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Assessment of Demand and Supply of Forest Products in Community Forests of Kaski District, Nepal

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KEYWORDS

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Growing Stock
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ABSTRACT

Community forests in Nepal are crucial for rural livelihoods, providing products like fuelwood, fodder, and timber. However, demand and supply imbalances threaten their sustainability. This study evaluates both the demand and supply of fuelwood, fodder, and timber in two CFs located in the Kaski district: Kurchinekharkha CF in Armala and Sisneridopare CF in Kaskikot. Data collection involved questionnaire surveys to estimate demand, while forest inventory and secondary data were used to estimate supply. A comparative analysis of Kurchinekharkha CF and Sisneridopare CF reveals critical disparities. Kurchinekharkha CF requires 23.9 tonnes of fodder annually, significantly less than Sisneridopare CF's 44.7 tonnes. Fuelwood demand mirrors at 0.88 tonnes per household in both areas, while timber demand is negligible in Kurchinekharkha CF but reaches 2.55 m^3 in Sisneridopare CF, used mainly for livestock sheds. Despite Kurchinekharkha CF boasting a higher growing stock (114.94 m^3/ha) compared to Sisneridopare CF (70.87 m^3/ha), supply deficits persist. Fuelwood supply covers a mere 21.16% and 18.42% of demand, respectively. Fodder supply is severely limited, meeting only approximately 10% of demand in both forests, due to short collection periods and limited species. Timber supply remains near-zero due to regulations and lack of awareness. Demand drivers include household size, livestock holdings, and alternative energy access. While community forestry has benefited from forest regeneration, considerable supply gaps require adaptive strategies. Recommendations include promoting multipurpose tree species, integrating fodder plantations, and revising harvesting policies to better harmonize conservation with livelihood needs.

INTRODUCTION

Nepal's community forestry (CF) program stands as a globally recognized model for decentralized forest management, transitioning from a historically centralized system to one that empowers local communities (Ojha et al., 2009). Since late 1970s, this shift has contributed significantly

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to forest restoration, biodiversity conservation, and community livelihoods (Poudel et al., 2015). The Forest Act of 2019 formally defines community forests as designated national forest areas managed by user groups for development, conservation, and resource utilization, granting them autonomy in pricing and resource management (Gautam et al., 2023). This approach acknowledges the crucial role of local populations in sustainable forest management and emphasizes the need to balance conservation with livelihood improvements (McDougall et al., 2008).

Despite its successes, community forestry in Nepal faces ongoing challenges, particularly in balancing conservation efforts with the economic needs of local users. Many households depend on community forests for essential resources such as fodder, fuelwood, and timber (Paudel, 2023). However, current management practices often prioritize conservation over sustainable resource extraction and equitable revenue distribution, leading to limited economic benefits for forest-dependent communities (Sapkota et al., 2020). Additionally, operational plans for many community forests are designed without adequate consideration of local demand and resource availability, creating mismatches between supply and demand that can undermine sustainable management efforts.

Understanding and estimating the demand for forest products is crucial for effective community forest management. A clear assessment of demand can inform resource allocation, enhance sustainability, and ensure that forest management plans align with user needs. Without accurate assessments, community forests risk overexploitation or underutilization, both of which can have negative ecological and socio-economic consequences.

Therefore, this study analyzes the demand and supply dynamics of key forest products – fodder, fuelwood, and timber – within two Community Forests (CFs) in the Kaski district: Kurchinekharkha CF and Sisneridopare CF. Instead of solely estimating demand, the study aims to provide a more comprehensive analysis. The specific objectives are: i) Quantify the demand for fodder, fuelwood, and timber in Kurchinekharkha CF and Sisneridopare CF, considering factors such as household size, livestock ownership, and alternative resource availability; ii) Assess the supply of fodder, fuelwood, and timber from both CFs based on current harvesting practices, forest inventory data, and existing management plans; and iii) Identify the key factors influencing the demand and supply of these forest products in each CF, differentiating between factors leading to increased or decreased demand and those affecting supply limitations.

By integrating socioeconomic data, user assessments, and forest inventory analysis, this study seeks to provide insights for policymakers and forest user groups. The findings will help inform the development of more effective and equitable management strategies that balance conservation goals with the livelihood needs of community forest users, including addressing the demand-supply gaps and promoting sustainable utilization of forest resources.

MATERIALS AND METHODS

Study area

This study focuses on two Community Forests (CFs) – Kurchinekharkha CF and Sisneridopare CF – located within Pokhara Metropolitan City, Kaski District, Gandaki Province, Nepal. The selection of these specific CFs is based on their active participation in community forestry program and their potential to offer insights into forest product demand and supply, especially in the changing economic and demographic dynamics of forests near urban settlements.

