



Research, part of a Special Feature on [Everyday Adaptations to Climate Change](#)

Challenges and prospects of Local Adaptation Plans of Action (LAPA) initiative in Nepal as everyday adaptation

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ABSTRACT. Impacts of climate change, manifested in different forms, are integrally linked with context-specific socio-economic, political, and environmental stressors. Dealing with climatic risks, in most parts, requires understanding these mundane location-specific stressors exacerbated by climate variability and change. In large part, the discussion about dealing with impending threats from climate change has relied on policy objectives hatched at the global and national levels. Despite the fact that these policy objectives are responsible for a wide range of actions at the local levels, they often struggle to incorporate the voices of local communities. With the goal of integrating bottom-up and top-down approaches in climate adaptation and connecting them to local development, the Local Adaptation Plans of Action (LAPA) initiative in Nepal makes a promising case. However, little is known about the institutional barriers and enablers of local adaptation initiatives and how they are affected by the political nature of climate adaptation. Using Nepal's LAPA as a case study and relying on a preliminary field visit, analysis of LAPA documents, and interviews with stakeholders, we reveal several obstacles local communities face that limit their ability to adapt. These obstacles include regular challenges such as insufficient financial resources and the lack of implementation support, to more specific ones such as less recognition of local knowledge and power differences among institutions and between local-level stakeholders having varying interests, power, and views. Our results show gender-based differences on a few key issues. By building on the local knowledge, enhancing local capacity, and by fostering interaction among different actors having unequal power relationships, local efforts such as LAPA can increase the ownership of adaptation policy objectives both at global and local levels. Most importantly, this paper reveals the struggle in linking identified options for dealing with climate change with everyday practices of managing risk and uncertainty.

Key Words: *climate adaptation policy; everyday adaptation governance; LAPA; locally led adaptation; Nepal*

INTRODUCTION

An untimely rainfall during the third week of October 2021 in South Asia made headlines, destroyed paddy fields ready for harvest, and killed over 100 people in Nepal alone. While the variability of rainfall is a common phenomenon in the monsoon region of South Asia, it usually withdraws from the Himalayas by the end of September. An intense burst of rain, as much as 200 mm in 24 hours, which was unusual and continued for four days during the time of the rice harvest. While attributing such an event to global climate change can be a distraction (Pearce et al. 2017), it can make society complacent akin to nothing that can be done. We argue that the approach to dealing with climate change does not have to be grand schemes, but it can be tackled as one more routine activity (Lindblom 1959). Practical approaches to solving problems cannot be rigid and universalist (Lindblom 1986, Scott 1998). Following James Scott (1985) we also argue that climate responses led by experts can be divorced from the everyday activities of people at the local level. In this context, we examine the interaction between local stakeholders and their differential power politics among themselves and supporting institutions. Integrally linked with context-specific socio-economic, political, and environmental stressors, everyday adaptations are linked to routine activities conducted at the local level. Constituted as tacit knowledge, they are derived from an iterative process of learning by doing (Chhetri and Chhetri 2015, Anh Tran 2020). Considering everyday adaptation as a potential response to socio-political and changing climatic conditions will allow local stakeholders to take a lead role both in forming policy and its implementation. We analyze the challenges and prospects of routine activities conducted by the people of Nepal as an everyday adaptation.

Climate change is expected to intensify existing climate variability and extremities in Nepal (Xu et al. 2019), increasing the vulnerabilities of Nepal's smallholder farmers (Dhungana et al. 2020) who produce up to 70 percent of the food consumed in the nation (Rapsomanikis 2015). Also, potential impacts of climate change are seen as key challenges to attaining a number of UN Sustainable Development Goals (UN SDGs), including food security and alleviating poverty. Consequently, the Government of Nepal (GON) has enacted ambitious adaptation policies and plans focusing on devising adaptation tools at the local level. For example, Climate Change Policy 2011 and the National Adaptation Programme for Action (NAPA) 2010 are some of the early initiatives to integrate climate change adaptation into policies, programs, and development plans. Additionally, the GON has developed the LAPA which aims at increasing the resiliency of local communities by implementing a range of local actions. In consultation with local communities, this initiative fosters adaptation plans and integrates them with the local development goals. To this end, Nepal's LAPA can be seen as an ongoing phenomenon that calls for continuous coordination and cooperation at multiple levels (Nightingale 2015). So, the operational approaches of LAPA go beyond the structural distinctions between *community-driven* versus *state-led* action.

