Transboundary Socio-Economic Safety Assessment: Sustainability toward Anthropogenic Hazards and Bioproductivity Degradation

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Abstract

The presented study is dedicated to overview of Earth observation techniques and applicable methodological capabilities for coupled analysis of socio – ecological risks connected with socio-ecological safety of river basins in view of ecosystems sustainability toward drastic losses of landscape bio-productivity, natural and anthropogenic disasters natural and anthropogenic hazards such as floods wildfires and pollutions. Research is directed to improvement of sustainability oriented policy making and assistance the robust long term scenarios elaboration for Western Buh river basin.

The viable strategies of sustainable development require approaches for long-term threats forecasting. Moreover the policy makers and key humanitarian agencies declare necessity to develop the multi-term estimations of socio–ecological risks. The techniques spoken of should cover the periods even more than seasons – we should plan our mitigation and/or adaptation strategies on multi-year basis, up to decades. In view of purposes declared the climate change analysis and forecast is necessary. These decision oriented research should be done in regional scale primarily.

Ecosystems changes are critical for assessment of disaster appearance and its consequences. So the comprehensive landscape evolution analysis has been included into investigation. Satellite data utilization for plant cover change detection and vegetation indexes monitoring coupled with ground data and ecosystems models allows to analyze landscape vulnerability (to foresight the landscape degradation, bio-productivity losses, agricultural sustainability). At once using the advanced analysis of vegetation indexes and set of change scenarios the spatially distributed risks of natural disasters could be estimated. The key role of integrated Earth observation systems is demonstrated. Furthermore the estimations of droughts, floods and wildfires escalation are elaborated and presented.

The results presented are indicate the way to construct the scientific base for sustainability oriented policy making, and demonstrate high capabilities of Earth observation for coupled analysis of transboundary socio – ecological safety.