

Constructing a fabula of resilience: a lived experience approach

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Abstract

Recent research in the studies of socio-ecology has raised an intriguing side effect associated with coping strategies and perceptions of environmental risk – where a perceived ability to cope with the effects of climate change and ecological degradation leads to an over-estimation of self-reliance and resilience. Known as the ‘paradox of resilience’, little has been understood about how or when such over-estimations occur. This paper sheds light on such phenomena by constructing a fabula (or narrative structure) of the paradox by investigating the case of extreme water shortage and the coping strategies of residents in the Kathmandu Valley, Nepal. Despite the long delay in providing public access to water, and the high cost this imposes on the public, members of the public have grown accustomed to the unreliable water supply, and willingly accept the high and coping costs of finding alternative sources of water. Using the lived experiences method, the paper reveals a link between self-perceptions of resilience, the incremental nature of the problem, a perceived ability to pay coping costs, and a lack of confidence in government capacity.

Keywords: Coping; Emotions; Resilience; Water governance

Introduction

Despite the increasing frequency and impact of environmental problems, such as climate change, resource scarcity, and natural disasters, as well as widening consensus that vigorous action is necessary to mitigate the adverse impacts of these problems, the reaction among the general public remains one of relative apathy (Richler, 2017).

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Instead, many paradoxes and anomalies are inherent in the public's relationship with and attitude toward the environment. Marshall found that oftentimes, victims of flooding, drought, or severe storms become 'less willing to talk about climate change or even accept that it is real', and that having children can make people *less* concerned about climate change (Marshall, 2014, p. 2).

This does not mean that people are unconcerned or unaware of the threat of climate change. Rather, it belies the 'paradox of social resilience' (Shaw et al., 2014), in which the act of 'coping' gives people what the authors call the 'delusion of resilience', and results in inaction. This is an unintended result of individual or social resilience, whereby people paradoxically take on greater risks than they are able to manage due to the unfounded conviction that they are well equipped to handle it, or resign themselves to absorbing the coping costs involved rather than recognizing it as a situation of crisis. In the context of environmental or ecological issues, this interpretation suggests that people are not deliberately undermining the threats of climate change – rather, individuals are taking on extraneous coping costs due to a systematic miscalculation of the risks involved.

Within extant literature, there are two possible explanations for this. The first is 'emotional numbing' as a socio-emotional coping mechanism. Norgaard (2011) documents a curious reluctance by the Norwegian public to discuss and engage with climate change issues, despite a high level of knowledge about such issues. She suggests that the pessimism and fear surrounding climate change issues have paradoxically created a need for Norwegians to 'live in denial' and continue their lives as usual, avoiding prolonged thought or discussion of the issue, and only divulging their feelings about the environment when pressed.

The same emotional numbing argument has been presented in the work of Eckersley (2008) and Futerra (2005), who argue that fears of a bleak future have the potential to generate maladaptive and nihilistic responses, in contrast to more adaptive activist responses. In the specific case of climate change, dramatic, fearful or shocking images of climate change are 'likely to distance or disengage individuals from climate change, tending to render them feeling helpless and overwhelmed when they try to comprehend their own relationship with the issue' (O'Neill & Nicholson-Cole, 2009:375).

A second explanation for this reaction to environmental scarcity and governmental failures is a rational calculus of trade-offs. Figueiredo et al. (2009) show that while indigenous communities in Agueda, Portugal, accurately estimate the risk of local flooding, they continue to occupy liminal spaces in flood plains due to their optimism about other benefits such as employment and livelihoods.

This suggests that cognitive reasoning and decision-making also play a part in regulating emotional responses. Thus, expected negative emotional responses to vulnerability (e.g. fear, anger) must be read in the context of other factors which may promote a positive emotional response, such as job security. However, such conscious trade-offs may, in fact, be an implicit risk-taking strategy, as it is difficult to assure that other benefits (such as agricultural livelihoods) will remain relevant in the long run under unpredictable and uncertain processes such as climate change.

In a similar vein, González-Riancho et al. (2015) observe a low-risk perception of storm surge flooding amongst residents of Dithmarschen, a low-lying area along the German North Sea coast with two major storm surge events in the last century, including a 1962 storm surge which claimed 340 lives. Instead, the top two problems perceived to be affecting stakeholders were livelihood-related difficulties and demographic change and migration.

These findings are echoed by Boissière et al. (2013) work on local perceptions of climate change in Mamberamo, Papua, Indonesia, where locals considered climate variation to have little impact on their livelihoods when contrasted with other factors, such as anthropogenic changes to the watershed through

the logging and mining industries, political decentralization, and infrastructure development. The prioritization of other risks has therefore been thought to be a rational response for communities that appear calm about certain environmental risks.

In this paper, a resilience response is exemplified by populations that display positive adaptation and coping mechanisms despite experiences of significant adversity or trauma caused by social or environmental injustices. This is primarily a psychological conception located within the work of scholars such as Luthar *et al.* (2000), Masten *et al.* (1999), and Rutter (1999, 2000).

