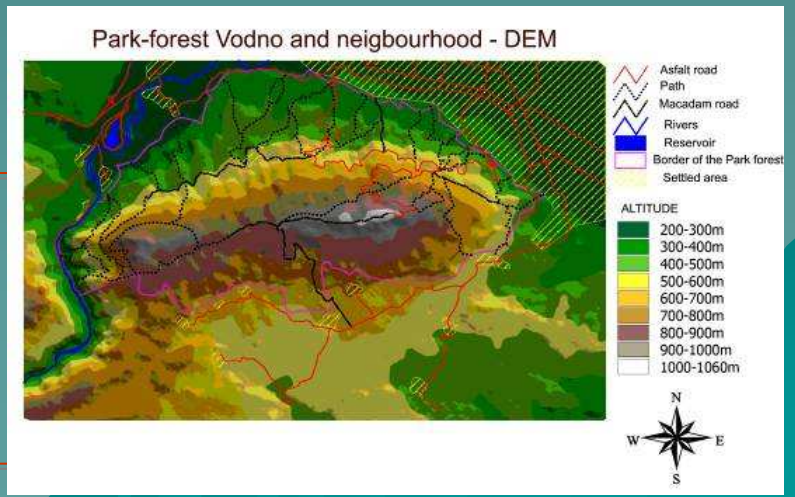
Faculty of forestry – Skopje, Institute of forestry,
bul.” Alexandar Makedonski “bb. 1000 Skopje,
phone: +389 2 3135 033
E-mail: blinkov@sf.ukim.edu.mk i_mincev@yahoo.com
Web site: http://www.sf.ukim.edu.mk

EROSION RISK ANALYSES ON THE VODNO MOUNTAIN AND IMPACT TO THE SURROUNDING AREAS

Prof. Ivan Blinkov, PhD;

Ivan Mincev, BSc



Introduction

Climate change

- Increase of rainfall intensity
- Increase of temperatures

↓

Forest die-back

↓

Increased risk of forest fires

↓

Increased risk of erosion

RISK ASSESSMENT METHODOLOGY

Two approaches exist in risk assessment:

based on **historical data** about different events (intensity and damages)

- Risk assessment refers to the quantification of a risk. It requires a determination of both the consequences of an event and the likelihood of its occurrence

RISK = P x S

P - Probability of a Particular Hazard Occurring

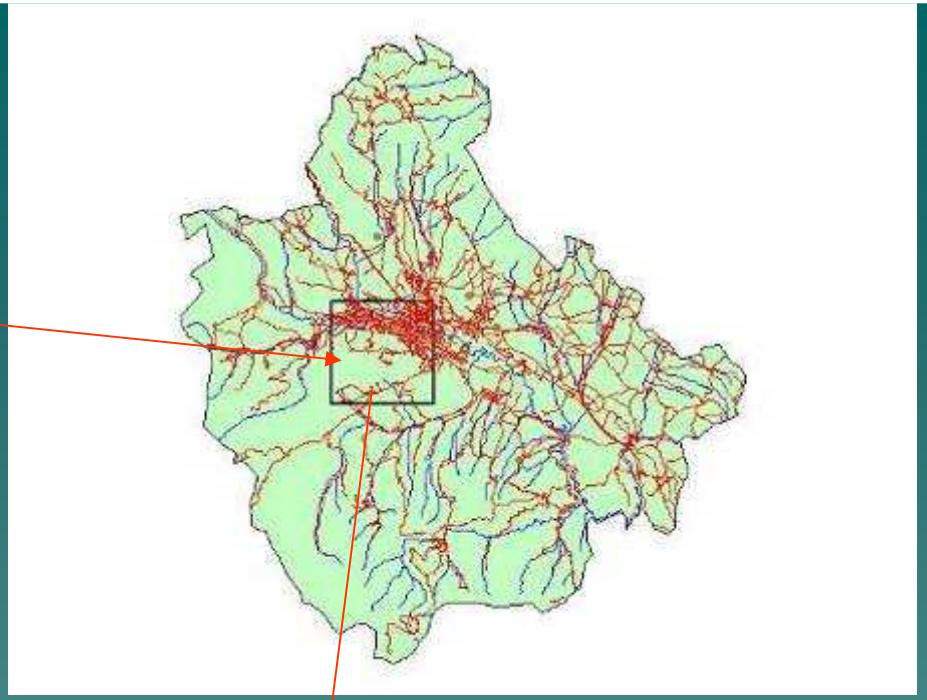
S - Severity of the Outcome When the Hazard or Associated Event Occurs (Damages)