The selection criteria for these study areas were: 1) their designation as Community Forests under the national forestry program,

2) their location within the mid-hills ecological zone, making them representative of a common forest management context, and 3) their proximity from Urban Settlements. Additionally, these CFs were chosen to capture variations in forest management practices influenced by differences in forest user group (CFUG) characteristics, including user composition, governance structure, and institutional experience. Although the two forests are similar in area (17.36 ha vs. 26.77 ha), their differences in household numbers (61 vs. 81) and years of handover (2052 BS vs. 2065 BS) provide an opportunity to explore how socio-institutional factors influence forest product demand and supply.

By examining these two CFs, this study aims to provide valuable insights into the dynamics of forest product demand and supply within the community forestry of the mid-hills of Nepal with close proximity to urban settlements.

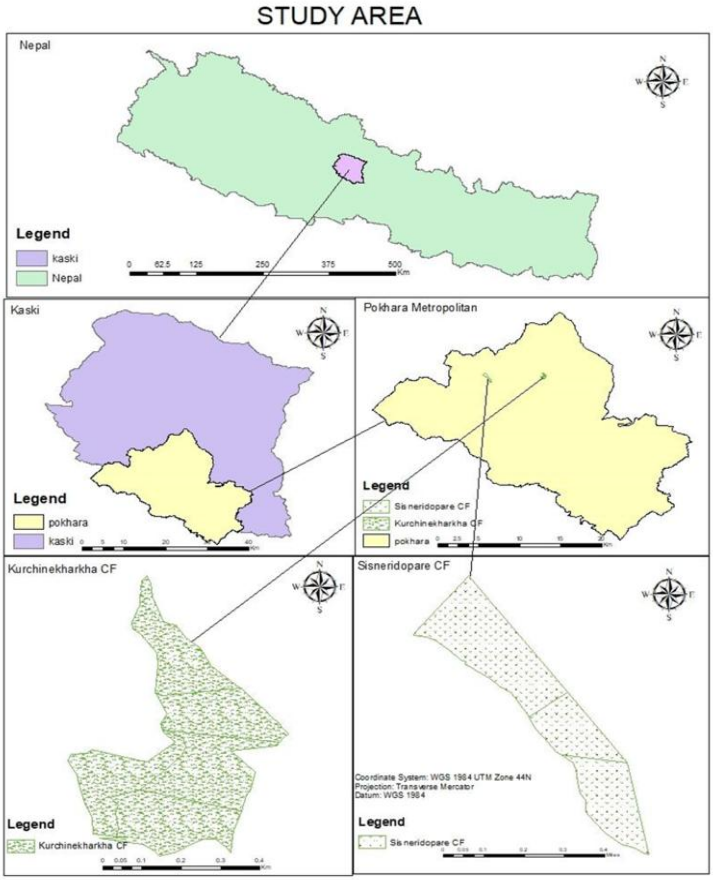

Figure 1: Location Map of the study area.

Data collection

This study employed a mixed-methods approach to investigate forest product demand and supply in Kurchinekharkha Community Forest (CF) and Sisneridopare CF. Data collection tools were selected to address the specific research objectives, focusing on quantifying demand, assessing supply, identifying influencing factors, and estimating Annual Allowable Cut (AAC).

Quantifying forest product demand: Household surveys and key informant

interviews were used to quantify the demand for fodder, fuelwood, and timber.

Household surveys: A structured questionnaire was administered to 36 households selected using a purposive sampling method to ensure representation of diverse socioeconomic backgrounds within both the CFs. A snowball technique was used to identify initial contacts. The questionnaire included both closed- and open-ended questions to gather data on household size, livestock ownership, alternative resource availability, and consumption patterns of fodder, fuelwood, and timber. Face-to-face interviews and phone calls were conducted with the head of household or a knowledgeable adult member to gather accurate information.

Key informant interviews (KIIs): Seven key informants were interviewed to gather qualitative data on demand for drivers and broader community perspectives. These included three officials from the Pokhara sub-division of the District Forest Office (DFO) and four Community Forest User Group (CFUG) executive committee members (the chairperson and secretary from both the CFUGs). KIIs focused on understanding local perceptions of resource demand, factors influencing these patterns, and challenges related to meeting community needs.

Assessing forest product supply: Forest inventory data and a review of CFUG operational plans informed the assessment of fodder, fuelwood, and timber supply.

