



## **Global change and landscape structure in Ukraine: Ecological and socio-economic implications**

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The current land cover of Ukraine is very heterogeneous. While on average forest covers 15.9% of its land, substantial part of the country is basically forestless. The agricultural potential of Ukraine is high. However, in spite of the fact that 68% of the arable land in Ukraine consists of the famous Ukrainian black soils (chernozems), the quality of the country's arable land (69.5% of the total land) is not satisfactory. The country has the highest over the globe share of the tilled land (~80% of the agricultural land in the country) and processes of soil erosion impact about one third of arable land. Air pollution, soil and water contamination are widespread. Substantial problems are generated by the Chernobyl disaster. Overall, about half of the country is in the critical and pre-critical ecological situation. Climatic predictions suppose that the country will live in much warmer and drier climate by end of this century. Taking into account that major part of Ukraine lies in the xeric belt, the expected climatic change generates diverse risks for both environment and vegetation ecosystems of the country, particularly for forests and agriculture.

The presentation considers the role of forests and trees outside of forests in transition to integrated ecosystem management and sustainable structure of landscapes within two scenarios of socio-economic development for the next 20 years. The "business-as-usual" scenario prolongs tendencies of dynamics of the land-use and forest sectors during the last 20 years. This scenario leads to further deterioration of quality of land and environment in Ukraine. The "progressive" scenario is considered as a crucial initial step of adaptation to climatic change and includes a system of pressing measures which are needed to decrease destructive processes that are observed at the landscape level. It is shown that it would require development of 1.62 M ha of protective forests including 0.62 M ha on unstable elements of landscapes (sands, steep slopes etc.), 0.51 M ha on heavily eroded lands and 0.49 M ha of linear stands (field protective and run off - protective shelterbelts). Such a development has a solid economic background within post Kyoto international policies. Suggested measures in the forest sector are considered as a first step in transition to sustainable forest management, implementation of urgent adaptation activities to climate change and would allow substantially intensified multi-service use of forests (including impacts on major biogeochemical cycles, increasing wood harvest at ~25% etc.). We present major indicators of the carbon budget of forest and agro-forest ecosystems for the last two decades and for the next 20 years in the framework of the two above scenarios.

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