



Scrutinizing the relationship between adaptation and resilience: Longitudinal comparative case studies across shocks in two Nepalese villages



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ABSTRACT

Growing concerns regarding the vulnerability of communities to natural disasters and climate-related hazards and risks have caused attention to be increasingly directed towards adaptation and resilience as important policy prescriptions. These two concepts are commonly becoming normative when used in this context and seen as intrinsically linked to each other, i.e. adaptation leads to resilience and resilience is a property needed for having capacity to adapt. If not having positive outcomes, it is instead often referred to as maladaptation. The aim of this study is to scrutinize the relationship between adaptation and resilience with reference to two Nepalese villages, Khumjung and Ingla, which recently experienced earthquake and pest attacks on crops, respectively. It does so through longitudinal comparative case studies based on data mainly collected through qualitative interviews with residents and other key respondents before and after shocks. The results indicate that applying the concepts of adaptation and resilience in the context of risk and sustainable development requires: (1) explicit consideration of values, goals and aspirations, (2) explicit spatial and scalar delineations of the system we are considering, and (3) explicit definition of the timeframe in mind. The article therefore advice against any universal normative claims that certain adjustments are adaptive or maladaptive, and that they will or will not lead to resilience.

1. Introduction

The negative impact of disasters on societal development is well established [73]. Between 2004 and 2014, the average number of victims of natural disasters per year has been reported to be 199.2 million, with material damage averaging US\$ 162 billion [31]. Growing concerns regarding the vulnerability of communities to natural disasters and climate-related hazards and risks have caused attention to be increasingly directed towards adaptation and resilience as important policy prescriptions [64,77,79].

Adaptation and resilience have come to be viewed as complementary goals that must be achieved in order to reduce vulnerability [51] and ensure that communities are able to withstand the impacts of disasters and recover quickly [80]. This has led to various questions, such as: What makes adaptation and resilience complementary? Which one leads to the other? or Do the two concepts refer to the same system feature? In the literature concerning resilience, reference is increasingly

being made to the adaptive capacity [56,57,59], adaptive mechanisms [52] and local adaptive strategies [48] required to improve system resilience and reduce vulnerability. Resilience is viewed as a property or the characteristics required to adapt [43,48,83]. Despite the popularity of these terms, there does not appear to be a clear link between adaptation, resilience and vulnerability [27]. In fact, there is still contention regarding the meaning of the concept of resilience, which varies with context [4,49]. The fuzzy nature of the concepts of adaptation and resilience, and the relation between them brings into question whether adaptive capacity is sufficient to create resilient communities; in other words, How can communities be labelled as being non-resilient or maladaptive in the first place? This raises the question of the normative character of the two terms.

The aim of this study was to scrutinize the relationship between adaptation and resilience with reference to two Nepalese villages, Khumjung and Ingla, which recently experienced earthquake and pest attacks on crops, respectively. Scrutinizing the relationship between

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adaptation and resilience, for this paper, involves critically examining the implicit causality in the form of a positive feedback loop between the two.

2. Conceptual clarification

In this section, we briefly introduce conceptualization of link between adaptation and resilience, broadly summarized across two dichotomies. The first dichotomy entails whether adaptation and resilience are conceptualized as outcomes or processes, while the second dichotomy involves whether adaptation and resilience are descriptive or normative concepts. The following sections elaborate on these two dichotomies.

2.1. Outcome or process?

The concept of adaptation usually refers to an outcome or process, or sometimes the actions resulting in the outcome or contributing to the process [61,76]. O'Brien and Holland [61] gave abundant examples of how adaptation is conceptualized as an outcome in both the natural and social sciences. Others have conceptualized such outcomes more explicitly as adaptive traits (e.g.[67]) or features (e.g.[37]), and refer to adaptation as being more of a process. This is also the most common approach to adaptation relevant for this paper. For instance, [1] refers to adaptation as: “those processes by which a population attempts to achieve a ‘working relationship’ with its environment”, while [61] suggest that anthropologists often view adaptation as “the process by which groups of people add new and improved methods of coping with the environment to their cultural repertoire”. Adaptation is thus, in one sense, a process of overcoming risk [2,61]. Both these definitions of adaptation have in common that they relate adaptation to adjustments made so as to reduce the threat to what is considered valuable; either as the outcomes of those adjustments, or the process or actions resulting in them.

