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Impact assessment of land use change on surface temperature and agricultural productivity in Peshawar-Pakistan

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The profound appreciation of urban expansion and land use change (LUC) considerably influences the ecosystem functions, services and biodiversity along with the local and regional climate. Land use has undergone an awful transformation due to rapid urbanization and population growth, which in turn increased land surface temperature (LST) in district Peshawar, Pakistan. The current study tends to capture the influence of land use on LST and agricultural productivity by employing multi-temporal, multispectral satellite data and agricultural production data during the selected years, i.e. 1996, 2003 and 2016. The results demonstrated that barren land considerably decreased while the urban area increased over time in all three phases. Furthermore, significant LST difference was found in different land cover units e.g. barren land and urban area has the maximum, while water bodies followed by vegetation retains minimum LST in all three phases i.e. 1996, 2003 and 2016. Similarly, the results from agricultural production revealed that except for wheat crops which decreased by 7.54% during 1999-2003, the production of all major food crops increased during the selected years. However, the production of sugar cane and barley experience considerable reduction during the selected years, except for barley which increased by 22.86% during 2003-2016. The finding of this study provides guidance, policy recommendations and reference for future researchers.