The **proneness** approach in case where there is no historical data

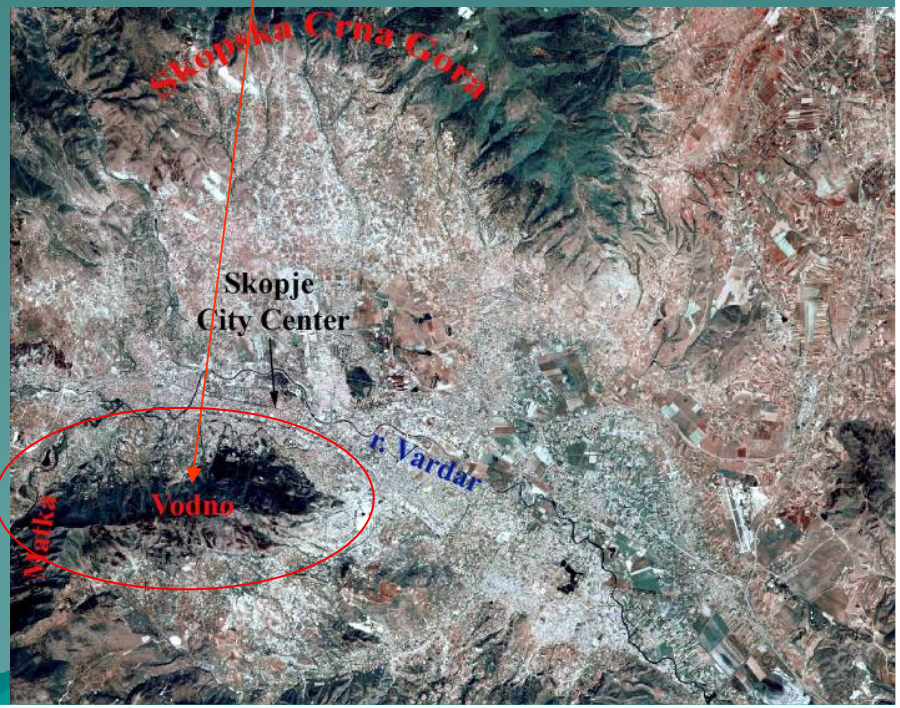
- Assessment according to the proneness of the area to appearance of any event (e.g. torrent flash flood – precipitation intensity probability, land cover, geology, slope, soil type, structural measures etc.)

  - Actual (current)
  - Potential Risk (what>if scenario)

