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RESEARCH ARTICLE

Dropping out of environmental governance: Why Nepal's community-based forestry program is losing participants

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Nepal's community forestry program is widely regarded as successful. At its peak, the program enlisted a large share of the rural population as managers of the country's communal forests. However, recent empirical evidence suggests that voluntary participation in the program is in decline. Analyzing the empirical literature, we describe this surprising pattern of decline and discuss potential negative impacts. We also use political-economic reasoning and extant evidence to theorize about the drivers of this decline, arguing that livelihood diversification and profitable out-migration have altered the forest–people relationship in many villages, weakening incentives for participation in community forestry. Finally, we assess the viability of several institutional options for either replacing the program with other management approaches or reforming it to boost incentives for participation in light of the noted socioeconomic changes in rural Nepal. We argue that well-designed payment schemes or reforms that enable local people to commercialize community forests could both support participation by enhancing the associated benefits, and institutional changes related to local meetings and labor requirements could do so by reducing the associated costs. The replacement of community-based approaches with top-down management or privatization, however, appears risky due to a potential lack of government capacity and the possibility that such institutional changes could damage livelihoods or create negative externalities for some households. The consolidation of community forests also presents governance and management challenges. Our analysis suggests the need for greater scholarly attention to how environmental policy tools withstand social and economic change and to environmental policy succession—or how environmental policies are reimagined when they are no longer an appropriate fit for the local context.

Keywords: Forestry, Development, Participation, Community-based natural resource management, Nepal

1. Introduction

Nepal's community forestry program is widely regarded as a success story. In the early 1990s, the Government of Nepal gave rural communities across the country management authority and collective use rights over forests. The preceding decades had been characterized by a sense of alarm over Nepal's forests among many researchers and policy actors. The World Bank projected that forests in the heavily forested Middle Hill Region of Nepal would be completely lost by 1995 (Gilmour, 1988). Given the high reliance on forest products, such as firewood, small timber, grazing, and fodder for rural livelihoods, this outcome would have had severe economic implications for the rural poor. The government's perceived failure at preventing widespread deforestation and forest degradation in rural areas over the preceding decades, coupled with the growing popularity of decentralized, community-based development strategies among donors and governments at the time, encouraged this dramatic shift toward community-based forest management in Nepal (Ministry of Forests and Soil Conservation [MFSC], 2013). Central to this community-based model was the establishment of more than 23,000 local community forest user groups (CFUGs) to govern more than 24 million hectares of collectively held forests, which some estimates suggest have enrolled roughly half of the rural population as participants (Pandey and Pokhrel, 2021; Ministry of Forests and Environment [MoFE], 2025). These participants contribute their time and effort voluntarily to activities such as tree planting, forest monitoring and patrolling, and fire mitigation, fulfilling many of the forest management roles that government foresters perform in centralized,

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government-led forest management arrangements (Cook et al., 2023; Cook, 2024; Benedum et al., 2025). Given the popularity of top-down protected area models of environmental protection at the time (Kashan et al., 2021), Nepal's ambitious program was also highly progressive.

Community forestry is intended to curtail forest degradation and promote reforestation while promoting forest-based livelihood opportunities for the rural poor. In other words, it has both environmental and socioeconomic aims. There is considerable evidence that Nepal's community forestry program has been successful with respect to these goals. Media reports attribute dramatic reforestation since the early 1990s to the community forestry program (Singh and Sharma, 2022), and rigorous impact evaluation research suggests that the program had a substantial, positive causal effect on forest cover, biodiversity, and carbon storage during that period (Luintel et al., 2018; Oldekop et al., 2019). The socioeconomic effects of community forestry appear positive as well. The importance of community forestry for meeting the subsistence needs of the rural population grew dramatically in the first 2 decades of the program, with the share of the population who reported using fuelwood from community forests quadrupling between 1996 and 2011, in addition to the other forest products and livelihood opportunities provided to members (Central Bureau of Statistics, 1996; Gautam et al., 2004; Central Bureau of Statistics, 2011). Furthermore, CFUGs raise funds that local communities can use to fund public goods or provide assistance to the rural poor (Pokharel et al., 2007; MFSC, 2013; Cook, 2024; Benedum et al., 2025). Evaluation research attributes modest but notable poverty-alleviating effects to the program (Oldekop et al., 2019), though a number of studies argue that these positive socioeconomic effects fail to reach some rural forest users (Malla et al., 2003; Parajuli et al., 2015; Basnyat, 2020).

Despite the dramatic growth of the program, its apparent success as a forest conservation policy over the past 3 decades, and the potential for community forestry to fund local development and poverty alleviation, recent observations suggest that participation in the program is declining sharply, particularly in the Middle Hill Region where community forestry once flourished. This is reported in a number of recent empirical studies showing that rural households are increasingly opting out of participation in CFUGs (e.g., Poudel, 2019; Shahi et al., 2022; Poudyal et al., 2023). Why is such an apparently successful program in decline? In this article, we will identify the social and economic drivers of this puzzling decline and highlight implications for forestry-sector policy within and beyond Nepal.

Through this case, we explore a neglected theme in the study of environmental policy instruments. The literature on environmental policy instruments—including those based on community-based resource management—has prioritized the estimation of their causal impacts on environmental and social outcomes (Miteva et al., 2012; Adhikari and Agrawal, 2013; Samii et al., 2014; Jayachandran et al., 2017; Luintel et al., 2017, 2018; Oldekop et al., 2019; Ribas et al., 2020; Loveridge et al., 2021; Hajjar et al., 2021b; Palfrey et al., 2021). However, scholars have paid comparatively less attention to how environmental policy tools withstand social and economic change, and even less attention to environmental policy succession (Hogwood and Peters, 1982)—or how environmental policies are reimagined when they are no longer an appropriate fit for the local context. While the previous literature on environmental policy instruments has generated invaluable insights regarding the positive, negative, and heterogenous impacts of various environmental policy tools, the literature to date tells us too little about the potential for programs to stand the test of time.

The case of Nepalese community forestry—introduced in greater detail in Section 2—demonstrates these points. Our analysis of patterns and drivers of declining participation in Nepalese community forestry—presented in Section 3 and based on a review of the extant empirical literature from Nepal and informed by our own field experience—suggests that even successful participatory policies can decline in the face of social and economic change. Our analysis also suggests that such declines can jeopardize past gains made by well-designed environmental policies or at least impede future gains. However, the insights we generate from this surprising case of a successful program in decline also point to potential program reforms to remedy the decline, as we show in Section 4. As we also show in Section 5, the changing nature of participation in Nepal's program provides crucial lessons for other countries, since many low- and middle-income countries rely on community-based management models for natural resources. More generally, our analysis in this article suggests an approach for assessing the viability of environmental policies in the face of social change—an approach which we call *environmental policy reevaluation*, as discussed in Section 5.

2. Forest governance and community participation in Nepal

See **Figure 1** for an overview of the development of forestry-sector policy and the evolution of the community forestry program in Nepal.