In this sense, it departs from traditional hydrological conceptions of resilience, as a function of *systems* as per Holling, which focuses more on empirical systems, such as infrastructure or institutions, and their ability to ‘absorb change and disturbance and still maintain the same relationships between populations or state variables’ (Holling, 1973:14).

As such, we interpret the outcome of general apathy toward climate change as symptomatic not of a *lack* of concern but rather its presence, by way of the paradox of resilience and people’s use of cognitive and emotional arithmetic in order to understand and relate to more complex and abstract subjects. This generates two outcomes, which form the basis of our two hypotheses:

H1: Resilient response due to emotional numbing, resulting from pessimism and fear.

H2: Resilient response due to rational calculus of trade-offs.

H1 and H2 have quite different implications for policy-makers. The first relies on a denial of reality and masks a vulnerability that may be exposed over time. Policy-makers may then have to deal both with present fears while providing a strong safety net in order to pre-empt the manifestation of these fragilities. The second assumes a population able to make reasoned choices and to recalibrate their responses adaptively to suit environmental changes. This would be closer to ‘true’ resilience. However, the question for government is the extent to which government policies can or should impact such resilient behavior – government interventions could lead to perverse outcomes if the paradox holds. Of course, H1 and H2 are not mutually exclusive, and one line of enquiry in this paper is to examine whether and how they can be integrated.

The case of Kathmandu in Nepal presents a unique case to study this paradox.

The Kathmandu Valley is the largest metropolis and most populous area in Nepal. It faces rapid urbanization, modernization, and population growth. As its urban area expands to accommodate more inhabitants, the lack of attendant proper land-use planning has resulted in the growth of peri-urban sprawl along the fringes of the Valley. The sprawl exacerbates problems of sanitation and water services, causing severe water insecurity and associated health risks.

While the Kathmandu Upatyaka Khanepani Limited (KUKL) – the government’s water utility – is ostensibly responsible for the Valley’s water resources management, it has largely failed to ensure a safe and secure supply of water for most residents. The lack of reliable water supply has resulted in significant economic coping costs for residents who resort to alternative sources of water supply, including private wells, storage tanks, or purchasing water from tanker trucks and bottled water vendors (Gurung *et al.*, 2017). Therefore, despite their poor socio-economic status, many residents in the Valley still spend a substantial proportion of household income on the basic necessity of potable water (Gurung *et al.*, 2017).

A survey by Guragai *et al.* (2017) evaluating consumers’ perceptions of the water supply found that nearly half of the respondents (48%) rated water services as average – suggesting satisfaction, if not acceptance at the very least, of the quality of water provision in the Valley. However, 39% of

respondents also rated piped water services as very poor, with only 13% of respondents considering it satisfactory. This shows that although consumers are critical of the quality of water services in the Valley, this does not translate into an impetus for broader collective action or public pressure on the KUKL or local government. Rather, consumer efforts are channeled toward dealing with rising coping costs and searching for supplementary water sources.

Two factors that characterize the residents of the Kathmandu Valley – high coping costs and the lack of participation in decision-making concerning the chronic water shortage – allow us to study the paradox in a pure sense. In other words, we are able to exclude all other hypotheses for low salience (lack of direct experience, lack of knowledge, and lack of certainty about the nature of the problem due to its complexity) (Laerhoven, 2014).

This paper studies the paradox of social resilience by constructing a fabula of this phenomenon. A fabula is defined as a series of logically and chronologically related events that are caused or experienced by characters in a story world, or what Bal calls the ‘logic of events’ (2009:7).

This construction is motivated by an impulse to understand environmental behavior. It starts from a structuralist premise that ‘the series of events presented in story answers to the same rules as those controlling human behavior’ (Bal, 2009:7).

The fabula is based on the following conditions:

1. There is direct experience, knowledge, and certainty about the problem.
2. There are coping costs involved.
3. There is a resilient response to the problem.

A fabula is distinct from a ‘story’ in the sense that a story is an instantiation from a fabula; that is to say, a story is told from a certain point of view. In this paper, for example, a particular story of resilience can be captured from one single respondent of the 50 people interviewed, whereas a fabula would be generally true of all 50 of them. Last, a narrative text is an expression of the story in language signs (e.g. words or pictures).

This narrative-centric approach moves away from interpretations of resilience purely in terms of economic valuation and seeks to gain a more comprehensive understanding of the emotional and mental coping costs involved, such as the negative experience of witnessing environmental damage caused to the Valley, and the loss of precious ecological sites. One example is that of the sacred Bagmati River which has run through the Kathmandu Valley for centuries, and which was turned into an open sewer and garbage dump for nearby factories (Muzzini & Aparicio, 2013).

A fabula is, therefore, a series of logically and chronologically related events that are caused or experienced by characters. It comprises of four elements – events, actors, time, and location. This paper uses the lived experiences method to collect these main elements.

Using a lived experiences approach, we investigate the subjective narratives of the delayed project; in particular, the self-reported perceptions of the residents’ resilience or ability to cope with adversity which engenders the self-perception of resilience, so as to identify the extent to which these two hypotheses hold true in the case of Kathmandu.

