K&C Phase 3 – Brief project essentials

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Climate-Relevant Modernization of the National Forest Policy and Piloting of REDD+ Measures in the Philippines

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> Science Team meeting #17 – Phase 3 RESTEC HQ, Roppongi, Tokyo, March 26-29, 2012



Project areas: Philippines

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Sub-national REDD+ Pilot Sites

- 1. Southern Sierra Madre mountain range
- 2. Leyte island
- 3. Victoria-Anepahan mountain range, Palawan island

K&C Project Collaborators and Partners

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Project Collaborators

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- 1. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
- 2. Fauna & Flora International (FFI)
- 3. Department of Geodetic Engineering, University of the Philippines (UP-DGE)

Partners & Supporting Agencies

- 1. Non-Timber Forest Products Task Force / Exchange Programme
- 2. TEaM Energy Foundation in the Philippines (supported by Tokyo Electric Company & Marubeni)
- 3. European Commission
- 4. Department of Environment and Natural Resources: Forest Management Bureau & National Mapping and Resource Information Authority

Project objectives

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For each of the three identified REDD+ pilot sites, the project aims to:

1. Establish baseline forest carbon stocks

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- 2. Pilot forest carbon inventory and monitoring methods in support of validating ALOS PALSAR imageries
- 3. Determine reference deforestation rate

Updates LEYTE ISLAND

ALOS



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Leyte: Systematic Cluster Distribution

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Leyte Island FRA Update

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• Total of 123 of 200 clusters in Southern Leyte assessed

• 81 clusters inside pilot area

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42 clusters outside pilot area

• Total of 15 of 50 clusters assessed in (Northern) Leyte

- 15 clusters inside Energy Development Corporation area
- 13 clusters in dense natural forest
- 2 clusters in forest plantation non-native species

Variability/Change Detection

Same Polarizations Stack

Acquired same year:2007, 2008, & 2009

R: 2007 HV G: 2008 HV B: 2009 HV







Some challenges: Leyte island

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Updates

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SOUTHERN SIERRA MADRE & PALAWAN



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Abor

Some background

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- In the Philippines, 12 natural forest formations have been described based on physical characteristics (Fernando et al 2008; Whitmore 1984)
- Limitations of previous national mapping efforts:

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- 1 Multi-spectral data affected by cloud cover
- 2 Different forest classification schemes employed
- ③ Only partially reflects various Philippine forest formations
- Forest classification scheme by Whitmore (1984) was adopted in the 1997 NBSAP, but still not adopted by DENR
- Some previous efforts to map the extent of Philippine forests using satellite remote sensing:
 - 1 1987 SSC land cover map using 15m SPOT imagery
 - 2 2002 NAMRIA/FMB land cover map using 30m Landsat data

Forest formations of the Philippines

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Image source: Fernando et al. 2008. Forest Formations of the Philippines. ASEAN-Korea Environmental Cooperation, Seoul, Korea.

Forest types, elevation, rainfall, and temperature

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Image source: Heaney and Regalado. 1998. Vanishing Treasures of the Philippine Rain Forest. The Field Museum, Chicago, Illinois, USA.

Some factors shaping forest structure and growth

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Image source: Ong *et al.* (eds.). 2002. *Philippine Biodiversity Conservation Priority-setting Programme. Final Report.* DENR, CI-P, UP-CIDS, and FPE, Quezon City, Philippines.

Comparison of forest classification

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Forest formations	1987 SSC	2002 NAMRIA/FMB		
Lowland evergreen forest	Closed canopy, mature >50%	Closed broadleaf forest		
Lower montane forest	Open canopy, mature <50%	Open broadleaf forest		
Upper montane forest	Mossy forest	Coniferous forest, closed		
Subalpine forest	Pine forest	Coniferous forest, open		
Forest over limestone	Mangrove forest	Mixed forest		
Forest over ultramafic	Marshy area and swamp	Mangrove forest		
Beach forest	Submarginal forest	Forest plantation, broadleaf		
Mangrove forest		Forest plantation, coniferous		
Peat swamp forest		Forest plantation, mangrove		
Freshwater swamp forest				
Semi-evergreen forest				
Moist deciduous forest				

Methodology: image processing

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Considerations: accessibility elevation gradients sampling intensity per strata



2009 50-meter mosaic ALOS/PALSAR

Victoria-Anepahan mountains

Unsupervised classification

Initial 11 forest carbon plots

Legend

Forest ?
Transition ?
Lowland ?





Project schedule

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Main Activities	2011		2012		2013		2014	
	S1	S2	S1	S2	S1	S2	S1	S2
1. Image processing								
 Forest carbon inventories and biodiversity assessments 								
3. Image post-processing, analysis, change detection								
4. Report writing								
Legend: Sierra Madre			Ley	te	Palawan			

Support to JAXA's global forest mapping effort

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- 1. Sharing of in-situ data from forest inventories and other field activities from REDD+ sites
- 2. Validation of JAXA forest/non-forest cover maps and land use/land cover change maps
- 3. Input to development of algorithms for forest classification, carbon stock assessment, and forest stratification

The in-situ data that will be shared with JAXA includes: broad habitat and land cover types; location/GPS coordinates; tree diameter, merchantable tree height, and tree species; tree canopy cover; leaf litter; and deadwood.

Deliverables

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The project envisions the following results:

- □ Forest cover and change maps produced
- Deforestation rates determined

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- Baseline forest carbon stocks established
- Image processing methodologies and accuracy assessments documented