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Nepal's Towering Climate Adaptation Challenges

ANDREA J. NIGHTINGALE

Nepal is on the front line of climate change adaptation. Most people know of the country as the home of the Himalayas, the highest mountain range on earth, covered in large glaciers. In the Nepali language, *himal* means "snow-covered mountain." The Himalayas have been called the "Third Pole" because their glaciers contain the largest reserve of fresh water outside the North and South Poles.

Changing with the Climate

Seventh in a series

Nepal's largely rural, agricultural population continues to be one of the poorest in the world. Local livelihood systems are highly vulnerable to variations in rainfall and temperature, which are becoming more severe due to climate change. Opportunities for nonagricultural occupations remain limited in rural areas.

That encapsulates one story about vulnerabilities and capabilities linked to climate change adaptation in Nepal. It is the one most often told and the one that informs the vast majority of nationally and internationally supported efforts to help Nepal adapt. But there is another story that is less well known yet equally worth telling.

Nepal's rural, agricultural population is indeed highly vulnerable to changes in rainfall, but it is also highly mobile and innovative. People move up and down steep mountain slopes, taking advantage of variations in microclimates for cultivating crops and grazing animals. Many are quick to adopt new technologies and new crops, and experiment with other ways of coping with a variable climate.

ANDREA J. NIGHTINGALE *is a professor in the Department of Urban and Rural Development at the Swedish University of Agricultural Sciences.*

Their mobility is not confined to Nepal. The World Bank estimated that in 2009, 2.1 million Nepalis between the ages of 20 and 40 were living abroad, and the government of Nepal estimated that 27.7 percent of gross domestic product came from remittances in 2014–15. The remittances sent home by expatriates have become one of the most important sources of household income in rural areas. The vast majority of households have at least one family member working abroad, significantly reducing their dependence on agriculture.

In the high Himalayas, considered the most vulnerable region in the country, another source of income is the collection of medicinal herbs for sale in lucrative markets in India and China. Selling herbs has further reduced dependence on agriculture and livestock. The herbs are also vulnerable to climate variability and overexploitation, but at least for now they have enriched people who were historically quite poor.

These two stories offer rather different pictures of climate change adaptation. The first presents rural Nepalis as poorly prepared to respond and highly vulnerable to a changing climate. The second frames the same people as resourceful, capable, globally mobile, and not afraid to take risks in order to improve their chances for a decent livelihood. While these pictures are not mutually exclusive, and both are largely accurate, the difference highlights the huge gaps in our knowledge of how rural livelihoods are changing and what challenges Nepalis face.

Both of these stories acknowledge the profound ongoing biophysical changes that make agricultural livelihoods in the Himalayas vulnerable. And rural areas in Nepal are in a state of rapid social, economic, political, and cultural change. Migration and exploitation of medicinal herbs are not necessarily long-term solutions to adaptation

challenges, and unlikely to be particularly sustainable on a large scale.

There is no question that climate change is already having an impact on livelihoods in Nepal. Global climate models predict increasing temperatures and changes in the timing of the monsoon. If the last several seasons are any indication, these changes have begun. In rural villages, people complain that the rains are less predictable and heavier when they do arrive. They have also noticed temperature increases that are forcing them to move some permaculture crops such as apples and oranges to higher elevations where the temperatures are more favorable.

Forecasters expect climate change to exacerbate extreme floods in Nepal, threatening cities and lowland plains. In recent years there have been several catastrophic floods that are difficult to directly attribute to climate change but nevertheless point to the challenges ahead. Clearly, Nepalis have to adapt to climate change. It is less clear what precisely the challenges are and who is best positioned to lead the response.

Adaptation activities have been plagued by inequalities based on caste, class, and gender.

GLACIAL INDICATORS

Nepal's formal climate change adaptation programs are linked to funding and initiatives that are part of the United Nations Framework Convention on Climate Change (UNFCCC), as mandated by the 2001 Marrakesh Accord. The accord allocates financial and technical support to developing countries to help them devise adaptation plans. Several different programs emerged in Nepal in response to these international pledges, including the National Adaptation Program of Action (NAPA), the Local Adaptation Plans for Action (LAPA), and the Pilot Program for Climate Resilience (PPCR).

Biophysical science and central-level planning have led the way in the adaptation plans and programs that have been implemented so far in Nepal. The efforts are aimed at mapping and cataloging risks, attempting to predict future environmental changes, identifying the most vulnerable districts and municipalities, and linking these assessments to the country's socioeconomic conditions.