Further, the fabula is also better able to explicate the paradoxes in human behavior, whereby empirical evidence does not always equate to corresponding explanations. A fabula allows us to peer underneath the surface of apparently resilient behavior to understand how and why responses occurred as they did, and how such responses can inform climate change and environmental policies.

Coping costs and the paradox of social resilience

Social resilience, therefore, has two elements – first, an agent within a certain policy context who is presented with adversity; and second, the agent's reaction to this adverse event. He is resilient insofar as he makes a positive adjustment.

Positive adaptation, the second construct, is usually defined in terms of behaviorally manifested social competence, or success at meeting some specific tasks (Waters & Sroufe, 1983; Masten, Best, & Garnezy, 1990; Luthar & Zigler, 1991; Masten & Coatsworth, 1998). High social competence is not, however, the only or preferred index used to define successful adaptation in resilience research; sometimes, the mere absence of emotional or behavioral maladjustment is appropriate (Rutter, 1999; Luthar et al., 2000).

In this paper, these concepts are placed within the policy arena, such that social resilience is located within the research of Carpenter & Brock (2008), Walker et al. (2006) and Zolli & Healy (2012:9), who define resilience as a community's 'ability to maintain their core purpose to integrity in the face of dramatically changed circumstances'.

Extant literature has shown that this levies high and multidimensional costs on human life. It affects the everyday socio-economic decisions of households, and the act of coping with water scarcity also adds to psychological and emotional stress (Table 1).

Such coping costs are often given an economic valuation and calculated using revealed preferences (Katuwal & Bohara, 2007) or using water treatment behavior as a proxy (Katuwal & Bohara, 2011; Cook et al., 2015).

In a paper by Pattanayak et al. (2005), it was shown that coping costs essentially contribute to another type of financial burden as a result of the inability of public water infrastructure to address households' water needs. An additional cost is thus required to supplement domestic water demand, using methods such as collecting, pumping, treating, and purchasing. These costs which are absorbed by households impose coping costs that can amount to 1% of the monthly income of households and thus represent the real but hidden costs of poor infrastructure service.

However, what is often less discussed are intangible costs – such as emotional costs – which are difficult to measure with existing quantitative methods. Stevenson et al. (2012) developed a new scale of water insecurity in order to understand women's emotional well-being in Ethiopia. They found that difficulty in obtaining sufficient and clean water introduces psychosocial stressors into women's lives such as physical illness, a conflict between family members or neighbors, shame at failing to adhere to normative standards of cleanliness and conduct, and absence during communal events.

Wutich & Ragsdale (2008) found that emotional distress amongst people in Villa Israel, Bolivia, is a result of uncertainty related to the regularity and sufficiency of water supply, as well as tension from neighbors and vendors, rather than a simple lack of water supply. In particular, that fear is related to irregular and insufficient water supply, whereas anger is related to interpersonal interactions involving water. The expression of different emotions in response allows researchers to obtain a clearer picture of the sources of emotional distress, even though emotional distress itself is hard to measure. Yet, because these emotions are so culturally specific and subjective, they cannot be measured by standard quantitative methods such as those employed by Cook et al. (2015) and Katuwal & Bohara (2007, 2011).

As such, the cost associated with these types of emotional labor must feature in any notion of social resilience.

Table 1. Coping costs, emotional, and economic.

No.	Source	Adversity/Positive outcomes	Intervention/Methodology	Findings/Summary
1	Wutich & Ragsdale (2008)	<ul style="list-style-type: none"> • High cost of water (~20% of average adult's income)/no positive outcome • Social tensions from borrowing water • Four emotions caused by water insecurity – fear, worry, and anger and bothering 	<ul style="list-style-type: none"> • Random samples, 72 household heads and interviews • Binary data on emotions to create a 4-point scale of water • Related emotional distress using the Guttman scaling and multiple linear regression model 	<ul style="list-style-type: none"> • Access to water and gender are significantly associated with emotional distress • Economic impact: half of household heads interviewed (47%) lost income because of the time it took to collect water and affect their survival (cattle and domestic gardens for vegetable, etc.)
2	Cook et al. (2015)	Sharing water with neighbors or using public wells or taps sometimes led to conflict	<ul style="list-style-type: none"> • Sixty percent of the 387 households were interviewed • Sampled households in four different 'Sub-locations' in Tigrania West 	<ul style="list-style-type: none"> • The total economic costs due to unreliable/distance water supply equal to 4.3% of the households reported income (US\$38 per month). • Also, the coping costs depend on the size of the households
3	Stevenson et al. (2012)	<ul style="list-style-type: none"> • Tension arising from deciding between household chores and fetching water • Conflict with spouse and neighbors over water • Feeling ashamed for appearing unclean to others and failing to fulfill expectations of hospitality • Suspicions of neighbors stealing water 	<ul style="list-style-type: none"> • 2009–2010 two phases of research (Multiple Regression Models, Focus group discussions) • Phase I – qualitative and designed to identify locally relevant experiences of water insecurity • Phase II – a quantitative survey to test the relationship between women's reported water insecurity and the Falk Self-Reporting Questionnaire (SRQ-F), a measure of psychosocial distress 	<ul style="list-style-type: none"> • Water collection is women's responsibility in rural South Gondar, Ethiopia. This has impacts on women's health. Easy and reliable access to water contributes to healthy pathways to psychological well-being. However, stress of time, costs, and physical illness due to poor water supply contribute not only to family conflict but also social conflict, and failure to take part in customary communal events

Together, these provide a three-pronged methodological premise that undergirds our investigation of resilience:

1. Adverse event: Insecure and insufficient water supply.
2. Response: Coping with economic and emotional costs.
3. Fabula of resilience: Understanding responses to adverse events and perceptions of costs.