Historically, forests in Nepal were either managed by traditional community institutions or controlled by a few feudal landowners. In 1942, the Forestry Department was established with the aim to improve protection, management, and utilization of Nepal's forests (Kanel and Acharya, 2008). The shift in the political system from the oligarchic Rana regime to multiparty democracy in the early 1950s led to a notable change in Nepal's forestry-sector policy, with the Private Forest Nationalization Act of 1957 transferring forests from feudal landowners and community institutions to state control. To exert control over forest resources, the state strengthened the Forest Department, thereby depriving rural communities of customary rights to use forests (Kanel and Acharya, 2008; Ojha et al., 2009; Paudel et al., 2022).

The growing mistrust between the state and rural people led to widespread deforestation and forest

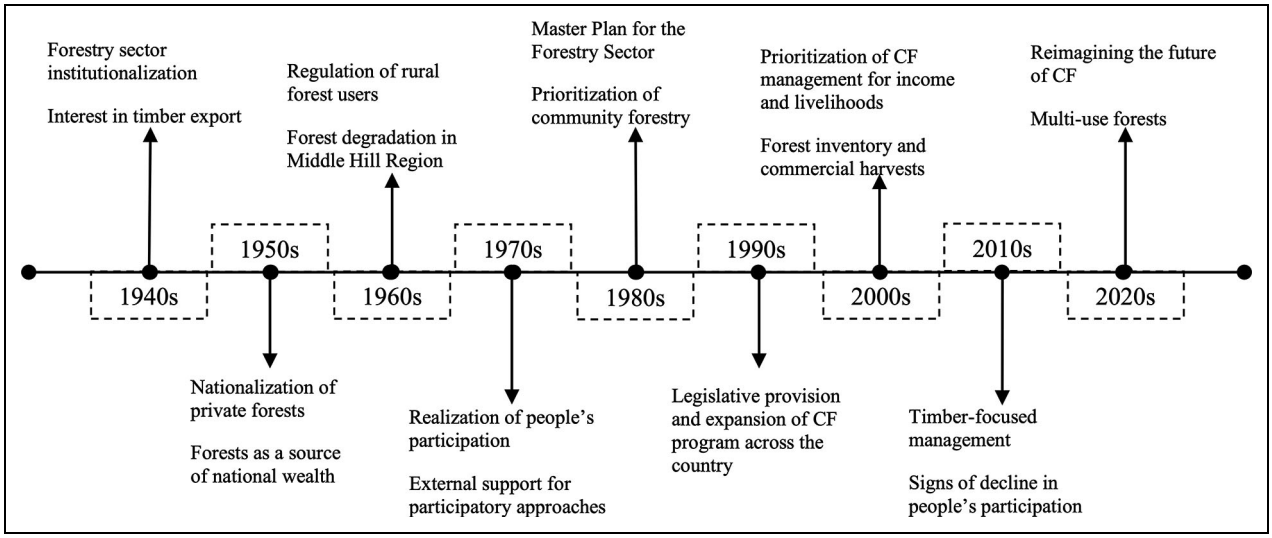

Figure 1. Timeline of forestry-sector policy development and community forestry evolution in Nepal.

degradation (Arnold and Campbell, 1986). However, the popular narrative held that unabated population growth had led to a fuelwood crisis, which had in turn resulted in massive deforestation and soil loss (Blaikie and Brookfield, 1987). The so-called "Himalayan Degradation" discourse (Eckholm, 1978) identified this deforestation as the cause of downstream flooding and siltation. Such global concerns captured the attention of the international community and pressured the central government to reform its forest management policies. The National Forestry Conference convened in 1975 and the first National Forest Plan in 1976 paved the way for government-community partnerships in forest management (Kanel and Acharya, 2008). Similarly, the Forest Act of 1961 was amended and also expanded to Panchayat Forests and Panchayat Protected Forests in 1978. These incremental reforms aimed to transfer some authorities to protect and regulate forest access to the Panchayat—the village council—for protection and to regulate the extraction of forest products for local uses (Ranjit, 2019). The Decentralization Act of 1982 and Decentralization Rules of 1984 officially recognized and incorporated local communities into development activities through community user groups (Kanel and Acharya, 2008). The Master Plan for Forestry Sector (His Majesty's Government of Nepal, 1989) endorsed the user group-based model, identified community forestry as a priority program, and recognized local communities as the stewards of Nepal's forests.

Since then, the community forestry program has been implemented widely. The Forest Act of 2019 (originally enacted in 1993) provided the legislative framework for community forestry and recognized CFUGs as self-governing, autonomous institutions responsible for managing, using, and selling surplus forest products (Kanel and Kandel, 2004). CFUGs are registered in the Divisional Forest Office (formerly known as the District Forest Office), a local unit of forest bureaucracy (Cook et al., 2025). The CFUG membership is comprised of local forest users, with membership defined at the household level (Cook, 2024). The CFUG functions according to its own constitution and management plan known as the Operational Plan. The key rules in the constitution and management provisions in the Operational Plan are formulated by the CFUG's membership in collaboration with government foresters from the Divisional Forest Office to ensure compliance with national forestry act and regulations, and CFUGs are expected to update their constitutions and Operational Plans on a regular basis in collaboration with government foresters (Cook et al., 2023; Cook, 2024; Cook et al., 2025).

Previous research outlines the cost–benefit structure facing CFUG participants (Cook, et al., 2023; Cook, 2024; Benedum et al., 2025). Through CFUGs, the community forestry program provides rural people with the rights to manage and use local community forests, and this tenure arrangement has historically helped motivate them to participate in afforestation programs, as outlined in previous research. CFUG members also actively participate in making forest governance decisions in a CFUG general assembly held 1–2 times per year. In return, members receive timber, fuelwood, fodder, and other major products, which help to meet rural households' basic needs. Participation in the CFUG is highly institutionalized through its constitution, which has provisioned mechanisms for participation, decision-making, and benefit-sharing. Furthermore, various policy provisions adopted since the 1990s have sought to strengthen the inclusion of women, the poor, and marginalized ethnic and caste groups in the CFUG (Cook et al., 2023; Cook, 2024). As a result, CFUGs have been recognized as some of Nepal's most democratic and inclusive institutions, not only in the forestry sector but also in rural development more broadly (Pokharel et al., 2007).

The community forestry program was implemented widely in the Middle Hill Region and Mountain Region during the early years. Around the year 2000, community forestry was expanded to the resource-rich Tarai Region and the Churia Range (a mountainous formation stretching along the Tarai Region). Implementation of community forestry in these regions led to more commercialization of forest resources, with many CFUGs involved

in the harvesting and sale of timber. This means that the expansion of community forestry into the Tarai Region marked a significant departure in terms of commercialization and scientific framing (Khatri et al., 2022).

3. Declining participation: Patterns, drivers, and implications

3.1. Patterns of declining participation

A number of empirical studies, mostly from the past 6 years, suggest that community forest use is in decline. One case study reported that users who had visited community forests 5 times per week in previous years reported visiting the forest only once per week at the time of data collection (Poudel, 2019). Another case study reported more than an 85% reduction in resources collected from community forests (Poudyal et al., 2023). Additionally, case study research has shown that most households who still use resources collected from forests source them primarily from privately owned forests and idle farmland (Poudyal et al., 2023; Poudel et al., 2024). Survey evidence corroborates this general story. In the most recent wave of the Nepal Living Standards Survey, the proportion of the population who reported collecting firewood from community forests was more than one-third lower than in the previous wave of the survey nearly 1 decade prior (Central Bureau of Statistics, 2011, 2024).