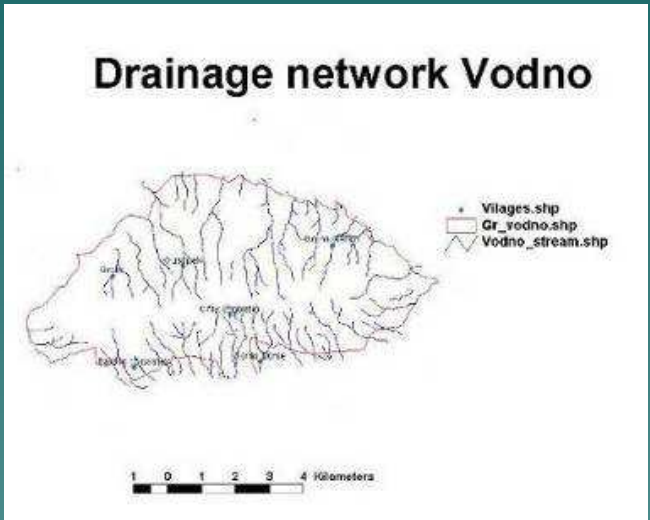

СКОПЈЕ

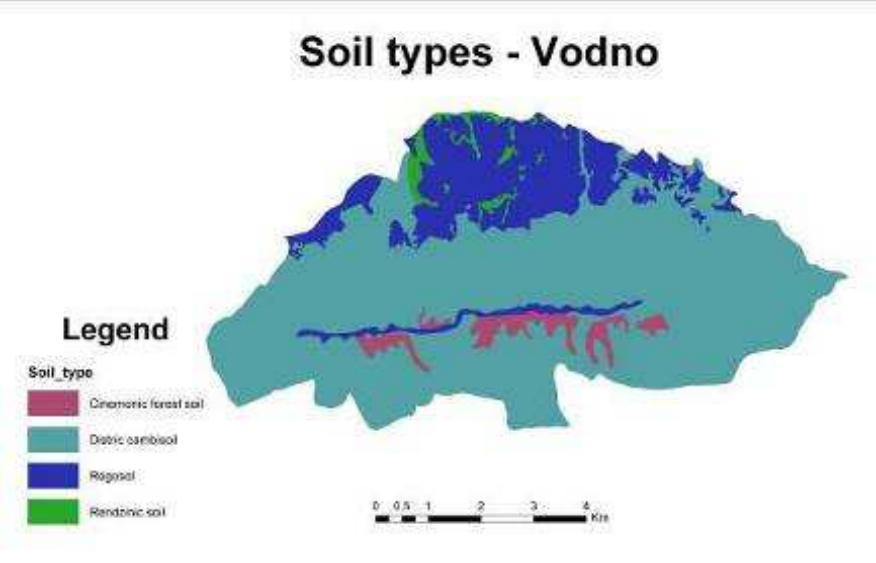


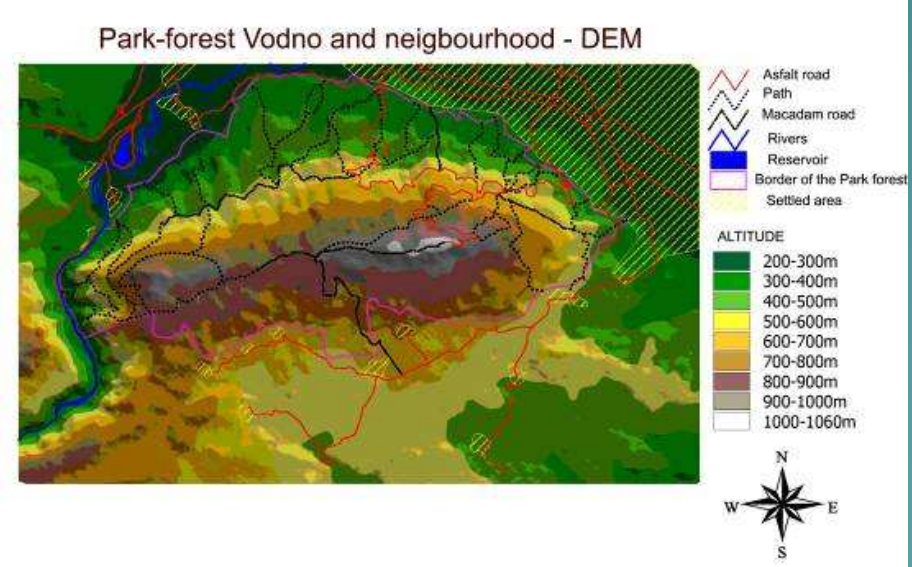
Study area

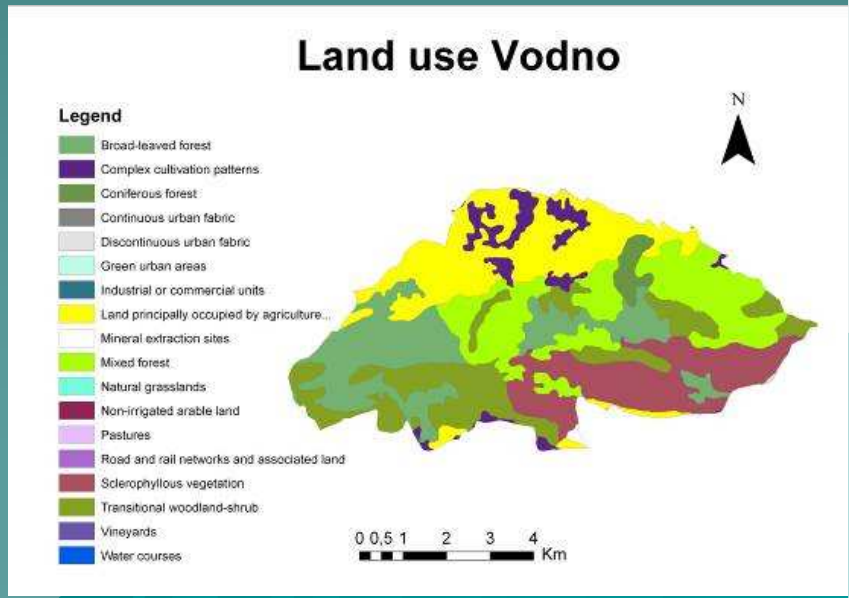

Skopska Crna Gora
Skopje
City Center
r. Vardar
Vodno
Markа

Basic dataset









Aims

- The aim of this study is:
- To create GIS-model for assessment erosion and torrential risk based on the methodologies of Gavrilovic

