CHAPTER 11

Looking and Moving Forward

T.R. Robinson, H.A. Ruszczyk, and L.J. Bracken

11.1 Reflections

This book is unique in that it brings together multiple disciplinary perspectives on the Gorkha earthquake just two years after the event occurred. In the aftermath of large earthquakes, there is always an outpouring of academic papers and disciplinary perspectives attempting to understand the event and to place it in a greater context. The physical sciences are especially quick to publish findings in the months and years after an earthquake, as the necessary data can be collected, processed and interpreted relatively quickly. Comparatively, social science perspectives take far longer to develop, because the sociocultural impacts take far longer to emerge and interpret. As a result, most reflections on earthquake disasters that cover both physical and social perspectives do not emerge until long after the earthquake has faded in memory and receded into the everyday.

Undertaking this book so soon after the earthquake is a deliberate attempt to bring together knowledge based on the perspectives from multiple disciplines. These disciplines are drawn from Durham University and long-term collaborating partners in Nepal involved in the earthquake and

T.R. Robinson (✉) • H.A. Ruszczyk
Department of Geography, Durham University, Durham, UK

L.J. Bracken
Institute of Hazard, Risk and Resilience, Durham University, Durham, UK

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the aftermath of the major disaster. The chapters contained in this book purposefully span a range of perspectives, including five academic subjects across Durham University (anthropology, archaeology, human geography, physical geography and social work), practitioners from varied backgrounds and organisations in Nepal and Nepalese colleagues who are, or have been, Durham University scholars.

Throughout this book, we have highlighted the myriad impacts and consequences earthquakes cause and demonstrate that disparate efforts to understand the earthquake from individual disciplinary perspectives can, by definition, never truly comprehend the total impacts that result. This volume showcases the way in which viewing the consequences of an earthquake through the lens of inter- and multidisciplinary work, can contribute to a more holistic and nuanced understanding of the fuller impact of the event. We hope this approach can more fully inform the planning for, recovery from and rebuilding after future hazardous events.

Here, we reflect on the previous chapters and tease out what we see as the key emerging themes discussed from multiple perspectives. We briefly summarise and discuss these themes in an effort to shed some light on the true costs of the Gorkha earthquake with the hope that such costs may become avoidable, rather than inevitable. We highlight gaps in the book, and where future insights are required to better inform our current narrative of the earthquake. We conclude by looking towards the future.

11.2 Emerging Themes

11.2.1 Rural Earthquake in Urbanising Nepal

As in many earthquake-prone nations around the world, much of the planning and emphasis on earthquake risk reduction before the Gorkha earthquake focussed predominantly on the major urban centres—in Nepal this was the Kathmandu Valley. Previous planning efforts (Chaps. 2, 3 and 6) predominately focussed on the idea that the next earthquake would almost certainly cause devastating losses in Kathmandu Valley; consequently, most planning focussed on this area. However evidence documents that the effects of the Gorkha earthquake were felt most acutely in the rural regions north of Kathmandu. Two thirds of the total earthquake deaths occurred in four remote rural districts: Sindhupalchok, Rasuwa, Nuwakot and Dhading.

This predominantly rural impact presented a substantially different challenge to what had been expected and planned for. Key bridges in

Kathmandu remained standing, and the airport, for the most part, remained functional. Despite more than 1000 fatalities in the city, many areas escaped relatively unscathed; buildings swayed and cracked but did not collapse. The total devastation of Kathmandu that had been so meticulously planned for, fortunately, did not eventuate.

Instead, millions of remote, rural Nepalese citizens were impacted. Landslides wiped out roads, removing the only point of access and, in some locations, burying entire villages. Villages on ridgetops and valley bottoms were reduced to rubble, and avalanches in the high Himalaya struck and buried climbers and Sherpas. In the hours, days and weeks that followed, simply gaining access to the majority of affected people became an almost impossible task; some villages remained without aid for days. Despite significant efforts in road construction in the last 60 years, access remains difficult for much of the country. Only 43% of the rural population live within 2 km of a road that is useable year round (World Bank 2013). Emergency access to most of these locations depend on the use of helicopters, of which there are not many nationally.

