SETOF Soil Erosion and TOrrential Flood Prevention: Curriculum Development at the Universities of Western Balkan Countries

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WP1

# Analysis of soil erosion state and torrential floods in Western Balkan Countries

Lead Organisations of WP1**: UNSCM; UB**

**Participating Organisation:** UNS; UNI; UBL; UNSA; INSZASUM; BOKU; UNIRC; FRI-BAS

Deliverable 1.3

Title: Report of prevention measures for soil and torrent control in EU countries.

**Participating Organisation**: BOKU, UNICR, FRI-BAS

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## PROJECT INFO

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| Project acronym | SETOF |
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## DOCUMENT CONTROL SHEET

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|---|---|
| Ref. No and Title of Activity | **1.3. Report of prevention measures for soil and torrent control in EU countries.** |
| Title of Deliverable: | **Report of prevention measures for soil and torrent control in Bulgaria** |
| Institutions: | Forest Research Institute at the Bulgarian Academy of Sciences (FRI-BAS) |
| Author/s of the deliverable | Eli Pavlova Traikova, Rositsa Yaneva, Ivan Ts. Marinov |
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Activity 1.3 Report of prevention measures for soil and torrent control in EU countries. Analyses into the measurment and works that are undertaken for prevention of torrent control in Bulgaria. Report of the measurements for torrent control - DRAFT.

Protection against external threats, crises and natural phenomena is a difficult task, because is connected with many studies, analyzes and forecasts. The main point when using unexpected events is a quick reaction and preliminary action plan. The prevention also guarantee lower risk of such events.

In Bulgaria there are over 2000 currents with torrential character. Some of the most well-known torrent rivers are Badechka, Badinska Topolnitsa, Eninska, Maglizhka, Klisurska, Leva, Perperek, Lebedski doland others. The fight against erosion in the forest of our country began immediately after the Liberation in 1878. Before Liberation, Bulgarian lands are managed by the virtue of Turkish Law. Forest-related legalization began in the 1970s., but the information for the first anti-erosion afforestation dates back to 1885.

In 1905 the Torrent Stabilization and Forestation Bureau in Kazanluk was established and the beginning of the torrential strengthening activity in Bulgaria was set. One of the founders of the anti-erosion work in Bulgaria, the French forester Felix Vozhli, assesses the condition of the Bulgarian forests. According to him, 90% of the forested areas are covered with low-stemmed forest. The high professionalism of Vozhli manages to realize a wide-ranging activity for strengthening the torrents and afforestation. Under his leadership, 5,000 decares of were afforested, 3,400 $m^3$ of barrages and over 6,000 $m^2$ of oil mills were built, and over 1 million seedlings per year were produced.

During the period 1905-1944 eroded lands, spread on the area of 170,000 ha have been afforested and 160,000 $m^3$ stone barrages (check dams) and thresholds (< 2.0 m above torrent bed) have been constructed. National Long-term Erosion Control Programme (NLECP) have been designed and implemented since 1982 and a design of erosion control measures at a level of catchment, administrative territorial unit or the area of the farms was made (Biolchev et al. 1977). About 450, 000 $m^3$ barrages and thresholds, 380,000 $m^3$ small stone thresholds and 350, 000 $m^2$ wattles have been constructed during the period 1945-1989. This period is also remarkable for comprehensive afforestation of 1.9 million ha of which 760,000 ha (about 40%) are anti-erosion forestation, and development of 20, 000 ha shelterbelts (Zuckov 2005). In this period, the stabilisation of the torrents has been recognized as a substantial part of erosion control activities. So more than 80 large complex erosion control projects have been designed and applied in the dam watersheds. The measures limited significantly the siltation of the dams.

After 1990 the anti-erosion activities mark significant decrease. Considering the erosion control for the agricultural lands, the 1990's are marked as a decade of the complete carelessness. Permanent constructions to control erosion, once completed, have not been maintained after that, so their disintegration has been in progress (Rouseva et al. 2006). During the period 1989-2004 about 16,000 ha eroded lands has been afforested, 10,000 $m^3$ barrages and thresholds, 12,000 $m^3$ small stone thresholds and 7,000 $m^2$ wattles has been constructed (NFB 2005). A significant reduction of the afforestation rates and in the building of technical

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facilities was occurred after 1990. In 2014 the afforested territories for erosion and torrent protection cover 542 ha and in 2016 the applied activities cover 580 ha and 108 sq. m of constructed "clayonnage" (wattles) systems (*source:* MoAF - EFA).

In recent years, projects for biological strengthening and correction of parts of torrential rivers - Perperek, Stryama, German, Archar and others have been successfully implemented. A project for erosion control afforestation in the watershed of the Zhrebchevo dam has also been implemented. Despite the very good results achieved so far in the, the work needs to continue. There are still watersheds in which torrential activity is high and in extreme situations a threat to settlements, engineering facilities and homes are possible. Nowadays, erosion control activities are with very small sale mainly in or around the settlements. In other hand a various strategies and plans for erosion and flood risk management are established. The last plan for flood risk management is from 2016 and is scheduled for implementation until 2021. It has several priorities and goals that are listed below:

Priority 1: Protection of human health
- Goal 1.1. Minimize the number of people affected by floods.
- Goal 1.2. Ensuring fast drainage of water during intensive rains and floods.
- Goal 1.3. Restoration of normal living conditions
- Goal 1.4. Minimization of the number of affected objects of the social infrastructure

Priority 2: Higher level of protection of critical infrastructure and business
- Goal 2.1. Improvement of protection of objects from technical infrastructure
- Goal 2.2. Improvement of the protection of significant economic and cultural-historical sites

Priority 3: Improving the protection of the environment
- Goal 3.1. Improving the protection of sewerage systems
- Goal 3.2. Improving the protection of industrial sites (mainly IPPC and SEVESO sites)
- Goal 3.3. Minimization of the affected zones, protected territories and protected zones
- Goal 3.4. Improving the water retention capacity of agricultural, forest and river areas.

Priority 4: Improving the preparedness and response of the population
- Goal 4.1. Increasing the preparedness of the population for floods
- Goal 4.2. Improving the reactions of the flood population

Priority 5: Improving the administrative capacity for FRM (flood risk management)
- Goal 5.1. Creation of modern regulations for spatial planning and FRM
- Goal 5.2. Providing operational information on FRM
- Goal 5.3.Increasing the qualification of the staff, engaged FRM
- Goal 5.4. Minimizing the risk of floods along the entire river basin
- Goal 5.5. Ensure adequate response of institutions

In the forest the protection against erosion, torrential floods and landslides, incl. the erosion control activities (such as afforestation and construction of facilities) are regulated in the Regulation for protection of the forest territories against erosion and floods and construction of erosion control facilities (Regulation 4/2013 and Regulation 2/ 2013).

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