- Erosion Risk was assessed as:
- Actual risk (based on present situation)
- Potential risk (scenario was created for a hypothetic situation i.e. to back to the period before 50’)

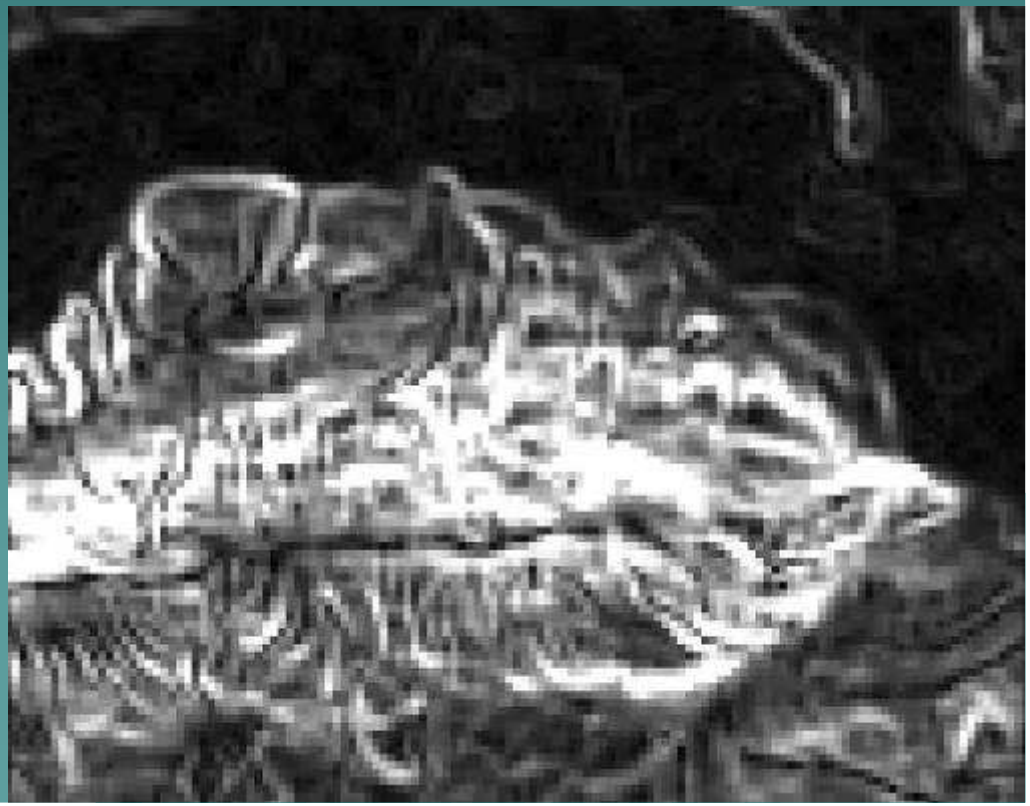
Multi criteria soil erosion hazard mapping

The soil erosion was estimated according the modified methodology of Gavrilovic, Erosion Coefficient –