Thus in considering and planning for future earthquake risks in Nepal, it is essential that the requirements of the rural population are considered alongside the urban centres. The impacts and response required for rural events are vastly different from those of an urban event, and the Gorkha earthquake provided an opportunity to better study and understand these differences. The potential scale of losses from a rural earthquake larger than the Gorkha event (Chap. 6) are similar to what has previously been expected for a direct hit on the Kathmandu Valley (Chap. 2). The Gorkha earthquake clearly demonstrated that large-scale losses from earthquakes are not necessarily centred in urban areas. It is therefore essential that earthquake preparedness simultaneously considers the needs and requirements of difficult to access rural populations living in areas of challenging terrain as well as needs in population centres now more frequently defined as municipalities (Chap. 3).

In a broader context, Nepal, similar to many parts of the world, is urbanising rapidly. The government of Nepal is in the process of reclassifying many rural areas and smaller towns as municipalities (Chap. 8). This is likely to result in confusion in the future if Nepal is described as an urban country; although there are 161 more municipalities in 2017 than in 2014, it does not mean they are urban. Despite the significant increase in the number of municipalities, Nepal continues to be a rural country, with the majority of its population living in small, remote villages. This

changing administrative environment, however, gives Nepal a unique opportunity to implement and enforce the building code in a more uniform manner throughout the country (Chaps. 2 and 8), especially post-earthquake.

11.2.2 Invisible Issues

The collection of perspectives presented in this book has made a range of topics visible. Some contributions have showcased old vulnerabilities, but others have opened new spaces for thinking and acting. For example, mental health and well-being are often overlooked in the focus on recovery and restoration of the built environment. We must not forget that women, the elderly, the young and the disabled bore the brunt of the earthquake and were left to rebuild (Fig. 11.1; Chap. 4). Mental health issues are difficult to address in a rural environment where many of the health facilities were destroyed in the earthquake. Supporting communities as they face their trauma and the task of rebuilding is tremendous and at times overwhelming (Chap. 9).

Fig. 11.1 With many men working abroad, many women are rebuilding communities (Source: NSET)

This book gave voice to those most heavily impacted by deaths, destroyed physical infrastructure and loss of livelihoods (Chap. 7). The Tamang were particularly devastated by the earthquake sequence. They not only lost their family members, homes and livelihoods but they are struggling to receive what has been promised to them by the central government. The voice of the Tamang community is not usually heard by people with power in Kathmandu. Lost access to electricity has caused a particular sense of loss of modernity for this ethnic group. The long-term impact from the earthquake will be felt politically, socially and economically in these rural mountainous communities.

Investigating Kathmandu Valley's UNESCO World Heritage Site post-earthquake (Chap. 10) shed light not only on visible cultural heritage damage but also on the invisible aspects of subsurface structural development, resilience and adaptation over time. Taking a broader perspective, many UNESCO-inscribed monuments around the world have been damaged by human conflict and natural hazard events, leading to the creation of emergency preparedness and response protocols. We hope in the future these protocols will support Nepalese first responders in knowing how to utilise post-disaster archaeological methods and protocols to enable the protection of heritage sites alongside rapid response during search and rescue efforts.

11.2.3 The Role of Science and Technology

Science and technology have been discussed throughout this book, with the majority of contributors highlighting the role they play in the before, during and after phases of an earthquake. Relatively simple but fundamental and widely available understandings of science and technology can be used to forecast earthquake hazards (Chap. 5) and make such knowledge part of everyday practice for development and resilience practitioners. There is no need for earthquakes to be considered as random and unexpected events. Instead, it is feasible to understand that earthquakes are inevitable and, although not predictable, most certainly foreseeable. Such basic and simple understanding is the first step towards better planning and preparedness.

The National Society for Earthquake Technology—Nepal's (NSET's) efforts (Chaps. 2 and 3) in mainstreaming earthquake awareness, preparedness, mitigation and response strategies showcase the long-term approach that incorporates new knowledge and available cutting-edge research with a dedication to supporting all aspects of society and government. In the long term, individuals and their local communities must

implement earthquake planning and preparedness and, ultimately, make decisions about the types of buildings they construct and live in. Oversight in terms of construction methods and building codes should come from the government, but this relies on having locally trained engineers to implement these codes and local people who are prepared to accept these standards and any associated costs. This requires everyone working together for a common goal—an earthquake-resistant society.

