FIG WORKING WEEK 2019

22–26 April, Hanoi, Vietnam

"Geospatial Information for a Smarter Life and Environmental Resilience"

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APPLICATION OF REMOTE SENSING, GIS AND TOPOGRAPHIC DATA FOR ESTABLISHING SOIL EROSION MAP

Authors:
Son Nguyen Phi
Thuy Nguyen Thanh
Tuan Nguyen Anh

Introduction

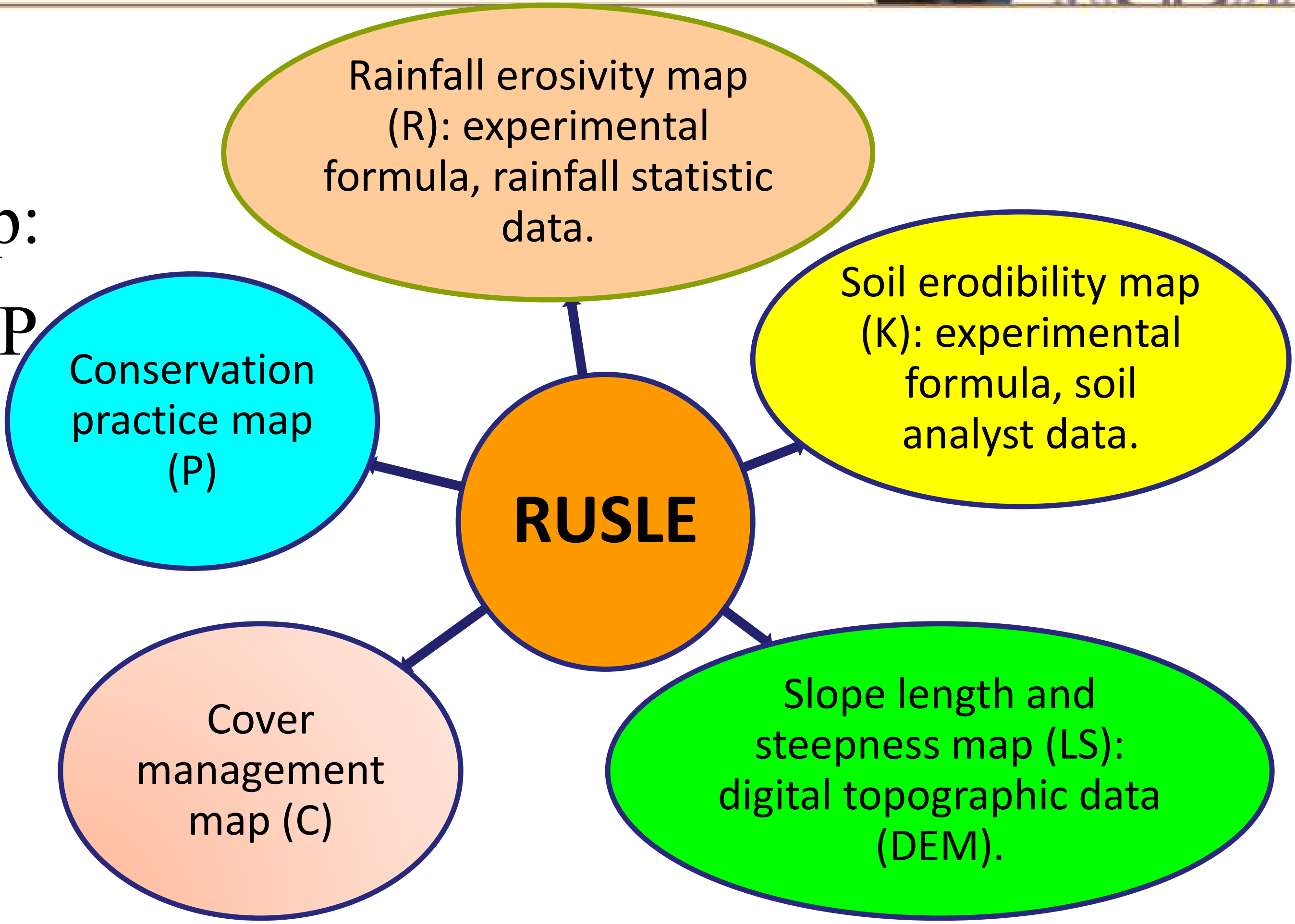
Vietnam is one of the tropical countries:

- 3/4 area is hill and mountain;
- Much affected by rain;
- The current soil erosion mapping method: RUSLE

Theory

Soil erosion map:

