



## Effectiveness of community forest user groups (CFUGs) in responding to the 2015 earthquakes and COVID-19 in Nepal

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### ABSTRACT

Natural disasters and pandemics are evolving as major global threats that are posing an enormous challenge to socio-economic and environmental wellbeing. Using a real time analysis of the impressive role played by Community Forest User Groups (CFUGs) in Nepal in responding to the 2015 earthquakes (Earthquake-15) and COVID-19, this paper explores the scopes, capacities, institutional strengths and attributes required for community-based institutions such as CFUGs to become effective in managing and responding natural or other disasters. Our findings suggest that being an autonomous and well-recognized community based institution with trusted social capital (trust, connectedness, norms and network) for collective action together with its scope and mandate to democratically manage and mobilize its physical, financial, natural and human assets, CFUGs have become the most effective institution to provide immediate support to disaster affected communities. While most of other agencies including non-governmental organizations spend a lot of time exploring avenues for immediate response to the disasters, CFUGs have immediate access and infrastructure to support millions of people in rural areas. We argue that this contribution needs to be recognized, and CFUGs can provide a valuable institutional framework for the preparedness, response and recovery from disasters and to build resilience in the future.

### 1. Introduction

Disasters and extreme environmental events are major global challenges to protect millions of lives and livelihoods and to safeguard growth in key socio-economic sectors. The world on average witnesses more than 700 natural disasters a year (Shah et al., 2019). From 2005 to 2015, the global damage caused by disaster was estimated at USD 1.4 trillion, and 700,000 human casualties (UNISDR, 2015), with over 70% casualty occurred in the 40 mountainous countries (Klein et al., 2019).

The countries in the global south are highly vulnerable to disasters owing to their low adaptive capacity and inadequate infrastructure to deal with these disasters. With the rise of global environmental destruction particularly the catastrophic impacts of climate change, rural communities have been encountering increased disaster events annually (Adger, 2003; Allen, 2006). This is particularly chronic in the Himalayan region where seismic, climatic, and developmental disasters are frequent and poor people are heavily affected (P. Gentle & Maraseni, 2012; Klein et al., 2019). Nepal

is exposed to multiple natural disasters such as earthquakes, floods, landslides and droughts, and identified as one of the highly vulnerable countries in the world (Saito, 2012; Shah et al., 2019).

The debates on what institutional mechanism is more effective in responding to the immediate aftermath of a disaster is resurfacing once again in Nepal in the midst of the COVID-19 pandemic. There were some discussions, particularly on the institutional importance and effectiveness of responding agencies during the post-earthquake (Earthquake-15) response and recovery in 2015. Exactly five years after the devastating earthquakes, Nepal is currently facing one of the biggest global crises due to the COVID-19 pandemic and the country is in lockdown for more than four months and with uncertainties ahead. The pandemic has not only created the health, economic and social devastations across the country, it has triggered a massive return of migrant workers internally and from outside the country particularly from India and the Middle East back to rural areas as a main vector for transmission of COVID-19 in Nepal (Singh, Sunuwar, Adhikari, Szabo, & Padmadas, 2020). Identifying, quarantining, testing,

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tracing and isolating the infected ones from among the hundreds of thousands of migrant workers became the most daunting task in managing this unprecedented disaster in Nepal.

Globally, civil society organizations (CSOs) play important role in reducing the impacts of natural disasters, but in most cases, they are with inadequate or lack of required knowledge and skills (Shah et al., 2019; Shaw & Goda, 2004; UN, 2008). Being in proximity to the affected communities, the local CSOs are found to be playing key role in providing first-hand rescue and recovery to the vulnerable groups and therefore they are expected to integrate the disaster preparedness into their plan of activities (UN, 2008). Community based disaster preparedness is determined by a number of community characteristics such as the presence of strong social and economic infrastructure, strong social cohesion, and shared values (Levac, Toal-Sullivan, & O'Sullivan, 2012; Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2008; Regmi, Star, & Filho, 2016).