While the potential contribution of LAPA to effective adaptation has been acknowledged in the literature (Chaudhury et al. 2014), the lack of knowledge about the effectiveness of current approaches to implementing LAPA has hindered its wider application (Nightingale 2015). While Nepal's LAPA is integrally linked to the local climatic context and the wider developmental needs of the community, its success hinges on how they are connected to institutions whose main goal is to help society adapt

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to changing climate. Against this background, our study expands knowledge on the role of LAPA in advancing climate adaptation policy objectives of the institutions operating at various levels. We draw on the theoretical foundation of the induced innovation hypothesis which postulates that climatic and other stressors can give rise to location-specific technological and institutional innovation (Chhetri et al. 2012). Therefore, we argue that institutions will continue to evolve in response to changes in resource endowment, and over a period of time these institutions evolve and reorganize themselves in response to challenges that they face. However, little is known about the barriers to institutional innovation and the issues related to internal power and politics. In this study, we examine the challenges and prospects of community leadership, stakeholder engagement, and the gendered differences when implementing LAPA within these communities. Three organizing questions of our study include: (a) How, and in what ways, does the LAPA initiative represent the everyday nature of adaptation? (b) What are the opportunities and challenges of the LAPA initiative related to institutional innovation? (c) How does the difference in power within society and between institutions impact the local adaptation? We use LAPAs prepared by the USAID-funded Hariyo Ban Program implemented in the Gandaki River Basin of western Nepal. In the next section, we propose our analytical approach and discuss how it contributes to climate change adaptation research. The following section presents the research methodology followed by the results of this study in the subsequent section. The discussion section explains how LAPA and everyday adaptation can advance adaptation objectives. The final section concludes by reiterating the key findings of this research.

THE CASE OF LOCAL ADAPTATION

For too long, solutions for tackling climate change have been driven by high-level policy architects (Chhetri et al. 2020, Nightingale et al. 2020), resulting in crafting policies and programs at the national and international levels. While high-level policies are important, implementing those policies at the local levels has been a struggle (Klein et al. 2017) as they are usually detached from the context in which they are implemented (Funder and Mwemba 2019). Although community-based adaptation initiatives are proposed to create a strong link between high-level policy objectives, integrating them at the local level is still in its infancy. While vulnerable communities around the world are developing adaptation responses to threats posed by climate and other ongoing changes, adaptation research has yet to uncover how national and international policies translate into local-level adaptation initiatives (Klein et al. 2017). Following the three organizing questions of this research, we explore three related arguments to explain how the LAPA initiative contributes to local adaptation. First, we examine how the LAPA initiative connects to the idea of everyday adaptation. Second, we investigate enablers and barriers to advancing climate adaptation policy objectives at the institutional level. Finally, we study the political nature of adaptation by exploring the differential power relationships between actors and how that impacts adaptation.

By integrating adaptation policy objectives with local development goals, LAPA connects itself to local contexts in which climate change manifests itself (Ribot 2013). It also recognizes the significance of other changes that may amplify the impact of climate change (Eriksen et al. 2011). Following Chhetri

et al. (2012), we argue that LAPA's focus on integrating contextual knowledge itself can empower people. Communities have been adapting to changes throughout history by showing considerable resourcefulness in the face of external threats and is a part of the social fabric (Lebel 2013). Successful adaptation to climate change requires understanding local context, including local culture, values, and knowledge systems (Hulme 2009, Ghimire and Chhetri 2021). In the case of Nepal, farmers' managed irrigation systems (Ostrom 1990), community forestry (Ojha et al. 2009), community health volunteer programs (Glenton et al. 2010), and local cooperatives present good examples of local responses to emerging challenges. We also argue that when climate adaptation policy objectives are linked to other sectors that are vital to people's livelihoods, such as agriculture, forestry, irrigation, and energy, they are connected to local development goals. In doing so, such initiatives build adaptive capacity to multiple stressors that give rise to vulnerability (Eakin et al. 2014).

Climate change cuts across traditional boundaries, existing institutional structures and routines, policy areas, and jurisdictions. It is a wicked policy problem where traditionally designed policy tools no longer suffice. For this reason, understanding potential linkages and feedback between local institutions and global adaptation policy objectives is particularly important. For local climate adaptation goals to be successful, adequate institutional support, at all levels, is a must (Agrawal 2010) and they need to be evolved with time (Chhetri et al. 2012, Ghimire et al. 2022). However, in most developing countries the contemporary approach to mainstreaming adaptation at the local level is institutionally fragmented and politically naive and poses significant challenges in realizing institutional and technological innovation (Paudel et al. 2013). Often the path-dependent nature of institutions that tend to resist the change in governing natural resources and public services is considered a key barrier to adaptation (Barnett et al. 2015). Instead of acting as enablers, institutions may act as barriers to climate adaptation at the local level (Biesbroek et al. 2013). A clear understanding of how institutions may evolve and the potential hurdles they face may advance the knowledge gap in adaptation (Biesbroek et al. 2013, Eisenack et al. 2014). Recent studies on how or why barriers emerge in adaptation governance have revealed that barriers are the result of asymmetrical power relations between institutions and actors (Ishtiaque et al. 2021a). The institutional design of Nepal's formulation of LAPAs and NAPAs is an outcome of the result of global deliberation involving multiple international and national players. Thus, Nepal's LAPA provides an interesting case for understanding institutional dimensions of climate adaptation.