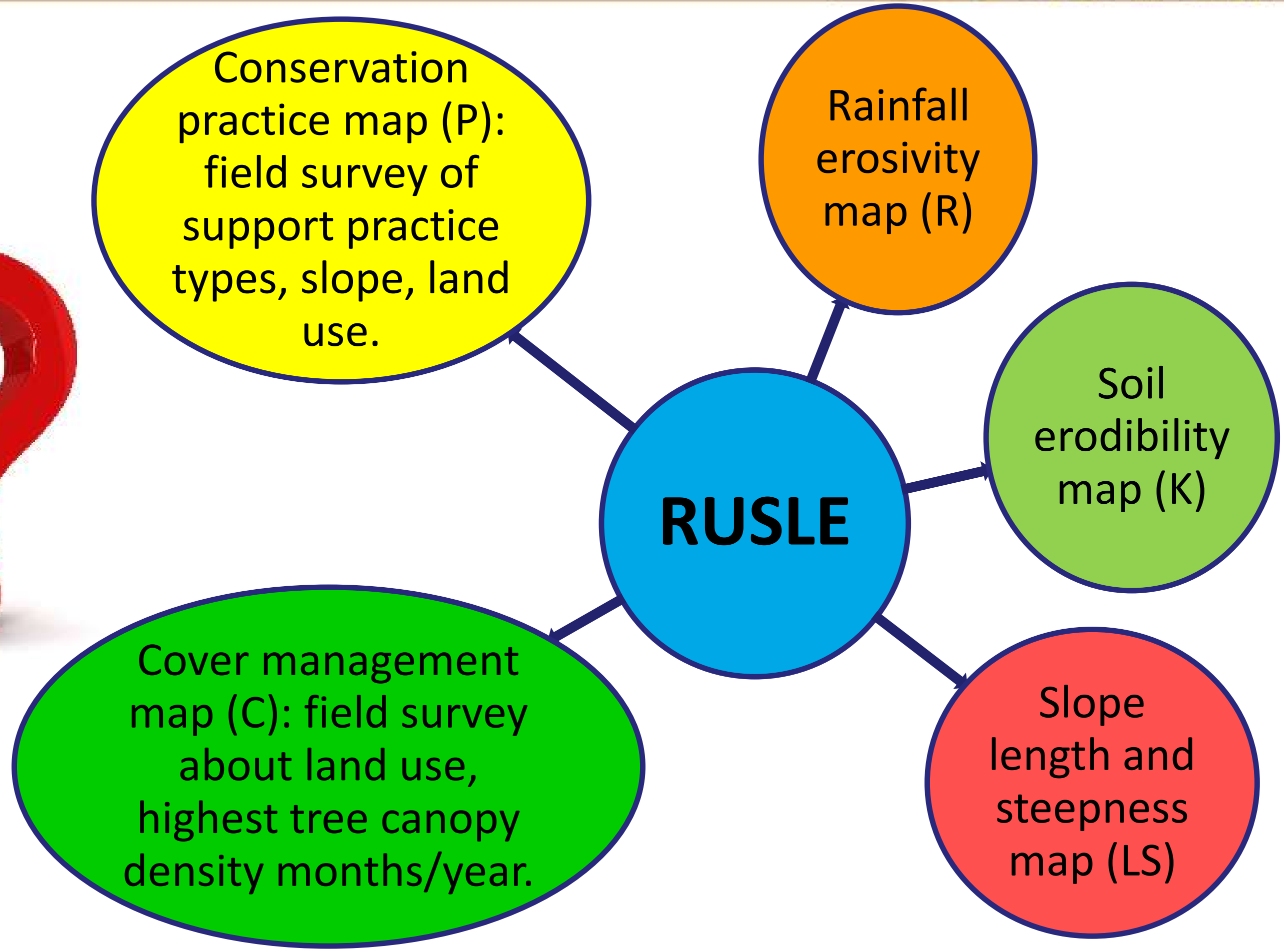
$$A = R \times K \times LS \times C \times P$$



Theory

$$A = R \times K \times LS \times C \times P$$

Are there any alternative solutions for P, C?



Method

Calculating C factor

- Processing VNREDSAT-1 images.
- Calculating the average NDVI.
- Calculating the C values based on NDVI.