The increased role played by local institutions in dealing with the COVID-19 pandemic is already reported in some Asian countries. Woo (2020) shows that civil society organizations in Wuhan province of China have been providing patients with virtual care support and self-care guidance, mental health support, and end-of-life support for affected families. In Bangladesh, Sakib and Rahman (2020) has highlighted that the engagement of local institutions in distributing food, cash and protective personal equipment (PPE). In India, the *Kudumbashree*, a Keralan grassroots network of local organizations and women's self-help group, has performed a role model in handling public-health emergency caused by the pandemic (Tharoor, 2020). Tharoor (2020) also reports that *Kudumbashree* supported the state's containment strategy by producing large amounts of protective measures such as face masks and hand sanitizers and managed 1200 community kitchens to feed the COVID-19 affected people.

The role of community based local institutions in Nepal has been well recognized globally because of their active role in managing the country's most important natural resources such as forests and water as commons (Lim, Spanger-Siegfried, Burton, Malone, & Huq, 2005; Ostrom, 1990). Local institutions such as CFUGs, farmer groups, mothers' groups, youth clubs and irrigation groups have been recognized for their potential roles to adapt and mitigate climate induced disasters in Nepal (Agrawal, 2010; GoN, 2010, 2015; FAO, 2020; D. Paudel & Reck, 2016). According to Agrawal (2010), these institutions can influence the distribution of climate risks by organizing incentives for households and community level adaptations, and mediating external interventions suited to the local context. Particularly, the CFUGs and Federation of Community Forestry Users, Nepal (FECOFUN)-a nationwide network of CFUGs in Nepal- have been instrumental to implement immediate response measures to Earthquake-2015 and Covid-19 pandemic in 2020 (FAO, 2020).

Based on the demonstrated roles played by CFUGs in both Earthquake-15 and COVID-19 disasters, it is noticed that CFUGs are committed, and have resources, institutional capacity, national and local networks and infrastructural facilities making them very effective and proactive in community-based disaster management especially in rural areas. The CFUGs and FECOFUN were emerged largely as a result of civil society advocacy rather than solely driven from government initiatives. This allowed them to take the increased responsibility to address community interests and needs, enhanced social cohesion and shared values. There are diverse initiatives to build the community level mechanisms in developing resilience and to plan recovery strategies. CFUGs' strategies are found to be compatible with local knowledge and practices and therefore their trajectories for relief and recovery are effective (Agrawal, 2010).

However, it is important to evaluate and document how community institutions like CFUGs are effective and accessible in disaster responses and in what ways they can provide a new framework for just and sustainable post-disaster reconstruction. The academic investigation on this particular issue is limited and the questions such as how CFUGs, as one of the largest and resourceful local institutions, are responding to large scale disasters; and in what ways size and scope of the institution, motivation of their members, organizational mandate and policies, and social capital (mainly trust and connectedness) are under explored. Investigating CFUGs through

these questions would allow us to understand the effectiveness of CFUGs as a major institutional modality in disaster response. Understanding these institutional dynamics by exploring these gaps through this study will provide a policy input to the Government of Nepal and millions of community-based local institutions across the globe.

Inferences in this article are drawn from the interview of 40 community level beneficiaries and service providers from four hilly districts of Lamjung, Gorkha, Dhading and Ramechhap. The districts were selected among severely affected areas from the earthquakes and the interviewees were purposively selected among those who were in the frontline of disaster response including CFUG executive committee members (10), FECOFUN (5), local government officials (4), civil society actors including NGOs and media (6), and forest user group beneficiaries (15). We conducted ten focus group discussions (FGDs) with earthquake affected CFUG members from the highly affected villages. With regards to COVID-19 response, seven virtual webinars, as FGDs, were organized with FECOFUN office bearers and CFUG members from seven provinces. Twenty key informants, who were in the frontline of the response, including local community beneficiaries (10), local government officials (5), and civil society actors representing NGOs and media (5) were virtually interviewed to explore their immediate actions and what: (1) response mechanisms they have developed so far; (2) factors have triggered their motivation and successes; and (3) challenges they are facing. Building on these field-based explorations, the researchers have reviewed local newspapers, reports and journal articles about the role played by CFUGs and FECOFUN in responding to the COVID-19 pandemic.

