

Mongolia Green Resilient Landscapes

Session III: Local Training by Trained Trainers

Introduction on the Field Practice

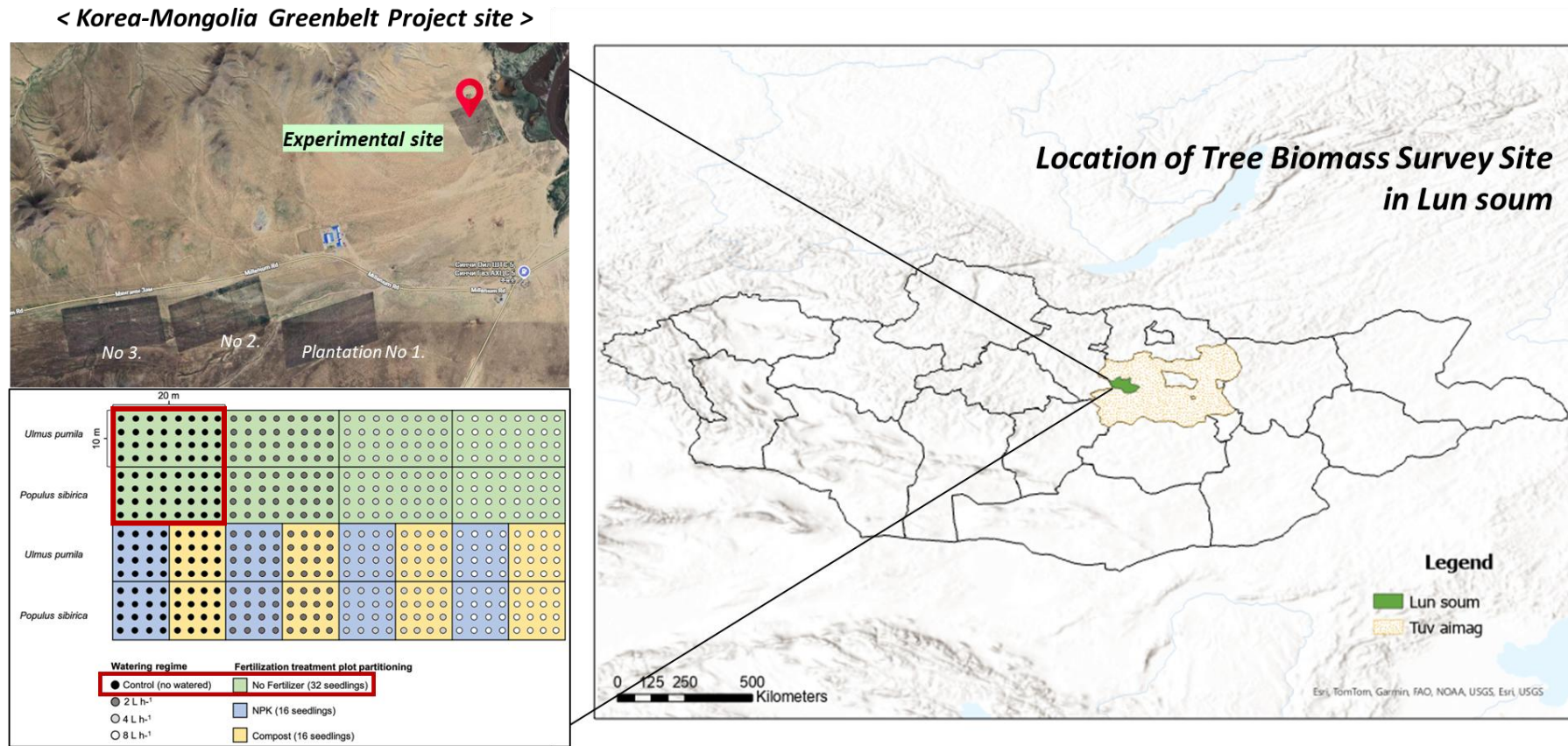
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1. Study site

- A **experimental site** of 0.2ha with 12 plots was established in 2011 under the Korea-Mongolia Greenbelt Project
 - **Planted Species:** *Ulmus pumila* and *Populus sibirica*, with 32 individuals per plot
 - **Survey history:** a biomass survey was conducted for both species in 2019
 - **Upcoming survey:** 9~10 individuals of each species will be selected and measured in 2025