Kathmandu: water scarcity in the Kathmandu Valley

The Kathmandu Valley in Nepal is one of the fastest-urbanizing areas in South Asia, with an average urban population growth rate of 6% since the 1970s (UNDESA, 2012). These urbanization and

population pressures place an enormous burden on the already weak infrastructure facilities in the Valley. Access to piped water in urban areas has decreased over the years from 68% in 2003 to 58% in 2010 (Muzzini & Aparicio, 2013). Further, access to water does not equate to water quality and much of the water that passes through pipes remain unsafe to drink. While daily domestic demand for water is around 220 million liters, the KUKL is only able to supply up to 100 million liters a day (Muzzini & Aparicio, 2013). There continues to be considerable under-investment in municipal water supply in the Valley, and policies geared toward addressing such deficits have encountered multiple delays due to inefficiency and political instability (Gurung et al., 2017).

The Melamchi Water Supply Project (MWSP) was envisioned as a way to import raw water into the Valley to accommodate its long-term water needs arising from the burgeoning urban population. The Melamchi River, situated just outside the Valley, was identified as a potential water source, which could transfer water to the Kathmandu Valley via a 27.5 km diversion tunnel (Domènech et al., 2013).

Since then, the MWSP has endured numerous obstructions and delays, owing to factors ranging from the withdrawal of lenders, operational obstacles, to civil war. In 2008, the public company Kathmandu Upatyaka Khanepani Limited (KUKL) was appointed on a PPP model to lead the construction of the tunnel, which formally began in 2009. Since then, little substantive progress has been made with multiple delays caused by contractual or financial problems, miscommunications between contractors and subcontractors, and natural disasters – including a devastating earthquake in 2015 that claimed 8,790 lives (Udmale et al., 2016). Deadlines for project completion have been extended numerous times, from the initial goal of 2007 being delayed to 2012, then to 2016, and most recently October 2017 (The Himalayan Times, 2017a, 2017b).

At the time of writing, while 70% of the population have access to a piped water connection, many households receive water for only a few hours a day. As a result, many have coped in various ways – such as collecting water from public taps, investing in tubewells, and purchasing water from vendors and neighbors (Pattanayak et al., 2005). The remaining 30% of the city's population that reside outside the piped network also use private tubewells, ancient stone water spouts, and supplies from tankers (Bhattarai & Conway, 2010).

As a result of this adaptation to a lack of piped water, informal water markets have grown exponentially (Domènech et al., 2013). In 2004, there were about 60–70 tankers. By 2014, there were 210 firms operating about 700 water tankers in total (Gurung et al., 2017). At the time of writing, some estimate that more than half of the city's water needs are being fulfilled by small private water tankers and bottled water vendors (Dixit & Upadhyaya, 2005), while others propose more conservative estimates; 8% of the peak and 4.8% of the off-peak season demand (Dongol et al., 2012).

The supply comes from surrounding rural areas. Because of rising demand, water prices have increased – the market is now estimated to be worth 8 million USD per year (Pandey et al., n.d.). This informal vending market represents a large part of the coping costs borne by the residents due to the continued delay in the Melamchi project.

Despite these rising costs, which place a tremendous burden on the majority of Kathmandu residents who live below the poverty line, people continue to accept and absorb the rising coping costs, with demand for private vendors increasing steadily. On average, the KUKL receives 60 complaints per month out of the approximately 1.9 million residents that it serves, most frequently regarding an absence of or limited supply; leaks and pollution; or unequal distribution (KUKL, 2008).

While frustrations have been expressed, there are minimal demonstrative protests over the water supply, as compared to protests over other issues, such as amendments to the constitution (Al Jazeera,

2017); air pollution (The Himalayan Times, 2017a, 2017b); or the rebuilding of monasteries (Ojha, 2017). It is, therefore, evident that while civil disobedience is not a foreign concept to the residents of Kathmandu, chronic water shortage does not rank as a protest-worthy cause.

Methods

The lived experience relies on a phenomenological premise that ‘knowledge has its origin in experience’; in other words, ‘objective realities’ are built upon *subjective* perceptions (Sadala & Adorno, 2002:283) and there is ‘no single “lived experience”’ (Thomas et al., 2008:328). As such, rather than focusing on the causal explanations usually elicited in surveys or interviews, phenomenology focuses on descriptions of experience, which are thought to bring the researcher into ‘more direct contact’ with the phenomenon in question (van Manen, 1984:1), as they challenge pre-given assumptions and bring into focus the experiences of minorities.