This decline in community forest use is mirrored by a decline in community forestry participation. Respondents in a recent survey of 600 households in communities east of Kathmandu showed declines in the amount of time spent on key forest management activities such as cleaning, thinning, and protecting forests from fire (Bardsley et al., 2024). Additionally, various case studies across Nepal have reported that the number of CFUG meetings has substantially declined in the Middle Hill Region and Mountain Region, many CFUGs' Operational Plans have not been renewed for several years, and local people are not spending as much time on local forest governance and management (Fox, 2018; KC and Race, 2020; Poudyal et al., 2023; Poudel et al., 2024). While many CFUGs fine members for missing meetings or under-contributing to forest management, many users would apparently rather pay these fines than spend time on these activities (Poudyal et al., 2023). These trends mirror national trends revealed by the limited quantitative data collected from a census of CFUGs by the central government, with the number of households holding memberships in CFUGs and individuals serving on CFUG executive committees apparently declining on a national scale, according to one analysis (Pandey and Pokhrel, 2021).

Overall, the declining use of community forests and participation in Nepal's community forestry program is noted widely in empirical research from the past 6 years (Poudel, 2019; KC and Race, 2020; Chhetri et al., 2021; Pandey and Pokhrel., 2021; Shahi et al., 2022; Poudyal et al., 2023; Bardsley et al., 2024; Laudari et al., 2024). The phenomenon of declining community forestry participation is also widely discussed in policy discourses in Nepal. For instance, we observed that some of the key concerns raised by keynote speakers, presenters, and participants in the International Conference on Community Forestry in Nepal in March 2024 were the decline of participation in community forest management, the weakening of community forestry institutions, and a perceived need to revitalize forest governance.

3.2. Drivers of the decline: Migration, livelihood diversification, and changes in land use

In this section, we draw upon case study evidence to analyze the drivers of the decline in community forestry participation. The extant research suggests that several social and economic factors such as out-migration from rural areas, livelihood diversification, and decreasing reliance on small-scale agriculture have contributed to a rural labor shortage in forest management and changed the incentives around community forestry participation.

Changing patterns of out-migration from rural areas are the key drivers of the decline in participation (Benedum et al., 2025). This out-migration—which typically involves sending a family member outside of the community (domestically or internationally) for cash income and less often entails permanently relocating the household—has always been driven to a large extent by strategic economic considerations, especially for rural households for whom the income from farming is insufficient to meet basic needs such as food, education, health, and festivals (Benedum et al., 2025). Before 1990, India was the destination country for most international out-migration. This out-migration to India was typically temporary, with migrants returning home to support families during the main cultivation and harvest times. This meant there was a strategic balance between small-scale agriculture and migration in the past, wherein the former did not necessarily disrupt the latter. However, the share of adult migrants migrating to India decreased from 80% in 2000 to 41% in 2009 (Sharma, 2013). After the 1990s, and especially after the 2000s, Nepali youths started migrating especially to the Middle East and East Asian countries due to neoliberal policies in Nepal that created an enabling environment for out-migration, along with a growing demand for unskilled and semiskilled labor in the Middle East and East Asian countries (Seddon et al., 2002; Sijapati and Limbu, 2012; Ojha et al., 2017; Sugden et al., 2018; Sugden et al., 2022).

Technically, the migration of a household member to the Middle East or an East Asian country is also a temporary practice for most migrants, but due to legal hurdles and substantial travel costs, many migrants stay abroad for at least 2 years. Consequently, the growth of this style of out-migration has contributed to a labor shortage in small-scale agriculture. Now, more than 50% of youths and adults have out-migrated, and these individuals are typically not very involved with agriculture, even when they return home (KC and Race, 2020).

The dramatic rise of out-migration has not only resulted in fewer household members residing in the rural areas but has also caused an influx of money sent home by household members who have out-migrated (Benedum et al., 2025). According to the Nepal Living Standard

Survey (Central Bureau of Statistics, 2024), about 77% of Nepalese households now receive such remittances, compared to about 24% of households in the mid-1990s. Although this remittance income can be extremely helpful for the rural poor, it contributes to the labor shortage noted above (Maharjan et al., 2020). With so many rural households receiving remittance income, some localities in rural Nepal have become "remittance villages" where most households disengage from small-scale agriculture because they are supported by remittances (Sunam et al., 2021). Even in villages where these trends are not as pronounced, many agricultural households who previously cropped two to three seasons per year are now cropping only one season, driven in part by widespread disinterest in agriculture among youth. Many youth consider agriculture a "dirty job" and regard out-migration as a much more lucrative livelihood option.

Out-migration and remittances have likely contributed to other changes in the rural socioeconomic context. The flow of remittance income encourages other livelihood diversification choices for household members left behind, since capital from remittances can enable households to start businesses or pursue other off-farm or nonfarm livelihoods (Marquardt et al., 2016; Poudel, 2019; Benedum et al., 2025). Remittance income also helps to finance the growing trend of rural to urban migration with the aim of educating children in private schools, which increases the likelihood that those children will eventually pursue nonagricultural livelihood strategies. The shortage of farm labor due to continuous out-migration reinforced by remittance income increases agricultural land abandonment. Several studies have found that the trend of land abandonment and keeping agricultural land fallow is increasing due to these factors (Ojha et al., 2017; Khanal, 2018; KC and Race, 2020). Furthermore, in Nepal, lands are inherited among sons and daughters in each generation, resulting in decreased landholdings with each generation and a potential concomitant decline in food production by smallholders due to these traditional inheritance practices (Fox, 2018; Rigg, 2020; Poudel et al., 2024). This further pushes households out of agriculture and toward migration as a livelihood strategy. The trend of shifting from agriculture to nonagricultural livelihoods has increased rapidly over the past 15 years (Shahi et al., 2022).

So far, we have presented a model of social and economic change in rural Nepal in recent decades—a model characterized by dramatic out-migration, an influx of remittance income, agricultural land abandonment, and livelihood diversification. How do these various changes help to explain the decline in community forestry participation? There are at least two theoretical links. First, since out-migration from rural areas has created a labor shortage in the agricultural sector, it has likely reduced the amount of labor available for community forestry participation as well (Benedum et al., 2025). The amount of time and effort that CFUG member households are expected to contribute to CFUG meetings, forest management activities, serving in leadership roles, and other work is not trivial (Rai et al., 2016; Cook, 2024; Benedum et al., 2025). With fewer household-members residing in many villages, there are fewer people available to participate in these activities (Benedum et al., 2025).

Second, the various social changes described above diminish the uses of community forests and hence the incentives associated with community forestry participation for household-members who remain in the village. In general, these incentives are driven to a large extent by the excludable or semi-excludable benefits associated with participation, by how potential participants value those benefits, and by the costs of participation (Cook, 2024; Benedum et al., 2025). Historically, most of the benefits have been fairly small, such as the right to collect subsistence forest products from the community forest (such as firewood, fodder and dry leaf litter for livestock, small timber, and building materials) or the opportunity for employment in the CFUG (as a forest guard, for example) (MFSC, 2013; Cook, 2024; Benedum et al., 2025). These benefits can be attractive for some households, especially the poorest. However, as households raise their incomes through out-migration and livelihood diversification, the opportunity costs associated with participation increase as a result, meaning that these small-scale benefits are less and less likely to outweigh the time and effort required to participate (Benedum et al., 2025).

