Script for radio program

Title: **The Flood Has Gone – Problems Remained**

Duration: 12:58
Radio Vesta 91.2

Intro sound – Authentic sound of river Vrbas during flood in Year 2014

Background music - Chris Zabriskie - Oxygen Garden 6:03

Intro (Anchor) 0:50 – A year has passed since floods that affected 950.000 citizens. Total direct damage was 10 % of Bosnia and Herzegovinas' GDP. Introducing an expert, Head of Agro-pedology Institute, Mr. Esad Bukalo PhD.

Bukalo 0:27 – Significance of soil for the future. Soil is non-renewable resource made over thousands of years. Types of damage to soil during floods are erosion and pollutants of organic and inorganic nature, specifically heavy metals and polymers.

Erosion (Anchor) 0:40 – Profuse rain caused landslides. Upper layers of soil on mine fields were also moved downstream. Erosion caused formation of cracks which were filled with upper soil layers causing layers mixing.

Bukalo 0:42 – Detailed of types of damage upstream and downstream regarding soil types. Downstream areas are flooded by soil from upstream covering existing layer of agricultural soil (cultivated soil). Somewhere this new cover is about 1 meter high.

Agricultural soil (Anchor) 1:00 – Agricultural soil is especially sensitive to floods. The presence of oxygen is zero in soil after one day of flood. Without oxygen the root of some plants cannot function. Some crops are covered with mud, sand, gravel or garbage. Micro funguses are disappearing from soil.

Bukalo 0:59 – Samples of soil are taken. Analysis of general characteristics is performed in order to determine type of soil and presence of carbonates and calcium. Presence of pollutants is evidenced, especially heavy metals. Thanks to the fact that soil is carbonic type, heavy metals are bound to soil and therefore unavailable to plants. The fact is, healthy soil creates healthy environment.

Soil pollution (Anchor) 0:46 – Explanation of agro-pedology science. Explanation of Agro-pedology Institute role. This Institute started to take samples on 19th may 2014. Preliminary analysis shown that there are no poly-cyclic carbohydrates. Some areas were polluted with nickel mostly and with chrome and cadmium in lesser extent.

Background music - Chris Zabriskie - The Sun is Scheduled to Come Out Tomorrow 7:33

Bukalo 1:02 – After water has withdrawn Institute has been taking samples. Sampling has shown that lower areas of river Bosna and river Spreca contained mostly nickel, in concentrations up to 700

mg/kg of soil. Less concentration of cadmium, arsenic and quicksilver were also evidenced. Prevention measures are necessary as foresting and model of soil treatment.

Why did this happen (Anchor) 0:15 – Floods are rapid way to spread pollution. If the area around the river is unregulated the consequences of flood are bigger.

Bukalo 1:20 – Climate changes are major trigger to floods. First it was extremely dry. This caused deep cracks in soil. Then extreme rains triggered soil movement. Some measures need to be taken to make accumulation of water in upper stream areas.

Irrational usage of land (Anchor) 0:15 – Soil must be treated and processed in certain manner. Too steep terrain must not be used as plough land.

Bukalo 1:00 – Some agricultural measures need to be taken. These are biological and agro technical. If the soil is acidic type then calcification is recommended. This would block heavy metals. Next is phytosanitary measures which is taking the pollution from the soil by plants itself and then disposing plants accordingly. Preventively, growing cultures that are susceptible to heavy metals is forbidden.

What to do next (Anchor) 1:30 – Agricultural soil is destroyed and needs to be restored. Universities and Institutes should offer information regarding revitalization of soils. The simplest method is calcination and deep ploughing. Agricultural producers need to plan gradual restoration and recovery of agricultural areas. Sediments need to be taken out, stimulation of microbiological activity within soil and avoiding formation of superficial crust. Phytoremediation is treatment of soil by extracting heavy metals from it by several vegetation cycles of certain plants. These plants must not be used for human or animal food. Agro-pedology Institute must offer guidance in terms of re-cultivation and healing of soils.

Bukalo 1:01 – Existing plants were suffocated by flood. Excess of water is problem. Removing water is first step. When the soil is dry then shallow plowing is needed in order to avoid crust creation and increase aeration of soil. Then deal with decontamination.

Conclusion (Anchor) 0:27 – Long term consequences are loss of agriculture soil and alteration in biodiversity. Remediation would take years, consequences will be present for many years. Guest was an expert, Head of Agro-pedology Institute, Mr. Esad Bukalo PhD. This program is contribution to better inform citizens about what is expected to happen during the long period of recovery.

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