

An ever-changing place: interpreting landscape change in Sagarmatha National Park, Nepal; re-photographic survey and encounter

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Abstract

Repeat photography reveals changes in Sagarmatha (Mt. Everest) National Park and Buffer Zone – a microcosm of the Himalayas. The principal author re-took historical photographs from the same viewpoints, illustrating cultural landscape change and persistence over 50 years. The photographs were then used as a basis for interviews with local people.

The research also shed light on socio-economic change, particularly in land cover. It proved that repeat photography can rapidly provide important insights into landscape change patterns, cause, and management options.

Profile

Protected area

Sagarmatha National Park

Mountain range

Himalayas

Country

Nepal

Introduction

Human interaction with landscapes creates cultural landscapes (Antrop 2005; Naveh 2000) that contain much information, both ecological and social (Nassauer 1995; Nüsser 2001). As humans impact on almost every place on Earth, mountains included (Messerli et al. 2000), the world is a patchwork of cultural landscapes.

The use of repeat photography to study cultural landscape change in the Khumbu region (or SNPBZ – Sagarmatha National Park and Buffer Zone) is part of an ongoing PhD study (Figure 1).

What would repeat photography highlight about the changes in SNPBZ over 50 years? Can the method clarify landscape / land-use changes (Webb et al. 2010) and cope with the temporal and spatial complexity of environmental & landscape change (Moss 2000)?

The research revealed the variety and complexity of change in SNPBZ, particularly in land cover. It also revealed Sherpas' views on change. This deserves consideration as an application of repeat photography. Thus, this article first reviews recent contributions to the methodology, and pros and cons, then draws broader conclusions on landscape change in SNPBZ.

Repeat photography

Repeat photography monitors landscape change via two or more images taken in the same spot over time (Webb et al. 2010). The method can document change over three timescales: years, decades and / or centuries; seasons (e.g. vegetation – Nüsser 2000); or one-off events such as landslides (Ives 1987). Time-lapse photography takes the latter to the extreme (Trimble 2008).

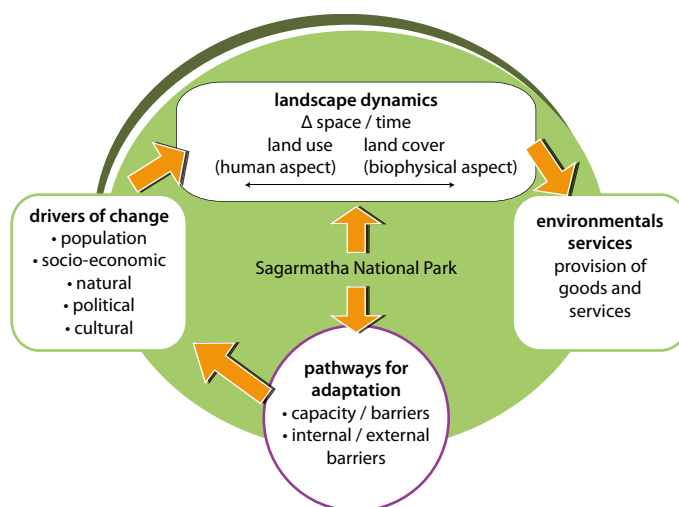


Figure 1 – Relationships between the different elements in the broader PhD project.

Repeat photography studies cover topics as diverse as geomorphology (Cerney 2010), biogeography and forest ecology (Turner et al. 2010; Veblen 2010), glacial recession (Zängl & Hamberger 2004; Byers 2007), range management (Lewis 2010; Western 2010), and historical architecture (Moore 2010) but over 90% focus on ecological or physical landscape change (Webb et al. 2010). The use of repeat photography in human geography is relatively new (Kull 2005; Nüsser 2001).

Compared to aerial photography and satellite imaging, it is less comprehensive and more biased. But it costs less, particularly if done during other fieldwork, is not limited by air space restrictions, cloud cover or complex topography and is easily recognizable by lay viewers. It can increase temporal depth (Webb et al. 2010) by adding data older than aerial or satellite images.

