Assessing Land and Soil Health in Son La Vietnam for Prioritizing and Tracking Restoration Activities within the AFLi project

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Introduction

Figure 1: Upland in Northwest region of Vietnam before maize cultivation season

- Annual crop cultivation provides the most significant source of food and income for smallholder farmers living in the mountainous areas of Northwestern Vietnam.

- The recent decades witnessed the remarkable increase in annual crops areas on sloping land which cover 75% total area of the region. This has led to severe land degradation and threatened multiple ecosystem services of the landscape.

- Applying Land Degradation Surveillance Framework (LDSF) in AFLi-2* project aims to:
  - Provide estimation of soil erosion prevalence at landscape level
  - Assess the impact of implementing agroforestry exemplar landscape on soil improvement and land health
  - Improve capacity of ICRAF staff, extension workers, farmers on the field measurement methods and data inputting

(AFLi-2: Developing and Promoting Market-based Agroforestry and Forest Rehabilitation Options for Northwest Vietnam)

Study site

- Location: Mai Son district, Northwest Vietnam
- Area: 100 sq. km (10 km x 10 km)
- 1 site includes 10 clusters, 160 plots
  - 10 plot/ cluster
  - 4 sub-plot/plot

Methods and Materials

The Land Degradation Surveillance Framework (LDSF) is a systematic landscape-level assessment of soil and ecosystem health

The LDSF provides a field protocol for measuring indicators of the "health" of an ecosystem including