Perhaps because of the linkages between warming temperatures and shrinking glaciers, the entire Himalayan range—stretching from Bhutan in the east to Pakistan in the west—is one of the places where scientists for decades have sought to measure global environmental change. Glaciers are good indicators of global warming because they are sensitive to changes in annual temperature. They form when the rate of melting in the summer is less than the rate of snowfall in the winter, allowing layers of ice to accumulate over time. Today there are only small remnants of the vast glaciers that covered large parts of the globe during the last Ice Age. Their rate of melting has accelerated alarmingly in the past fifty years.

Unfortunately, climatological data sets in the Himalayas are woefully incomplete. Some weather stations have large gaps in their data. Others have questionable data, tainted by suspicions that measurements were simply made up when taking them proved too onerous. Overall, though, the data indicate that temperatures are increasing and the rate at which Himalayan glaciers are melting is faster than expected.

Glaciologists in recent decades have closely monitored changes in glacial size and the emergence of glacial lakes in the Himalayas. Nearly all the major glaciers have lakes forming under the surface of the ice, which happens when glaciers erode the land beneath them and then begin to melt deep within their cores, filling the eroded areas with water. The lakes are prone to break out of their basins when water accumulates and pressure builds to the point that they burst through the dams of loose moraine holding them back.

Nepal has the highest number of glacial lakes of all Himalayan countries, posing serious threats to communities downstream: glacial lake outbursts can cause major flash floods. In addition to immediate hazards like these, rapidly melting glaciers have significant downstream impacts. The Himalayas feed every major river system on the Asian continent—from Pakistan to China—and both increased and decreased flow in these rivers affects billions of people.

To date, climate change adaptation planning in Nepal has been based on an analysis of biophysical threats combined with social and economic indicators of well-being such as income, gender and caste, type of livelihood, and education. While the biophysical threats are very real—a glacial lake outburst destroyed livestock and productive agricultural land in the northwestern Humla district in 2011—adaptation is more complex than assessments of these risks can convey.

Different kinds of adaptation vulnerabilities and capabilities emerge when biophysical impacts on individual households are placed in the context of wider social, economic, and political dynamics. Rapid changes in these dynamics add more dimensions of uncertainty to those produced by the Himalaya's sparse climatological data sets. When the two are combined, they create a very complex context for directing responses and managing change.

Planning and Politics

Current programs intended to support adaptation illustrate why the biophysical and social, economic, and political dimensions need to be considered together. The National Adaptation Program of Action provides a baseline assessment of vulnerabilities based on known biophysical conditions and identifies seven priority areas for adaptation efforts, including forestry and biodiversity, disaster management, water, and urban issues that encompass water and energy concerns. In line with definitions used by the Intergovernmental Panel on Climate Change (IPCC) in a 2007 report, "adaptation" in these plans means direct responses to perceived environmental changes, designed to moderate harm or capitalize on possible benefits.

In this earlier IPCC definition, it is assumed that adaptation is a positive process and that direct responses to climate change can be identified. The most recent IPCC report, released in 2014, has modified the definition to center more on risk, allowing consideration of social and political factors. But it still frames climate change responses as a matter of society adjusting to identifiable and external climatic threats.

Early in Nepal's adaptation planning process, the government assembled a multi-stakeholder group, including representatives from different political parties, civil society groups, and relevant projects supported by international donors. A NAPA team conducted "transect walks" to consult with communities across the range of the country's topographical zones, producing an impressive catalog of climate change threats that helped to identify the most vulnerable areas.

The multi-stakeholder process, though unusual globally, was normal for Nepal at the time. Not only is consensus decision-making highly valued in the local culture, but it had also become a mechanism to ensure legitimacy during a politically volatile time. Nepal had ousted its monarchy in a 2006 revolution and a constituent assembly was in the middle of writing a new constitution. Political change was a daily topic of conversation among ordinary people as well as politicians.

Infighting among political parties and leaders led to a nearly ten-year impasse over the new constitution, which was not finalized until 2015. Leadership of top government ministries turned over frequently as parties jockeyed for power, perpetuating administrative stalemates. Most high-level political appointees and bureaucrats were reluctant to make major decisions or spend their budgets for fear of political repercussions. Climate change programs were often delayed or only partially implemented.

During the NAPA process, facilitators reminded the group that they should focus only on technical issues. Nevertheless, as a colleague who was involved in the process explained, participants in the negotiations were reluctant to advocate particular positions for fear of revealing their political stance. The resulting document includes case studies for each of the seven priority areas, but in only one of them is the political transition listed as a potential risk to implementation.