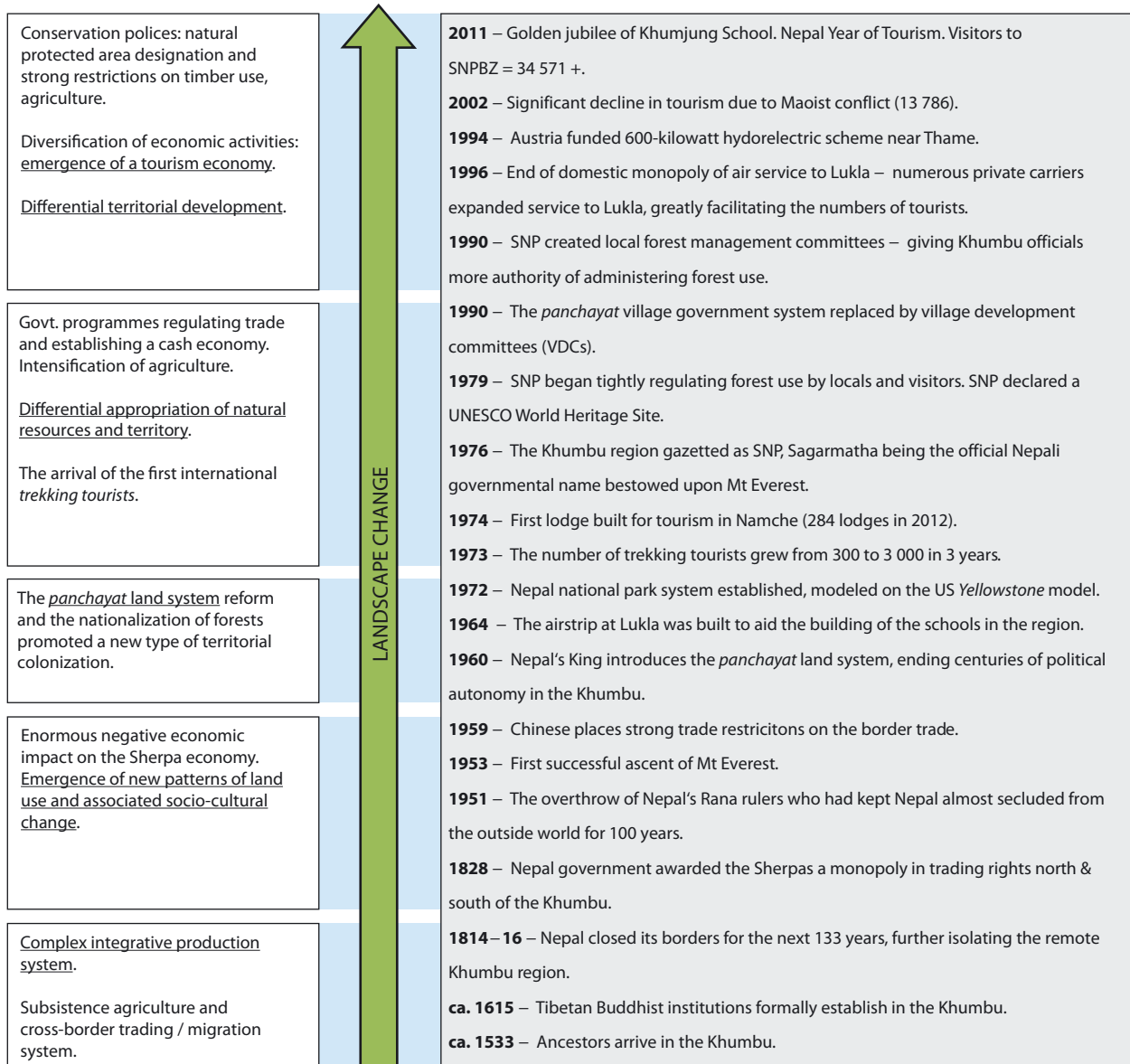


Figure 2 – Historical timeline related to landscape change in the Khumbu (adapted from Stevens 1993). SNPBZ – Sagarmatha National Park and Buffer Zone. SNP – Sagarmatha National Park.

Understanding landscape change

One pair of repeat photographs may be too specific; comparing across sets of photographic pairs helps minimize problems of scale and bias (Webb et al. 2010). In SNPBZ, this outlined different patterns of change, especially in vegetation, which generally increased for various reasons (see also Byers 2005), including declining pastoralism and village growth via tourism profits (Nepal et al. 2002), which can be seen in the photographs.