Relatedly, the various social changes noted above likely reduce households' reliance on subsistence forest products collected from the community forest. Wealthier households are better able to afford to purchase firewood and building materials from markets or switch to attractive alternatives such as gas cylinders for cooking (Benedum et al., 2025). Reliance on other community forest products is also tightly linked to agricultural livelihood strategies. Fodder and leaf litter for cattle have historically been two of the most common products collected by CFUG members, and households have less need for these products as they diversify away from agriculture, since those households are less likely to raise large-sized livestock such as cows, oxen, and buffalo (Marquardt et al., 2016; Poudel, 2019). As households leave agricultural lands fallow, they are more likely to find different forest products growing on their own private land, which means they are less reliant on community forest products (Benedum et al., 2025).

Thus, not only do the social and economic changes noted above mean that there are fewer individuals available in the village to contribute to community forestry, but these changes diminish the incentives associated with that participation. This theorized process is corroborated by recent empirical observations associating out-migration and livelihood diversification with reduced dependency on forests and less voluntary participation in community forestry (Fox, 2018; KC and Race, 2020; Chhetri et al., 2021; Shahi et al., 2022; Poudyal et al., 2023; Benedum et al., 2025).

3.3. Implications of declining participation

It may be tempting to assume that declining community forestry participation does not matter much for forest conservation and management. After all, the key drivers

of the decline in participation—out-migration from rural communities, livelihood diversification in smallholder agricultural systems, and raised incomes—discourage participation primarily because they *reduce reliance* on forests. By extension, one might assume that villages experiencing a decline in participation should experience simultaneous improvements in forest conditions owing to this reduced forest reliance, especially since previous research suggests that out-migration and the related shifts in agricultural practices are associated with local-level improvements in forest conditions in Nepal (Oldekop et al., 2018).

Such an assumption views community forest users as agents who primarily *extract* resource units from the forest, and views community forestry primarily through the lens of regulating that extraction. In reality, community forestry participants are involved in *managing* forests and help to provide a broad range of services, and community forestry is a vehicle to harness users' collective efforts toward providing those services—many of which remain important even if local people are less reliant on subsistence forest products (Laudari et al., 2024; Benedum et al., 2025). The apparent decline in community forestry participation, therefore, has concerning implications for forest-based ecosystem services, rural economies, and the future of local governance in Nepal.

For example, many CFUGs play a key role in mitigating forest fire risk through thinning and other fire mitigation activities, some of which forest-dependent participants undertake voluntarily because they are able to collect fuelwood during forest thinning efforts (Poudyal et al., 2023; Laudari et al., 2024). It is not yet clear how those activities will be sustained if participation and forest dependence decline further. Recent studies find that Nepal experiences more than 3,000 forest fire events annually, which has a negative impact on forests and biodiversity conservation (Bhujel et al., 2022; Dahal et al., 2025). Declines in forest use and associated increases in fuel storage, along with the rural population's waning availability and motivation to participate in forest fire management, are argued to be the factors behind increased forest fire incidents. Declining rainfall during winter and pre-monsoon seasons is also believed to play a role (Dahal et al., 2025). Importantly, previous research suggests that CFUG-led fire mitigation activities seem to be much more likely among CFUGs with strong norms of collective action and participation (Sapkota et al., 2015). Increased forest fire risk is therefore one potential impact of declining community forestry participation (Laudari et al., 2024), as has been reported recently in some localities in Nepal (Poudyal et al., 2023).

Similarly, some CFUGs have historically played a role in controlling invasive plant species through voluntary collective efforts. One study of CFUGs in the highly biodiverse Chitwan-Annapurna Landscape found that while CFUGs in the study area did not include invasive species management in their Operational Plans, half of focus group participants reported investing their efforts in invasive species management activities such as the manual uprooting of invasive plants, often during their routine day-to-day use of the community forest (Shrestha et al., 2019). Other research credits some level of "human disturbances" in Nepalese forests with certain biodiversity benefits. Specifically, plant species biodiversity appears highest in forests with a moderate level of human disturbance, prompting some scientists to recommend "prescribed forest utilization systems," such as those promoted under community forestry, as a strategy to promote biodiversity and ecological functionality (Shrestha et al., 2013; McGunnigle et al., 2025).

Finally, there is some evidence associating declining community forestry participation with growing human–wildlife conflict. Forest-dwelling animals such as monkeys and boars can damage crops and harm domestic animals, and some recent research suggests that such instances are growing more frequent due to the decline in participation. This is because overgrown, neglected forests provide shelter for such wildlife, and because human activity in community forests has previously played a role in keeping animals away from some habitations (Khatri et al., 2024).

Thus, there is empirical literature suggesting that community forestry contributes to an array of ecosystem service benefits such as biodiversity promotion, fire risk mitigation, and invasive species management, and that the decline of community forestry threatens the provision of these ecosystem services in some localities. However, the management of community forests in Nepal has been shaped by dominant forestry science through an expert-led process of defining forest management objectives and management interventions. Those interventions have either focused on improving tree cover through afforestation (tree planting) or carrying out silviculture activities to promote marketable timber (Nightingale, 2005; Khatri et al., 2022). Furthermore, the forestry-sector bureaucracy has used its technical expertise to assert control over forest management and commercial extraction, which has limited forest-dependent populations in their ability to influence decisions and derive local subsistence benefits (Nightingale, 2005; Khatri et al., 2022). Such technical and bureaucratic processes have important implications for the decline in participation in maintaining forest services (Khatri et al., 2022; Poudyal et al., 2023). Our ongoing research shows that such declines in management interventions in the forest have led to forests becoming denser, which causes declines in certain ecosystem services such as availability of fodder for local farming households and declines in availability of certain non-timber forest products such as wintergreen (*Gaultheria fragrantissima*), which has been used to extract exportable essential oils (Paudel et al., 2025).

These emerging insights suggest that the decline in participation threatens the provisioning of forest services, at least in some contexts. The dynamics of ecological change in Nepal resonate with the theoretical debate between the production-oriented view of forests and the view that undisturbed forest ecosystems have intrinsic value (Nocentini et al., 2021). They also relate to the unsettled empirical and applied debate regarding human activity as either a "disturbance" that damages forest ecosystems or as a less-damaging phenomenon with

potentially positive ecological impacts in some forests (Rogers, 1996). Ecological outcomes viewed by some scholars as "overgrowth" or "neglect" are viewed positively by others as "rewilding" (Pereira and Navarro, 2015). We suggest in Section 5 that the ecological effects of forest "overgrowth" or "neglect" relative to the effects of active forest use and management need further research in Nepal. These effects have the potential to vary across local contexts, such as between the Mountain Region, the Middle Hill Region, and the Tarai Region in Nepal, which have drastically different ecological conditions. While there is an evidence base suggesting potential negative impacts of the decline in community forestry on the provisioning of *forest-based ecosystem services* to human populations—such as fire risk mitigation, invasive species control, the provision of non-timber forest products, and protection from human–wildlife conflict, there is a need for more empirical research to corroborate these potential effects, and especially to study the effects of declining community forestry participation on biodiversity and forest ecosystem health are even less understood at the time of writing.