The program emphasizes plans to increase adaptive capacity through "livelihood support, improved governance, collective responses, improved service delivery mechanisms, [and] access to technology and finance." It designates community-based groups as the preferred mechanism for promoting adaptation.

This technical document, which many high-level bureaucrats struggled to understand, was written during a politically contested time, yet is strangely devoid of political realities. It avoids addressing head-on the inequalities based on political influence, caste, class, gender, and ethnicity that shape vulnerability in Nepal.

As a consequence of these political complications, Nepal's NAPA, published in 2010 after an 18-month process, was one of the last to be completed by any nation. But climate change adaptation had been on the agenda in Nepal since at least 2004, when international and Nepali consultants produced reports on vulnerability and urgent adaptation needs.

Local Needs

The publication of Nepal's NAPA was closely followed by the Local Adaptation Plans for Action and a linked training manual, as well as a Climate Change Strategy paper and the Pilot Program for Climate Resilience. All these documents were produced by the Ministry of the Environment in col-

laboration with other ministries, top-level government officials, and international consultants.

The NAPA and LAPA mainly focus on identifying vulnerable areas of the country and promoting community-based activities that can increase adaptive capacity and resilience. The PPCR was developed with support from the Asian Development Bank and is primarily concerned with promoting investment in climate resilience by both government and private actors. It provides grants for pilot activities that are in line with the NAPA and increase engagement by different organizations, address social exclusion issues, and stimulate investment in "climate-proof" programs. The overall objective is to identify programs that can be scaled up to promote climate resilience nationwide. Implicit in these climate strategy documents is an assumption that Nepal lacks human and financial capital and therefore requires economic and educational support.

Although the LAPA was finalized in 2011, its adoption was delayed by political struggles among project leaders, donors, and government ministries. In 2013, it was further delayed by a sudden change in the bidding process for implementation contracts. Initially, Nepali nongovernmental organizations were invited to bid for projects at the national level, though they could propose to limit their work to specific parts of the country. Five days before the deadline for detailed proposals, the entire process was cancelled and a new call for contracts was issued from the district level instead. This meant that NGOs would have to bid separately in each of the 72 districts targeted for projects.

An informant explained to me in frustration that groups associated with one political party, which otherwise would not be competitive due to their lack of capacity and experience, wanted access to LAPA contracts. It was not until 2014 that the projects began to be implemented across the country.

A SENSE OF URGENCY

Despite the delays and political struggles, Nepal's experience has been instructive for the UNFCCC as it initiates similar processes in other countries. During the NAPA meetings, a Nepali employee of an internationally supported project suggested that national planning was not as useful as local-level planning. The real action for change occurs at the grassroots, he argued. As he recounted to me, "I said, 'Why are we talking about NAPA? We should be talking about LAPA. We need a local adaptation plan of action!'" He attributed his belief in the grassroots to his experience with a program that empowers communities to govern forests. The idea was rapidly embraced in Nepal.

Indeed, in many respects the NAPA was an obsolete document by the time it was finalized. In keeping with a grassroots focus and the need for multi-stakeholder consultation, the LAPA policy was based on the results of several pilot projects involving drinking water, irrigation, and agriculture. Such policies have now been instituted elsewhere, including Pakistan and several states within the United States, though as yet there is no global UNFCCC mandate for local adaptation action plans.

When Nepal's LAPA was first rolled out in 2014, several donor-supported projects in the natural resource and food security sector had already established their own programs under the banner of community-based adaptation planning (CAPA). In some respects they were hoping to establish themselves as competent implementers of the anticipated national-level program. But the initiative was also due to their sense of urgency.

From approximately 2008 to 2013, impatience grew among international donors, local environmental and development professionals, and scientists over the slow pace of implementation, leading to a "some response is better than no response" attitude that was nicely summed up by a Nepali colleague working for an international development organization. In a 2010 interview with me, he exclaimed, "Planning is not enough. One year from now might be too late. We need more action now." He shared with many others the view that the political infighting, revolving senior government ministers, repercussions from Nepal's decade-long civil war (1996–2006), and struggles between donors and the government were barriers to receiving climate change funds from donors.

Most of the community-based projects followed the LAPA model, adopting the same protocols for vulnerability assessments and planning. While many of these efforts were rooted in learning from community forestry projects, adaptation planning has failed to become a truly bottom-up process. The concept of adaptation planning still assumes that ordinary people lack the knowledge, skills, and resources to understand what their adaptation needs are and how to change their activities and systems accordingly. While people are not very clear on what adaptation might consist of, they

nevertheless are highly capable of understanding their circumstances and changing their practices.