Forest inventory: A forest inventory was conducted following the Community Forest Inventory Guideline 2061, aiming for a 1% sampling intensity. Sample points were randomly distributed across the study area using ArcGIS software. GPS devices were used to locate these points in the field. At each sample point, circular plots of varying sizes were established to measure regeneration (saplings), poles, and trees. Specifically, circular plots with an area of 25 m^2 were used for saplings, 100 m^2 for poles, and 500 m^2 for trees. This data was used to estimate timber volume and potential sustainable yield. Fodder availability was estimated based on tree species composition and existing literature on fodder biomass production.

Review of CFUG operational plans: The operational plans from both the CFUGs were analyzed to understand planned harvesting practices, management objectives, and projected yields of forest products.

Identifying factors influencing demand and supply: The factors that influence demand and supply were gathered from household surveys, key informant interviews, and CFUG meeting minutes.

Household surveys: The survey questionnaire included questions designed to elicit information on factors influencing household demand for forest products, such as income, access to alternative energy sources, and changes in livestock populations.

KIIs: Key informants were asked about their perspectives on the factors driving both demand and supply of forest products, including socioeconomic changes, environmental factors, and policy interventions.

CFUG meeting minutes: Meeting minutes from 2017 to 2021 were examined to understand community discussions and decisions related to harvesting regulations, resource allocation, and challenges in managing forest resources.

Estimating annual allowable cut (AAC): The forest inventory data, CFUG operational plans, and sustainable harvesting principles were used to calculate the AAC.

Data analysis

Data were analyzed using MS Excel. The analysis framework is outlined below:

Estimation of annual household forest product demand: The annual household

demand for key forest products, particularly fuelwood and fodder, was estimated using the approach outlined in Pokharel et al., (2018). The following equations were used to calculate the annual household demand:

$Dfw = 12 * \alpha fw * Qfw$

$Dfd = 12 * \alpha fd * Qfd$

Where,

Dfw = Annual household demand for fuelwood (kg/year)
Dfd = Annual household demand for fodder (kg/year)
Qfw = Average monthly household demand for fuelwood in local units
Qfd = Average monthly household demand for fodder in local units
αfw = Conversion factor from local units to kilograms for fuelwood
αfd = Conversion factor from local units to kilograms for fodder

Table 1: Conversion factor of the local unit to SI unit

Local unit	Conversion factor
1 Ropani land	0.05 ha
1 Kattha land	0.034 ha
1 Bhari fodder (αfd)	50 kg
1 Bhari fuel wood (αfw)	30 kg

Source: Community Forest inventory guideline 2004

The collected demand data were compiled in MS Excel and categorized based on users' socioeconomic attributes, such as economic status and ethnicity, to assess variations in forest product dependency.

Estimation of sustainable yield: The sustainable yield of the community forests was determined using forest inventory methods as per the Forest Regulation 2079. The growing stock (GS) and annual allowable harvest (AAH) were calculated based on inventory data.

$Volume = (G/4)^2 \times l$

Where, G = Circumference of log in inches

l = length of log in feet

The annual growth rate of the forest was assumed to be 2% of the total growing stock. Based on sustainable forest management principles, 40% of this annual growth was considered as the Annual Allowable Cut (AAC), ensuring sustainable resource utilization.

This analytical approach facilitates an assessment of whether the community forests can meet the demand for fuelwood and fodder while maintaining long-term ecological sustainability.

RESULTS

Socioeconomic characteristics of user groups

Demographic characteristics: Kurchinekharkha CF consisted of 61 households with a population of 274 individuals, while Sisneridopare CF included 81 households totaling 531 residents. The sampling intensity for household surveys was set at 25%, resulting in 16 households sampled in Kurchinekharkha CF and 20 in Sisneridopare CF. Ethnically, both CFs were predominated by Brahman/Kshetri with a small number of Dalit and Janajantis.

Livelihood and land ownership: Majority of community forest users were involved in agriculture followed by business and service sectors. Land ownership varied, with most households holding between 0.25 to 0.76 hectares, while smaller percentages own more than 0.76 hectares or less than 0.25 hectares, and a few are landless.

Livestock ownership: Livestock numbers were higher in Sisneridopare CF (mean = 3.4) than in Kurchinekharkha CF (mean = 1.53)