Planting scheme of the experimental site (Batkhuu et al., 2021)

2. Method

Step 1. Measuring the data of trees in the plot and selecting sample trees

- **Tree inventory** will be conducted in one plot per species

Target trees

- *Ulmus pumila*: 10m x 20m plot
- *Populus sibirica*: 10m x 20m plot
- *Hippophae rhamnoides*: at a nearby site managed by the Lun soum forest unit

Sample tree selection

- 9~10 trees per species (*Ulmus*, *Populus*) selected from **three DBH classes**
- 3~4 trees chosen from each class

Sample tree condition

- Trees from the **untreated plots (no irrigation x no fertilizer)** prioritized
- If tree mortality in the plots get too high, 2 L h⁻¹ × no fertilizer plots as an alternative

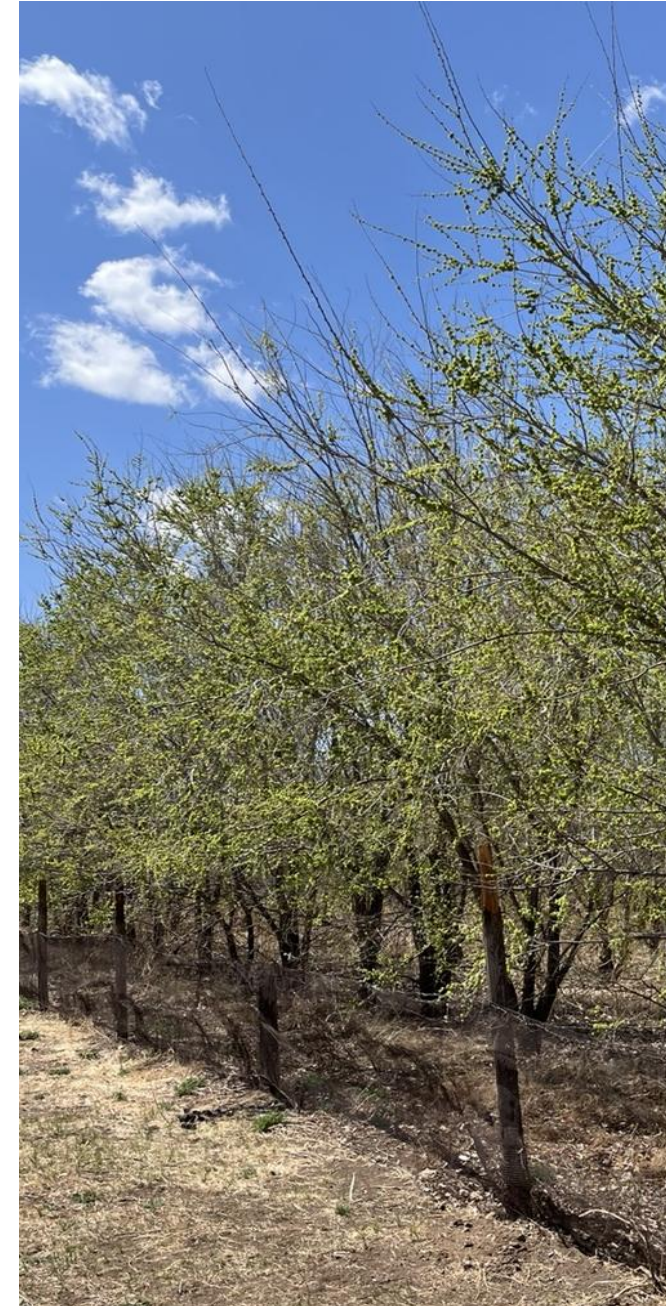


Figure 1. *Populus* trees planted in 2008 at plantation site No2. near the experimental site →

2. Method

Step 2. Felling sample trees and measuring fresh weight by biomass component

- *Tree Felling and Root Excavation*
 - Selected trees are felled at the root collar
 - Roots, excavated manually using shovels (1.2 radius, depth of 80cm)
- *Measuring fresh weight by component*

Species	Height (m)	DBH (cm)	Root collar diameter (cm)	Crown diameter (cm)
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- *Sampling for dry weight analysis by component*
 - Stem: 5cm-thick disks at 1 m intervals along the stem
 - Branch: Three branches selected from 3 parts (upper, middle, lower crown)
 - Leaves: All leaves, used for dry weight analysis
 - Root: Approximately 20% of the total fresh root biomass collected