In addition to its potential to undermine the important ecological and ecosystem service benefits provided by CFUGs, declining participation has the potential to exacerbate the economic underutilization of Nepal's forest resources (Dahal and Cao, 2017). The country's forests have substantial economic potential, and that potential grows as previously degraded forests have regenerated since the early 1990s. The community forestry program has been the main vehicle for bringing those benefits to the people of Nepal, not only in the form of subsistence forest products for community forest users but also through the revenues raised by CFUGs as discussed in previous literature (MFSC, 2013; Cook, 2024; Benedum et al., 2025). Among other things, these funds have supported local schools, water and sanitation, temples, roads, and electricity. If participation dwindles without some alternative policy to support the continued productivity of forests, it is likely that the economic potential of Nepal's forest resources—in its various forms—will go unrealized. Some CFUGs have also helped to provide cultural services, such as CFUGs that have maintained, operated, and promoted areas for recreation and tourism within community forests (Birch et al., 2014; Paudyal et al., 2015). If some CFUGs continue to lose participants, and if the forests associated with those CFUGs continue to devolve to "dense thickets" as community management declines (Laudari et al., 2024), it is unclear whether cultural services such as these can reach their full potential.

Finally, recent research points out some potential equity problems associated with declining participation, though the research does not explore these equity issues empirically (Benedum et al., 2025). It is argued that as many drop out of community forestry participation, this has the potential to generate new burdens for forest-dependent households who remain as participants. With less access to economic opportunities, the poorest and most marginalized rural populations are likely to comprise a substantial share of this subpopulation that remains engaged in community forestry. The remaining participants may be saddled with more labor responsibilities in CFUGs—CFUGs which are simultaneously underfunded due to declining forest product sales, as rural populations have less of a need for forest products. Thus, this implication of declining participation represents a particularly important area for future research, as we discuss in Section 5.

4. Supporting people and forests in a changing context: Incremental change, radical change, or the status quo?

In this section, we build upon our previous analysis to suggest potential policy changes in light of the noted decline in community forestry participation. While we do not claim that this current study can identify the most effective path forward with certainty, we draw upon the literature and our own field experiences to identify several possible options for adapting Nepal's forestry-sector policy, identify their potential strengths in an era of declining participation, and highlight threats to their viability. In Section 5, we call for future research and policy experimentation to better assess the various policy options. In this section, we argue that reforms that lower the barriers to the local commercialization of community forests by community members or well-designed, targeted payment schemes could both help to boost participation by enhancing the perceived benefits associated with such participation. Similarly, we suggest that reforms that streamline community governance and management activities and reduce the labor burden on CFUG participants have the potential to boost participation by reducing its perceived costs. Community forestry consolidation may be a path forward in some settings, though we argue that it has some limitations. We also consider the implications of privatizing community forests or replacing them with top-down management as participation declines, though we will argue that these are probably the riskiest policy options.

4.1. Opportunities for incremental change: Lowering barriers to local commercialization

Community forestry has the potential to significantly contribute to forest-based commercial opportunities for rural people in Nepal through forest-based enterprises. Such local commercialization holds a great deal of potential as a means of supporting rural people's livelihoods, creating jobs, and contributing to forest-based economic growth (Peredo and Chrisman, 2017). Previous research suggests that in some other low- and middle-income countries, forest-based enterprises organized around community forestry contribute substantially to rural economies, and that approximately 13%–35% of rural nonfarm employment comes from forest-based enterprises in some settings (Antinori and Bray, 2005; Donovan et al., 2006; Soviana, 2015).

Despite this potential, community forestry-based enterprises face challenges that impede their economic profitability and viability in Nepal. An unfavorable policy environment has been the most obvious barrier to such local commercialization. Previous empirical research has shown that legal procedures related to the extraction of

forest products (especially timber) and their supply to the factory are complex, extremely time-consuming, and costly for local forest users seeking to commercialize community forest products (Paudel et al., 2018). Forest users must spend considerable effort and incur financial costs to expedite the transportation of raw materials, often by seeking permission from government officials and providing various incentives to them, including direct payments (Khatri et al., 2022). All of these complications and barriers create uncertainty in the supply of raw materials, which makes it difficult to sustain forest-based enterprises (Gritten et al., 2015). In addition, small-scale, rural, nonfarm forest-based enterprises mostly suffer a lack of access to capital and insurance. Banks focus more on large and urban industries than the forestry enterprises located in rural areas, which makes securing financing from banks and other financial institutions a key challenge. Typically, insurance companies in Nepal prefer to work with enterprises that have secured investments from banks (Paudel and Paudel, 2010).

Thus, there is scope for government reforms to foster an environment that is more friendly to small, locally led forest-based enterprises. Among other things, the government could revise forestry-sector regulations to lower the legal barriers for community forest users to establish forest-based enterprises and could either introduce regulations that would encourage existing lenders and insurers to work with small community forest enterprises or provide financing and insurance through new government programs.

Such changes have the potential to boost the incentives associated with participation. This is because, as described in Section 3, the small-scale benefits on offer to community forestry participants are no longer attractive to many households, particularly households not engaged in agriculture or households with high opportunity costs due to their higher incomes. Because forest-based enterprises have the potential to raise cash income, policy changes that encourage the growth of these enterprises could increase the perceived benefits of participation if either involvement in such enterprises or a share of the associated income are offered by CFUGs as an excludable benefit for CFUG members.

4.2. Opportunities for incremental change: Payment schemes

The proliferation of both community-based management schemes and conservation payment schemes—such as those associated with the international initiative on Reducing Emissions from Deforestation and Forest Degradation (REDD+)—has drawn attention to initiatives that blend the two conservation approaches. Among other things, this could mean channeling REDD+ funding toward existing CFUGs to help incentivize or support community forest management, since such management can play a role in averting or reversing deforestation and forest degradation under REDD+. In Nepal, REDD+ pilot projects in the past have delivered funds to communities participating in community forestry, and those funds have been used for a diverse range of purposes such as climate-related trainings and sensitization workshops, technical support to help communities access funds from carbon credit schemes, and direct payments to community members or the CFUGs themselves (Newton et al., 2015; Satyal et al., 2020; Sharma et al., 2020). Other countries, such as Tanzania (Collins et al., 2022) and Vietnam (Bayrak and Marafa, 2020), have also undertaken initiatives that integrate REDD+ with community forestry.

The potential impacts of REDD+ on community forestry are hotly debated, with some research pointing to potential synergies between the two approaches (Rakatama et al., 2020) and others arguing that REDD+ could undermine community forest tenure, forest-based livelihoods, and local autonomy (Phelps et al., 2010; Khatri et al., 2018; Hajjar et al., 2021a). Acknowledging this important debate which could inform the design of REDD+ projects so that they are more likely to support community forest governance and less likely to undermine it, we argue that one way in which well-designed payment schemes could support community forestry as participation declines is by providing direct incentives for participation in CFUGs. Recent research suggests that even in this era of declining engagement, rural community members in Nepal are substantially more willing to participate when they are offered excludable cash benefits in exchange for their participation (Cook, 2024). Such benefits supported by REDD+ funds could be structured in a number of ways, such as stipends, small grants, or microloans to households who maintain a CFUG membership (Cook, 2024), engage in specific management activities, or serve in high-level roles in the CFUG (such as chairpersons or secretaries). Some of these benefits may resemble activities that many CFUGs are already accustomed to doing, since many CFUGs have historically provided grants, loans, employment, and other benefits to community members (MFSC, 2013; Cook, 2024; Benedum et al., 2025). If REDD+ funds were channeled to CFUGs and earmarked for these excludable benefits, CFUGs may be able to offer a more substantial range of incentives to participants than they otherwise would.