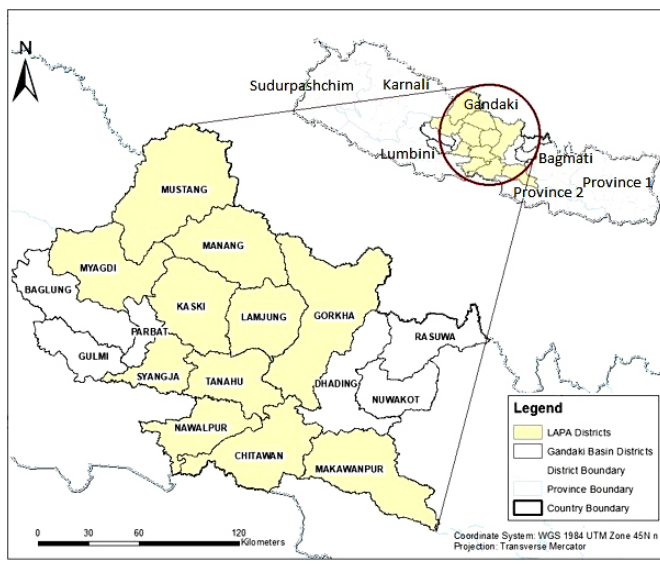
The political nature of climate change adaptation which involves a struggle over authority, knowledge, and resources is well established in the literature (Eriksen et al. 2015, Ojha et al. 2016). Local communities are not homogenous but there are multiple positions based on the dynamic relationship between the natural system and relations of power such as gender, educational level, and caste (Ribot 2013, Ahlborg and Nightingale 2012). These differential impacts call for understanding sociocultural contexts, societal goals, and varying values and interests (Engle 2011, Eriksen et al. 2011). The difference in authority, subjectivity, and knowledge among different actors have the potential to open or close the pathways to transformative adaptation (Eriksen et al.

2015). This makes the issue of power both an enabler and a barrier to adaptation initiatives. Often embedded within the institutional dimensions, these cross-sectional issues make addressing societal vulnerabilities and risks a social and political challenge rather than a technical one. The voices of marginalized communities and at-risk people are crucial for any adaptation initiative.

RESEARCH METHODOLOGY

This study is based on the LAPA initiative implemented in eleven districts of the Gandaki River Basin of western Nepal (Fig. 1) representing all three ecological zones: high mountains, mid-hills, and Terai. This study combines both qualitative and quantitative data. Quantitative data were collected by interviewing local stakeholders using semi-structured questionnaires. The transcripts from the open-ended interviews with the regional and national level stakeholders form the basis for qualitative analysis. Secondary data were collected from LAPA documents that use both methods.

Fig. 1. Map of Nepal showing the Gandaki River Basin and LAPA districts



The data collection for this study follows three steps: a) scoping field visit from November 2017 to January 2018; b) collection of secondary data including climate change policy documents from the GON and the LAPA ($n=65$) from the Gandaki River Basin; and c) virtual interviews ($n=60$) from September 2020 to January 2021. First, using the Qualtrics program we conducted 45 semi-structured telephone interviews representing all eleven districts and almost half of the communities where LAPAs were prepared. The respondents include local representatives who were involved in the preparation and/or implementation of the LAPA initiative in their place identified based on the snowball sampling method. Among the 65 LAPAs that we reviewed, our interviews with local stakeholders cover interviewees from communities representing 29 LAPAs. Second, we conducted 15 interviews with stakeholders from research institutions, governmental and non-governmental organizations, media houses, and development partners knowledgeable about local adaptation initiatives in Nepal. Respondents were selected based on their knowledge, experience, willingness to participate in our survey, and the recommendation

of other interviewees following the snowball sampling method. In both these surveys, we ensured that at least one-third of respondents were women.

The LAPA documents were analyzed with the intent to understand, a) the nature of local climate impacts (hazards); b) proposed adaptation activities in response; and c) types of institutions identified to support these activities. Findings from this analysis were used to guide the interview question with stakeholders. Interviews with local-level stakeholders formed the basis of quantitative analysis and helped in identifying stakeholder perceptions of climate adaptation actions proposed in LAPA and their implementation. The survey data was exported from the Qualtrics program to SPSS for the quantitative analysis. We conducted Fisher's exact test to understand the relationship between participants' responses based on gender. Fisher's exact test is an alternative to the Pearson Chi-Squared Test (χ^2 -test) appropriate for smaller sample sizes with low-frequency events. We considered the difference to be significant if the P-value was less than 0.05. Targeted to understand the link between national policy objectives and the local-level adaptation activities, the interviews with the national level stakeholders were more exploratory in nature so they were analyzed qualitatively. We used the RQDA computer program for the analysis of qualitative data.

RESULTS

Climate Change Impacts and Adaptation Initiatives

The analysis of the LAPA documents reveals that there is a common understanding among the community members that the impacts of climate change are already visible and are manifested in different forms. The most common reference is in the water resources, drying of water springs, lowering of groundwater levels, droughts, and untimely rainfall. In agricultural systems, the most prevalent impacts were increases in pests or diseases and a decrease in agricultural production. Incidence of increased forest fire, loss of medicinal plants, and widespread infestation by invasive plant species are also commonly reported impacts in the forest sector. Similarly, the rise of climate-induced disasters, such as landslides and floods, is also frequently noted. Figure 2 presents how widespread a given hazard is in the region and what level of severity communities assign to each of them. The types of hazards most prevalent in the region were landslides, fire, hail, crop pests, disease, drought, etc. Among these, drought and landslides are seen as more severe. This suggests that for most stakeholders, climate change impacts are intricate to various stressors acting on the systems including natural climatic variabilities that give rise to extreme events and socio-natural changes.