## 2. Community forestry institutional capacity for disaster response

Since the 1970s, CFUGs have been established as local institutions for the protection, ownership and management of forest resources in Nepal (T.N. Maraseni, Cockfield, & Apan, 2005). However, they have gained momentum only after the 1990s, with the promulgation of new facilitating and regulatory systems. Since then, CFUGs are gradually growing in number and size and have been successful in enrolling a large swath of population especially from rural areas (Fig. 1; T.N. Maraseni et al., 2019).

Since its conception, community forestry has been significantly contributing towards improving the forest conditions, practicing democratic decision-making processes, and promoting local development activities (Acharya & Gentle, 2006; Andersson & Agrawal, 2011). As a result, the community forestry programs have been providing a wide range of socio-economic and environmental benefits including ecological, institutional, financial, and social services and safety nets (Adhikari, 2009). Recently, CFUGs have been progressively engaged in contributing to climate change adaptation and disaster risk reduction programs by providing ecological goods and services and socio-economic benefits to the communities (P. Gentle & Thwaites, 2017; D. Paudel, Khatri, & Paudel, 2010). However, there are concerns that CFUGs are not always able to achieve their progressive mandates particularly in equitable decision-making and benefit sharing, and some argue that CFUGs may not provide a viable 'safety net' for poor people (P. Gentle & Thwaites, 2017; Ojha, 2014; Poudyal, Maraseni, & Cockfield, 2020).

As of May 2020, there are 22,266 CFUGs in Nepal managing 2.24 m ha (35% of total) of country's forest resources and directly benefiting 2.91 m households (about 33% of total) population of the country (Pathak, 2020). These groups are expanding their capacity to deal with other environmental development and humanitarian domains with the focus on equity, justice, participation and sustainability (P. Gentle & Thwaites, 2017; Poudyal et al., 2020; Rana, Thwaites, & Luck, 2017). They have developed local to national networks and sophisticated decision making and implementing mechanisms that mobilizes both the indigenous knowledge systems and contemporary practices of the state and development institutions (Fig. 1). FECOFUN as a national network has been committed to promoting, protecting and advocating for community rights in natural resource governance in Nepal.