Furthermore, NGO staff facilitating implementation in several districts feel they are not given enough time to properly work with communities to identify adaptation needs and put in place appropriate activities. In part because of the delay in spending donor money for implementation, actors at all levels in Nepal are under pressure to get projects off the ground quickly. Those working in the field say this pressure is undermining their ability to work in a bottom-up manner.

RECYCLED IDEAS

While LAPA implementation is at last proceeding in districts that are clearly in need of support, there remain serious questions about whether the groups doing the work have the right kind of knowledge and expertise, how municipalities within those districts are prioritized, and whether the actions taken are effective for adaptation or have an underlying political motive.

In order to try to understand these dynamics, in 2013 I visited a CAPA project that had been running for about four years. The project had international donor support, and consistent with Nepali law, it was implemented through a local-level NGO. This NGO, associated with the forestry sector, worked closely with community forestry user groups to identify local-level climate hazards and establish which municipalities and households were most vulnerable. Once vulnerabilities were identified, it worked with community groups to implement adaptation activities designed to "mitigate harm and capitalize upon benefits" from changing environmental conditions.

Climate change is already having an impact on livelihoods in Nepal.

In the communities I visited, a number of activities had been carried out. The project provided financial support and pipes for irrigation systems in cardamom plantations to help compensate for the decline in winter rain and snowfall. A local landowner donated land for an experimental tea plantation. Since temperatures are warming, the hope is that tea, now a somewhat marginal crop in this area, will thrive in the conditions expected by the time the plants are mature.

The project also planted a shrub called lokta in the community forest to help provide a steady supply of raw material for a paper factory set up as an alternative source of income. Paper made from the bark of lokta saplings is sold to tourists and in international handmade paper markets.

Finally, the project provided livestock to impoverished families with the aim of helping them sell milk or establish a herd. Each of these adaptation activities was intended to address different levels of society, from individual households to entire communities, and to address various dimensions of rural livelihoods, from increasing agricultural production to diversifying sources of income.

But for anyone familiar with rural development in Nepal, none of these initiatives are new. They represent a fairly standard set of interventions that are used to address poverty, food insecurity, and so on. None of them are exclusively climate-related—except perhaps the tea plantation, which might not otherwise have been promoted.

Part of the reason for this repackaging is that no one really knows what "adaptation" is. The local project beneficiaries, NGO personnel, and international donor staff in the district center all complained that they had poor information and a limited understanding of what adaptation planning can accomplish, so they fell back on standard development priorities. As one colleague in a different international donor–sponsored project said of these CAPA efforts, "It's just good development practice."

REINFORCING INEQUALITY

Good development practice or not, adaptation activities have been plagued by inequalities based on caste, class, and gender, raising questions about whether they can support the most vulnerable members of society. These inequalities permeate most aspects of life in Nepal.

Managers of community forestry and other natural resource–related development projects have insisted on adhering to practices that place disadvantaged people on management committees. The hope is that elevating women, Dalits (socially marginalized castes), and ethnic minorities to leadership positions will result in decision-making that is more responsive to their needs—and that gaining leadership experience will help them overcome other forms of social disadvantage. Indeed, some powerful women and Dalit political leaders have emerged from such projects. Adaptation projects, however, have largely ignored these lessons from community forestry.

A cornerstone of adaptation planning is a vulnerability assessment, which usually includes a participatory wealth-ranking exercise whereby villagers identify the most vulnerable among them. Participatory wealth-ranking has been used in other contexts and is recognized as giving a better profile of marginality than other measures. In adaptation programs, though, it not clear that these exercises reach the most vulnerable people. In some cases, they can even exacerbate inequalities. The ways in which elites capture benefits from adaptation activities are often subtle, as my brief observation of a CAPA project revealed.

While I was visiting the community, my local guides went to great pains to show me evidence of their activities. I walked irrigation lines, helped water tea seedlings, took pictures of lokta plants, and met the families who had been given livestock. Poverty in this part of the country is relative; on the whole, people are substantially better off than in other places where I have worked, calling into question why the international donor targeted this area for pilot adaptation projects in the first place. The chosen activities and families did not seem to suit the purpose of supporting the most vulnerable people in the community.

It was said that national planning was not as useful as local-level planning.

Irrigation for cardamom cultivation benefits farmers with extensive private forests, none of whom are destitute by Nepali standards. In one municipality, livestock had been given to two Dalit families headed by a father and son living separately. But these families already owned other livestock—the father had six cows, goats, a pig, and chickens in addition to the calf given to him by the project. In rural Nepal, such households are not poor.