This method has been used in water research to provide a nuanced reading into different facets of water. For example, in her exploration of water as a distributed right, Parmar (2008) illustrates a striking difference between mainstream and rural communities’ interpretation of the ‘right to water’.

In constructing a fabula, a ‘lived experiences’ approach is useful as it provides a basis for constructing the logic of events as experienced by actors, within a certain time and location. By understanding the premise of their actions, it also provides an understanding of apparently irrational behavior – such as an over-estimation of one’s ability to cope. This is central to the question in this paper.

However, a phenomenological approach has its limitations. First, unlike quantitative research methods, phenomenological studies often yield results that are non-replicable, due to the primacy given to individual experiences. A common criticism is that conclusions are, therefore, merely a subjective matter (Hycner, 1985), with little influence on policy scenarios where it is imperative to balance the needs of multiple stakeholders fairly. There is no assurance that the fabula constructed here is representative of social resilience as a whole.

In this paper, we focus specifically on an aspect of resilience that has been often elided; that of the emotional and cognitive costs of resilient responses. In doing so, we adopt a structural approach in seeking to understand how the actors, events, timing, and location of particular events coalesce in the manifestation of the paradox. We hope to express a narrative that explains the situation in Kathmandu from another angle and shed light on other situations where the paradox of resilience occurs.

The interviews were conducted in Kathmandu from May to July 2016. A total of 55 respondents participated in the exercise. The respondents are residents of Kathmandu and have an average age of 49 years. The youngest and oldest respondents were 18 and 83 years old, respectively. The respondents consisted of students, housewives, professionals, government servants, business owners, and retirees.

Two rounds of interviews were conducted for this study. The first, conducted on 26th May 2016, were short interview sessions (15–30 minutes) with the locals of Kathmandu to obtain a general understanding of their perception of the water supply situation in the city.

Based on the first round of interviews, a detailed set of questions were prepared and a subsequent interview session was carried out in the month of July 2016. A total of 36 local residents of Kathmandu were interviewed. Each session lasted an average of 60 minutes. Respondents had an average age of 41 years and ranged between 26 and 75 years old. Thirty-six percent of the interviewees were female.

All the interviews (amounting to 40 hours of tape) were transcribed and translated. The interviews were subsequently coded using the NVivo software.

Coding using NVivo involved identifying statements from each of the 36 interviews that expressed an idea, opinion, or fact in relation to five main themes, which emerged from the interviews. These themes form the ‘units of relevant meaning’ (Hycner, 1985:284) or significant and distinct topics (Sadala & Adorno, 2002) of the lived experience.

Our method follows Lindseth & Norberg’s (2004) phenomenological hermeneutical approach. First, interview statements were read several times to get as close to the original meaning as possible. A ‘naïve understanding’ of participants’ perceptions of water security was formulated based on our reading, allowing us to generate the five thematic statements in Table 2. The relevant statements were then categorized according to the different themes.

The statements were condensed into concise phrases based on their essential meaning, using the participants’ own words as far as possible. These condensed statements were further sorted based on similarities and differences, generating sub-themes which formed a more complete picture of each theme.

Results and discussion

There are three main themes in the narratives, as shown in Table 3. These three themes correspond to our hypotheses (H1 and H2) in different ways.

First, there is a high cost to the current situation, a cost both in economic terms (Unit 1) and in opportunity costs, and behavioral changes (Unit 2). Participants are often acutely aware of the monetary cost of obtaining bottled and tanked water when piped water supply becomes intermittent, citing figures and comparing costs with household income. They also describe changes to daily routines to obtain water and heated arguments at public taps. Yet, despite the high costs, participants have adapted, accepting these costs as part of their lives. Paradoxically, the measures adopted further engender reliance on, and entrenchment of, the informal water market. This attitude of resignation and acceptance corresponds to our hypothesis of emotional numbing and an increased vulnerability despite an appearance of social resilience (H1).

On the other hand, the second and third themes represent uneasiness with the status quo and a rejection of both the informal market and existing government measures. Central to the second theme is the feeling that the current situation is not a stable equilibrium, requiring more drastic measures in the future (Unit 4). This theme has the largest number of statements and can be further broken up into two sub-themes: (i) that the current consumption pattern is unsustainable and (ii) that the problem has (and will) worsen over time.

Table 2. Result of the NVivo software analysis: number of statements per factor.

Units of meaning	Themes	No. of statements
1	We are paying a price high economic cost for poor water	29
2	Coping with water shortages is a part of our daily life	29
3	The government does not have the capacity to provide safe water	17
4	The situation will get worse over time	95
5	The water utility company in KMD is to be blamed	58

Table 3. Phenomenological hermeneutical analysis of KMD interviews: modified from.

