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250 years history of land use in meshchera Lowlands of Russia

Analysis of land-cover change and its drivers is a prerequisite for the development of environmentally-sounded land-policies. Combination of satellite remote sensing observations, historical datasets and statistics allows to reconstruct long-term land-use dynamic and assess drivers of land change. Here, by using CORONA and Landsat imagery, combined with cadaster and topography surveys dating back to 1770, we reconstructed land-use change for three study sites in meshchera Lowlands of Russia. This study sites are located in typical for the southern part of forest zone landscapes (opolie and polesie) that differs in natural conditions. To assess the spatial determinants of land-cover change we also prepared parameters reflecting suitability of farming, such as elevation, drainage, soil fertility, erosion, etc. By using historical statistics, we also reconstructed socio-economic dynamic for our study area, such as population density, distance to rivers, villages, and roads, which was rasterized and matched up with land-use change maps. We used spatially-explicit multinomial logistic regression to establish the statistical relationship between land-use change and selected explanatory variables. Last, but not least, with qualitatively linked explored spatial determinants of land-use change with underlying drivers, such as technological changes, socio-political shocks. The results obtained suggest that in the regions, where economic activity was strongly limited by natural conditions, the structure of land use remains practically unchanged for a long time, while in the absence of constraints the socio-economic and positional factors play a leading role in the diversification of the land use.

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