Our survey of the local stakeholders revealed that respondents are concerned about climate change impacts, and they are enthusiastic about the LAPA initiative in their place. When asked how aware they were of climate change impacts in their place, a significant number (82%) of respondents revealed that they are moderately aware (Table 1). The result from Fisher's exact test for this statement has a P-value of less than 0.05 which suggests that there was a significant difference between response from males and females. The male respondents showed more confidence in their self-reported level of awareness regarding climate change than women respondents. The impacts the respondents described were similar to the ones reported in LAPA documents. Likewise,

Fig. 2. Prevalence and severity of major hazards in the GRB. Series 1 shows the prevalence of hazards reported >20% times, and series 2 is the severity of each hazard where 1 is most severe and 7 is the least severe; Source: LAPA documents Gandaki River Basin.

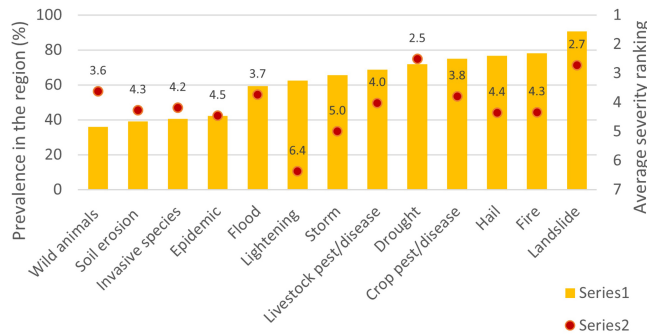


Table 1. Stakeholders' views on climate change impacts and LAPA preparation (Source: Interviews with local stakeholders)

No.	Statement		Percentage of respondents		
			Female	Male	Total
1 Awareness regarding climate change and its impacts *	High		0	20	13
	Medium		87	80	82
	Low		13	0	5
2 The severity of impacts of climate change	High		60	80	73
	Medium		40	17	25
	Low		0	3	2
3 Importance of LAPA for the overall climate adaptation initiatives in their place	High		100	97	98
	Medium		0	3	2
	Low		0	0	0
4 Level of engagement of the respondent during the preparation of LAPA	High		27	53	45
	Medium		47	27	33
	Low		26	20	22

* Statistically significant association with 95% confidence (p-value <0.05) according to the Fisher's exact test based on gender; female (n) = 15 and male (n) = 30

when asked how severe the impacts of climate change in their place are, a significant number of the respondents (73%) reported that their community is severely affected by changing climatic phenomena. Most of them revealed that climate-induced disasters are getting more severe compared to the time when LAPAs were prepared. Consequently, almost all the respondents (98%) reported that LAPA is highly important for the overall adaptation initiative in their community. This finding corroborates with the earlier studies that have reported that LAPA in Nepal provides a useful framework for strengthening the local-level response to climate change impacts (Regmi et al. 2016) and is adopted in several other countries (Maharjan 2019). When asked how engaged they were during the preparation of LAPA, a majority of respondents (45%) mentioned that they were highly engaged, and the rest mentioned that they were either moderately or slightly engaged. Likewise, when asked whether they feel their engagement in LAPA preparation made a difference, a majority

of respondents (80%) mentioned that it made a difference (Table 2). Generally, local stakeholders seemed enthusiastic about implementing the LAPA initiative in their place.

Table 2. Stakeholders' views on LAPA preparation and implementation (Source: Interviews with local stakeholders)

No.	Statement		Percentage of respondents		
			Female	Male	Total
1 My engagement in LAPA preparation made a difference	Yes		87	77	80
	Otherwise		13	23	20
2 New activities were proposed in LAPAs that were not already happening in our pace	Yes		27	20	22
	Otherwise		73	80	78
3 LAPA would have been different if it was prepared by other programs	Yes		20	3	9
	Otherwise		80	97	91
4 Updates were made in the LAPA or any plans to update or prepare a new one	Yes		7	13	11
	Otherwise		93	87	89
5 LAPA programs were discussed during VDC level planning and budgeting	Yes		87	60	69
	Otherwise		13	40	31

Note: female (n) = 15 and male (n) = 30

LAPA documents prepared with the consultation of stakeholders have proposed several context-specific adaptation activities as a response to impending threats from the rapidly changing climate. Among the activities most frequently proposed are training on animal husbandry and farming, irrigation efficiency, seed improvement, and training on growing high-value crops such as vegetables and/or fruits. Options proposed for water and energy sectors include improved cooking stoves, conservation of water sources, maintenance of drinking water systems, and the conservation of water harvesting ponds. Over 95 percent of the LAPAs documents have identified tree plantation to be an important adaptation program followed by the construction of fire-lines, plantation of non-timber forest products, and awareness regarding forest conservation. Several LAPA documents have also mentioned approaches for raising awareness, building embankments and early-warning systems, bio-fencing, and fundraising to deal with climate-induced disasters.

