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Developing a spatial livelihood vulnerability index for third pole region

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The Mid-Latitude Region Network (MLRN) focuses on ecotones, such as the transition zones between temperate and tropical forests, as well as mountainous and cryosphere ecosystems. These ecotones are primarily identified within the Third Pole Region, the high mountains of Asia. Livelihoods in this region face the destabilization of the water-food-energy nexus exacerbated by ecosystem degradation and climate change. Recently, livelihood vulnerability assessments have been conducted in several countries in the region, such as Mongolia, Bhutan, Kazakhstan, Nepal, and the Kyrgyz Republic. However, these vulnerabilities were primarily assessed using local community surveys without the application of spatial datasets. Therefore, this study aims to transition from a static survey framework to a spatial assessment framework. Focusing on the social, human, financial, physical, and natural aspects of livelihood vulnerability, representative and modified spatial data were selected for the assessment. The selected spatial data were aggregated using a normalization approach, and a spatial vulnerability index was generated. Through this study, regional and global livelihood vulnerabilities were evaluated. In addition, this research contributes to the further development of adaptation strategies in the Third Pole region.