Resilience is an even more contentious concept, with numerous definitions and approaches, and an eclectic etymological background [4]. Most approaches to resilience can be divided into three main categories [70], describing resilience as: (1) *the ability to bounce back* to a single equilibrium after a disturbance (e.g. [17]:14; [65]); (2) *the buffering capacity* before a disturbance forces a system from one stable equilibrium to another ([11]:12; [35]); or as (3) *the ability to adapt* in reaction to a disturbance (e.g. [70]: 76). It has been suggested that these approaches require further development to describe resilience in systems that include human beings with the ability not only to react to disturbances, but also to anticipate and learn from them [8]. This is especially the case in adjustments over longer time periods, which Berkes and Jolly [12] reserve for adaptation when defining more short-term responses to disturbances as coping. However, the literature dealing with disasters often includes both long-term adaptation and short-term coping, resisting, responding and recovering [4], while others stress the importance of anticipation and learning in developing resilience (e.g. [8]).

Although there are examples of attempts to conceptualize resilience itself as a process [21,59], it is most commonly conceived as a property or feature of a particular system [4,57,59,70]. However, there is a distinction between approaches to resilience that focus on a snapshot of this property or feature at a particular moment in time, and approaches that focus on how they change over time. To accommodate this distinction in the outcome/process dichotomy, the former type of approaches can be referred to as outcome-oriented, and the latter as process-oriented.

Conceptualizing resilience as the ability to “bounce back” or as buffering capacity is clearly outcome-oriented, emphasizing resistance to the disturbance and maintaining the stability of the system [25]. Such approaches have been applied to a range of systems, ranging from power grids [42] to communities [52,54,63,80,87], mainly emphasiz-

ing disaster resistance that minimizes vulnerability and loss [28]. Although clearly important, this type of approach has been criticized for focusing on the continuation and maintenance of the status quo [43], while largely ignoring the fact that people may have aspirations beyond particular disaster events [48]. This approach has also been criticized for focusing mainly on technocratic engineering solutions, rather than on preparedness, social learning and capacity development [49,53].

As a result of the problems associated with outcome-oriented approaches to resilience, interest in process-oriented approaches has increased. This has caused a shift in focus from immediate response and recovery, to developing the future resilience of communities [3], including increased focus on adaptation and adaptive capacity [43,55]. [59] suggest that resilience is “a process linking a set of adaptive capacities to a positive trajectory of functioning and adaptation after a disturbance”([59]:130); thus still focusing on adaptation, but maintaining the reactive notion of resilience, while ignoring its, at least equally important, proactive aspect [33,8].

The literature on resilience includes numerous references to adaptive capacity [56,57,59], adaptive mechanisms [52] and local adaptive strategies [48] as requisites for resilience. There are also many references to resilience as a property or feature required for adaptation [43,48,83]. In this study, we adhere to the conceptualization of resilience given by Nelson and colleagues (2007) as a dynamic system property or feature, and of adaptation as processes of adjustment and transformation.

2.2. Descriptive or normative?

The second dichotomy of the relations between adaptation and resilience involves the role of values in their conceptualization. Most early approaches to adaptation and resilience are descriptive in nature [20,35,44,66], and influential scholars argue convincingly for the continuation of this approach [13]. However, when applying these concepts in highly normative contexts, such as in relation to risk [6,68], development [75] and sustainability [46], they necessarily become equally normative [8].

This normative take is clearly visible in approaches to resilience as the dichotomous opposite of vulnerability [81], or as inversely proportional to, and contingent on, adaptive capacities [45,63,80,9]. Others are even more explicit in their normative approach to resilience as a positive adaptive response [15], or as the ability “to cope positively with rapid-onset shocks or significant and protracted sources of stress” [49]. Even when acknowledging that resilient systems can reside in undesirable states, normative thinking pervades the description of such systems as “pathologically” resistant to change [57]. Some have even proposed the concept of “negative resilience” to capture persistent patterns of increasing vulnerability [49]. Similarly, adaptation is also often conceived as value-laden, distinguishing between adaptation resulting in positive outcomes, and maladaptation resulting in negative outcomes [24,47].

It is not our intention in this paper to argue for or against either descriptive or normative approaches to adaptation and resilience. Both are used in practice, and they both have strengths and weaknesses [62,86]. Instead, we attempt to scrutinize the relationship between adaptation and resilience in the context of two communities in Nepal.

3. Method

A case study methodology was used to analyse adaptation before and after two different shock episodes: earthquakes, in the case of the village of Khumjung, and pest attacks on crops, in the case of the village of Ingla. Pre-shock data were collected during field trips from December 2014 to March 2015, and post-shock data were collected from December 2015 to March 2016. Qualitative methods comprising in-depth interviews consisting of life narratives were used for data

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