

# THE ROLE OF FORESTS IN WATER AND RISK MANAGEMENT IN THE PUTNA RIVER BASIN / ROMANIA

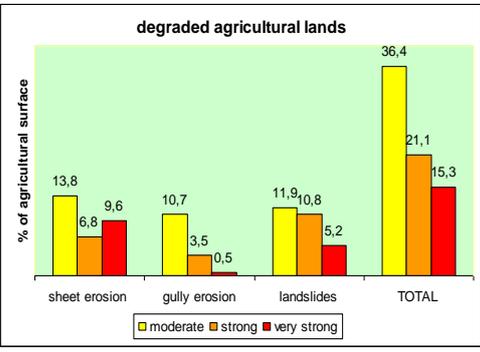
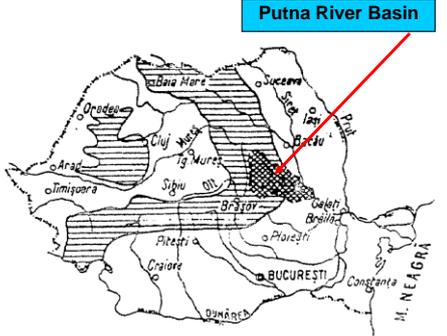
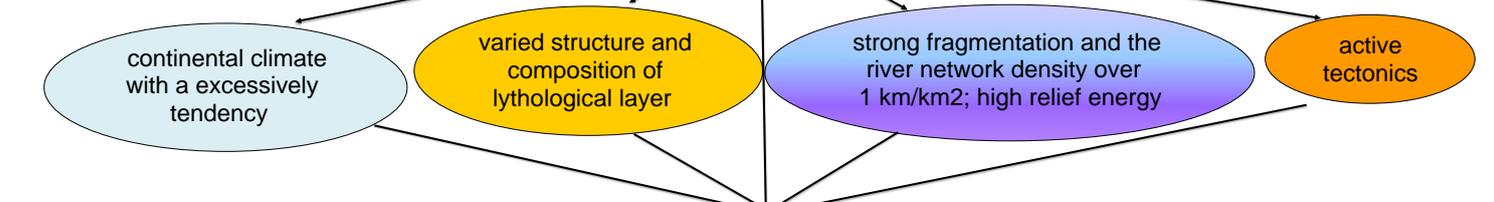
Cristinel CONSTANDACHE\*,  
Codruț BÎLEA\*\*, Petrișor VICĂ\*\*, Sanda NISTOR\*, Aurel BILANICI



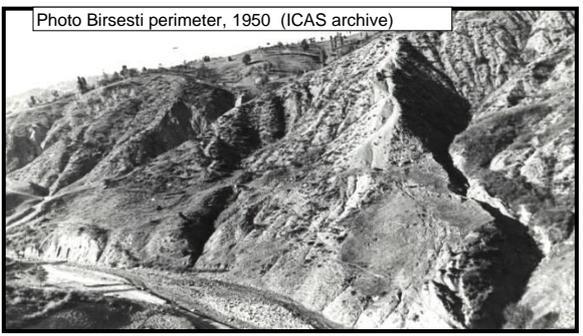
Recurrent natural hazards such as floods, mass movements, earthquakes and forest fires are major factors increasing the vulnerability of the population in Southeast Europe (SEE).

Putna River Basin, situated at the margin of the Curvature of Carpati Mountains in south-east of Romania, is most difficult zone regarding the destructive phenomena which causes high risk of disasters due to floods, landslides e.a.

Forest vegetation – represented 52% from basin surface, ununiform distribution



Putna River presents a high torrentiality indicated by:  
-275 torrential basins, 764 km degraded bed of the torrent representing about 60% of hydrographic network, located in the mountains and high hills .  
-the raport between the maximum discarge (1323 cm/sec) and middle discarge (15,4 cm/sec);  
-annual average flow of sediments transported (16,4 t / ha / year).



Specific stationary of degraded conditions imposed the performance of special works to strengthen the ravines, torrential river beds and planning / consolidation of the slopes for planting and use of specific procedures for afforestation.  
Such way, the unproductive or very strong degraded lands were reintegrated into the economic circuit, as degradation stopped on most of the surface after 15-20 years after afforestations

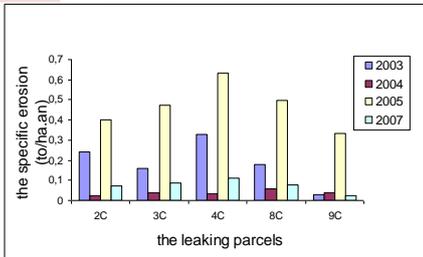
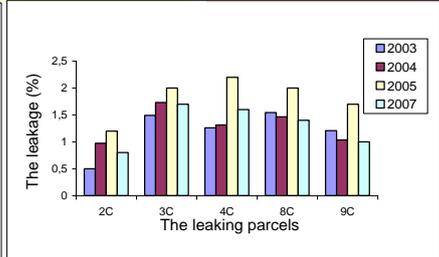
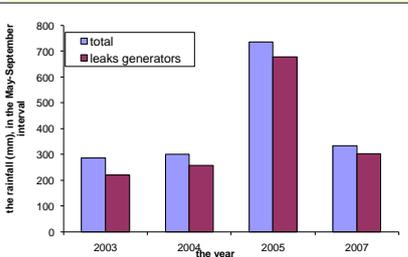
Considered natural risks or hazard depending on their effects, these phenomema can evolue to disasters or catastrophes that could destabilize large geographic systems functionalities.  
Presently, the forest and watersheds management system has a deciding impact on the evolution of torrential and land degradation processes in this area.

Research emphasized the fact that the forest vegetation, after 20 years from afforestations, has a determinant importance in rehabilitating the degraded lands by:  
-reducing the volume of the surface flows by 4-10 times  
-reducing the average specific erosion from 57,5 t/ha year on lands with active erosion below 1 t/ha.year  
-retaining water and mud soil touching brances and in the litter  
-creating favorable conditions for water storage and infiltration in the forest soil  
-accumulation of organic substances.



General view on the perimeter of degraded lands amelioration in Valea Sarii, Vrancea County, before the works of afforestation (photo: E. Costin, 1954) and after 50 years from the afforestation

The rainfall, the leakage and the erosion on leaking parcels placed in forestry plantations, set on eroded lands



\*Forest Research and Management Institute, Romania  
e-mail: cicon66@yahoo.com  
  
\*\*National Forest Administration-Romsilva  
e-mail: petrisor.vica@gmail.com