

Evidence of urban land teleconnections and impacts on hinterlands

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That urban and rural places are connected through trade, people, and policies has long been recognized. The urban land teleconnections (ULT) framework aims advancing conventional conceptualizations of urbanization and land. The conceptual framework thus opens way to identify and examine the processes that link urbanization dynamics and associated land changes that are not necessarily colocated. In this paper, we review recent literature on four manifestations of urbanization that, along the lines of the ULT framework, highlight the importance of process-based conceptualizations of urbanization and land along a continuum of land systems. We then discuss potential approaches to improve the knowledge base on how and where urbanization is driving land change.

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Introduction

The urban land teleconnections (ULT) framework is a theoretical response to the need to advance current conceptualizations of urbanization and land that are increasingly inadequate to understand how changes in urban places affect nonurban places and vice versa [1**]. One of the central tenets of the ULT framework is to understand how changes in urban locations are linked to distant, and sometimes, multiple places through a complex set of processes. In this context, the conceptual framework re-examines three themes in the current land change literature: the traditional system of land categorization, place-based relationships, and implicit assumptions about deterministic progression of land change. The conventional system of land classification calls for

assigning land parcels into discrete units. The ULT framework argues that this system ignores the nuances in the quality, uses, and functions of land. The focus on place-based characterizations of land similarly ignores the connections between places, in particular, between urban and rural land uses [2]. Finally, accepting a given progression of land change as universally valid ignores the differences in how the land is conceptualized, used, and governed in different geographical and cultural contexts [3].

The ULT conceptual framework argues that by making the linkages between processes and places explicit, the multiple (and sometimes unintended) consequences of urbanization and land changes can be explored. With its emphasis on processes, the ULT framework goes beyond an aggregated hinterland approach used by indicator-based concepts such as the ecological footprint [4]. The purpose of this paper is twofold: First, we review recent literature for four examples of specific pathways through which urban processes affect hinterlands. Second, we discuss several approaches to improve the knowledge base on how and where urbanization is driving land change in hinterlands.

Four examples of the ULT

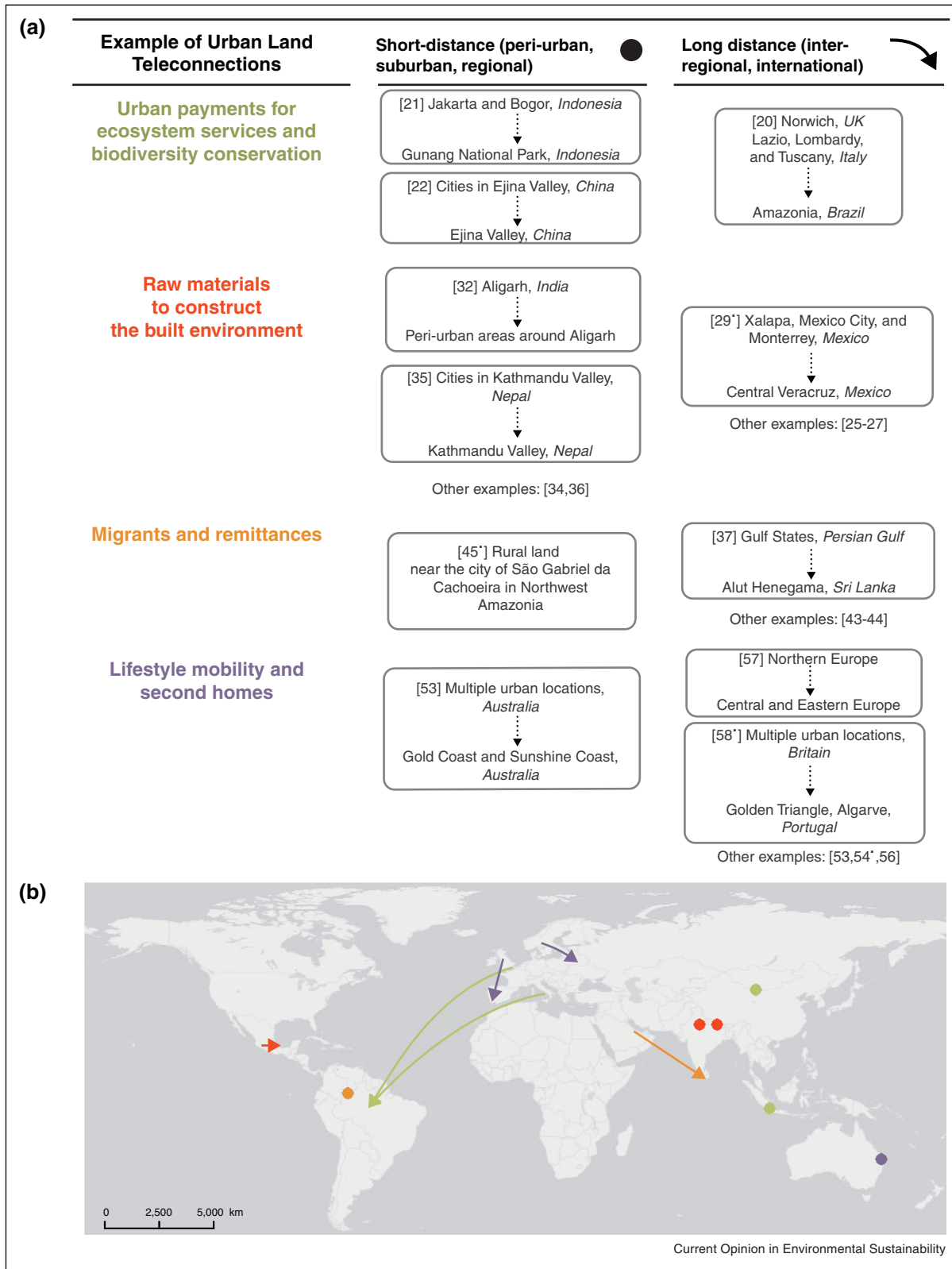
We provide four examples of how processes are connected through urbanization and discuss their implications for exploring the concept of ULT. An important consideration in this respect is that teleconnections can extend from short-distances such as the continuum between a central urban area and peri-urban areas to longer-distances such as those between places across nations or continents (Figure 1).

We selected four examples that illustrate unexpected linkages between the urban and the hinterland and which span a range of topics: from perceptions of people about places they have never or rarely been (willingness to pay, WTP, for ecosystem services in distant locations) to physical movement of materials (mining of raw materials to construct the built environment), people (migration, tourism and lifestyle mobility), and money (remittances) between urban and nonurban places.

Example 1: urban payments for ecosystem services and biodiversity conservation

Several recent studies show that WTP for certain ecosystem services and species preservation tends to increase with increases in income [5–7]. Because

Figure 1



Four examples of the ULT representative of different types of processes. **(a)** The breakdown of the case studies is illustrative of one defining aspect of teleconnections, that is, distance; **(b)** the teleconnections in the selected case studies highlight the continuum across space.

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