

GPS-GIS Database Experts

<Note>

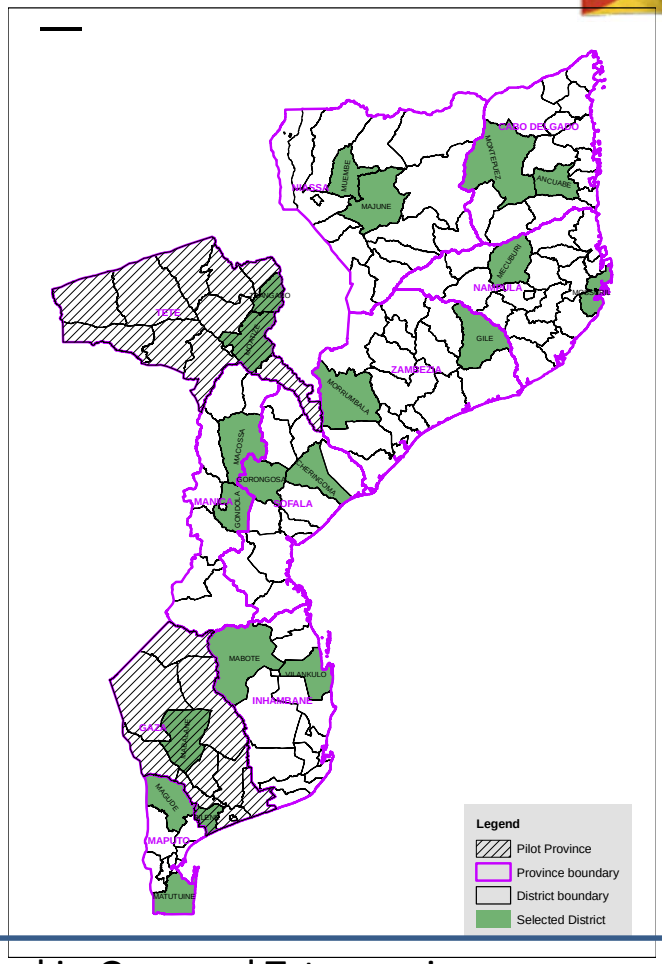
*SDAE: districtal service of economical activity (Agricultura, Forestas, etc)

**SPFFB: Provincial service of forest and wild life

***HQ: Department of Natural Resource Inventory

DNTF-JICA Project -- Location of Component 2 – KC3 with JAXA

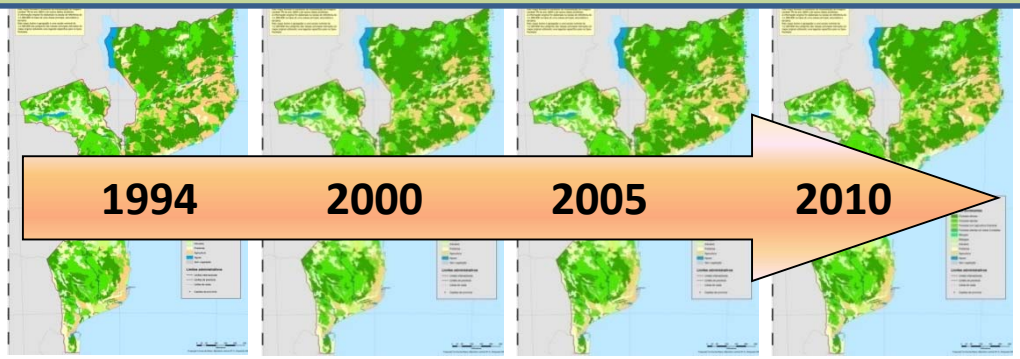
Province	District 1	District 2
Maputo	Matutuine	Magude
Gaza	Bilene	Mabalane
Inhambane	Mabote	Vilanculo
Manica	Gondola	Macossa
Zambezia	Murrumbala	Gile
Tete	Moatize	Tsangano
Sofala	Golongoza	Cheringoma
Nampula	Mecuburi	Mossuril
Niassa	Nuembe	Majune
Cabo Delgado	Ancuabe	Montepuez

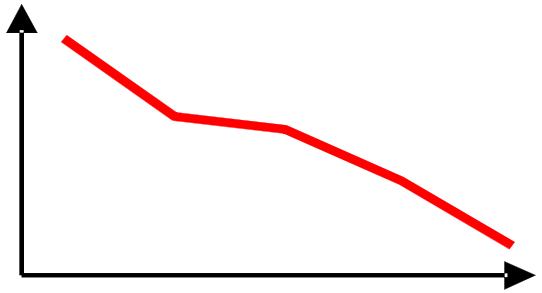


From 2012 to 2013, the pilot inventories will be started in Gaza and Tete provinces.
From 2014 to 2017, forest resource inventory survey will be conducted in 2 provinces and in two selected districts of each of all 10 provinces.
After 2017, the DNTF hope to extend monitoring areas to whole country areas using all data including archives from 2014.