Meaning unit	Condensation	Sub-theme	Main theme
I spend about Rs. 30,000 (S\$390)/- per month for management of tanker, jar, and bottled water which I think lots of amount for water management. I pay Rs. 150 (S\$2)/- per month for piped water and Rs. 3,000 (S\$40)/- for tanker water. I feel I am paying a lot for tanker water	Recurring costs of compensating for poor water supply	Expensive alternatives to piped water	Economic cost of poor water supply
They are using the tap water by boiling and filter. Water becomes even more costly	Water has additional costs	Access to water	
Paying Rs. 5,500 (S\$72)/- is a difficult thing for me as I have not that good income	It is hard to afford good water	Access to water	
There is no water supply for a long time they have to buy or collect water from public tap which needs more time and money	There is no secure supply of water	Water insecurity	
Price has changed hugely, for example, a tanker water used to cost 1,000 rupees in the past and it costs 1,500 rupees today, a bottle of water used to cost 15 rupees in the past, and it costs 20 rupees now, a jar used to cost 35 rupees and costs 50 rupees today	The problem has worsened over time	Unsustainability	
I pay Rs. 100 (S\$1.3)/- bill for piped water, but I have to use the machine to pull water which increases lots of electricity bill at my home	Use of expensive electricity	Expense for water distribution	Coping with water shortages is a part of daily life
Though my home is connected with piped water, there is no piped water supply at my home since a month, and I am fulfilling my water needs from a public tap which is called 'char dhara' situated about 300 m distance from my house	No water from pipes	Masked undersupply	
I have seen people quarreling while standing in queues in public taps	Tensions observed from shortages	Welfare loss suffered	
Yes, this is not a recent problem, it is happening till around 2 decades	Long-standing problem	Adaptation to status quo	

People have no faith in political leaders, they have been hearing about the Melamchi project for two decades, but it still not completed	Lack of trust in the capacity of leaders	Long delay experienced	} Lack of trust in government capacity
The municipal government only collects water bills from us, but they are not concerned about the water condition in our house	Money collected but no service rendered	Sense of unfairness	
Reasons for not carry out development activities is not lack of money but incapable staffs, politicizations, the intention of corruption, and recruitment of staffs through political parties	Poor view of public officials	Corruption	
There is no proper maintenance of the water pipeline connection	Poor operational maintenance	Poor performance	
Political leaders waste much money in dirty politics and non-profitable works, they organize unnecessary seminars regarding water supply but does nothing	Distrust in observed behavior	Corruption	
I am very angry with the KUKL and municipality for not caring. One can see old and unplanned water pipes in many places and water leakages in many places, but municipality and KUKL are silent on this	Anger against observed poor infrastructure	Poor performance	} Current consumption is unsustainable
People from all over Nepal are migrating into Kathmandu, current water resources are diminishing and no long-term water supply projects are in progress except the Melamchi project	Rising population	Stresses on water supply	
If the water from the Melamchi project arrives, it may partially solve the water problem in Kathmandu but as the rapid growth in population and water demand and necessity, it will not be a permanent solution to the water problem in Kathmandu	Rising population	Even the Melamchi project will not be enough	

(Continued.)

Table 3. (Continued.)

Meaning unit	Condensation	Sub-theme	Main theme
Water used to come twice in a week (Tuesday and Wednesday) in my house before 2 years but water routine has been uncertain since 2 years (sometimes water comes and sometime not). In addition, water scarcity has risen after the devastating earthquake	Uncertain water supply and scarcity after the earthquake	Environmental hazards worsen water scarcity	The problem has worsened over time
Water price is going up and water availability is going down	Increasing water price	Increased water scarcity	
Because of growth in density of population, water problems are increasing since 8/9 years	Increased water problems due to population density	Population problems worsen water scarcity	
Before 8/9 years, there was not such a water problem in my house, piped water used to come every day	No water problems in past	Past water supply stable	
There was easy access to water 20 years ago, there used to have 24/7 water in the pipe, in well, and in public spouts or taps	Clean water was widely accessible	Past water supply stable	
Thirty years ago, pipelines, spouts, and natural wells were the sources where we could get clean water but this is not the case these days	Many sources of clean water in past	Past water supply stable	
I used to get water every 3 days before 5 years, after then I used to get in every week and nowadays, I am getting water every 10 days	Declining water access	Increased water scarcity	
Two years ago, piped water used to come once every 2 days, but now it comes only once a week today	Declining water access	Increased water scarcity	
KUKL is not serious about addressing the public water problem – staff there are more interested in their personal interests than the public good	Distrust of water utility company	Corruption	The water utility company in KMD is to be blamed
Being unable to do development activities are not due to lack of money but due to the unstable government, politicization in projects, politicization and corruption in KUKL	Money available but corruption hinders development	Corruption	
It collects money. But cannot invest	Money collected but no investment	Mismanagement of funds	

However, those areas where KUKL supplies water have been facing more water scarcity than our area	Larger problems in areas served by water utility company	Water utility company is the root of the problem	The water utility company in KMD is to be blamed
Maximum of unskilled staffs in KUKL are recruited by political parties, these are reasons for not being able to carry out development activities in by KUKL	Poor view of the water utility company	Corruption	
Staffs there are affiliated to political parties and they intend to corruption and achieve position than quality water supply	Distrust of water utility company	Corruption	
I feel angry about the current situation because KUKL supplies water one time in 10 days, which is very poor water supply	Anger against poor water supply	Water mismanagement	
KUKL collects enough money from water bills per month and gets supports from government and non-government organizations, so, the organization have sufficient money for development activities	Sufficient funding for development activities	Mismanagement of funds	
I think the KUKL should be abolished first. It would be better then	Abolishing the water utility company will improve the situation	Water utility company is the root of the problem	
KUKL staffs are more focused on commission and position than quality water distribution	Distrust of water utility company	Corruption	
I don't see proper management of water supply in Kathmandu	Poor management of water supply	Water mismanagement	

Population growth is viewed as a ticking time-bomb, and there is pessimism about the long-term ability of the Melamchi project to provide for growing water demand.