Figure 2. Measurement of Stem Fresh Weight (NIFoS, 2007)



Figure 3. Separation of Branches and Leaves (NIFoS, 2007)

2. Method

Step 2. Felling sample trees and measuring fresh weight by biomass component

Table 2. **Total Fresh Weight** Measurement Field Survey Record

Survey tree number		Age of trees (yrs)		Excavating root (Y/N)	
Fresh weight by component (kg)					
No.	Stem	Branches	Leaves	Root	
Total:					

Table 3. **Sample Fresh Weight** Measurement field survey record

Survey tree number		Age of trees (yrs)		Excavating root (Y/N)	
Fresh weight of Sample by component (kg)					
No.	Stem	Branches	Leaves	Root	
Total:					

* Fresh weight is measured to the nearest 0.01kg

2. Method

Step 3. Oven-drying collected samples and measuring dry weight by biomass component

- Final sample preparation before oven-drying
 - Sample labeling (ID: species – tree number – component – sample number)
 - Drying conditions by plant part (Batkhuu et al., 2021)
 - Stem: dried at 105 °C until constant weight is achieved
 - Branch: dried at 105 °C for 48 hours (until constant weight is achieved)
 - Leaves: dried at 105 °C for 48 hours (until constant weight is achieved)
 - Root: dried at 70 °C for 72 hours (until constant weight is achieved)
- * In this field work, all the drying process are in charge of the National University of Mongolia (NUM)



Figure 5. Labeled-Samples of Branches, Leaves for Dry Weight Conversion (NIFoS, 2007)



Figure 4. Oven-drying of collected samples

2. Method

Step 3. Oven-drying collected samples and measuring dry weight by biomass component

Table 4. **Sample Dry Weight** Measurement field survey record

Survey tree number		Age of trees (yrs)		Excavating root (Y/N)	
Dry weight of sample by component (kg)					
No.	Stem	Branches	Leaves	Root	
Total:					

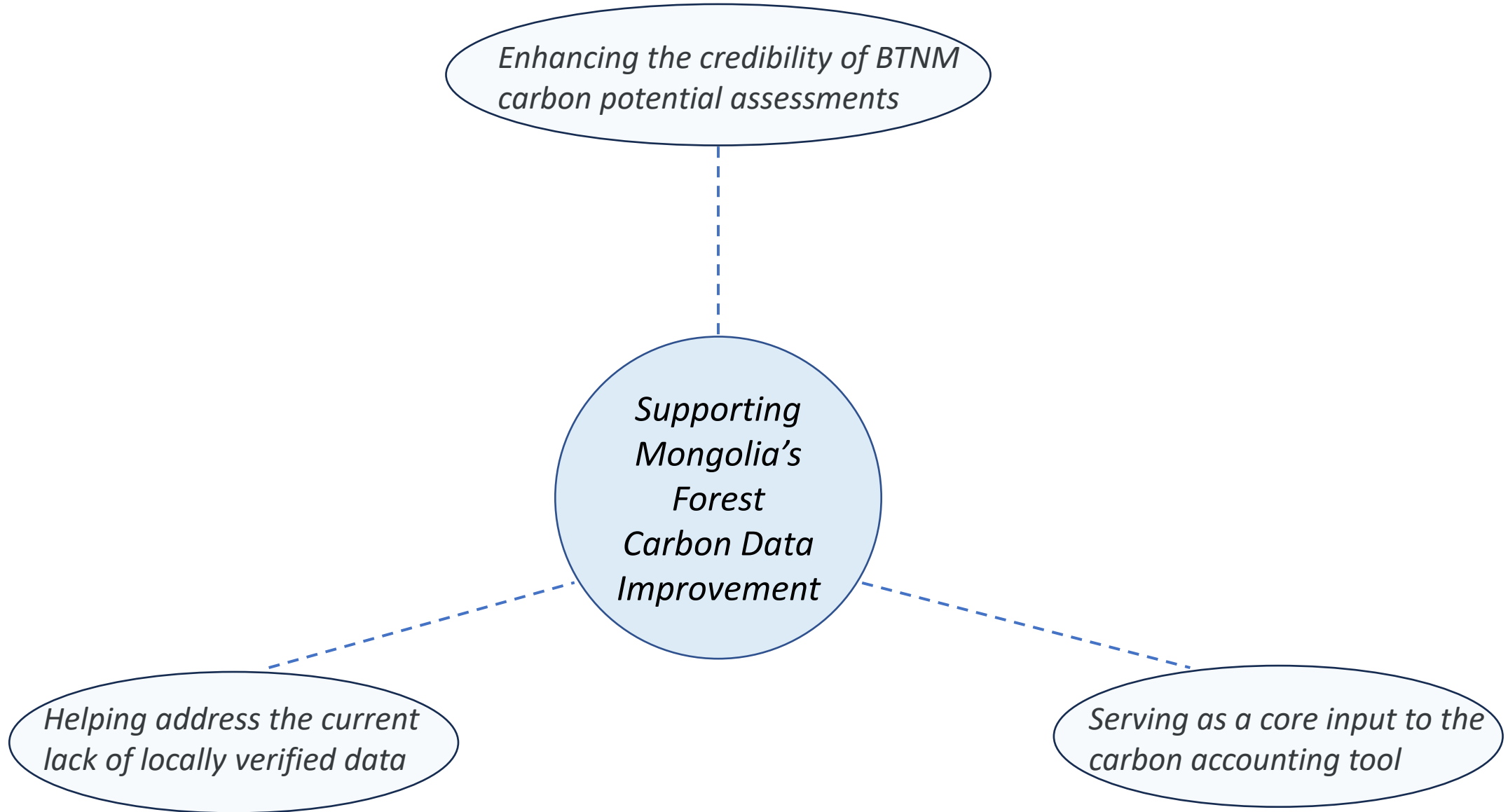
* Dry weight is measured to the nearest 0.01kg

