

Allometric Equation Development for Biomass Estimation in Vietnam

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Hanoi, 31 August 2012

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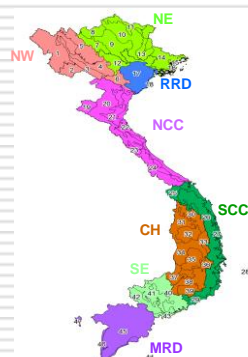
- Forest ecological stratification
- Data & AE availability
- Current study on AE development
- AE gaps analysis
- Next steps for AEs development

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Forest ecological stratification

- Carried out under the support of UN-REDD Vietnam
- A set of criteria & indicator developed (climate; , soils, forest vegetation)
- 8 ecological regions
- 47 ecological units



Key forest types by eco-regions

Forest types	NE	NW	RRD	NCC	SCC	CH	SE	MRD
Evergreen and semi-evergreen broad leave forest	***	***	***	***	***	***	***	***
Deciduous forest	○	○	○	○	○	○	○	○
Bamboo forest	***	***	***	***	***	***	***	***
Mixed wood & bamboo forest	***	***	***	***	***	***	***	***
Needle forest	○	○	○	○	○	○	○	○
Mixed broadleaves and needle forest	○	○	○	○	○	○	○	○
Mangrove forest	***	***	***	***	***	***	***	***
Limestone forest	***	***	***	***	***	***	***	***
Plantations	***	***	***	***	***	***	***	***

*** Very commonly distributed
 ** Commonly distributed
 * Less distributed
 ○ Not distributed

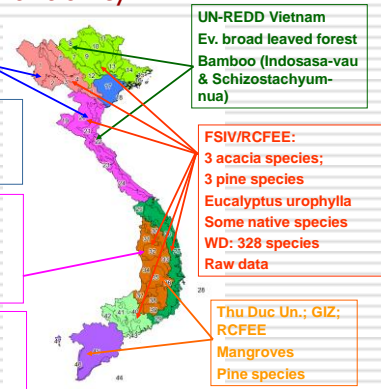
Data & AE availability

RCFEE/JICA (Dien Bien & Ha Tinh):
Ev.broad leaved forest

FIPI:
Form factor;
Wood volume estimation
Forest inventory data

FSIV & TNU:
Ev.broad leaved forest
Deciduous forest
Bamboo (lo o)
WD: 54 species; Raw data

VFU: Wood volume: 8 species
WD: 110 species;
Raw data



AEs status documentation

- Inputted data into a spreadsheet
- Test AEs based on raw data
- Developing documentation on the national status of AE (firstly scientific reports and scientific papers then)

Current study on AE development

Goal:

Generating scientific base for REDD activities in UN-REDD program in Vietnam and contribute to green house gases inventory in LULUCF.

Specific objectives:

- Develop AE for biomass estimation ;
- Develop a database for REDD activities and GHG inventory;
- Improve personnel capacity.

Scope:

- Six forest types (Evergreen; Deciduous; Dendrocalamus; Indosasa; Schizostachyum; Bambusa balcoa).
- Above ground biomass for timber trees
- Allometric equations at tree level.

#	Forest types	NE	NW	RRD	NCC	SCC	CH	SE	MRD	Total
1	Evergreen and semi-evergreen broad leave forest	1	1	0	1	1	1	1	0	6
2	Deciduous forest	0	0	0	0	1	1	1	0	3
3	Bamboo forest (Luong - Dendrocalamus barbatus)	1	1	0	1	0	0	0	0	3
4	Bamboo forest (Nua - Schizostachyum sp)	1	1	0	1	0	0	0	0	3
5	Bamboo forest (Vau - Indosasa sp.)	1	1	0	1	0	0	0	0	3
6	Bamboo forest (Lo o - Bambusa balcoa)	0	0	0	0	1	1	1	0	3
Total plots		4	4	0	4	3	3	3	0	21

Activities

- 24 sample plots (1 ha each) in 5 eco-regions: NE, NCC, SCC, CH, SE)
- Harvest ~ 980 trees (Min DBH: 5 cm; Max DBH: 75 cm) and 700 Bamboos;
- Analysis of dried biomass and wood density all samples.
- Develop AEs for every studied forest type
- Finalizing guidelines on destructive measurement for forest biomass estimation
- Updating and finalizing the database on forest biomass and carbon

Organization

- **VRO & FAO Vietnam:** overall coordination
- **Service providers:**
 - **RCFEE/FSIV:** Coordination among service providers; AEs for CH
 - **FIPI:** AEs for NE and SCC
 - **VFU:** AEs for NCC
 - **TNU:** AEs for SE

Expected output

1. Report on AEs development at tree level by forest types, ecological regions and national levels;
2. Raw data on the field; data on dry mass and wood density;
3. Completed database on Existing and newly developed AEs, species list, wood density, raw data etc.

Timing:

April-August 2012

AE gaps analysis

For which forest types are AEs not existent

Region	Type of forest	Note
NE+NW	Broad-leaved evergreen forest on lime montane	**
	Natural timber mixed with coniferous forests	*
	Timber and bamboo mixed forests	*
NCC	Broad-leaved evergreen forest on lime montane	**
	Timber and bamboo mixed forests	*
SCC	Natural timber mixed with coniferous forests	*
	Timber and bamboo mixed forests	**
	Semi evergreen	**
	Coatal drought tolerant	*

Note: * significant level in carbon sequestration portion



For which forest types are AEs not existent

Region	Type of forest	Note
CH	Timber and bamboo mixed forests	**
	Timber and bamboo mixed forests	***
	Semi evergreen	**
	Natural coniferous forests	***
	Montane broad-leaved evergreen forest	**
SE	Broad-leaved evergreen forest	**
	Timber and bamboo mixed forests	*
	Bamboo	*
	Dry dipterocarp	*
	Semi evergreen	*
	Mangrove	*

Note: * significant level in carbon sequestration portion

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For which forest types are AEs not existent

Region	Type of forest	Note
SW	Broad-leaved evergreen forest	*
	Timber and bamboo mixed forests	*
	Bamboo	*
	Semi evergreen	*
Plantation		
NE	<i>Styrax tonkinesis</i>	*
NW+NE	<i>Pinus caribea</i>	*
SCC	<i>Azadirachta indica</i>	*
NCC+SCC	<i>Casuarina equisetifolia</i>	**
SE+SW	<i>Mangrove</i>	**
SW	<i>Melaleuca</i>	**

Note: * significant level in carbon sequestration portion

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- Sub-tropical mountain forest and coastal drought tolerant forest not been concerned
- Distribution in basal area by forest type has not been concerned
- Large trees (>75cm DBH) and small trees (<5cm DBH) not been considered in the previous AE development
- BGB

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Issue/problem in AE development

- Missing information (raw data, biomass component of tree, WD not available..)
- Defining name of species
- Weighting big samples
- Cutting permission
- Rainy influence

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Next steps for AE development

- Finalize and accuracy assessment of AEs following ecological regions and forest types
- Developing AEs for forest which AEs not exist
- Training in AE development

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Thank you