The last theme relates to a perception of incompetence on the part of the government. Many participants refer to corruption within the municipal government and the KUKL – including the personal greed of government and KUKL staff and deliberate mismanagement of funding as key reasons for failures in water provision. One statement even recommends the abolition of the KUKL as a start to dealing with the water problem. Above all, participants seem most emotional when describing government incompetence, emphasizing their anger at the perceived injustice or bitter resignation at the lack of progress on the issue of water supply.

The dissatisfaction with the status quo in the second and third themes accords with our second hypothesis of a ‘rational calculus’ of a weighing-up of relative costs and benefits of moving (H2). Participants recognize that the status quo of increasing water demand and poor water provision by the government and KUKL is unsustainable and that over time, they may be unable to bear the economic, social, and opportunity costs.

Participants’ acute recognition of the unsustainable nature of the current situation, and their rational calculus of the increasing costs of poor water provision by the government and informal markets should lead to the conclusion that this is an important policy failure that requires a large-scale substantive response. However, there is little evidence of this conclusion across the narrative strands. This leads us to suspect that there has been an over-estimation of resilience.

The fabula consequently constructed comprises of three elements:

1. Coping (Hero Hypothesis): Although there is some blame on the government for the delay, the experiences also contain elements of surprisingly positive perceptions about the ability to cope. This contrasts with economic and scientific research about the high economic costs incurred.
2. Lack of alternatives to the status quo, mistrust, and lack of confidence in the capacity of the government. These elements lead to a lack of an identifiable villain and account for a relatively low valence of the public response. In this, we also find an explanation for why the status quo has persisted over a long period of time.
3. Tension and need for change: There are discourse elements which show that there are resignation and acceptance of the status quo; at the same time, there are also elements which acknowledge that the status quo is unsustainable. Therefore, a third element of the fabula is between the need for mitigation and that for adaptation. That is to say, a polyphony of two concepts of resilience: one which stands on stasis and another for change.

The fabula can be illustrated in a causal loop diagram (Figure 1).

As illustrated in the diagram, there are two processes affecting Kathmandu residents’ resilience to water insecurity. There is a negative (balancing) feedback loop arising from resignation and acceptance of the status quo according to H1, which we call the ‘Hero Hypothesis’ as the residents perceive themselves to be coping with a difficult situation. This, however, is clearly an over-estimation.

From a simple water security point of view, the current situation arises from the informal nature of the supply, with over two-thirds of transactions taking place in cash, without any written contract. At the same time, there are no legal or institutional mechanisms that regulate the price, quantity, or quality of water sold by these vendors (Moench, 2001). Clearly, individuals cannot cope with these problems.

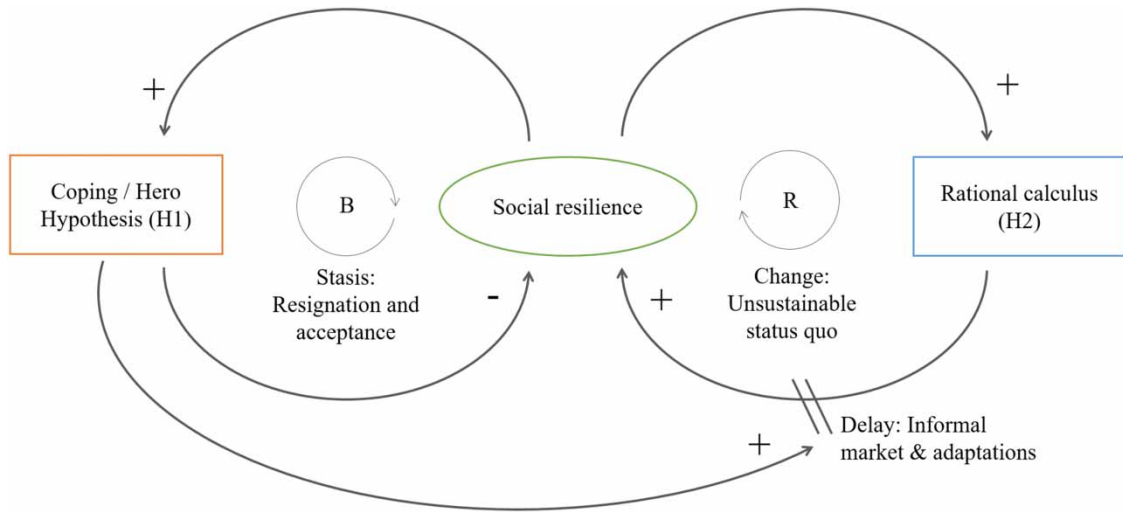


Fig. 1. Causal loop diagram of social resilience in Kathmandu.