In light of our analysis in Section 3, which suggests that many rural households are no longer as dependent on small-scale subsistence forest benefits as in the past and the opportunity costs of CFUG participation are therefore no longer justified for them, such payment schemes would make theoretical sense. If REDD+ funds were indeed able to support larger or more attractive excludable benefits to participants than what are currently on offer in most communities, then the provision of those benefits could shift the cost–benefit calculation for a share of households who would view those benefits as an appealing income stream, making participation a rational choice for them. This might be especially true for rural households near some midpoint of the income distribution, who are not as forest dependent as poorer households but also not so wealthy so as to make the excludable benefits insignificant for them in comparison to their opportunity costs.

There has been a great deal of attention paid to gender-based, caste-based, and ethnic inequalities in

Nepal, owing in part to the fact that women and members of marginalized ethnic and caste groups have been historically disempowered in local governance (Bennett et al., 2006; Cook et al., 2023; Cook, 2024). Policy initiatives in the forestry sector have sought to boost participation among women and members of marginalized groups, and payment schemes could be targeted, either wholly or partly, based on gender, economic status, ethnicity, or caste (Cook et al., 2023; Cook, 2024). Such targeted payments are not new to the Nepalese context, since many CFUGs have implemented targeted payments funded by the proceeds from community forestry to women and marginalized groups under the government's Community Forestry Development Guidelines (MFSC, 2013; Cook et al., 2023; Cook, 2024). Thus, payment schemes could be designed either to boost participation across the board regardless of identity or to boost participation especially among historically excluded groups in the hope of supporting forest governance while empowering the excluded.

Previous research from outside Nepal suggests that, where successful, payment schemes can improve forest conditions, generate local economic benefits, and strengthen local institutions (Samii et al., 2014; Jayachandran et al., 2017; Grillos et al., 2024). However, payment schemes have important potential drawbacks, which suggest a need for careful design. For example, such payments may redirect the focus of forest management to meeting carbon targets, which may undermine the need for poorer sections of communities who still rely on community forestry to meet their subsistence needs (Khatri et al., 2018). As Khatri et al. (2018) reported, in REDD+ pilot sites in Nepal, CFUGs imposed restrictions on some uses such as grazing and harvesting of pole-sized trees, which affected land-poor community members negatively. This draws attention to the need to design payment schemes with equity goals in mind. Moreover, in some local settings, the distribution of REDD+ earnings to some poor households and not others may create antagonistic sentiments among different segments of the local community (Poudel et al., 2014). Further, previous research also suggests that relatively wealthy sections of the communities are benefiting from the cash income associated with communal forest management in some localities (Khatri et al., 2022), and REDD+ payment schemes would need to be designed consciously to mitigate this problem. Research in other settings suggests that the design features of payment schemes play a substantial role in making such payments equitable (Cook et al., 2023).

4.3. Opportunities for incremental change: Reducing labor demands

The potential options outlined in Sections 4.1 and 4.2 would aim to support community forestry participation by increasing the benefits associated with such participation, thereby improving the benefit–cost ratio facing potential participants. However, another way to improve this benefit–cost ratio is to reduce the *costs* of participation. The time and effort associated with CFUG activities such as CFUG general assemblies, CFUG executive committee meetings, forest management activities, and service in CFUG leadership roles can be substantial (Poudyal et al., 2023; Cook, 2024; Benedum et al., 2025). Furthermore, the opportunity costs associated with these activities tend to grow as a result of the social and economic changes discussed in Sections 3.2 and 3.3, since households with diverse and profitable livelihood options have high opportunity costs (Benedum et al., 2025). A policy approach that seeks to reduce the costs of participation is not mutually exclusive with one that improves the associated benefits as discussed in Sections 4.1 and 4.2, and there are several avenues through which the community forestry program could be redesigned to make participation less costly.

First, it is possible to reduce the typical number of CFUG executive committee meetings per year—a number which is stipulated in a CFUG's constitution. As mentioned in Section 3, many CFUGs are increasingly unable to hold as many meetings as required by their constitutions. These meetings are highly important, since they are the main venue through which community forestry participants make consequential decisions about forest management and governance (MFSC, 2013). CFUGs could reduce their required number of executive committee meetings per year, and government foresters could use the process of periodically updating CFUG constitutions (discussed in Section 2) to encourage this change in light of the changing social context around community forestry participation. While such a change would likely increase the number of CFUGs that actually hold the number of meetings stipulated in their constitutions, it would also have the added benefit of reducing the time and effort associated with participation, particularly for potential participants who express reluctance to serve in key executive committee roles as noted previously.

Similarly, there may be some scope to reduce the number of general assembly meetings per year for some CFUGs—a number which is also stipulated in a CFUG's constitution. Some CFUG general assemblies are supposed to meet biannually, and those CFUGs could move to an annual general assembly meeting schedule. Since some CFUGs fine members who do not attend general assembly meetings (Poudyal et al., 2023), such a change could broaden the appeal of participation for people who view the time allocated to meeting attendance as a significant cost.

4.4. Opportunities for incremental change: Consolidation

One of the characteristics that sets Nepal's community forestry program apart from similar programs in other contexts is the relatively small size of landholdings under Nepal's program. Recent data suggest that the average size of a community forest in Nepal is roughly 100 ha (Pandey and Pokhrel, 2021). By contrast, individual community forests governed under Mexico's community-based forestry program often cover thousands of hectares (Bray, 2020). The small holding size typical to Nepal may itself be a barrier to local commercialization by community members if smaller forests are unable to support the

operationally efficient forest-based enterprises that are within reach for larger community forests that benefit from economies of scale. Thus, the consolidation of smaller existing community forests may facilitate more effective local enterprises, which could make community forestry more lucrative and thus enhance local communities' incentives to participate in forest management under the program.

In fact, the idea of consolidation is not new in Nepal, but it also has not been extensively put into practice. Previously, two different forms of consolidation were piloted: the first approach was to merge smaller CFUGs to form larger ones with larger holdings. The second approach was to form collaborative networks, shared commercial enterprises, or other cooperative arrangements. In the absence of enabling policies or legislation, the idea of merging CFUGs (or community forests) has not yet been undertaken at a large scale by the time of writing. However, the formation of networks of CFUGs has been practiced in a number of districts, including Dang, Dolakha, and Ramechhap, according to our own field observations. This has taken various forms. For example, in Dolakha and Ramechhap, forest-based enterprises were established through networks of CFUGs (Pokharel et al., 2009; Paudel, 2012). Similarly, in Parbat and Baglung districts, CFUG networks were formed for the marketing of non-timber forest products. In other districts, "CFUG clusters" were formed to conduct forest management activities and run forest-based community enterprises collectively (e.g., Tiwari et al., 2023). Recently, in the national government's updated Community Forestry Guidelines 2025, a provision allows the merger of two or more CFUGs provided all the participating CFUGs agree to the proposal with at least a two-thirds majority in their respective general assemblies (MoFE, 2025).