In LAPA documents, communities have identified several institutions as helpful for supporting their adaptation needs. Among them, civil society and public sector institutions were often recognized, and market-based institutions were rarely selected. This finding agrees with previous studies that have argued that decentralization initiatives have relied more on government and non-governmental organizations than on market-based organizations (Korten 1987, Bratton 1990, Uphoff 1993). The three most important public sector institutions identified for the implementation of LAPAs were the District Development Committee, District Agriculture Development Office, and Village Development Committees (VDC). The non-governmental organizations and local-level organizations identified include NGOs, user groups, women's groups, youth groups, committees, and sub-committees.

Along the same lines, interviews with local-level stakeholders revealed that local government agencies (Wards and Municipalities/Rural Municipalities), as well as the Hariyo Ban Program, are major institutions that can support the implementation of adaptation initiatives. This result shows greater decision-making power and responsibility in local public agencies than in civic or private agencies and actors (Agrawal et

al. 2012). As illustrated in Table 2, when asked if LAPA would have been different if prepared in support of institutions other than those involved in the Hariyo Ban Program, 91 percent of the respondents mentioned that LAPA would not have been significantly different with or without the presence of the Hariyo Ban Program. This result supports the findings of the other research that concluded that LAPAs prepared by the three different programs in Nepal were not noticeably different from each other (Silwal et al. 2019). In general, respondents were satisfied with LAPA preparation and the support they received from the Hariyo Ban Program. One of the interesting revelations is that when asked if new adaptation activities were proposed in the LAPAs, 78 percent of the respondents mentioned that proposed adaptation options are not entirely new activities, they were already happening. This is an indication that the climate adaptation options proposed in LAPAs are context-specific and endowed with local experiential learning of the communities (Eriksen and O'Brien 2007). Likewise, when asked if the programs proposed in the LAPAs were discussed during the VDC level planning and budgeting meetings a significant number of respondents (69%) mentioned that they were discussed.

Challenges of the LAPA Initiative

Stakeholders were generally satisfied with the LAPA prepared in their place, but they revealed that the implementation of proposed activities was rife with challenges. When asked whether they were able to integrate these activities with the government planning process, a majority of the stakeholders we interviewed (60%) said that they were able to integrate them (Table 3). However, when asked if it was easy to implement the LAPA in their place, a majority of the respondents (58%) mentioned that it was not easy. This result corroborates with other studies that have mentioned that the LAPA was successful in mobilizing local actors in adaptation planning, but its implementation was constrained by socio-cultural and governance barriers (Regmi et al. 2016). As a result, when asked if they are aware of any changes that were made in the LAPA after it was prepared or any plans at present to revise or update LAPA, a significant number of respondents (89%) mentioned that they are not aware of any such initiatives (Table 2). The representation of women and marginalized groups was reported to be strong during the LAPA preparation. When asked if the participation of women in the LAPA planning process was strong, a significant proportion of respondents (91%) mentioned that it was strong (Table 3). However, the result from Fisher's exact test for this statement has a P-value of less than 0.05, which suggests that there was a significantly different response between males and females. The male respondents mostly agreed that the participation of women was strong, but the response from women is more nuanced and spread out. Likewise, in the analysis of LAPA documents, we found that almost all LAPAs have a male member as a chair of the LAPA implementation or MandE committee. During our interviews with local-level stakeholders, we noticed that female respondents were hard to reach, and they often thought other male members of the community were more knowledgeable, so they frequently referred us to speak with a male leader. We noticed that women's groups were making crucial contributions to implementing LAPA activities at the grassroots level, and women were more likely to bring their issues and contributions that were not reflected during interviews with male respondents. As with women, respondents

mentioned that the participation of marginalized people was strong during LAPA preparation. However, they also revealed mixed thoughts regarding whether marginalized people benefited from the LAPA initiative as much as others.

Table 3. Stakeholders' views on LAPA implementation and representation (Source: Interviews with local stakeholders)

No.	Statement	Percentage of respondents			
		Female	Male	Total	
1	Proposed activities were integrated in local government planning process	Strongly agree	20	10	13
		Agree	40	50	47
		Neutral	27	17	20
		Disagree	13	20	18
		Strongly disagree	0	3	2
2	It was rather easy to implement plans proposed in LAPA	Strongly agree	0	0	0
		Agree	40	33	36
		Neutral	20	0	7
		Disagree	40	57	51
		Strongly disagree	0	10	7
3	The participation of women in the LAPA planning process was strong *	Strongly agree	33	10	18
		Agree	47	86	73
		Neutral	7	0	2
		Disagree	13	3	7
		Strongly disagree	0	0	0
4	The participation of underrepresented people in the planning process was strong	Strongly agree	7	3	4
		Agree	47	40	42
		Neutral	7	27	20
		Disagree	27	27	27
		Strongly disagree	13	3	7
5	LAPA struggled to benefit vulnerable and marginalized as much as others	Strongly agree	13	7	9
		Agree	73	33	46
		Neutral	7	27	20
		Disagree	7	30	22
		Strongly disagree	0	3	2

* Statistically significant association with 95% confidence (p-value <0.05) according to the Fisher's exact test based on gender; female (n) = 15 and male (n) = 30