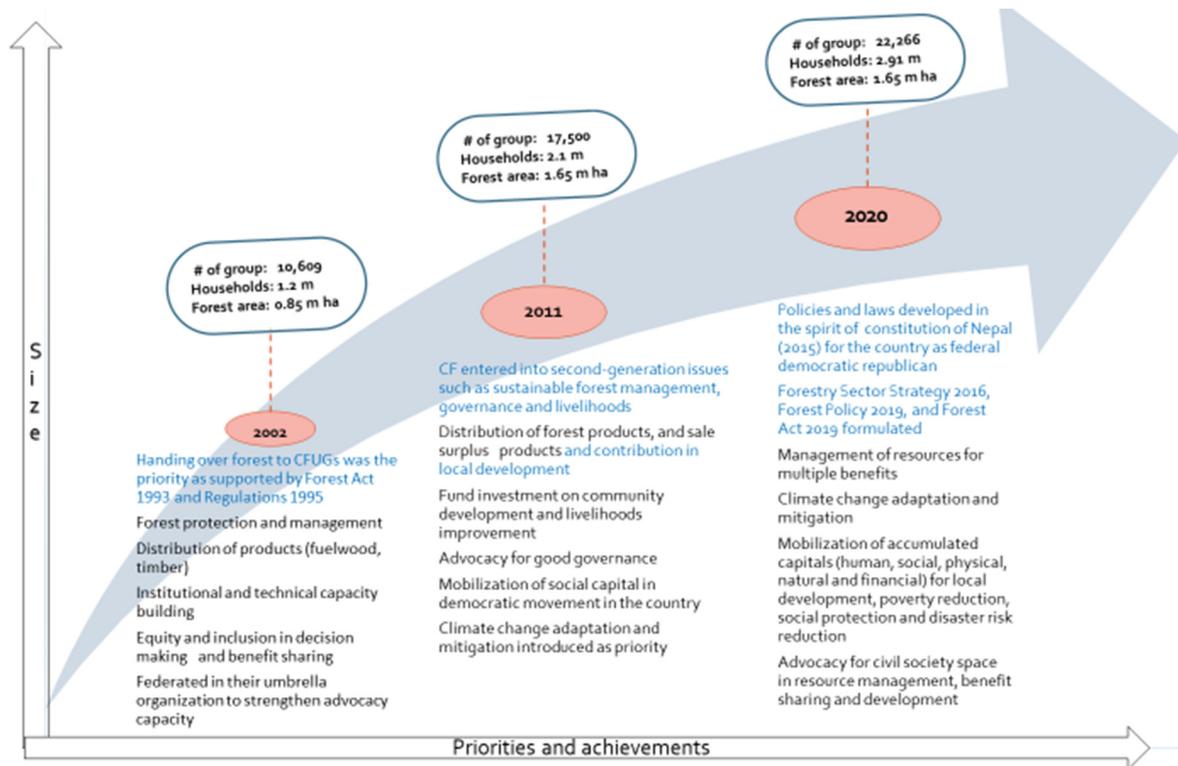


Fig. 1. Trend and magnitude of community forestry in Nepal. (Source: DoF, 2002, 2011 and Pathak, 2020)

The growth of CFUGs demonstrates that the institutional robustness is growing in terms of size, capacity and are achieving maturity to deal with various contemporary issues (Andersson & Agrawal, 2011; Paudyal, Baral, Bhandari, & Keenan, 2018). In the era of climate change and growing disaster there has been huge and growing scholarly interests on the institutional dynamics, shifting priorities and environmental achievements of CFUGs in Nepal (P. Gentle, Thwaites, Race, & Alexander, 2013).

### 3. 2015 earthquake and the role of CFUGs

Two major destructive earthquakes struck Nepal on 25 April and 12 May 2015 where nearly 9000 people lost their lives, another 22,000 were injured, and over a half a million family homes including 1369 office buildings of CFUGs were damaged (GoN, 2015). The total loss or the damage by 2015 earthquake was estimated at 7 billion USD (GoN, 2015). Despite of this loss, CFUGs provided forest products for reconstruction, forest area for temporary shelter and funds for livelihood recovery in many places. In addition, a large number of CFUG members were mobilized in rescue, response and recovery operations.

The earthquakes did not only destroy the houses, infrastructure and economies, but also affect the support systems particularly of the state and development agencies. Most of the NGOs working in rural areas for rescue and support work left immediately and came back only after few months with some reconstruction activities. In this situation, a new solidarity emerged at the community level primarily to build temporary shelters, help each other to provide immediate relief materials and develop support networks locally. In some cases, the earthquakes gave a pause and made them rethink about disaster management as a priority sector. This has contributed a lot in generating new form of solidarity, collective action and the space for new imageries for prosperity and community-based development.

As the Earthquake-2015 became the moment of reviving collective action the CFUGs were instrumental in providing actual material support to the victims as well as a collective place for planning, negotiating and preparing for the potential future disasters of similar nature. The rescue and relief operations were their first intervention immediately after the

earthquakes. Shelter spaces and construction materials were provided to build temporary houses in many rural areas. Access to and supply of timber, fuelwood, fodder, medicinal plants along with CFUGs' funds were increased especially to poor households. As FECOFUN claimed that community forests had a capacity to provide at least 60% of the timber need for post-earthquake reconstruction (Rai, 2016). The earthquakes damaged water catchment areas in many places, and the CFUGs were first to recognize and identify those areas in the communities for prioritized watershed protection initiatives. CFUGs were quick to connect local farming practices with the forest ecosystem to bring back the production that was halted by the earthquakes.

### 4. The 2020 COVID-19 pandemic and CFUGs

The COVID-19 transmission in Nepal started from late January 2020. The GoN announced restriction in travel and mass gathering from late February onward and a complete restriction through country wide lock down introduced on 24 March 2020. Following the closure of employment sectors such as industries, markets, hotel and restaurants, tourism related businesses, many poor and vulnerable people, specifically those working as daily wage labors are suffering most for their survival.

Furthermore, a large number of people (estimated over 1 million only from Kathmandu valley), including daily wage labors, returned back from urban and semi-urban areas to rural areas. Likewise, over a million migrants have returned back to Nepal from India, Middle East and other countries and this trend is still continuing. Consequently, rural areas are suffering from shortage of food and non-food items and with increased threat of COVID-19 transmission. Restriction in transportation has further exacerbated the scarcity of goods and services in rural areas of Nepal.