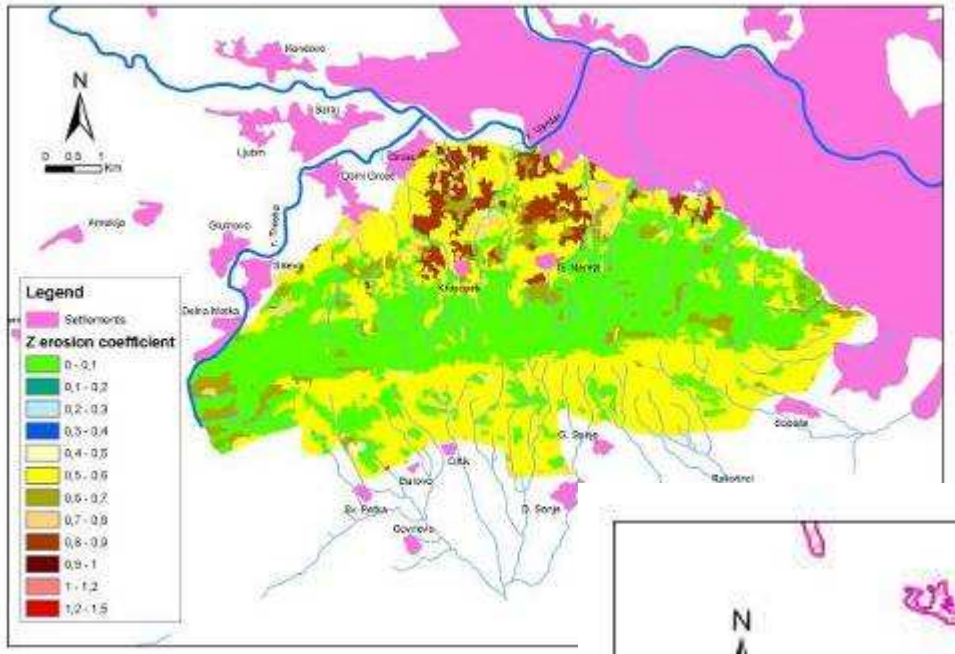
Z (0 to 1.5 - low to high)

Criteria:

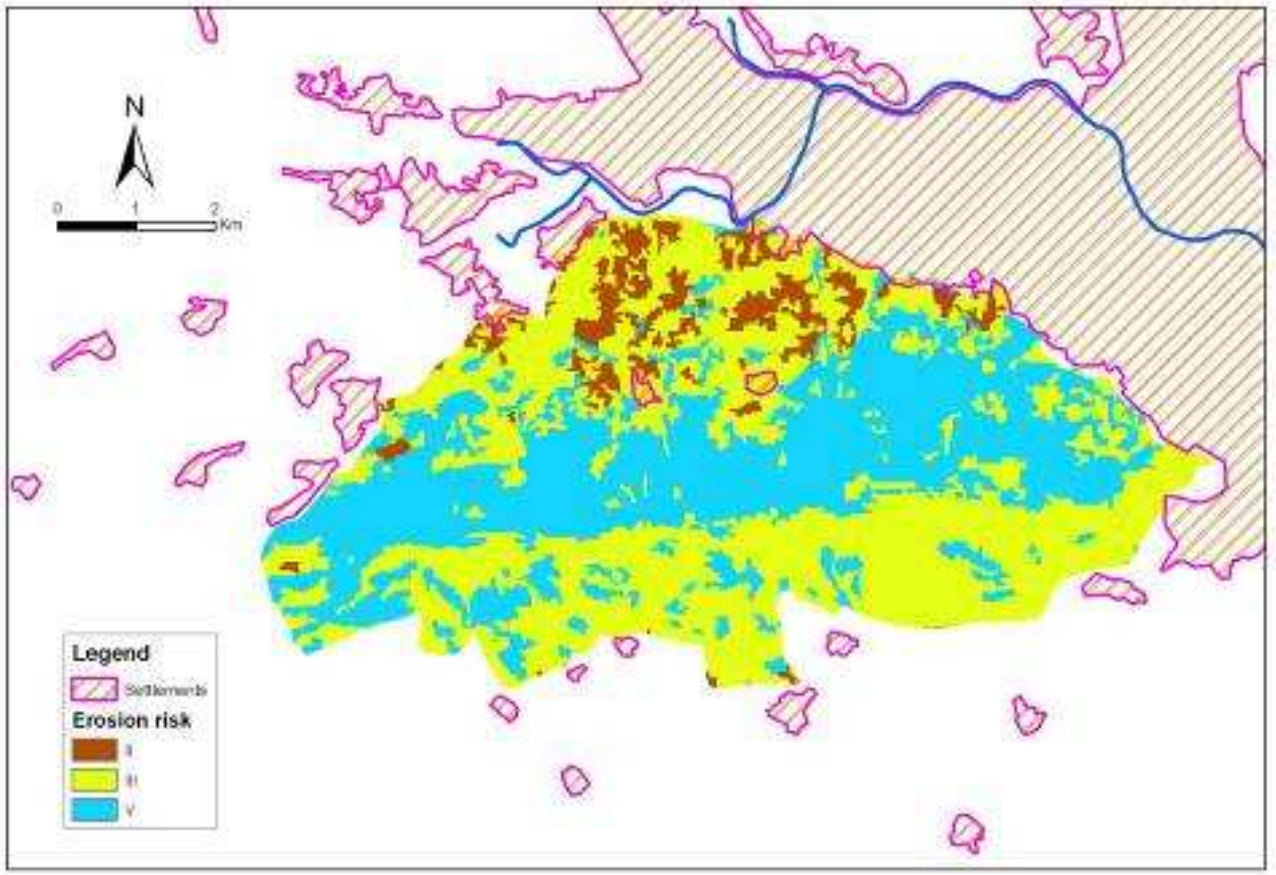
- Slope (extracted from DEM)
- Land cover/use
- Structural measures
- Soil and geology type
- Erosion types