Table 4 presents a list of potential barriers during the implementation of LAPAs. The barriers identified by a larger proportion of stakeholders (>60%) are lack of financial resources, absence of functional local government, less recognition of the role of local knowledge in adaptation, and minimal support from government institutions. This is also explained by the fact that there was no functioning local government for almost two decades until the local-level election of 2017 (Nightingale 2017). For the statement that mentioned that there was less recognition of local knowledge, Fisher's exact test has a P-value of less than 0.05, which suggests that there was a significantly different response between males and females. Compared to men, a larger proportion of women believed this to be a barrier to LAPA implementation. Other barriers identified by many respondents (30–60%) include lack of support from organizations engaged in local development, low interest among the management committee, and the ambitious nature of the proposed activities. Our study also has several other interesting findings, such as the need for raising awareness, enhancing local capacity, ensuring long-term support, and more participation of women and marginalized groups. This is an indication that climate adaptation is no longer a choice, it is a new reality even if there are significant barriers to realizing climate adaptation policy objectives. By mainstreaming adaptation and by incorporating local and Indigenous knowledge into adaptation planning (Tiwari et al. 2014, Dhungana et al. 2017), we argue that some of the barriers

could be remedied. Potential barriers such as lack of human resources or capacity, lack of time, and improper local-level institutional arrangement seemed to be minor hindering factors (Dhungana et al. 2020). This suggests that local government and local-level institutes have capacities, and more than acknowledgment, they need to be treated as significant partners in realizing climate adaptation policy objectives in the future (Ribot 2013).

Table 4. Barriers in the implementation of LAPA ranked based on the descending order (Source: Interviews with local stakeholders)

Rank	Barriers	Percentage of respondents		
		Female	Male	Total
1	Lack of financial resources	93	83	87
2	Absence of functional local government	73	70	71
2	Less recognition of local knowledge *	93	60	71
4	Minimal support from government institutions	47	73	64
5	Lack of support from development organizations	40	57	51
6	Low interest from the management committee	46	43	44
7	Ambitious proposal, activities difficult to implement	33	33	33
8	No clear institutional framework for implementation	27	30	29
8	Lack of time	40	23	29
8	Lack of human resources	46	20	29
11	Lack of support from Hariyo Ban Program	13	27	22

* Statistically significant association with 95% confidence (p-value <0.05) according to the Fisher's exact test based on gender; female (n) = 15 and male (n) = 30

The interviews with the national and regional level stakeholders also revealed several challenges. Some of the major challenges include the lack of awareness regarding climate change among local-level stakeholders and the public; less ownership and willingness to act on the issue of adaptation in the local government; and the lack of clear understanding of the LAPA initiative. Simultaneously, several other plans are prepared at the local level in conjunction with LAPA such as yearly development plans and local disaster risk management plans (LDRMP). There was also a misconception among the members of the community that organizations who helped prepare those plans will also help in implementing them. This false sense of responsibility also made it difficult to mobilize local capacities to implement LAPA. Another related challenge was the short-term project-based focus of most LAPAs that lacked the engagement at the local level during the implementation, update, and follow-up.

While the LAPA framework of the GON considered VDC and municipalities as appropriate units for planning, some stakeholders argue that LAPAs could be prepared for other level units such as at the watershed level, ecosystems level, or targeted to specific market value chains. Related to that, stakeholders believe that the locals may not be able to propose entirely new practices or technology during the local-level planning process. Likewise, it is also possible that the locals may not be fully aware of the strengths of the traditional practices they have in their community. For example, mixed crop–livestock systems, known to make efficient use of available natural resources in the environmentally challenging Hindu Kush Himalayan region, are considered sustainable and in harmony with other local ecological

systems. Finally, some persistent challenges were related to the differential power among local-level actors and institutions. Despite its focus on providing support to the most vulnerable and marginalized members of the community, engaging women and the most marginalized groups has become an arduous task. Marginalized people lack resources and have limited political power to influence decisions and take advantage of adaptation initiatives.

Prospects of the LAPA Initiative

There are some promising developments in the LAPA initiative in Nepal. The new constitution and the restructuring of the administrative units have provided more authority and financial resources at the local level. To align the adaptation governance with the newer administrative structure, the federal government has enacted two important policy initiatives: a) climate change policy 2019; and b) LAPA framework 2019. The lack of funds is undoubtedly a big issue, but there are cases where the local government has been promoting some promising practices using their own funds. Since local governments (municipalities and provinces) are new, enhancing the capacity of local institutions and raising awareness at local levels have been a priority. The Nepal Climate Change Support Program, for example, has tried to work with local governments to integrate the LAPA into their development planning. Now that the local governments have elected authorities, many respondents felt optimistic that a major barrier that hindered the implementation of the LAPA initiative has now turned into an enabling factor.