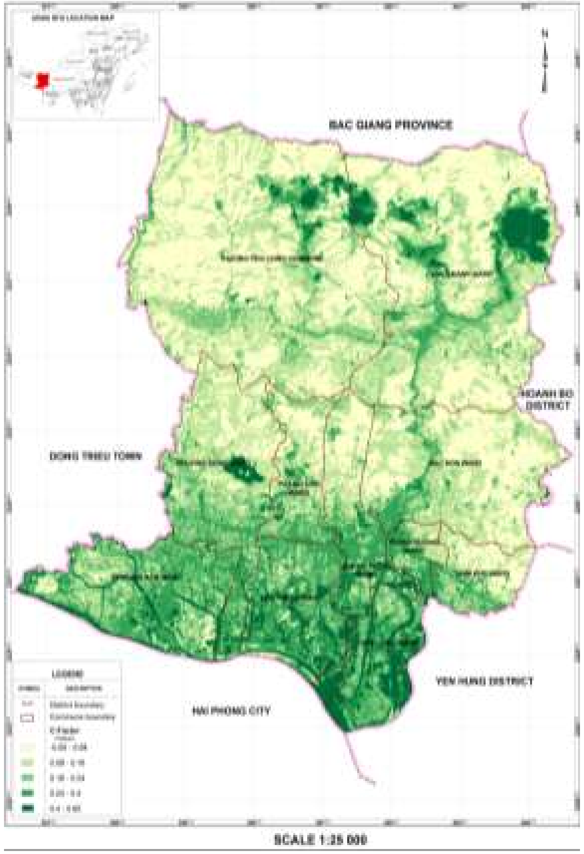
Calculating P factor:

- Classifying and interpreting the structures: the strip and none-strip cropping cultivations.
- Reclassifying slope steepness.
- Assigning P values for each combination of support practices and slope steepness.

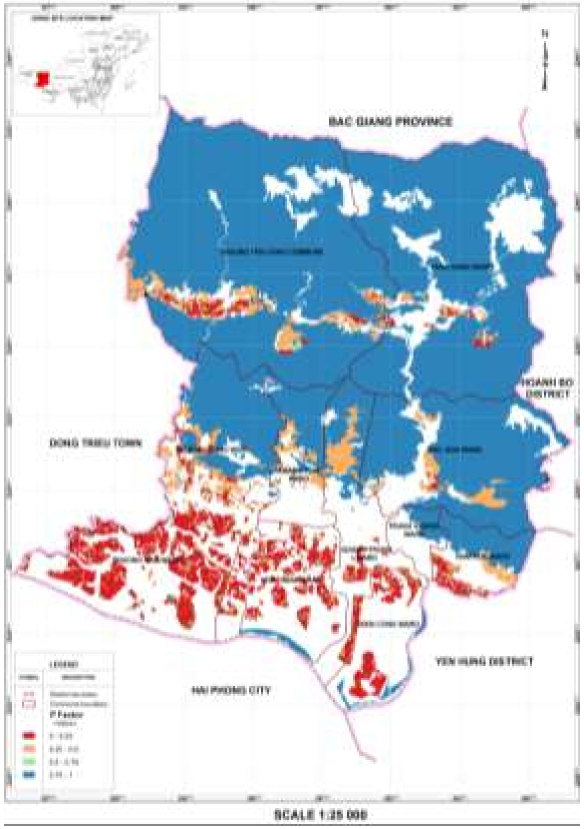
Results

Data:

- VNREDSAT-1
- DEM
- Rainfall
- LMU



Cover management map



Conservation practice map

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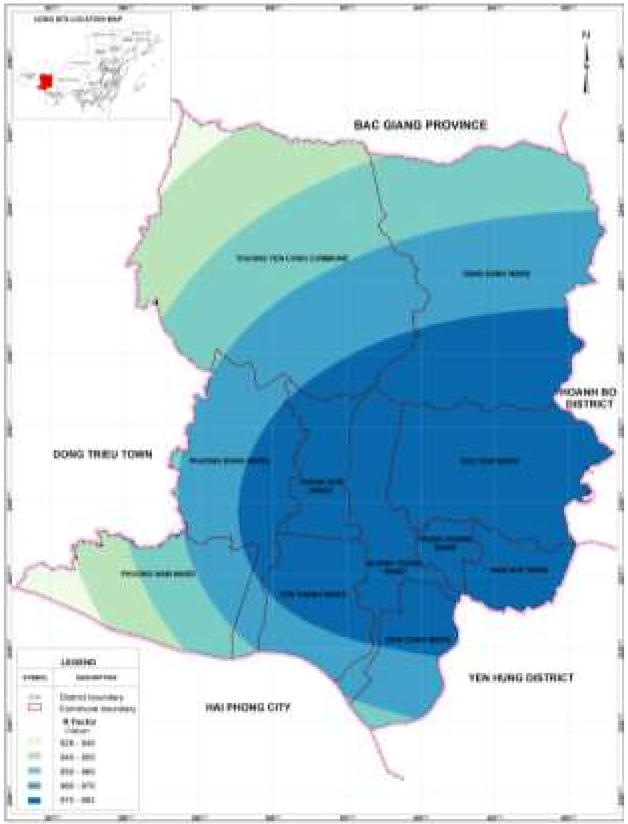
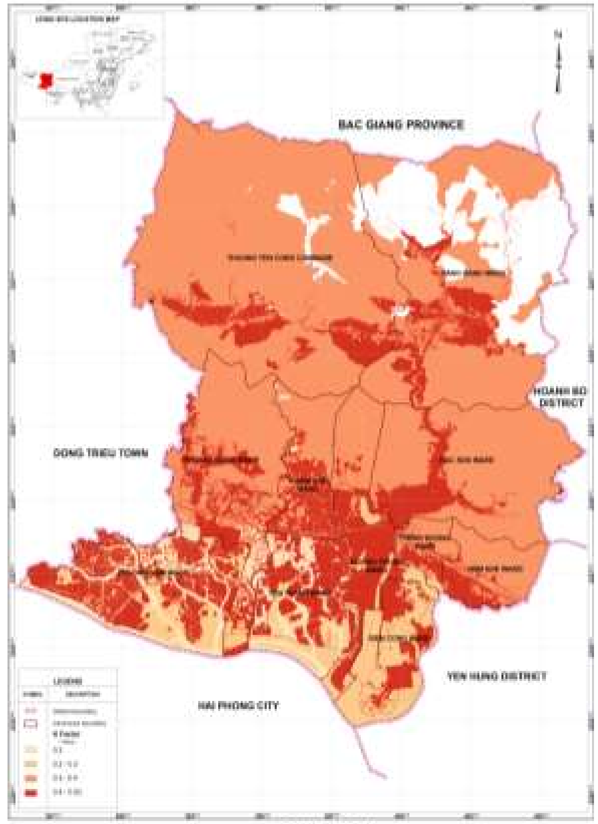