- Vegetation cover and structure
- Current and previous land use
- Topography/landform
- Soil erosion prevalence
- Vegetation structure
- Tree and shrub biodiversity
- Land degradation
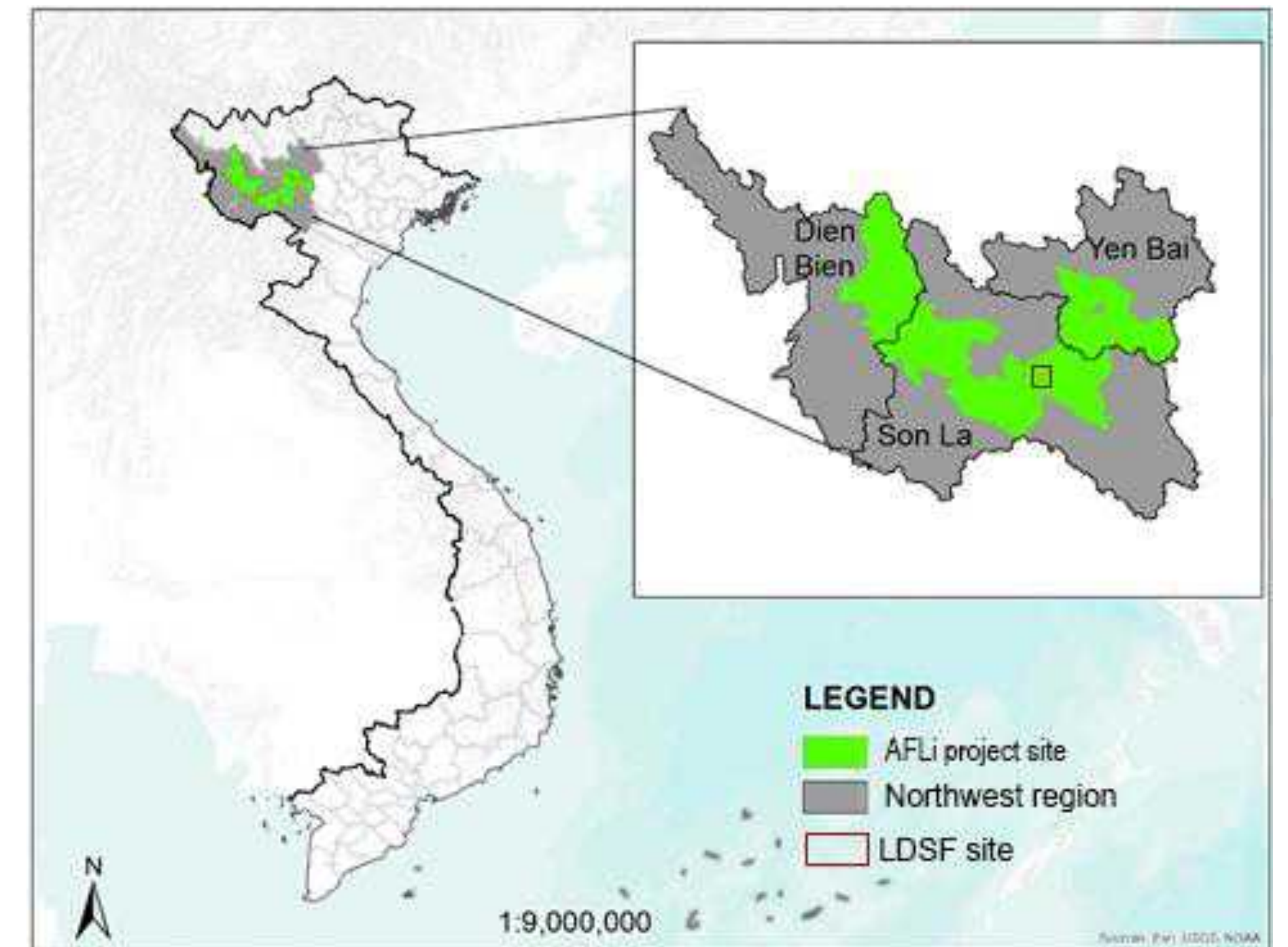- Soil infiltration capacity
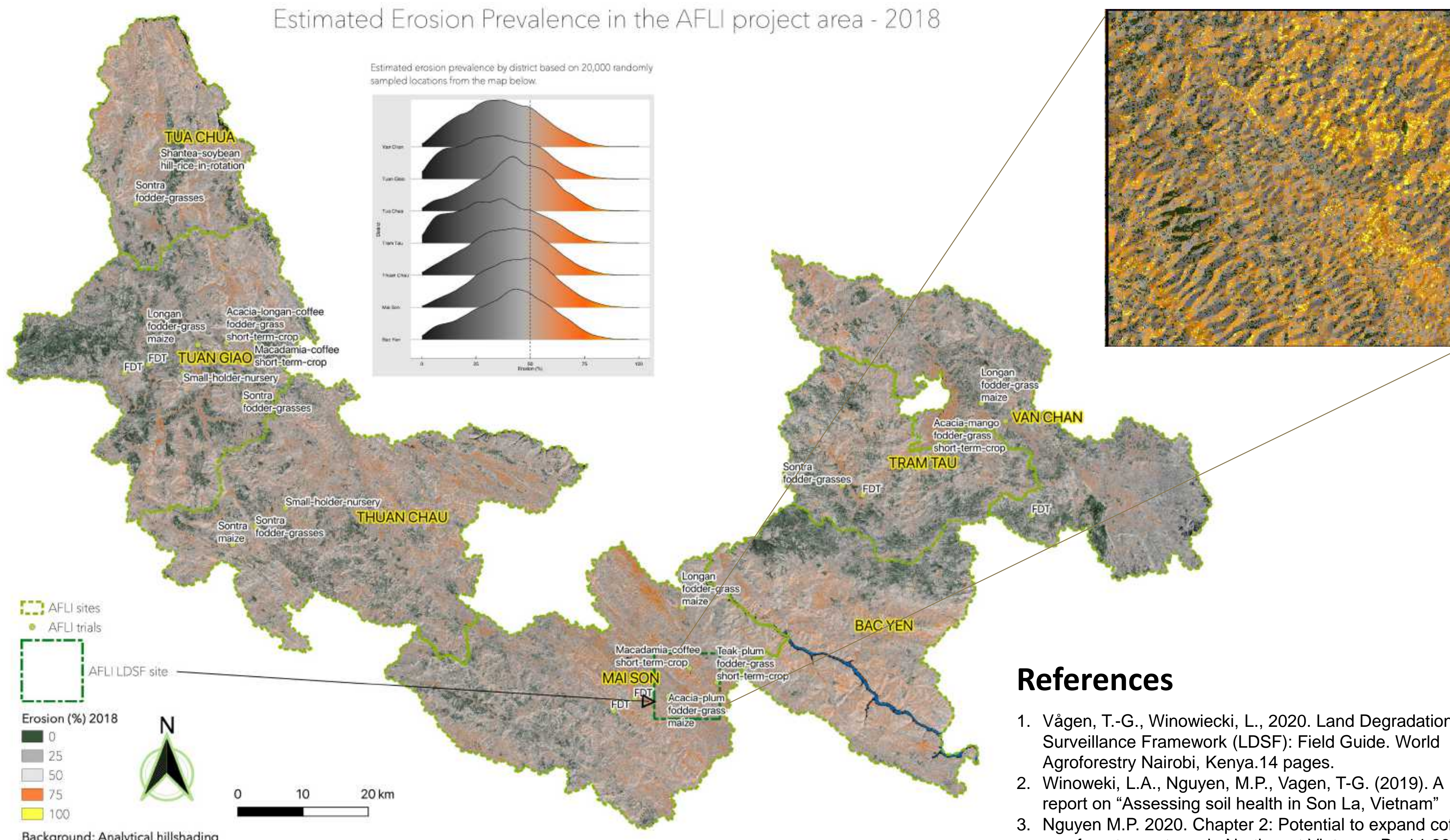

Figure 2: Study site

Figure 2: ICRAF soil scientist training research partner to measure trees and shrubs

Results

- The majority land cover of the plots was annual crops (85%) with the remaining plots classified as shrubland (8%) and bushland (7%).

- Visible erosion was recorded for 70% of sampled plots, all of them were annual crops on steep or medium slopes.

- Only 32% of the sampled plots had soil water conservation measures, indicating an opportunity for improved on-farm soil management interventions.

- Soil erosion prevalence mapping shows that 2% of project site (16,500 ha) is under the highest threat of soil erosion (75%- 100%) while 27% of the area (215,500 ha) falls into the medium level of soil erosion prevalence (50% - 74%).

Discussion & Conclusions

- The study benefited and contributes to global datasets
- Changes of soil and land health and impact of implementing agroforestry at landscape over time can be monitored using historical Landsat imagery.
- The map has implications for land use planning and interventions to reduce soil erosion and restore the capacity of ecosystem services.
- Soil samples will be sent to Nairobi for laboratory analysis
- More LDSF data will be collected for two more sites in Northwest Vietnam to improve the accuracy of the prediction model

Estimated Erosion Prevalence in the AFLI project area - 2018

References

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