Sometimes the more significant changes at a site were economic and commercial, particularly in villages on the main trail to Everest. Figure 3 shows that traditional civic centres (monasteries *gombas* or *chortens*) have either grown or been supplanted by commercial lodges.

Tensions of change often evoke nostalgia: “When I look at these photographs, we have lost so much, everything

has changed ... everything has a price in today’s life, even stone and sand.” Everyone smiled at the older photographs. Many said they preferred the way it used to be, but that in general things are better now.

The fieldwork illuminated local perceptions of environmental change and sometimes the disjuncture between perception and reality. This helps inform the photographic observations and understanding of land use history (Figure 2).

Field encounters inform the re-photographic survey

Chance encounters with prominent Sherpas illustrate another cultural aspect of repeat photography. For example, at a bird sanctuary high above Khumjung village (Figure 5), Tenzing Tashi Sherpa greeted me and we briefly discussed the area. He told us the forest had once supplied firewood and building mate-



Figure 3 – Namche Bazaar in 1955 and 2010. Today Namche has grown significantly and is the administrative centre and headquarters for SNPBBZ authorities. Namche's monastery (gompa), centre right, with yellow roof and surrounding sacred grove (Lu), has grown in size. © left: F. Müller (1956), courtesy of G. Kappenberger's & A. Byer's archives; right: R. Garrard (2010).



Figure 4 – The villages of Kunde and Khumjung in 1961 and 2009. Both villages have increased in size by more than 50% between 1961 and 1995 (Byers 2005), an increase largely attributed to population growth (Stevens 2003). These growth trends appear to be continuing as of 2011 (Ang Rita Sherpa pers. comm.). There has been an increase in trees in the forest, centre right, which is a mixture of protected (Kyaksbing) and sacred forest groves (Lami nati). The area of vegetation on the slope behind both villages and the left slope behind the village of Kunde (Gyajo Valley) has increased perhaps two- to threefold, probably due to an increase in vegetation and new plantings (Tenzing Tashi Sherpa pers. comm. 2011). The U-shaped valley is characterized by sandy, nutrient poor, former lake and alluvial terraces. © left: E.F. Schneider (1961), courtesy of A. Byers; right: R. Garrard 2009 after A. Byers.



Figure 5 – Khumjung in 1966 and 2011. The photograph was taken en route to the bird sanctuary. The school (Khumjung School) and group of lodges at the village's south entrance (2011) has become the new civic space of the settlement. The settlement's sacred forested grove (Lu) surrounding the monastery is shown. The forested areas are decorated with prayer flags extolling the virtues of trees and forests and the pertinence of planting and caring for them (Tenzing Tashi Sherpa pers. comm. 2011) – a landscape of conservation ideology. Part of the recent complexes of what the author terms dooryard gardens used for intensive potato cultivation are shown. © left: H. Heuberger (1966), right: R. Garrard 2011.

rials until the vegetation was destroyed by cattle used for Everest expeditions. "It's beautiful, the forest. We need forest here. It's good ... The relationship between the national park staff and the local people does not help these forests ... the National Park is always looking for Sherpa mistakes ... which has caused more chopping or cutting of trees. We used to have thicker forests around here."

In the village of Dingboche (Figure 6), Sonam Hishi Sherpa said the village had grown much, especially since the 1990s. When he was a child, he said, "it was so different. It was much smaller. I went to Pharak to work in the fields but now they (non-Sherpas) are coming here in our village ... The production methods are fast, giving fast cash ... Nowadays people here live for today." His comments reflect a



Figure 6 – Dingboche village in 1977 and 2011. The spectacular terracing so ubiquitous in SNPBZ is shown and has historical origins. Note the apparent increase in juniper cover on alpine slopes upstream of Dingboche, most likely related to a locally imposed ban on juniper cutting since 2004. Dingboche was traditionally a summer pasture (gunsa) area but is now inhabited year-round due to tourism development and is one of the remaining villages that impose D-system (communal regulation of livestock system). The village has grown in size since the late 1990s due to trekkers preferring the sunnier side of the upper Imja valley and the popular climb of Imjaste (Island Peak 6032 m) centre-right. © left: B. Jefferies (1977); right: R. Garrard (2010).