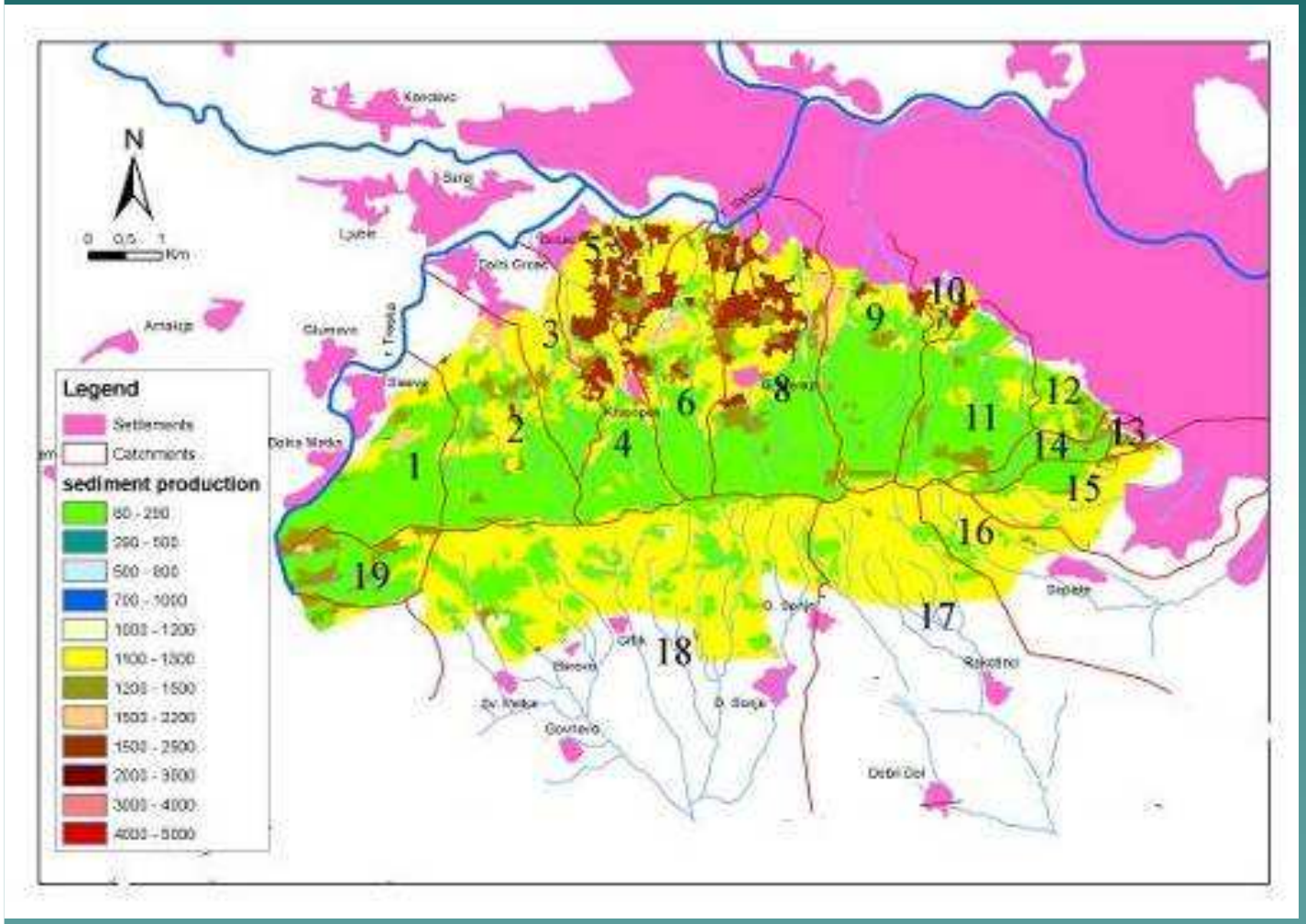


Erosion risk maps of the working area



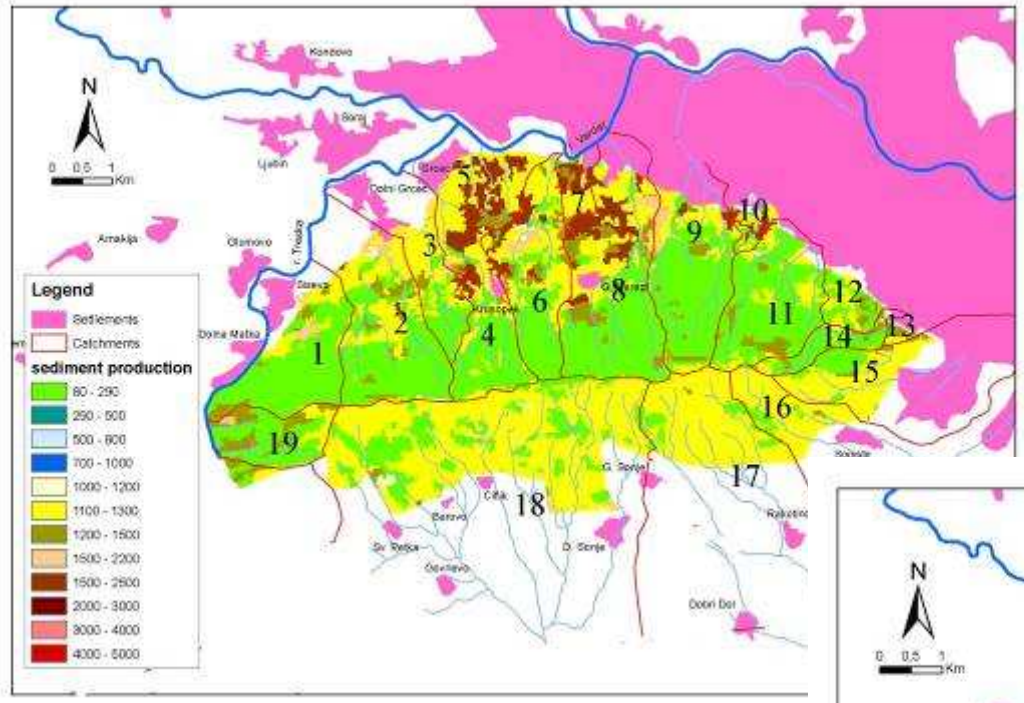
- Actual risk





- *Risk of sediment production by catchments*

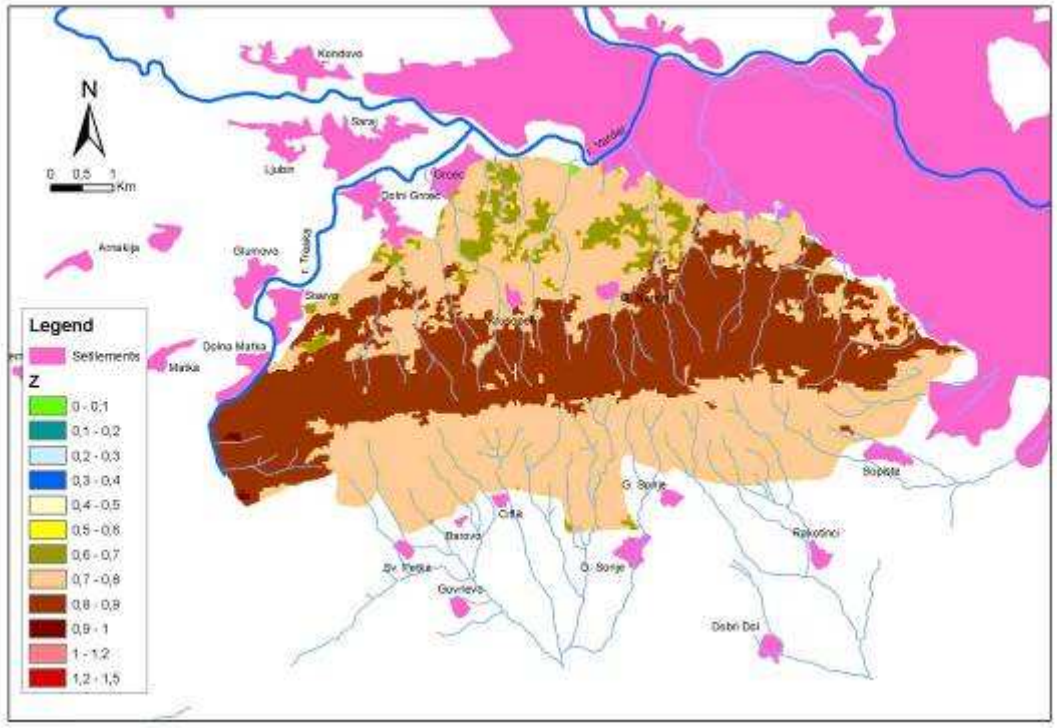
Chained hazardous events



Actual erosion risk

Potential erosion risk

after fire or ….



Conclusions

- Current erosion risk is low Z=0.37
- Potential erosion risk is high Z = 0.78
- Few parts of the city of Skopje : Taftalidze, Kozle, Kapistec, Centar, Kisela Voda, Pripor, Usje