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Does outmigration lead to land degradation? Labour shortage and land management in a western Nepal watershed

S. Jaquet [a, *], G. Schwilch [a], F. Hartung-Hofmann [a], A. Adhikari [b], K. Sudmeier-Rieux [c], G. Shrestha [d], H.P. Liniger [a], T. Kohler [a]

[a] Centre for Development and Environment, University of Bern, Hallerstrasse 10, 3012, Bern, Switzerland
[b] International Union for Conservation of Nature, Nepal Country Office, Kupondole, Lalitpur, P.O. Box 3923, Kathmandu, Nepal
[c] Institute of Earth Science, University of Lausanne, Geopolis, 1015, Lausanne, Switzerland
[d] Nepal Centre for Contemporary Research, Ekantakuna, Jawalakhel, Lalitpur Sub-metropolitan City, Nepal

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ABSTRACT

In Nepal, changing demographic patterns are leading to changes in land use. The high level of outmigration of men in the hills of Kaski District, Western Development Region of Nepal, is affecting the household structure but also land management. Land is often abandoned, as the burden on those left behind is too high. How do these developments affect the state of the land in terms of land degradation? To find out, we studied land degradation, land abandonment caused by outmigration, and existing sustainable land management practices in a subwatershed in Kaski District. Mapping was done using the methodology of the World Overview of Conservation Approaches and Technologies (WOCAT). While previous studies expected land abandonment to exacerbate slope erosion, we demonstrate in this paper that it is in fact leading to an increase in vegetation cover due to favourable conditions for ecosystem recovery. However, negative impacts are several, including the increase of invasive species harmful to livestock and a decline in soil fertility. Traditional land management practices such as terraces and forest management exist. To date, however, these measures fail to take account of the changing population dynamics in the region, making the question of how migration and land degradation are linked worth revisiting.

Introduction

The relationship between land degradation and population trends has always been of great concern in the Himalayan region: an increasing population pushed people to the forest frontiers, and deforestation was one of the main causes of land degradation, for example through landslides. Land degradation in itself has been studied for decades in the Himalayas due to the region's dynamic landscape and monsoonal climate. The first theory about Himalayan land degradation was discussed in 1975 by E. Eckholm, whose paper subsequently led to the theory of Himalayan Environmental Degradation – a theory many scientists adopted over the years (Ives & Messerli, 1989). This scenario forecast that the hills of Nepal would be barren by the year 2000 (The World Bank, 1979). Although widespread land degradation did indeed occur, the cause–effect relationship was not as simple as suggested, and the theory was widely criticized (W. M. Fleming, 1985; Gardner & Gerrard, 2003; Gerrard & Gardner, 2002; Ives, 2004; Ives & Messerli, 1989; G. Thapa & Weber, 1995).

Similar predictions were made for the Phewa watershed (about 100 km^2, in Kaski District, Western Development Region of Nepal), where it was said the hills would be barren by 2002 (W. M. Fleming, 1985). This predicted degradation was mainly blamed on open grazing, which was very common in the forest. The estimated number of livestock within the watershed was one per inhabitant (W. M. Fleming, 1985). The Department of Soil Conservation and Watershed Management intervened (1975–1995), and the Food and Agriculture Organization of the United Nations prepared a

* Corresponding author. Centre for Development and Environment, University of Bern, Hallerstrasse 10, 3012 Bern, Switzerland. Tel.: +41 31 631 88 22, +41 79 722 43 55 (mobile); fax: +41 31 631 85 44.
E-mail addresses: stephanie.jaquet@cde.unibe.ch (S. Jaquet), gudrun.schwilch@cde.unibe.ch (G. Schwilch), fritzi.hartung-hofmann@students.unibe.ch (F. Hartung-Hofmann), Anu.ADHIKARI@iucn.org (A. Adhikari), karen.sudmeier@gmail.com (K. Sudmeier-Rieux), gittat@gmail.com (G. Shrestha), hanspeter.liniger@cde.unibe.ch (H.P. Liniger), thomas.kohler@cde.unibe.ch (T. Kohler).
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study for a new basin management programme (1977–1978) (Awasthi, Sitaula, Singh, & Bajacharaya, 2002; B. Fleming & Fleming, 2009; W. M. Fleming, 1985; G. S. Paudel & Thapa, 2001): these measures were rooted in the belief that a bigger population was putting more pressure on resources. The objective was to use forests and cultivated lands sustainably, by limiting the loss of soil and nutrients and by including the government and international agencies in land use management. Several researchers have studied the implementation and impacts of the Phewa Lake Watershed Area Management Project and compared the area to other non-project areas (Awasthi et al., 2002; G. S. Paudel & Thapa, 2001; G. Thapa & Weber, 1995). Conclusions were positive: technical help, awareness raising, and information were leading to more sustainable land use (e.g. implementation of bunds and waterways to improve water flow), even though some problems of degradation still remained (G. S. Paudel & Thapa, 2001).