Following the COVID-19 impacts in Nepal, more than 500 CFUGs immediately mobilized their social, financial and human resources for COVID-19 response with their institutional decisions. According to FECOFUN (2020), as of May 2020, 252 CFUGs invested close to 170,000 USD cash support for covid-19 response including about 10 million USD contribution to the local government's relief fund directly reaching out to

**Table 1**  
COVID-19 Response by FECOFUN led CFUGs from March–May 2020.

SN	Provinces	Cash support to local government's relief fund (USD)	Cash invested for food and non-food items (USD)	Population directly benefited from the response
1	One	18,731	25,786	13,390
2	Two	2236	5126	3400
3	Bagmati	4801	11,200	11,970
4	Gandaki	11,161	21,927	33,650
5	Lumbini	22,031	31,300	68,505
6	Karnali	5500	–	3575
7	Sudur Pashim	5684	3719	8,280
Total (USD)		70,184	99,058	152,770 (30,554 households)

Source: FECOFUN, 2020.

over 152,700 poor and vulnerable people (Table 1). Over 1400 CFUGs offered their office buildings and meeting halls to use as venue for quarantine.

## 5. Effectiveness of CFUGs in disaster

### 5.1. Experiences from Earthquake-15 response

More than 90% of our interviewees claimed that CFUGs were the first institution to mobilize a large number of their members as volunteers (social asset) for immediate relief and rescue to earthquake affected people. 75% of the interviewees reported that the CFUGs in the earthquake affected districts provided office buildings and land for shelter (physical asset) to affected communities, distributed forest products (natural asset) for reconstruction works and for immediate source of energy and livestock feed, mobilized their savings (financial asset) for relief and recovery, and local knowledge and experience (human asset) in identifying local needs targeting the most vulnerable. The FGD participants in Dhading district revealed that the CFUG was the first institution to be able to reach out to the earthquake affected households with food and temporary shelter items.

CFUGs being a community-based organization with major objective of sustainable forest management, they have additional social responsibilities as well. Their involvement in disaster rescue and relief activities are considered more effective and efficient as they are close to the communities and their decision-making procedure is simple and quick. CFUGs leaders can mobilize its members instantly for the wider welfare of the communities in the case of emergencies in comparison to government institutions follow a complex bureaucratic institutional process to make a decision to extend emergency support to the affected people. In most cases, such supports used to be less effective as it reaches too late and provides too little to the vulnerable groups. As an autonomous and self-mobilized institution, CFUGs can make quick decision to initiate action for immediate rescue and relief to disaster affected communities. The scale of CFUGs that includes over 40% of country's population as members distributed in all districts of Nepal is an added advantage for CFUGs to operate in a sizable scale.

### 5.2. COVID-19 response

The institutional set up and the experiences CFUGs gained during the earthquake became valuable contributing factors to prioritize disaster management as one of the activities at the community level. As they were institutionally prepared and well equipped, CFUGs were also quick in responding to the COVID-19 pandemic in Nepal.

CFUGs have a well-established system of undertaking and regularly updating well-being ranking of their members with the objective of equitably distributing its resources to the member households. All the respondents (100%) of the webinar and FGDs utilized this approach as most effective in identifying vulnerable households and distributing relief support on a priority basis in the COVID-19 context. In most cases, government

has not been able to identify poor and marginalized population. As reported by FECOFUN member from Bardiya district, when government and many NGOs were unable to identify most needy households to distribute food items after the COVID-19 lockdown, CFUG facilitated this process to identify poor and most vulnerable households using their well established wellbeing ranking status of member households. Therefore, CFUGs' wellbeing ranking is instrumental for effective distribution of relief package. In addition, democratic process in decision making, transparent and inclusive mechanism in electing an executive committee, fairness and equity in distribution of benefits, were some of the attributes behind effectiveness of CFUGs in addressing natural disaster. The coordination and networking of CFUGs with other stakeholders including local governments also helped them to collaborate their response work with local governments (Table 1).