where the torrents 7, 8, 10, 12,13,14 pass have large erosion risk and possible damages from the torrents that originate from the Vodno Mountain.
- The catchments No.: 15 and 16 are also significant because a large residential area "Soncev grad - Sun city" is planned there and having in mind the large construction work which is planned there, this area should be taken into consideration.

Recommendations

We are obliged to :

- Protect the forest;
- Clean up the existing channels;
- Extract illegal bans
- Potential Erosion risk is high and we are obligated to protect the environment and citizens of Skopje and neighboring settlements.

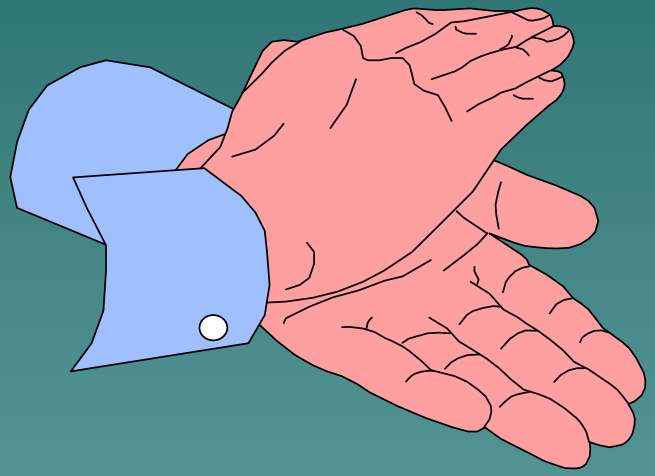
RimaDima
RISK MANAGEMENT • DISASTER MANAGEMENT

INTERREG IIIB CADSES
An EU-funded project managed by the European Agency for Reconstruction

RIMADIMA
Risk-, Disaster-Management & prevention of natural hazards in mountainous and/or forested regions

Ref.nr.: 5D102 RIMADIMA

Благодарам на вниманието



Thank you for your attention