However, the recent past has seen a change in population dynamics due to increased outmigration. While people have migrated for decades from the hills to the low plains of Terai or to India when land became scarce (Graner & Gurung, 2003; Kollmair, Manandhar, Subedi, & Thieme, 2006; Seddon, Gurung, & Adhikari, 1998), the current exodus to foreign countries or to urban areas has led to marked changes in the demographics of the hills (Blaikie, Cameron, & Seddon, 2002; Ghimire & Upreti, 2012; Seddon et al., 1998). According to 2014 statistics, 1,349[1] people leave the country every day (not counting those who leave through the open border with India or illegally). The task of managing the land falls to those left behind, mainly women and the elderly. Some villages even turn into ghost villages when entire families decide to move down to the valley or city (Gurung, personal communication, 2013).

Studies investigating how demographic change affects land management have so far tended to focus mostly on whether population growth increases or decreases land degradation (G. Thapa & Weber, 1995; Warren, 2002), whereas the consequences of population decline have received little attention. Outmigration can have very different impacts on land, including land degradation and a decrease in production; land abandonment and recovery of ecosystems; and changes in land use/land cover (Aide & Grau, 2004; Gisbert, Painter, & Quiton, 1994; Radel & Schmook, 2008). The lack of knowledge on the effects of population decline makes the question of land degradation in the Phewa watershed worth revisiting. Migration has a long history in this area, with the Indian and British Armies recruiting Gurkha soldiers since the 19th century; but it has changed and increased significantly in the past ten years (Sharma, Pandey, Pathak, & Sijapati-Basnett, 2014). Today, it is not population growth which affects the landscape and the environment, but depopulation.

The aim of our study in the Harpan subwatershed (a subset of Phewa watershed) was threefold: to investigate land degradation, land abandonment caused by outmigration, and existing sustainable land management practices.

Study area

The study area is located in Kaski District in the Western Development Region of Nepal (83°47′56″ to 83°52′59″E and 28°11′39″ to 28°15′28″N), west of Phewa Lake and Pokhara Sub Metropolitan City. The area lies between 825 m.a.s.l. (Thulakhet village) in the east and 2517 m.a.s.l (top of Panchase) in the west (Fig. 1). The Harpan subwatershed comprises the upper part of the Harpan River, which is the main river flowing west to east and the major source of water to Phewa Lake, further east. The study area comprises 36 km^2 of mainly steep slopes (slope gradients of 16 °–30 °) The climate of this area is subtropical humid to temperate humid, with temperatures ranging from 34 °C during summer to as low as 3 °C in the winter. Monsoon (June to September) sees around 80% of the rainfall, with an annual average of over 3500 mm (Dahal & Hasegawa, 2008).

The area is mainly covered by forest (70%) (Fig. 1) and cultivated land (26%), the latter consisting of irrigated (*khet*) and non-irrigated (*bari*) plots. Forest covers mainly the western and southern part of the watershed. The villages located in the upper part (Bhanjyang, Upper/Lower Shidane, Mankanpur, Philinghari, Chisopani, Kuiredanda, etc.) have relatively small cultivated areas compared to the villages further downstream (Thulakhet, Ghatichina, Borang, etc.), where forest covers smaller areas. The Harpan River is joined by the Andheri River coming from the north near the village of Thulakhet.

The area comprises 21 communities. Their size ranges from 6 to 150 households belonging to various ethnic/caste groups. Migration has a long history here and is significant: many men have migrated temporarily for employment and many families have moved from the hills down to the major cities and more accessible areas of Nepal. A similar phenomenon occurs at a more local scale within the study area: the population is decreasing in the more remote uphill villages on the slopes and increasing in the more easily accessible villages at the bottom of the subwatershed (Ghatichina, Thulakhet).

Materials and methods

Materials

To record information on the households, an existing questionnaire (Sudmeier-Rieux, Jaquet, Derron, Jaboyedoff, & Devkota, 2012) was modified to fit the context of this research with a special focus on outmigration. Two land use/land cover maps and a satellite image were used for fieldwork and to present results (Table 1). The Global Positioning System (GPS) was used to locate the main features of the area and to record the position of the households surveyed.

Demographic data and household survey

We conducted an in-depth demographic and household survey in six selected villages, obtaining a detailed understanding of the residents and the absentee population. Villages were selected according to several criteria intended to cover a wide range of issues. The main criteria were: significance of land abandonment (high/low), outmigration (high/low), land degradation (very much/little); location within the watershed (uphill/middle/downstream); and caste/ethnicity groups (indigenous/advantaged/marginalized). The in-depth demographic survey only covered gender, age, and the destination and work of migrant household members. The household survey covered the 5 livelihood assets (DFID., 1999) and focused specifically on outmigration. We used a systematic sampling method to select and survey 10–30 percent of the households in each village (91 households in total) during two periods, March 2013 and March 2014. This paper survey was conducted by the researchers in collaboration with field assistants. Additionally, in each village we conducted a group discussion with women and one with men. When it was not possible to have separate discussions, we conducted a mixed focus group discussion. Topics covered the village features; outmigration, its causes, consequences, and disadvantages; land management, including land degradation issues and how land is managed following outmigration; and the main concerns of the population. Since this article focuses on the

[1] http://www.onlinenepalnews.net/2014/05/labor-migration-has-become-fashion-in.html, retrieved on 28.05.2014.