

Forest Carbon Database and Data Analysis

Experience from a REDD+ Pilot Project in Nepal

Sanjeeb Bhattarai
sanjeebbhattarai@ansab.org

Forest Carbon Database

- Computer database
- Online database

Computer database – entry/view/query

MS Access
REDD Inventory Database

Entered by: ENUSHA
Start time: 4/7/2010
Date: 4/7/2010
Crew ID: 2 Rana BK
GPS X:
GPS Y:
GPS altitud: 675

Vegetation type: Sal
Slope: 44
Soil colour: Brown
Soil depth: 1
Tree crown cover: 80
Shrub cover: 5
Grass cover: 20

Additional information

Online database - entry

- Home
- Watershed
- Strata
- Community Forest
- Plot
- Tree
- Tree Species
- Working Area
- Logout

View data

Plot	: 0101001
Tree Number	: 1
Tree Sp Name	: Sal
Tree Measure Year	: 2010
Tree DBH	: 25.25
Tree Ht	: 25.65
Tree CO2	: 25.25

Online database – view & query

www.communityredd.net

District: Chitwan Watershed: Kayarkhola

View Kayarkhola Watershed Data

Name	Kayarkhola
District	Chitwan
Total Area of the watershed	8,001.93 hectare (ha)
Total CF area of the watershed	2,381.96 ha
Possible leakage area	41.00 ha
Number of strata within the watershed	2
Average carbon density	288.44 mega gram carbon per hectare [MgC ha ⁻¹]
Total number of plots within the watershed	180
Number of CFs	15
Total number of household	4,101
Total male population in CFs	10,145
Total female population in the CFs	11,345

Forest Carbon Data Analysis

- ### Carbon pools to measure
- a) Above-ground tree biomass (AGTB)
 - b) Above-ground sapling biomass (AGSB)
 - c) Below-ground biomass (BB)
 - d) Soil organic carbon (SOC)
 - e) Leaf litter, herbs, and grass (LHG)
 - f) Dead wood and fallen stumps (DW)**

Tree Biomass : tree height

where,
 AGTB = above-ground tree biomass [kg];
 ρ = wood specific gravity [$g\ cm^{-3}$];
 D = tree diameter at breast height [cm]; and
 H = tree height [m].

$$AGTB = 0.0509 * \rho D^2 H$$

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1			A	B					
2									

Tree height calculation:
 Condition 1 = $1.5 + \tan(A) * D$
 Condition 2 = $1.5 + D * \cos(B) * \tan(A) + D * \cos(B) * \tan(B)$
 Condition 3 = $1.5 + D * \cos(B) * \tan(A) - D * \cos(B) * \tan(B)$
 Condition 4 = $1.5 + D * \sin(B) - \sin(A)$

Tree Biomass : tree height

According to slope type:
 1. Condition 1 = $1.5 + \tan(A) * D$
 2. $1.5 + D * \cos(B) * \tan(A) + D * \cos(B) * \tan(B)$
 3. $1.5 + D * \cos(B) * \tan(A) - D * \cos(B) * \tan(B)$
 4. $1.5 + D * \sin(B) - \sin(A)$

Way to calculate tree height by inserting formula in MS Excel:

A	B	C	D	E	F			
1	Species	DBH	angle A	angle B	Distance D	slope type	formula for height	calculated height (m)
2	sal	88	65		16.6	1	$=1.5 + \tan(2 * 0.017453293) * 42$	37.10
3	kalikath	7.5	5	41	4.8	2	$=1.5 + \cos(0.017453293) * \tan(0.017453293) * 41 + \cos(0.017453293) * \tan(0.017453293) * 4.8$	4.97
4	sal	9	55	4	6.4	3	$=1.5 + \cos(0.017453293) * \tan(0.017453293) * 4 + \cos(0.017453293) * \tan(0.017453293) * 6.4$	10.17
5	badkaule	5	3	10	8.6	4	$=1.5 + \sin(0.017453293) - \sin(0.017453293)$	2.54

Training and Capacity Building

Access Guide for Beginners

With Examples and Exercises for a Simple Community Forest Questionnaire Survey

SN	participle
1	Ram Pras
2	Indira Rij
3	Hurn Kur
4	Man Bah
5	Shant Bahadur Magar male

Learning so far...

Learning by doing

- easily available/ open source database and data analysis tools and techniques

Local capacity building

- Do not expect that all local participants will turn into expert
- Even few capable: Transparency of method

By the end of the Pilot Project...

- A community carbon reporting to feed local data into national database will be developed
- We are working very closely with the Government of Nepal

Thank you



www.communityredd.net