Both Chaps. 7 and 10 discussed how mainstreaming science and technology, including tried-and-tested approaches from other countries, can play an important role in supporting and growing cultural practices in-country. Science and technology are routinely seen as the antithesis to traditional cultural practices, but here it has been shown how modern approaches can be integrated into and, most important, owned by local communities. The aim is not to change and mask cultural practices but instead to help maintain and adapt these processes so they can continue to thrive following earthquake disasters, enhancing community resilience. For much of the population (Chaps. 7 and 10), reestablishing important cultural sites and temples is often as pressing an issue post-earthquake as is housing. Integrating science and technology into the recovery and restoration processes can ensure these important buildings and practices are not only saved but restored to their full glory.

The range of perspectives brought together in this book also illustrate ways in which science and technology can be drawn into planning and training to help limit and reduce the impact of natural hazards (Chaps. 5 and 6). Simulations utilising the latest understandings of physical processes can be embedded in examining likely impacts and consequences of physical hazards, supporting meaningful changes in governance and practice to save lives in future events. Such an interdisciplinary and agile use of knowledge is crucial in planning and preparation for natural hazards.

11.2.4 Multiscalar Approach to Emergency Response and Planning

The role of local communities, central government and international agencies in terms of emergency response and planning has been discussed in detail. The interactions among the different scales and the relative strengths and limitations of each scale are essential for understanding how future emergencies can be managed.

After a hazard event, it is the communities themselves that form the immediate emergency response. This will remain the case in any future disaster, regardless of any improvements made in accessibility. The local community is *the* essential lifeline in the immediate aftermath of the earthquake because it is these people who will form the initial (and perhaps only) response in terms of search and rescue, immediate medical care and temporary shelter. The preparation undertaken in Nepal to provide local communities with training in various aspects of emergency response (Chaps. 2, 3 and 6) doubtlessly resulted in thousands of lives saved in the Gorkha earthquake.

As time progresses, there becomes a need for outside help in terms of the provision of aid and the evacuation of the most vulnerable. Here the regional and central governments are essential. Government's role is to coordinate emergency relief, balance support with funding and provide essentials to the affected population. The central government has the ability to collect and distribute sufficient materials to help the multitude of affected communities and ensure the safety of the population. In pre-event planning, the government plays a vital role in developing and implementing policy and building nationwide capacity.

Despite efforts from a range of stakeholders to increase national capacity, Nepal remains relatively ill-equipped to deal singlehandedly with major disasters and therefore requires international assistance, as in the Gorkha earthquake. The international response is in the form of the United Nations, humanitarian aid agencies and international governments (militaries) with the aim of providing the resources Nepal lacks as well as the financial means to respond. This issue has been highlighted in multiple chapters and ranges from the obvious role of international militaries and search and rescue during the immediate response phase (Chaps. 3 and 6) to the preservation of cultural heritage (Chap. 10) to longer-term capacity building in areas such as social care (Chap. 9).

While able to influence large-scale change, such international responses are often slow and cumbersome and are always subject to international politics, which are often not concerned with the local intricacies on the ground after a major event. In this regard, the Gorkha earthquake in particular highlighted the issues facing Nepal with respect to its geopolitical position between the Asian giants of India and China. Despite both nations having a huge presence in Nepal during the response, neither actively participated in the subsequent multinational response exercise aimed at planning for a future larger earthquake (Chap. 6). Such international politics

are something over which Nepal has minimal control but that ultimately is likely to play a defining role in how effective current planning and future response to an earthquake unfold.

11.3 Gaps in the Book

There are a range of issues that the book does not cover. Some topics not considered here but that are important in living with and responding to earthquakes include the following. Politics has not been used as a lens/entry point for this book but is implicitly discussed in each chapter. Power and politics are discussed at a range of scales and focus on discreet relationships—for example, between local communities and representatives of the government, between different levels of government, between international interventions, and between non-governmental organisations (NGOs) and government. The National Reconstruction Authority, tasked with overseeing the reconstruction of Nepal post-earthquake, is not directly referred to. The issue of corruption also does not appear in the book. We are aware that corruption plays an important role in the socioeconomic response, but researchers involved in the book did not explicitly explore this in their research. Last, the outpouring of support from Nepalese people throughout the country to the disaster-stricken districts was mobilised within hours and days after the shaking began. The positive role of the Nepalese diaspora after the earthquake and the role of remittances after the event have also not been discussed in this book. For an even more comprehensive understanding of the earthquake, perspectives of politics, the roles of power, corruption and mobility also need to be considered.