The demonstrated response in both earthquake and COVID-19 pandemic context has reaffirmed CFUGs as an effective local institution for any disaster events in the future. However, as CFUG chairperson from Kailali district reports despite having strong social and financial capital, CFUGs are with limited skills, knowledge, and experience, and basic equipment required for rescue and post disaster supports. Likewise, a Mayor from western Nepal revealed that many donor funded programs working on disaster risk reduction and climate change adaptation seem comfortable to form their own groups and invest on capacity building for disaster response by providing various training on search and rescue, first aid, firefighting etc. rather than investing on and mobilizing already existing functional community based permanent, resourceful and effective local institutions such as CFUGs. Therefore, CFUGs need capacity building through formal and informal trainings and equipment related to disasters rescue and recovery activities, a proper recognition by the which will eventually help to strengthen CFUG's disaster response capacity (Gilmour, 2016).

Effective management of collective action and existence of strong social capital of CFUG helps them to enhance social cohesiveness and networking to strengthen relationships with other actors operating at local level such as NGOs, local governments and private entities. Similarly, CFUGs are good in mobilizing community with sense of volunteerism, accountability and social responsibility to provide rescue and recovery support to their members. The presence of social capital lowers the cost of collective action, increases self-motivation, and facilitates cooperation.

## 6. Conclusion

Globally, local institutions have demonstrated their vital role in responding to disasters by utilizing indigenous knowledge and mobilizing local resources. Disasters have differential impacts on people depending on pre-existing vulnerabilities and nature of disaster preparedness. It is clear that disaster preparedness plans and responses should be equipped with readiness of appropriate institutions, resources and mandates. As we have shown in the paper, community level institutions such as CFUGs are more effective and appropriate to address disasters at the local level because of their presence in the disaster-prone locations, their experience in managing commons, and their practices of collective actions and culture of community self-help during emergencies. CFUGs in Nepal have well demonstrated their willingness, commitment and effectiveness to respond to the Earthquake-15 and COVID-19 by mobilizing their social assets and experiences. The study identified major attributes required for local institutions to be effective in disaster preparedness and response as their trusted social capital (trust, connectedness, norms and network) for collective action together with its scope, mandate and established approaches (such as voluntarism and wellbeing ranking), to democratically manage and mobilize its assets, to make instant decisions and extend rescue and recovery support to the affected ones. CFUGs' demonstrated effectiveness in responding disasters can be attributed to: (1) the well-established policies, governance systems and mechanisms; (2) their familiarity with local context; and (3) their ability to properly target the most vulnerable groups by applying well-established well-being ranking of households. However, as many studies revealed, the decision making of CFUGs in Nepal is mostly captured by local elites as a result the participation of women, poor and marginalized in

decision making and benefit sharing is jeopardized. Likewise, there is a need to critically review internal governance of CFUGs to make sure the compliance of basic governance indicators such as transparency, participation and accountability are in operation. Despite local institutions' tremendous roles in responding to disasters at the fore front globally, there is also a need that the Government properly recognizes their contributions, strengths, and share their experiences and learning widely and create environment for close collaboration. Working together will ensure synergy and increase effectiveness of both CFUGs and government institutions in disaster preparedness, rescue operation, and post disaster recovery for resilience.

### CRedit authorship contribution statement

Conceptualization; Popular Gentle.  
 Data curation; Popular Gentle, Dinesh Paudel, Tara Kumari Kanel, Bharati Pathak.  
 Formal analysis; Popular Gentle, Tek N. Maraseni, Dinesh Paudel, Ganga R Dahal.  
 Funding acquisition; N/A.  
 Investigation; Popular Gentle, Dinesh Paudel, Tara Kumari Kanel, Bharati Pathak.  
 Methodology; Popular Gentle, Tek N. Maraseni, Dinesh Paudel, Ganga R Dahal.  
 Project administration; Popular Gentle.  
 Roles/Writing – original draft; Popular Gentle, Tek N Maraseni, Tara Kumari Kanel, Bharati Pathak.  
 Review & editing; Popular Gentle, Tek N Maraseni, Dinesh Paudel, Ganga R Dahal Tara Kumari Kanel, Bharati Pathak.

### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### References

Acharya, K. P., & Gentle, P. (2006). Improving the effectiveness of collective action: Sharing experiences from community forestry in Nepal. *CAPRI working paper*, 54. <https://doi.org/10.22004/ag.econ.42493>.

Adger, W. N. (2003). Social capital, collective action and adaptation to climate change. *Economic Geography*, 79(4), 387–404.

