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From local studies to global patterns: Example of systematic reviews on local land use change to study global change processes

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Environmental changes have been studied in numerous local scale studies all around the world. They provide invaluable evidence on the causes and consequences of the way we use and change the environment. However, it remains unknown, how we can use this evidence beyond the study area boundaries, which limits the transferability of potential more sustainable solutions. We present a novel, interdisciplinary workflow on how to combine systematic reviews and meta-analyses with spatial analysis on the example of land use change. First, we performed a systematic review on local scale land use change. The collected studies were used to generate a classification of different actors behind land use change using clustering. Secondly, using the documented case study evidence, we statistically analysed how the location influences the spatial distribution of these studies. We used data on socio-economic, soil, terrain and climate variables. Using the derived statistical relationships, we were able to map the spatial likelihood of the studies, and how representative the study collection is for other parts of the world. The results enabled us to identify areas, which are similar to the meta-analysis collection. Conversely, areas that are very different can be used to identify understudied areas where more research is necessary. The proposed workflow can be used across different domains of environmental and earth system sciences.