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The World Atlas of Desertification assessment concept for conscious land use solutions

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Land degradation and desertification are complex phenomena that result in environmental damage, economic inefficiency and social inequity and are reflected by a reducing productive capacity of the land and soil. Research indicated that they are driven by a multiple but a limited number of causal aspects that unbalance the capacity of the environment system to sustainably produce ecosystem services and economic value. Competition for land, driven by societal needs or economic opportunities, adds further stress on the land resources. To address these complex global challenges, a monitoring and assessment system offering up-to-date information on the status and trends of land degradation and their causes and effects is needed to provide science-based routes for possible land use solutions. The assessment concept that has been outlined for the compilation of the new World Atlas of Desertification (WAD) confronts this complexity by converging evidence of stress on the land system caused by various issues. These issues relate to sets of dynamics of the human-environment system and include changing agricultural or pastoral land use and management practices, changing population and societal aspects, changing aridity and drought. The WAD describes the issues, spatially documents their change, whenever data is available, highlights the importance of the issues in relation to land degradation processes and illustrates the integrated assessment concepts. The first step is the preparation of solid global data layers that are related to, or express aspects that can be related to, land-system productivity dynamics and status. These can be used for identifying and evaluating the interaction of spatial variables with the land-system productivity dynamics. Initial analysis of the land productivity dynamics within stratified land cover/use areas, such as the global croplands, show substantial differences in the extension, geographic location and possible related causes of potentially critical areas. The stratified integration of global data layers does not produce the 'mythical map of global land degradation' but allows locating areas where stress on the land system is observed that can be related to manifest causal issues. Preventing judgement on the complex status of 'land degradation' the WAD opens the way to a positive approach to deal with the problem, providing also helpful evidence for stakeholders to design more conscious solutions for land use.