Adhikari, B. (2009). Reduced emissions from deforestation and degradation: some issues and considerations. *Journal of Forest and Livelihood*, 8(1), 14–24.

Agrawal, A., & Mearns, R. N. (2010). Local institutions and adaptation to climate change. *Social dimensions of climate change: Equity and vulnerability in a warming world*. A. Washington: The World Bank.

Allen, K. M. (2006). Community-based disaster preparedness and climate adaptation. *Disasters*, 30(1), 81–101.

Andersson, K., & Agrawal, A. (2011). Inequalities, institutions, and forest commons. *Global Environmental Change*, 21, 866–875.

Department of Forests (DoF) (2002). *CFUG database, 2002*. Kathmandu: Government of Nepal.

Department of Forests (DoF) (2011). *CFUG database, September 2011*. Kathmandu: Government of Nepal.

FAO (2020). The vital role of forest and farm producer organizations (FFPOs) in COVID-19 responses and plans to build back better. Forest and Farm Facility <http://www.fao.org/forestry/49503-05c07ce4577829f0336d313e93de757f2.pdf>.

Gentle, P., & Maraseni, T. N. (2012). Climate change, poverty and livelihoods: Adaptation practices by rural mountain communities in Nepal. *Environmental Science and Policy*, 21(2012), 24–34.

Gentle, P., & Thwaites, R. (2017). Community forestry and pro-poor climate change adaptation: A case study in Nepal. *Community forestry in Nepal: Adapting to a changing world*. Routledge: Taylor and Francis Group ISBN 9781138214620 - CAT# Y290871.

Gentle, P., Thwaites, R., Race, D., & Alexander, K. (2013). *A reflection on the role of community forest user groups to enable vulnerable communities to adapt to climate change in Nepal*. Japan: 14th global conference of the International Association for the Study of the commons (IASC), 3-7 June.

Gilmour, D. (2016). *Forty years of community based forestry*. FAO Publications.

Government of Nepal (GoN) (2010). *National Adaptation Programme of Action (NAPA)*. Kathmandu, Nepal: Ministry of Environment, Government of Nepal.

Government of Nepal (GoN) (2015). *Post disaster need assessment*. Government of Nepal: National Planning Commission.

Klein, J. A., Tucker, C. M., Steger, C. E., Nolin, A., Reid, R., Hopping, K. A., ... Yager, K. (2019). An integrated community and ecosystem-based approach to disaster risk reduction in mountain systems. *Environmental Science and Policy*, 94(2019), 143–152. <https://doi.org/10.1016/j.envsci.2018.12.034>.

Levac, J., Toal-Sullivan, D., & O'Sullivan, T. L. (2012). Household emergency preparedness: A literature review. *Journal of Community Health*, 37, 725–733. <https://doi.org/10.1007/s10900-011-9488-x>.

Lim, B., Spanger-Siegfried, E., Burton, I., Malone, E. L., & Huq, S. (2005). *Adaptation policy frameworks for climate change: Developing strategies, policies and measures*. Cambridge: Cambridge University Press, UK.

Maraseni, T. N., Bhattarai, N., Karky, B. S., Cadman, T., Timalinsa, N., Bhandari, T. S., ... Poudel, M. (2019). An assessment of governance quality for community-based forest management systems in Asia: Prioritisation of governance indicators at various scales. *Land Use Policy*, 81, 750–761.

Maraseni, T. N., Cockfield, G., & Apan, A. (2005). Community based forest management systems in developing countries and eligibility for clean development mechanism. *Journal of Forest and Livelihood*, 4(2), 31–42.

Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F., & Pfefferbaum, R. L. (2008). Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness. *American Journal of Community Psychology*, 41, 127–150.

Ojha, H. R. (2014). Beyond the 'local community': The evolution of multi-scale politics in Nepal's community forestry regimes. *International Forestry Review*, 16, 339–353.

Ostrom, E. (1990). *Governing the commons*. Cambridge: New York.