Nonetheless, consolidation faces significant challenges in Nepal—challenges which might be particularly severe in certain local contexts. Collective action theory holds that large groups have higher barriers to collective action than small groups (Olson, 1965). Furthermore, Nepal exhibits a high degree of ethnolinguistic, socioeconomic, and interest heterogeneity across neighboring communities (as well as within communities). Heterogeneity can complicate collective action in some settings (Habyarimana et al., 2009), though previous research argues that resource users can often overcome these challenges (Varughese and Ostrom, 2001; Ostrom, 2005). Thus, there is some risk that consolidation could create additional collective action barriers. This is especially concerning in an era of already-waning collective action. Furthermore, consolidation has garnered political opposition from the Federation of Community Forestry Users Nepal (FECOFUN), an active and influential NGO in Nepal's forestry sector. FECOFUN has opposed the idea of CFUG mergers, or of other forms of formal or informal institutions consolidating CFUGs (such as CFUG clusters), because it views such consolidation as possibly creating new competition for FECOFUN (Tiwari et al., 2023).

It is notable that none of the above-mentioned consolidation initiatives lasted very long, possibly due to the challenges of coordination across different CFUGs. Nonetheless, despite the various challenges noted above, consolidation may be a path forward in some localities. The viability of consolidation probably depends in part upon two local factors. First is the incentive structure around consolidation, which is shaped by the presence or absence of local commercial opportunities through consolidated community forest enterprises. Groups of CFUGs governing forests with commercializable nontimber forest products, for example, should have stronger incentives for consolidation as long as there is some critical mass of local households interested in commercializing these products. The second factor is the local potential for collective action. Small groups of CFUGs that are geographically closer to one another and fairly homogenous may be better equipped to consolidate compared to larger groups of CFUGs, CFUGs separated by longer distances, or highly heterogenous groups of CFUGs.

Given past interest in consolidation in Nepal, and especially in light of recent policy provisions aimed at enabling consolidation as noted previously, we believe that consolidation holds potential in some local contexts exhibiting the characteristics favorable to it. Where it is successful, consolidation could help the forestry sector adapt to declines in community forestry participation by enlisting the subset of rural households who are interested in commercial, forest-based livelihoods, enlisting them to manage larger areas of forest than has been typical under conventional community forestry, and compensating them with forest-based incomes that would potentially be greater under consolidated CFUGs that benefit from economies of scale.

4.5. Opportunities for radical change: Top-down management

Given the apparent decline in community forestry participation described earlier, some might point to increased top-down management of Nepal's forests as a viable policy option for the future. After all, if there is no longer enough grassroots participation to sustain the current model of decentralized, community-based forest governance in the rural areas of Nepal, then a centralized, top-down model that hands management authority or even property rights back to a regional or central government may be more effective. Previous research argues that decentralization policies like Nepal's community forestry program typically contain elements of centralization, since such policies grant limited rights to local people, often while imposing new regulations on local forest use, management, and governance (Ribot et al., 2006; Khatri et al., 2022). In Nepal, some scholars have argued that the government has already sought to recentralize forest rights in recent years while maintaining the community forestry governance model, particularly through scientific forest management which undermines the rights of CFUGs and diverts program funds from community forestry (Basnyat et al., 2020; Khatri et al., 2022). Nonetheless, one could imagine a more aggressive recentralization effort in the forestry sector—one which phases out CFUGs or drastically reduces their *de jure* governance responsibilities, handing

those responsibilities to government foresters who would become the key local actors responsible for forest management, monitoring, and governance.

Setting aside the question of whether there is the political will in Nepal to replace the community forestry program with more expansive government management, there is reason to be skeptical of such radical recentralization as a solution to declining participation in forest governance in Nepal. One of the justifications for a community-based model in Nepal was the clear inability of the government to manage forests in the mid-20th century (Gilmour and Fisher 1992; Gautam et al., 2004), and it is not clear that the current government would avoid a similar institutional failure. Furthermore, while participation declines, *some* forest users will remain reliant on community forests for their subsistence needs—especially the poor and marginalized, as noted previously (Benedum et al., 2025). A radical recentralization effort could restrict subsistence and commercial forest use among these rural households, thereby harming the rural poor. The other remedies for declining participation described previously would be less likely to harm the livelihood options of the rural poor (notwithstanding the important drawbacks of some payment schemes, already noted), and the remedies described in Sections 4.1 and Section 4.2 could provide economic benefits to the rural poor while strengthening participation. Thus, recentralization is unlikely to be the most desirable policy option in the face of declining community participation.

4.6. Opportunities for radical change: Privatization

Privatization has long been recognized as another policy option for the governance of natural resources (Ostrom, 1990). Privatization—as a radical shift away from Nepalese community forestry—could be done through the relinquishment of community forestry property rights in some villages and the sale of those previously community-owned forested lands to private sector actors through auctions or some other allocation mechanism. The economic logic of privatization as a policy tool for natural resource governance rests on the assumption that when an individual user owns a unit of the resource (such as a patch of forest), they are properly incentivized to invest in the efficient level of maintenance, monitoring, use, and protection of that unit of the resource (Ostrom, 1990). The extant literature studying past experiences with forestry decentralization is somewhat mixed, with some studies contradicting the optimistic economic logic of privatization and others showing apparent benefits from privatization (e.g., Gibson et al., 2002; He et al., 2020; Faingerch et al., 2021). A review of the effects of forestry privatization—and whether or not it generally appears to "work"—is beyond the scope of our study. Setting that important matter aside, we see at least two severe risks to forestry privatization in Nepal specifically.

First, even if only a minority of the country's more than 23,000 community forests (MoFE, 2025) were reallocated in this manner, such a reallocation would be an enormous administrative undertaking for the government. Administrative effectiveness, enforcement, and compliance of government agencies with mandates have been severe and long-running challenges in Nepal (Shrestha, 2019), and subnational governments vary in their capacity (Devkota and Khanal, 2024). While the country experienced a 10-year civil war that likely slowed the implementation of community forestry to some degree (Cook et al., 2025), it is still notable that the process of rolling out the community forestry program has taken decades. It is not clear that the government is equipped to handle a large-scale reallocation of the country's forest property rights.

Second, as already argued, some households—especially the poor and marginalized—still use forests for their subsistence even while participation wanes. If private property rights are sold, large landowners and businesses would almost certainly outcompete the poorest and most marginalized community members, leading to a reconcentration of Nepal's forestry-sector benefits.

4.7. Adherence to the status quo

As influential work in the field of public policy analysis points out, "doing nothing" is often the most politically feasible path forward (Bardach, 2012). In our context, this means that adherence to the status quo community forestry policies and practices should be considered as a policy option. According to our earlier analysis, it is likely that participation will further decline under the status quo in many rural areas, absent a reversal of the aforementioned socioeconomic changes in rural Nepal. As we argued previously, there is reason to believe that the decline in participation contributes to a number of problems, such as increased fire risks, more human–wildlife contact, and lower investments in forest maintenance, forest management, and invasive species control in rural settings.

