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Transformation of Traditional Livestock Systems under Land Use Changes from the 1970s to the 2018/2019 in Ladakh, India

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Abstract

Ladakh in N-India is an example for remote mountain areas that are still largely dedicated to subsistence agriculture while facing major rural-urban transformation processes. It is home to traditional agriculturists, agro-pastoralists, and nomads that are highly adapted to a unique and demanding high-mountain environment. Since the 1970s the local agricultural communities are subject to a profound structural change which accelerated with the recent advent of rapidly increasing tourism. This study aimed to analyse the (1) drivers of change, (2) adaptation mechanisms of the agro-pastoral subsistence communities to a changing market for labour and agricultural products, and (3) rampant land use change processes and urbanisation. To this end, four study sites, divided into two pairs, one for agro-pastoralists (Leh and Diskit), and one for pastoralists (Kharnak and Kharnakling) were selected. This allowed to compare sites with different levels of transformation and exposure to tourism. We conducted 98 semi-structured household interviews to determine agricultural practices, cropping patterns, livestock keeping, changes in herd composition and product marketing and motivation. Additionally, socio-economic parameters such as household expenditure, (off-farm) occupation, and impact of tourism on household revenue were surveyed. Besides, a remote sensing and GIS approach allowed classifying land use maps in the 1970s, the 2000s, and 2018/2019. The land use classification revealed an overall expansion of urban areas, particularly in Leh with an eightfold increase in built-up land since 1974, while in Diskit the urban area doubled. In Leh, 41.7% of the agricultural area transformed to urban compared with only 1.7% in Diskit. Households adapted to this process by incorporating new modes of cropping and livestock keeping in their traditional systems, resulting in a higher specialisation. Socio-economic data indicated increasing off-farm income generating activities while the available workforce dedicated to agriculture declined by 30% since the 1970s. Results showed that main drivers of transformation are tourism (direct) and border tensions (indirect). There is evidence that the local change processes may result in a complete abandonment of traditional systems in the long run, even if religious and cultural reasons may slow down this process.

Keywords: Agriculture, GIS and remote sensing, pastoralists, rural-urban transformation, tourism

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