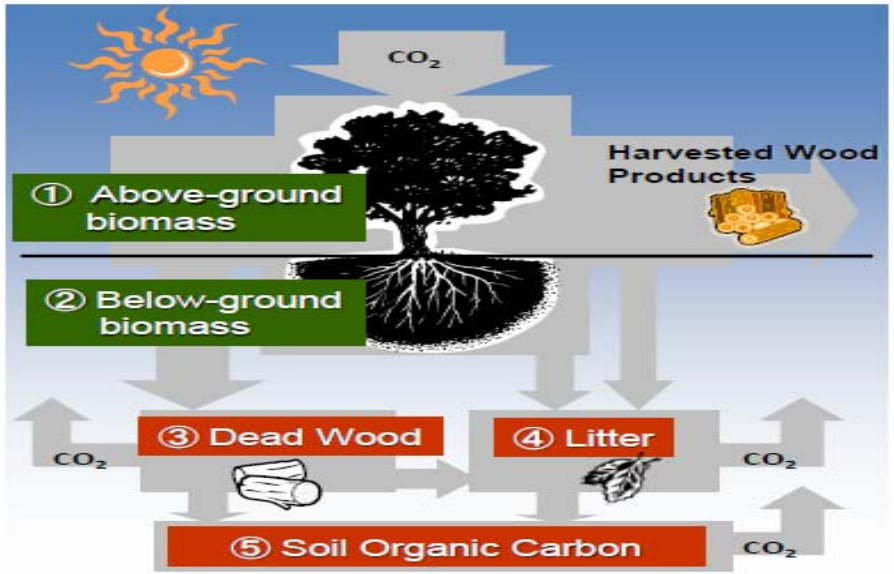
<u>Component 3 & 4</u> of the DNTF-JICA Project for the Establishment of Forest Resource Information Platform for Monitoring REDD+

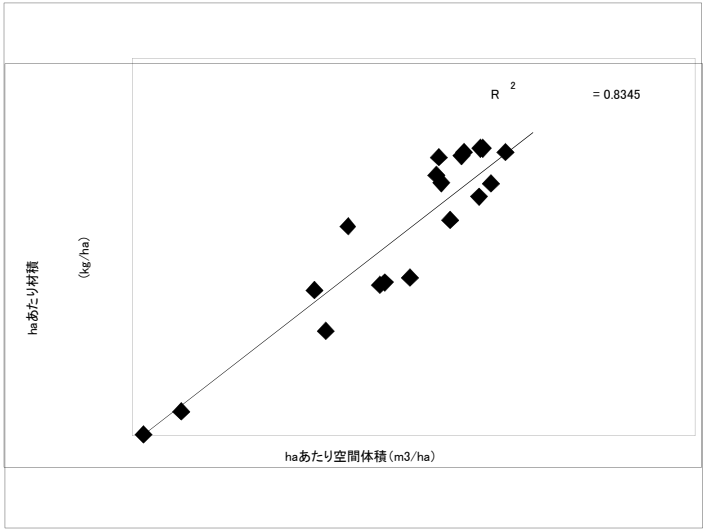
3. Create RELs/RLs for Natural Forest Resource Information Platform





4. Prepare data sets for biomass and carbon estimation





KC3 Project Objective

- **Key to success** of the Component 2 of the DNTF-JICA Project for Establishment of Sustainable Forest Resource Information Platform for Monitoring REDD+

  <Objective of the DNTF-JICA Project > Creating a database GIS facilities at HQ with a nationwide satellite image map and available forest and geographic information, bases for MRV and RELs/RLs for forest resource information platform.

Our project anticipate that PALSAR data will be useful for the following reasons:

- PALSAR can be taken no matter in rainy season, during night etc. & available to detect forest cover changes
- It has the ability to penetrate the forest canopy cover.
- compared to other sensors, it is less affected by soil and weather conditions.
- Therefore it will allow us to detect with accuracy deforestation and degradation areas.

- PALSAR looks like advantageously applicable in Mozambique because:
  - Mozambique is not mountainous country.
  - Tree height is less than 15m in average.

The project will improve reference level (Component 3 the DNTF-JICA Project).

Support to JAXAs global forest mapping effort

Our KC3 cooperation with JAXA will contribute to the JAXA's global forest mapping effort as:

<For KC3 Project Period (~2014)>

- Past inventory data sets (technical capacity training and formulate a manual of forest cover change detection using PALSAR archive from 2006 to 2011 of Gaza and Tete Provinces) (DNTF-JICA Project-- Component 2a)
- Ground truth survey data of Gaza and Tete Province and 20 Districts on completion of the field surveys (DNTF-JICA Project-- Component 2b)

<Post KC3>

- Field survey data continuously whatever we conduct in whole country if JAXA provide PALSAR images of whole country continuously
- Carbon stock estimated data (DNTF-JICA Project-- Component 4)
- Historical area change by REDD+ activity type

Thank You

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