Pathak, B., 2020. Achievements of 25 years of community forestry. *Langtangnews.com*. 01 June 2020. [http://www.langtangnews.com/समुदायिक-वनको-२५-वर्षे-उ/?fbclid=IwAR014emHTtc39mclTY-4SLsmEOepQz2prUhJiCxCNz9xWL7du6\\_Z3\\_CGLg0#.XtpgTjkZZ6c.facebookbook](http://www.langtangnews.com/समुदायिक-वनको-२५-वर्षे-उ/?fbclid=IwAR014emHTtc39mclTY-4SLsmEOepQz2prUhJiCxCNz9xWL7du6_Z3_CGLg0#.XtpgTjkZZ6c.facebookbook).

Paudel, D., Khatri, D. B., & Paudel, G. (2010). Corpo-bureaucratizing community forestry: Commercialization and the increased financial transaction in community forestry user groups in Nepal. *Journal of Forest and Livelihood*, 9(1), 1–15.

Paudel, D., & Reck, G. (2016). *Brewing disaster in post-earthquake Nepal*. Anthropology News <http://www.anthropologynews.org/index.php/2016/09/27/brewingdisasterinpostearthquakenepal/>.

Paudyal, K., Baral, H., Bhandari, S. P., & Keenan, R. J. (2018). Design considerations in supporting payments for ecosystem services from community-managed forests in Nepal. *Ecosystem Services*, 30, 61–72.

Poudyal, B. H., Maraseni, T. N., & Cockfield, G. (2020). Recognition of historical contribution of indigenous peoples and local communities through benefit sharing plans (BSPs) in REDD+. *Environmental Science and Policy*, 106, 111–114.

Rai, O.A., 2016. Seeing both forest and trees: Gains in community forestry have come in handy during post-earthquake reconstruction. *Nepali Times*. March 2016, (No. 799).

Rana, E., Thwaites, R., & Luck, G. (2017). Trade-offs and synergies between carbon, forest diversity and forest products in Nepal community forests. *Environmental Conservation*, 44(1), 5–13.

Regmi, B., Star, C., & Filho, W. L. (2016). An overview of the opportunities and challenges of promoting climate change adaptation at the local level: A case study from a community adaptation planning in Nepal. *Climatic Change*, 138, 3–4.

Saito, N. (2012). Mainstreaming climate change adaptation in least developed countries in south and Southeast Asia. *Mitigation and Adaptation Strategies for Global Climate Change*, 18, 825–849.

Sakib, N. H., Rahman, M. S. 2020. Local solutions for local COVID-19 problems: Community activism in Bangladesh. LSE South Asia Centre. Available at <https://blogs.lse.ac.uk/southasia/2020/05/20/local-solutions-for-local-covid-19-problems-community-activism-in-bangladesh/> 20 May 2020.

Shah, A. A., Shaw, R., Ye, J., Abidd, M., Amire, S. M., Pervez, A. K. M. K, Naz, S., 2019. Current capacities, preparedness and needs of local institutions in dealing with disaster risk reduction in Khyber Pakhtunkhwa, Pakistan. *International Journal of Disaster Risk Reduction* 34, 165–172.

Shaw, R., & Goda, K. (2004). From disaster to sustainable civil society: The Kobe experience. *Disasters*, 28(1), 16–40.

Singh, D. R., Sunuwar, D. R., Adhikari, B., Szabo, S., & Padmadas, S. S. (2020). The perils of COVID-19 in Nepal: Implications for population health and nutritional status. *Journal of Global Health*, 10(1). <https://doi.org/10.7189/jogh.10.010378>.

Tharoor, S. (2020). The Kerala model. Project syndicate: The world's opinion page. Available at <https://www.project-syndicate.org/commentary/kerala-model-for-beating-covid-19-by-shashi-tharoor-2020-05>.

United Nations (2008). *Effective response guidance and Indicator package for implementing priority five of the Hyogo framework*. (New York and Geneva).

United Nations International Strategy for Disaster Reduction (UNISDR) (2015). *The economic and human impact of disasters in the last 10 years*. Geneva, Switzerland: UNISDR <http://www.unisdr.org/files/42862economichumanimpact20052014unisdr.pdf>.

Woo, E. (2020). COVID-19 and Chinese civil society's response. Stanford social innovation review: Informing and inspiring leader of social change. Available at [https://ssir.org/articles/entry/covid\\_19\\_and\\_chinese\\_civil\\_societys\\_response](https://ssir.org/articles/entry/covid_19_and_chinese_civil_societys_response).