11.4 Looking and Moving Forward

It is unclear how the earthquake will change Nepal in the long term. This book, written only 24 months after the event, cannot assess the impact in the same manner texts on previous earthquakes have been able to eloquently analyse. There is a balancing act between time passing to enable reflection versus the need to move on to more pressing issues and not attempting to learn from such events. It is difficult to anticipate what will be the long-term, lasting effects and consequences of the earthquake. As has already been presented, the earthquake allowed the constitution to be promulgated, which resulted in the unofficial economic blockade (Chap. 8). The earthquake will be changing not only the physical

landscapes but also political, emotional, social and economic landscapes. Aftershocks in all these areas are still occurring. For example, it is unclear what will be the ramifications on livelihoods, economic security and outward migration.

At the outset of this book, we highlighted that disasters do not occur in political, social or economic vacuums. International, national and local geographies of inequality, ethnicity, caste, gender relations as well as social and economic marginalisation all shape the response and long-term recovery for those who remain (Hyndman 2011; Sidaway et al. 2008) to rebuild their lives, communities and country. This book has tried to bring together some of those narratives to help shed light on the various impacts that occurred and the efforts that are ongoing to help Nepal recover and move forward from the Gorkha earthquake.

In the last 60 years Nepal has made tremendous leaps forward; literacy rates have tripled and levels of poverty have reduced by half. But this has not come easily, and long-term political instability remains a way of life in Nepal. To understand the risks posed to Nepal by hazards such as earthquakes, we cannot ignore this reality; instead it must be accounted for and integrated into the planning and understanding of hazard and risk in Nepal and in other countries with similar profiles. Slow and steady progress has been the hallmark of Nepal's development over the last decades, and this remains the only logical step forward from the Gorkha earthquake; rapid, paradigm-shifting changes are simply not feasible or appropriate.

This book highlights what can be gained from a more holistic, multidisciplinary perspective on the impacts of an earthquake disaster. Viewing the event disparately from the viewpoints of single disciplines masks the ability to notice intricacies of the event, and some aspects are missed or, worse, ignored. Instead, a consideration of multiple perspectives, each informing the other, helps develop new ways of thinking, and new ways of engaging and working in practice is the way forward. It is important to work with and empower local communities by providing them with the resources to use the knowledge they already have. Local knowledge is essential in planning for future earthquake disasters and is evident in communities throughout Nepal; however, the resources to put that knowledge to use is lacking.

It is essential that international researchers and practitioners support and continue this empowerment by engaging with national and local stakeholders. Through their collaboration with various international institutions, stakeholders such as NSET (Chaps. 2 and 3) have helped the government of Nepal build greater capacity in the government; update

building codes; and train local people in awareness, preparedness and emergency response activities. All of this has proved essential in minimising the impacts felt by the Gorkha earthquake.

Preparing for a future earthquake in Nepal cannot occur independently of or at the expense of the country's continuing development. On the contrary, it must be fully integrated into development, making earthquake planning and preparedness (Chaps. 2, 3, 5, 6 and 8) commonplace among all levels of society and government. Everyday issues such as food security, water and energy (Chap. 7) as well as economic security remain challenging and, understandably, often take precedence over considerations for hazard events that may occur many decades in the future. There is a need to consider the ongoing spectrum of hazards and risks and how they are interrelated. People care about livelihood, health (Chap. 4) and education for their children. If more consideration is given to everyday concerns and ways to address them, a space is also opened up for preparing for the future, including considering earthquake risk reduction and building earthquake-resistant structures. Empowering people, communities and local authorities (Chap. 8) and supporting the central government will not only increase resilience but also the well-being for all of Nepal.

Moving forward it is essential that we do not rest on our laurels but instead maintain momentum to create change and new understanding that can help strengthen earthquake resilience in Nepal and elsewhere. The Gorkha earthquake was a major event with substantial impact; however, far larger earthquake threats remain. It is thus important that experiences and knowledge from the Gorkha earthquake are embedded into future planning to prepare for such potentially devastating earthquakes.

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