In addition to these points, adherence to the status quo—with its limited economic opportunities for local people in the forestry sector—raises another concern: The decline in community forestry participation can be viewed as a lost opportunity for Nepal's forests to contribute to rural economies. The previous subsections note several opportunities to reimagine forestry-sector policies to channel more substantial benefits to local people, such as through reducing barriers to local, community-based commercialization (Section 4.1), compensating local communities for their ecosystem service provision (Section 4.2), or consolidating community forests in some settings (Section 4.5). If successful, such changes might bring substantial benefits to those who remain in rural villages. There is also the potential to adjust the costs of participation so that such participation is a more rational choice for rural households at the margin, as explained in Section 4.3. Although there is no doubt that the economic context has changed in rural Nepal since the inception of community forestry, such benefit streams could still help to drive future rural development.

5. Conclusion

Forest systems are social-ecological systems, which means that they are subject to peripheral changes such as economic and demographic shifts (Messier et al., 2016). In this analysis, we have assessed the patterns, drivers, and

implications of the decline in participation in Nepal's community forestry program. We have shown that there is mounting evidence of this decline, with potential negative implications across wide-ranging areas such as economic development, forest fire prevention, invasive species management, and social equity, among others. We have argued that the most likely drivers of the decline are livelihood diversification and increased out-migration taking place in rural areas—social changes that weaken households' incentives to participate in community forestry. This understanding of the problem helps to resolve the puzzle posed in Section 1: How could such a successful, popular policy be in decline? Our analysis, as we have also shown, leads to clear policy options for boosting participation by either strengthening the benefits associated with community forestry (through carefully designed payment schemes or regulatory reforms that facilitate more small-scale commercialization of community forests by local forest users), reducing the costs of participation (through reforms to the program that would require less effort from CFUG participants in the way of meeting attendance and other labor related to the CFUG), or potentially consolidating community forests in some contexts where local conditions favor successful consolidation.

In addressing our initial puzzle, we have revealed another surprising insight: While community forestry in Nepal has endured multiple external shocks, economic advancement is now contributing to the program's decline. Community forestry has proven remarkably resilient during an era marked by multiple political and economic crises as well as a decade-long civil war (Karna et al., 2010; MFSC, 2013; Nightingale and Sharma, 2014). Now, livelihood diversification and profitable out-migration have weakened local people's incentives to participate in a program largely designed in a time when rural communities were more reliant on agriculture and subsistence forest uses. Thus, economic advancement in rural areas has the potential to undermine programs like this one, unless such programs adapt to changing socioeconomic conditions as discussed in Section 4.

More generally, our case study provides a blueprint approach for evaluating the viability of community-based programs during periods of social change: Analysts should assess indicators of participation, draw upon empirical data and social-scientific reasoning to develop a theoretical model that explains the pattern of decline if one is evident in those indicators, and use that theoretical model to inform potential strategies to reform or replace programs that are in decline. This approach to environmental policy *reevaluation* provides insights that the growing body of literature on environmental policy *evaluation* noted in Section 1 has not yet explored. Whereas evaluation is retrospective and focused on program outcomes, reevaluation is dynamic, forward-looking, and focused on the microlevel drivers of participation in addition to such outcomes.

Our analysis of the Nepalese case also raises at least three substantive questions that can inform understandings of community-based environmental policy in Nepal and other countries:

First, to what extent does the decline in community forestry participation—along with the theorized drivers of decline—generalize to other countries or to community-based initiatives outside of the forestry sector? Community forestry is widespread, with numerous countries having implemented such programs, and with nearly one-third of forested land in low- and middle-income countries managed or owned by local people or indigenous groups according to the most recent global estimates (Rights and Resources Initiative, 2018; Hajjar et al., 2021b). Some of the other countries implementing community forestry may be undergoing social changes similar to what we see in the Nepal case. Mexico, for example, has pursued community management of forests since the 1980s, with approximately 45% of its forested lands under community ownership by 2017 (Rights and Resources Initiative, 2018; Gutiérrez-Zamora and Hernández Estrada, 2020). Over approximately the past 10 years, remittance income from out-migration has increased, the rural population has shrunk as a share of the overall population, and the share of the population employed in agriculture has fallen among men while remaining roughly constant among women (World Bank, n.d.). Empirical observations from Mexico suggest that some of the same upstream drivers of reduced participation seen in the Nepal case—out-migration, livelihood diversification, and reduced reliance on agriculture—may be at play in Mexico as well (Robson, 2009; Robson et al., 2020). Researchers can also draw some insights from what socioeconomic changes, particularly male out-migration, mean for participation and collective action in farmer-managed irrigation systems in Nepal and elsewhere. Studies suggest that out-migration has led to some declines in local participation in these community-based irrigation institutions (Suhardiman et al., 2023). However, male out-migration may have provided opportunities for women to take such spaces and even political opportunity to improve agency and influence in irrigation governance in some contexts (Leder, 2022; Suhardiman et al., 2023).

Second, how can new or existing data be used to explore the patterns, drivers, and implications of the participation decline? Much of the empirical literature on the Nepalese case reviewed throughout this article consists of localized case studies. This previous research builds a rich, informative picture of the decline in participation, and especially informs the theorized drivers of the decline. However, large-scale quantitative data could yield new insights. For example, longitudinal data on participation across the country could reveal heterogeneities in the patterns or drivers of declining participation, especially across space but also potentially over time. Information like this could inform the targeting of interventions designed to support participation in the coming years.

However, as we suggested in Section 3.3, the socioeconomic and ecological impacts of the decline in participation are arguably more important areas for future research, since they have been subjected to less empirical study than the patterns and drivers of the decline. New or existing quantitative data sources should be combined with causal inference methods to quantify the potential

downstream environmental, economic, and social impacts of declining participation discussed in Section 3.3. Such analyses should pay particular attention to heterogenous effects across localities and across households within the same village. This is because locally disaggregated analyses are needed to explore the equity implications of the decline, such as burdens for marginalized rural households who remain forest dependent. It is also because the ecological impacts likely vary based on local ecological characteristics which vary widely across the country, which means that context-sensitive approaches are needed to adjudicate between the "rewilding" framing that views human activity as a "disturbance" (and, by extension, might predict positive ecological implications following from rural people's disengagement from the forestry sector) on the one hand (Pereira and Navarro, 2015), and opposing theories suggesting ecological benefits from forest use and active management.

Finally, future research and policy experimentation should evaluate the potential remedies proposed in Section 4. Policy reforms that foster local, community-based commercialization or streamline the labor demands associated with community forestry, well-designed, targeted payment schemes, and consolidation where it is locally appropriate all stand out as of particular interest. Such research and experimentation could take the form of randomized policy experiments, though it need not rely solely on those methods, especially in the near term. Randomized policy experiments can be costly and difficult to implement, and the potential feasibility issues and perverse side effects from some of the reform options discussed in Section 4 are not yet clear. As an initial step, survey experiments and qualitative tools such as focus groups could gauge rural people's preferences for the various reform options, and feasibility studies could highlight potential barriers to adoption or implementation. Furthermore, where some of these options are already being pursued, such as under the aforementioned consolidation efforts or extant payment schemes, research in the near-term should study the impacts of these initiatives on participation, local economies, and environmental outcomes.

Data accessibility statement

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None.

Author contributions

NJC conceived the study. NJC, DBK, and DPP developed the theoretical framework. NJC, DBK, DPP, GP, and SA wrote and edited the paper.

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