Rainfall erosivity map

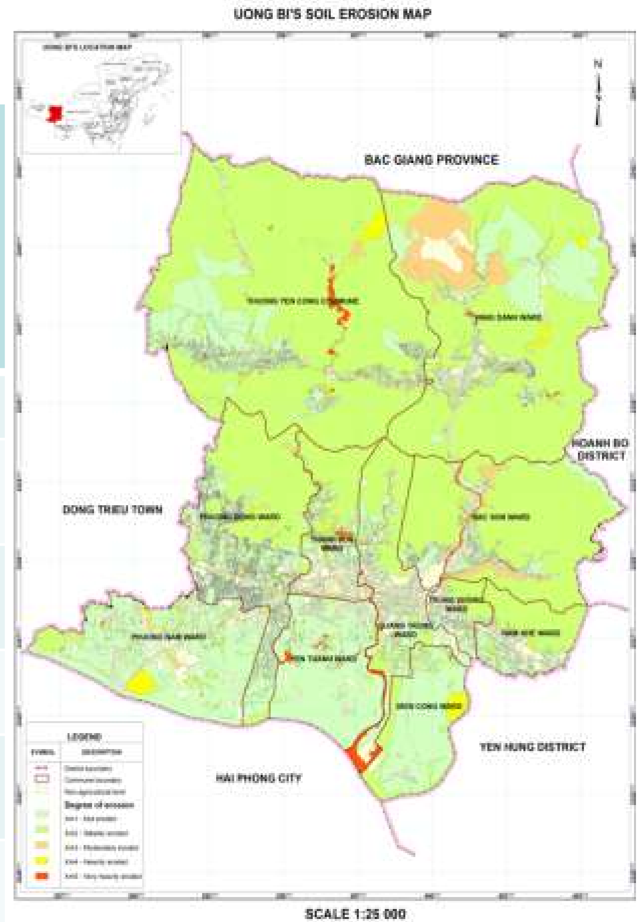


Soil erodibility map

Slop length and steepness map

Results

Soil erosion degree	The loose soil (Ton/ha/year)	Description	Area (ha)	Percent (%)
I	0-1	No erosion	7611.42	29.77
II	> 1-5	Moderate erosion	14557.38	56.94
III	> 5-10	Average erosion	805.55	3.15
IV	> 10-50	Strong erosion	358.56	1.4
V	>50	Extreme erosion	247.68	0.97
Total			23580.58	92.24



Results

- Strong erosion and extreme erosion: high slope and elevation mountains (2.37%);

- Average erosion: relatively high hills (3.15%);

- Moderate erosion: low hills and relatively flat terrain (56.94%);

- No erosion: the delta, low landforms (29.77%).

- The remaining percentage (7.76%) is the non-agricultural area.

Conclusion

The results indicate the ability of the use of remote sensing technology to establish C and P maps, especially using high and very high-resolution imagery that could meet the requirements of soil erosion map for the large areas, and is better in comparison with that produced by the traditional method.

CONTACT

Dr. Son Nguyen Phi

Vietnam Institute of Geodesy and Cartography

Address: No 479, Hoang Quoc Viet street, Hanoi, Vietnam

Tel: +84912308694

Email: sonnguyenphi@gmail.com

Website: www.vigac.vn

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