Stakeholders revealed that the current institutional framework fosters vertical integration in adaptation governance. In the past, the climate change initiatives were coordinated by the Ministry of Environment which was relatively marginalized within the central level bureaucracy and lacked offices at the sub-national level (Nightingale 2017). Now, the Ministry of Forest and Environment (MOFE) has been established, which has district level offices and also has the mandate to coordinate climate adaptation policy objectives formulated at the central and local levels. In addition, the MOFE has been initiating efforts to promote an integrated approach to adaptation planning. For example, institutions implementing LAPAs are working to integrate the LAPA with the LDRMP, another similar plan prepared at the local level with the support from the Ministry of Home Affairs. Likewise, the differential impacts analysis and focus on gender and social inclusion that some institutions are already doing have been helpful to bring voices of women and marginalized people. With the nature of adaptation programs such as those in forest and biodiversity sectors, LAPAs have also been able to contribute to mitigation as a co-benefit of adaptation initiatives.

DISCUSSION

The purpose of our analysis was to explore the case of LAPA as an everyday adaptation to understand the opportunities and challenges of institutional innovation in response to climate change. This study reveals that climate shocks, manifested variably across space and time, add to the set of everyday problems with which the farmers of Nepal routinely deal. Designed and developed using context-specific needs, LAPA is a climate adaptation intervention that local communities have identified in response to changing patterns of climatic and other stressors. By

linking itself to the local context, the LAPA initiative also helps build institutional capacity at the local level. Although governance of climate adaptation is seen as sectoral and top-down (Nightingale 2015, Ojha et al. 2016), the architecture of Nepal's LAPA is more interdisciplinary and brings multiple sectors together. By making adaptation policy objectives a part of the local development plan, the LAPA initiative has attempted to make adaptation governance more participatory and bottom-up. With the focus on routine local-level activities, the LAPA initiative has demonstrated its connection to local social, biophysical, and cultural context for raising awareness and increasing ownership among local-level actors. Further, our study also uncover that the adaptation initiatives focused on national and high-level policies, programs, and commitment need to be linked to the everyday nature of local-level arrangements, organizational structures, power dynamics, needs, and skill sets. This is in agreement with several studies that have documented that adaptation initiatives devoid of context are likely to be rejected by local communities (Scott 1985, 1989, Johansson and Vinthagen 2016). On the other hand, if done properly, local communities and their supporting institutions can generate adaptation options suited to their place through the iterative process of learning (Chhetri and Chhetri 2015, Anh Tran 2020). However, the bigger question is whether the everyday adaptations routinely practiced by the farmers are enough when the intensity and magnitude of climate patterns shift significantly. It is a big ask, but small initiatives, such as developing climate-based agro advisories, switching to newer seeds, or alternative cropping methods that communities are good to decide on, can raise the general adaptive capacities of communities to absorb shocks and build resilience (Eakin et al. 2014).

Stakeholders' Engagement in Adaptation

Our analysis revealed that climatic and other stressors can give rise to location-specific institutional innovation (Chhetri et al. 2012), however, the process is fraught with challenges. The case of LAPA underscores the need for interaction between actors across multiple levels of policymaking in all aspects of adaptation initiatives. Often these institutions can have similar priorities which require adaptation planning to be flexible in defining local-level planning units and reconciling them with other similar programs. For example, while the LAPA initiative in the past predominantly focused on local administrative units following political boundaries, Ecosystem-Based Adaptation at Panchase has focused on a mountain ecological region (Adhikari et al. 2018) and the Hariyo Ban Program has conducted planning at the ecosystem level (macro) and at the community level (micro). Local units can also be transboundary when it involves a broader ecosystem or a watershed of multiple river systems. Preparing a watershed level plan can enhance downstream and upstream linkage through schemes such as payment of environmental services or flood early-warning systems. Likewise, integration of the LAPA with other similar plans prepared at the local level can contribute to better implementation of these plans. All these different forms of adaptation planning can foster iterative interaction between multiple institutions giving rise to institutional innovation in response to the changing social and environmental context. This underscores the need for the engagement of actors at multiple levels so that local communities can prepare context-specific adaptation plans by working with

experts at the higher-level institutes (Ghimire and Chhetri 2021). Support from higher-level policy institutions can spark new ideas at the local level and realize the potential of existing adaptation practices (Silwal et al. 2019). For example, in Africa, local practices of Zai pit and farmer-managed natural regeneration were able to make widespread and effective adaptation after it was incorporated at the high-level government policy (Reij et al. 2009, Amaru and Chhetri 2013). Nepal has been successful in transforming the traditional top-down bureaucratic approach to a more participatory approach for the development of location-specific technologies for agricultural adaptation (Chhetri et al. 2012, Ghimire et al. 2022) and more such initiatives are expected to follow the changing climate.

At the local level, lack of financial resources is a major obstacle to implementing adaptation programs. Although Nepal's policy documents express its commitment to allocating significant financial resources at the local levels, the reality is different whereby only a small amount of money is allocated at the local level. This is a persistent problem in climate change adaptation and mitigation initiatives around the world (Dhungana et al. 2020). Most local institutions often lack adequate technical and financial support that calls for strengthening the capacity of municipalities and other local institutions (MCLD n.d.). One of the principles of locally led adaptation is ensuring funding that can be accessed easily by the local-level institutions (Soanes et al. 2021). To make local institutions more resourceful to adapt to climate change sustained financial commitment is important (Westoby et al. 2020). The case of LAPA also reveals that in addition to the funding from international organizations, the adaptation financing could also utilize public and private funds available at the local level. As the restructuring of administrative units in Nepal has provided more authority and added financial resources at the local level, the government can also attract local philanthropists and business operatives for activities that have broader economic appeal. Likewise, the project-based approach to adaptation largely implemented by the NGOs may not be sufficient for providing stable support for the community (Vij et al. 2019).