Figure 7 – Tengboche Monastery in 1951 and 2010. The monastery has been the heart of Sherpa culture since 1916. The 1951 photograph was taken on the British Mt. Everest reconnaissance expedition. The monastery was reconstructed in 1989 after a fire, to look similar to the former design from the outside. Surrounding Tengboche are well-established community-protected forests (Kyakshing) and sacred forest groves (Lu). © left: The Royal Geographical Society (UK) Everest Collection (1951); right: R. Garrard 2011. Different focal length and vegetation prevented an exact repeat.

sense of mourning for traditional agro-pastoral values, on the one hand, and welcoming earning opportunities on the other.

We said there seemed to be more shrub juniper surrounding the village than in the mid-1970s. He told us that the Khumbu Alpine Conservation Committee (of which he was chair) had banned the use of juniper as firewood in 2004. This is seen as positive.

When asked about changes to buildings, he replied: *“All the building materials used to be stone and mixed mud / clay. All the timber was local fir and juniper – very durable. Now the timber mostly comes from Jiri, Solu or from Kathmandu (plywood) to Synboche via helicopter; the costs are huge ... Some of these building materials last, but others are poorly designed for the conditions in the Khumbu.”*

At Tengboche Monastery (Figure 7), I had the privilege of speaking with the Tengboche Ringboche (spiritual leader of the Sherpa people). He stressed that Sherpas are at great risk of losing their culture and language: *“The schools are responsible for the loss of traditional language as well as clothing, because the school’s students only learn modern things there ... Because of the media, we know more of other cultures than our own. We never used to celebrate Dashain (National Hindu festival). The pressure from the (Hindu) Government is having an effect on the culture of the local people.”*

Interpreting change

In the 1950s and early 1960s SNPBZ was far less developed and could only be reached by foot or on the back of an animal; resource consumption was far more restricted; there was little or no communication technology and no modern education. However, by the mid-1960s, a transition into the tourist era began (Fisher 1990). Ties with Tibet loosened and the valley was integrated into Nepal (Figure 2).

With new income opportunities in mountain expeditions (Brower 1991), new roles replaced animal husbandry: lodge owner, trekking guide, government worker, globe-trotting trader, university lecturer and politician.

At the time of F. Müller’s visit (1956), see Figure 3, the population of SNPBZ was estimated to be 2200 Sherpas (today ca. 5750) and almost everyone worked in agriculture, trade and animal husbandry. Despite romantic Western notions, massive engagement in trade (Stevens 1993) suggests the region had hit or exceeded its agricultural limits well before the tourist era.

SNPBZ in 2011 is more connected, modern and economically diverse, with airports, cell phones, radios, TVs and internet access. *Boon or blight* is one label for the dilemma posed by tourist development in the

region (Byers 2005; Nepal et al. 2002; Stevens 2003). Not all villages have grown; those that have are located conveniently along the main trails (Brower 1991) and have economically *progressive* attitudes toward growth and tourism (Byers 2005).

Larger changes in social, political, ethnic and economic spheres, and land use associated with them, are often triggers for environmental change (Head 2004). Understanding the context of change may help explain why it happens.

Economic diversification and growth, increased health care and access, transport, communication, and education mean that many Sherpas no longer farm or cut firewood. Perhaps this leads to increased forest cover? With conservation concerns came the landscaping of settlement forests, adorned with prayer flags announcing their virtue as symbolic forests, landscape manifestations of people's feelings for the environment.

Discussion

Repeat photography allowed us to see biophysical and cultural changes that reflect a variety of larger forces at work. The fieldwork provided opportunities to interact with Sherpa residents, gaining another layer of understanding.

For example, while we observed consistent increases in vegetation, locals kept claiming that it had decreased. Understanding this mismatch may help address tensions between conflicting uses of the forest and current protected area policies.

Before drawing final conclusions, we must look at the adequacy of the method. The findings of a few encounters in the region may not be representative and focusing on socio-economic change risks underrating non-economic factors. This assessment aspires to be a first step in influencing conservation policies in SNPBZ towards broader participation of local stakeholders. The broader research project (Figure 1) aims to create a critical dialogue around issues important to residents and to catalyze community self-organization.

Conclusion

Repeat photography offers both specific empirical measures of landscape change and a more holistic perspective combining interviews and oral history. It can also give a contextual perspective on specific changes, on how and why people see them. This insightful method will hopefully continue to develop and help us understand some of the many complex factors at play in our landscape change assessments in protected mountain areas.

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