I was told of landless people living in the area, but when we suggested going for a visit our hosts insisted it was too far—a three-hour walk. It seemed clear that they did not want us to see the plight of the landless. That left us with the question of how the Dalit families were singled out as the area's "most vulnerable" even though they owned land and livestock.

In this case, I suspect recent elections were the primary reason. Because Dalit families are generally poorer than their higher-caste neighbors, it makes sense to include Dalits in a program intended to reduce vulnerability. But giving cows to these particular families also could have served the purpose of buying their votes. While it was impossible to directly confirm that suspicion, I heard plenty of other stories about how local political leaders—some of whom were also central to the adaptation activities—tried to influence the outcome of the elections. This led me to believe that the adaptation projects had become a political tool.

In another municipality, goats had been given to a family that was clearly more destitute than the Dalit families that had benefited from the program elsewhere. The young couple lost their agricultural land in 2008 when the Kosi River flooded and shifted its course in the lowland plains. They had migrated to the hills where they had distant family ties and were struggling to rebuild their lives. But again I questioned whether they really were the most vulnerable residents in that area. Their ethnicity was compatible with that of their neighbors, and they had received support from local people. The arrangement with their landlord seemed reasonable to all involved.

This municipality also has landless families going back multiple generations who were not included in adaptation efforts. I speculated that ethnic affinities were the main reason why this particular family had been given support instead of others. If that is the case, rather than overcoming discrimination based on gender, ethnicity, and caste, the adaptation programs were operating within those paradigms.

My time for research in this area was too short to draw any further conclusions, but a colleague working in another part of the country also found that adaptation programs were making vulnerable people more vulnerable. Adaptation activities allowed better-off families to diversify their livelihood strategies, making them less dependent on the labor of the Dalits and disrupting historical ties between them. These historical arrangements were highly unfair to Dalits, but nevertheless did operate as a form of social and economic safety net for the most vulnerable. The new adaptation programs do not provide a replacement safety net.

In 2018, adaptation programs are again in limbo, though several are operating in the villages. At a recent "Climate Dialogue" gathering in Kathmandu, colleagues drew attention to new challenges that are not necessarily easy to recognize without being closely connected on the ground. As of local elections in 2017, new jurisdictional units

have replaced the village development councils, the old municipal level of government at which LAPA projects were implemented. As a result, new projects are not being implemented and those that were not well established before the elections are on hold. Meanwhile, the Trump administration has removed climate change from US development aid priorities.

WHO IS VULNERABLE?

These examples of adaptation efforts bring us back to the questions I raised at the beginning of this piece: What are Nepal's adaptation challenges and who is best positioned to lead responses to them?

While IPCC definitions—and associated funding—are tied to understanding mainly the biophysical aspects of climate impacts, these stories show how climate change combines in a messy tangle with social, economic, and political dynamics. Vulnerability emerges from a complex interweaving of identity (caste, gender, ethnicity), geographical location, livelihood options, links to the global economy (handmade paper production, cardamom, migration for work), and political influence. The Dalits who had managed to associate themselves with local political leaders were able to obtain adaptation assistance while those who were landless could not.

It is not easy to identify the most vulnerable people. Yet doing so is crucial. If adaptation programs are actually increasing vulnerability for some, there is a need for more scrutiny of those who control the programs and how they decide who is vulnerable and what types of activities to implement.

A sense of urgency over adaptation needs is not conducive to careful scrutiny. Rather, it forces local people, facilitators, and national-level project managers to move faster than their confidence allows. It privileges activities that can show tangible outcomes in short time frames, like rearing livestock or building irrigation lines, which are not always the best options for addressing long-term adaptation needs.

I have to respectfully disagree with my colleague's opinion that "some response is better than no response." Adaptation challenges include preventing elite capture of projects in addition to mitigating vulnerabilities caused by changes in rainfall and temperature. Nepal's experiences show that it will take more than participatory processes to ensure that the most vulnerable have a voice in programs intended to support them, whether at the global level or in small communities on Himalayan hillsides. Our Climate Dialogues are one attempt to bring together professionals to debate these issues and to insert some critical questions into the mainstream policy debate.

Good adaptation requires long-term activities that are not tied to 3-to-5-year project funding cycles, and accepting messy political contexts as a normal part of adaptation challenges. The international community's promotion of technical documents and solutions in order to sidestep politics will simply exacerbate adaptation needs in the long run. Adaptation requires placing political realities, social inequalities, and global injustices in the center of the frame when designing interventions—and enough time, patience, and careful study to understand the needs of diverse populations and places. ■