3. Work plan

- The following schedule outlines daily activities from July 30th to August 1st, involving joint teams from Seoul National University (**SNU**), the National University of Mongolia (**NUM**), Local Trainees (**LT**)

Date	Time	Activities	Remarks and Accompanying person
July 30 (Wed) 5 trees	04:00-06:00	Arrival at Lun soum	SNU SNU + NUM SNU+ NUM + LT NUM
	06:00-08:30 (2h 30m)	4th tree biomass survey (<i>Ulmus</i>)	
	08:30-10:45 (2h 15m)	5th tree biomass survey (<i>Ulmus</i>)	
	10:45-11:00 (15m)	Short break	
	11:00-12:30 (2h 30m)	6th tree biomass survey (<i>Ulmus</i>)	
	12:30-16:30	Lunch & Afternoon break	
	16:30-19:00 (2h 30m)	7th tree biomass survey (<i>Ulmus</i>)	
	19:00	Move to hotel	
July 31 (Thur) 7 trees	04:00-06:00	Arrival at Lun soum	SNU + LT SNU +NUM + LT SNU +NUM + LT NUM
	06:00-08:30 (2h 30m)	8, 9th tree biomass survey (<i>Ulmus</i>)	
	08:30-10:45 (2h 15m)	10,11th tree biomass survey (<i>Populus</i>)	
	10:45-11:00 (15m)	Short break	
	11:00-12:30 (2h 30m)	12,13th tree biomass survey (<i>Populus</i>)	
	12:30-16:30	Lunch & Afternoon break	
	16:30-19:00 (2h 30m)	14th tree biomass survey (<i>Populus</i>)	
	19:00	Move to hotel	
Aug 1 (Fri) 6 trees	04:00-06:00	Arrival at Lun soum	SNU + LT SNU +NUM + LT SNU +NUM + LT NUM
	06:00-08:30 (2h 30m)	15,16th tree biomass survey (<i>Ulmus</i>)	
	08:30-10:45 (2h 15m)	17,18th tree biomass survey (<i>Populus</i>)	
	10:45-11:00 (15m)	Short break	
	11:00-12:30 (2h 30m)	19,20th tree biomass survey (<i>Populus</i>)	
	12:30-16:30	Lunch & Afternoon break	
	16:30-19:00 (2h 30m)	21th tree biomass survey (<i>Hippophae</i>)	
	19:00	Move to hotel	

4. Contribution to Forest Carbon Data Improvement in Mongolia



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Thank you!
Q & A