As government-provided water accessibility and quality worsen, Kathmandu residents rely increasingly on informal water sources, producing an illusion of social resilience which in fact belies increasing vulnerability, as the unregulated informal water market becomes increasingly entrenched.

On the other hand, there is a positive (reinforcing) feedback loop arising from residents' dissatisfaction with the status quo. The rational calculus of increasing water costs should result in the recognition of policy failure and pressure for more drastic policy measures, eventually creating greater social resilience. However, the corrective effects of the rational calculus are delayed by the existence of the informal market and current adaptive measures, such as behavioral changes, as the presence of these stop-gap measures discourages comprehensive action on the issue.

From our analysis, it appears that both mechanisms of stasis and change associated with H1 and H2 can be integrated within an emerging line of research on resilience and its relationship with governmentality. This line of research highlights how subjects of resilience are 'responsibilized' (Kaufmann, 2013), as the concept of resilience implicitly accords normative values to personal or local community efforts to self-organize, learn from, and adapt to disruption while placing the responsibility of reacting to adverse circumstances on the subject.

As such, what we refer to as the 'paradox of resilience' in this paper also parallels an emerging body of research on the governmentality of resilience. Kaufmann's (2013) insight is instructive: the governmentality of the 'cultural village' concept creates community subjects who are incentivized to display resilience despite physical, economic, social, and emotional difficulties, to maintain the normative identity of the 'Cultural village' and the political and socio-economic benefits associated with it.

The governmentality of resilience is not fixed. As Kaufmann (2013) notes, subjects may display unexpected agency and act 'off-script'. In the case of Kathmandu, as population and environmental pressures on water supply increase over time, the rational calculus of economic, social, and opportunity costs of continuing to rely on the informal market and inconsistent government sources may become the dominant narrative over time, and disrupt the current notion of social resilience as 'coping' or individualized responsibility.

If that happens, the fabula and the casual diagram show us that the equilibrium will be disrupted severely.

Conclusions

In the end, what does a fabula of resilience tell us? A fabula is a construct, a structure of a story that can embed itself within different contexts. In constructing this fabula, we have elucidated three points about the concept of resilience.

First, we have shown resilience to be comprised of two important components. The first relates to a more static or passive conception of resilience, or an ability to withstand and work within existing institutions or circumstances. In our case, this is evidenced by way of the ‘Hero’ narrative, in which individuals inadvertently shoulder the coping costs associated with the failure of the Melamchi project, accepting these costs as an inevitable part of their lives.

The second is understood as a more active, reactionary conception of resilience, which indicates a willingness to depart from the status quo and challenge pre-existing institutions. This is indicated in the second and third elements of the fabula we have constructed, which acknowledges that the current situation is untenable and the desirability of breaking free from the status quo.

The tension between these two conceptions of resilience thus provides the impetus for a change. In a detailed examination of the discourses, one can perhaps appreciate how this is the only way for a community to remain viable in the face of adversity – to resist harmful changes while adapting to new and adverse environments.

The fabula also reveals the implications of the true costs of continued government inaction in what appears to be an emotionally muted situation. The temptation is for governments in such situations not to take action as there appears to be little political motivation or benefit to doing so. However, the lived experiences approach has shown that the present calm is engendered by an over-estimation of resilience and the perceived ability to cope. There is little guarantee that future crisis situations, such as political conflict or natural disasters, will not destabilize such a tenuous equilibrium. While the valiant efforts of citizens in coping with such adverse situations is not to be underestimated, the fabula reveals that there are real and significant pockets of vulnerability that exacts not only emotional costs but also psychological and emotional stresses that threaten the residents’ future opportunities. [Gong & Wu \(2012\)](#) suggest that corruption in some developing countries is highly associated with low salaries. One policy to be considered could be to raise salaries to reduce wide-spread corruption.

A third contribution is that the fabula, by providing a relational map between the different elements, allows us to understand the processes that underlie the effects of both adverse environments, vulnerability, and protective factors. This is a point for future research.

As we have noted earlier, the identification of forces that show significant links with adjustment outcomes constitutes only the initial step for researchers in this field. The ultimate goal is to illuminate which potential mechanisms are implicated in the effects of these vulnerability or protective factors, such that appropriate directions for intervention can be derived.

The lived experiences method has revealed how the self-perceptions of resilience is fed by a rational calculus, which is due partly to the slow and incremental nature of the problem, and a perceived ability to pay coping costs (Hero Hypothesis). The lack of confidence in government capacity has meant that

while the Hero can be identified, there is, at the moment, not a clear villain. Future study can be directed at how such heroes and villains are constructed within public narratives.

In conclusion, while phenomenological methods may require thoughtful implementation, there is significant potential for phenomenology to illuminate various dimensions of water as experienced by individuals, households, and human society as a whole. The potential for phenomenological approaches to change the researcher–participant relationship is also a significant draw, particularly when working with vulnerable individuals.

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