The local adaptation planning cannot be merely local, but it needs to consider potential feedback between local and global processes (Eriksen et al. 2011). Therefore, when preparing local adaptation policies and programs, it is important to have a built-in mechanism for feedback, including regular review, periodic updates, and continuous monitoring as public views can be short-term and reactive. In fact, studies reveal that both top-down and bottom-up processes work in tandem during all phases of adaptation governance (Ishtiaque et al. 2021b).

Understanding the Differential Power and Politics Around Adaptation

Nepal's LAPA demonstrates that multiple stakeholders involved in adaptation governance have power and authority but work at different levels. The local government is more powerful as adaptation has been considered a public sector responsibility. At the same time, the financial resources are delivered by the central government. In the absence of healthy feedback and sincere engagement of actors at all levels, implementation of LAPAs can't be sustained as envisioned. The engagement of high-level government officials during the preparation of LAPAs raised the

expectation of local communities that the central government will be there to help both financially and technically to implement the plan.

There is also a strong need for engagement between multiple local-level actors who play an important role in implementing LAPAs such as local government, women's groups, forest-users' groups, community-based organizations, and NGOs. Engagement with multiple actors not only builds the capacity of local stakeholders but also raises awareness regarding climate change impacts and the need for local action, (Regmi and Bhandari 2013) which is crucial for raising interest and ownership of climate adaptation from the local government and was lacking until recently (Rai et al. 2015). While it is important to focus on the right institutional and policy environment for promoting climate change adaptation, it is equally important to understand the power and politics among these institutions (Nightingale 2017).

Our analysis has revealed that the participation of women has been strong, but the patriarchal social structure has still made women less confident to speak up about adaptation initiatives. Issues related to women cannot be represented by male members of society and there is more that needs to be done to make LAPAs more gender sensitive. Though the LAPA initiative aimed to focus on vulnerable people and places, the program struggled to significantly contribute to these groups. Although the vulnerable communities have fewer demands, their demands are considered less important and are pushed aside during the planning, budgeting, and implementation process. Initiatives such as conducting differential impact assessments and having a separate conversation with marginalized and vulnerable communities can be effective for adaptation. Co-developing adaptation planning, especially with women and people at the margin of society, can be one of the mechanisms by which structural inequalities can be addressed (Soanes et al. 2021). As the case of LAPA suggests, one of the strategies for ensuring meaningful participation of marginalized groups in adaptation decisions is ensuring that the policies prepared at the higher level are explicit about inclusion.

The fact that many of the community members believe that the limited recognition of local knowledge was one of the barriers to the implementation of LAPA demonstrates the power difference between different knowledge systems where science-based knowledge is valued over Indigenous and local knowledge (Chhetri and Chhetri 2015, Ghimire and Chhetri 2021). Local and Indigenous knowledge is changing and difficult to access, which poses a considerable obstacle in preparing adaptation strategies that call for long-term institution building with local stakeholders (Popovici et al. 2021). Thus, the case of LAPA as an evolving initiative in terms of reconciling barriers and tackling power differences among institutions provides a nuanced understanding of barriers to local adaptation and the interplay between power and politics at the local level.

CONCLUSION

We examined the institutional barriers and enablers of local adaptation initiatives and how they are affected by the political nature of climate adaptation. Our findings have shown that options for dealing with climate change do not have to be grand schemes, they can be linked with everyday practices of managing risk and uncertainty. Adaptation approaches that are location-specific can be helpful to build local resilience, whereas costly

initiatives promoted by external agents might struggle in connecting with the everyday reality of affected people. Understanding adaptation as everyday interactions can help connect adaptation initiatives to the lives of local people while contributing to local development aspirations. As institutions can be both enablers or barriers to adaptation, institutional collaboration in terms of planning, financing, and implementation is crucial for local adaptation initiatives to thrive. Initiatives such as LAPA are promising in strengthening the capacities of local-level institutions in adaptation planning and the implementation of identified options, however, they are not immune from challenges such as financial constraints, limited support from local government, and the differences in values and agencies among multiple institutions. The local adaptation initiatives need to understand where power lies and how the voices of those marginalized can be enhanced while making powerful agents more accountable. This study has demonstrated that there can be significant differences between women and men regarding their understanding and involvement in adaptation. Since local-level actors are not homogenous, future studies can make comparisons by dividing local stakeholders into several groups based on the difference in power, interests, and views. There is a need for further research to understand how local communities can be at the forefront of adaptation decision-making and for engaging actors at all levels for adaptation planning, implementation, and monitoring. Likewise, it is crucial to understand whether the adaptation strategies are effective and to be flexible to update or modify them.

Data Availability:

Data is described in the manuscript. Quantitative data used for this study are available from the lead author (RG) upon request. Ethical approval for this research study was granted by Arizona State University.

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