Table 2: Socioeconomic characteristics of two CFs

Characteristics	Kurchinekharka CF	Sisneridopare CF
Total Households	61	81
Total Population	Male: 141 Female:133	Male: 272 Female 259
Household by Ethnicity	Brahmin/Kshetri: 58 Dalit: 3	Brahmin/Kshetri: 76 Dalit: 5
Sampled Households (Sampling Intensity)	16 (25%)	20 (25%)
Sampled Household by Ethnicity	Brahmin/Kshetri: 14 (87.5%) Dalit: 2 (12.5%)	Brahmin/Kshetri: 16 (80%) Dalit: 4 (20%)
Education Level of Respondents	No Formal Education: 2 (12.5%) Primary: 2 (12.5%) Secondary: 10 (62.5%) Tertiary: 2 (12.5)	No Formal Education: 1 (5%) Primary: 7 (35%) Secondary: 8 (40%) Tertiary: 4 (20%)
Primary occupation of the Respondents	Agriculture: 8 (50%) Business: 5 (31.25%) Service: 3 (25%)	Agriculture: 12 (60%) Service: 8 (40%)
Land Ownership	More than 0.76 ha: 3 (18.75%) 0.25 to 0.76 ha: 8 (50%) Less than 0.25 ha: 4 (25%) Landless: 1 (6.25%)	More than 0.76 ha: 2 (10%) 0.25 to 0.76 ha: 15 (75%) Less than 0.25 ha: 2 (10%) Landless: 1 (5%)

Demand and supply of forest products

Demand and supply of fodder: Fodder demand differed significantly between the studied two community forests (CFs). Kurchinekharkha CF households demanded an average of 23,959 kg annually, while Sisneridopare CF exhibited a higher demand of 44,714 kg. Fodder is primarily sourced from private land (terrace risers, silvopastoral areas, and lower terraces). Both CFs permit limited fodder tree collection (1-3 days annually) and year-round grass collection, with Sisneridopare CF additionally providing *Drepanostachyum falcatum* (Nigalo). However, the estimated supply only meets approximately 10% of the demand in both CFs (2395.9 kg for Kurchinekharkha and 4471.4 kg for Sisneridopare). This gap is attributed to a combination of factors: declining demand (69.44% of respondents) due to reduced livestock, alternative feed adoption, and restricted collection, contrasted by an increase in demand (30.55%) driven by commercial animal husbandry and increased livestock ownership linked to greater wealth. Limited access to CF fodder and seasonal availability further exacerbates the supply deficit.

Demand and supply of fuelwood: Fuelwood demand was relatively consistent between the two CFs, with Kurchinekharkha CF households requiring an average of 881.1 kg (29.37 Bhari) and Sisneridopare CF households needing 892.5 kg (29.75 Bhari) annually. The primary source of fuelwood is the extraction of 4D trees (dead, dying, diseased, and deformed) during salvage logging, thinning, and pruning, distributed equally among community users. The estimated fuelwood supply from these sources is 704.88 kg for Kurchinekharkha CF and 714 kg for Sisneridopare CF. Demand dynamics are influenced by opposing trends: decreasing demand due to alternative energy

adoption and improved cooking stoves (particularly in Sisneridopare CF) versus increased demand (33.33% of households) due to increased livestock numbers. Limited sustainable extraction practices also influence the overall balance, impacting the potential supply relative to the current growing stock.

Demand and supply of timber: Timber demand showed a stark contrast between the two CFs. Kurchinekharkha CF reported negligible demand due to the prevalence of modern housing and a scarcity of high-value timber species. In contrast, Sisneridopare CF experienced a demand of approximately 90 cft per year, primarily for animal shed construction and traditional house repairs. New houses rely on timber purchased from markets for wooden frames and furniture. While both CFs have policies to provide a single tree for house construction, no households in either CF had requested timber in recent years. The estimated timber supply from the CFs is near zero (approximately 0.01 cft for Sisneridopare CF assuming eventual harvesting of a tree under the policy scheme), resulting in a significant gap. This gap is attributed to the limited availability of desired timber species in Kurchinekharkha CF, the shift towards modern housing reducing demand in one CF while a need persists for animal sheds in another, and strict regulations combined with a lack of awareness regarding timber harvesting in community forests, creating inefficiencies and barriers to effective management and utilization.

Table 3: Demand vs. supply table: Estimated annual demand and supply of forest products

Forest product	Community Forest	Demand	Unit	Estimated supply	Unit	Justification
Fodder	Kurchinekharkha CF	23,959	kg	2395.9	kg	Supply is estimated as 10% of demand due to limited collection periods and restrictions.
Fodder	Sisneridopare CF	44,714	kg	4471.4	kg	Supply includes grass, tree, fodder, and *Nigalo*, but is still limited. Estimated as 10% of demand.
Fuelwood	Kurchinekharkha CF	881.1	kg	704.88	kg	Supply is from 4D trees and thinning.
Fuelwood	Sisneridopare CF	892.5	kg	714	kg	Supply is from 4D trees and thinning.
Timber	Kurchinekharkha CF	0	cft	0	cft	Demand is negligible.
Timber	Sisneridopare CF	90	cft	0.01	cft	Demand is for animal sheds and house repairs. Supply is near zero; policy is to provide one tree but no one has requested in recent year.

Table 4: Summary of inventory

CF	GS of pole (m^3)	GS of tree (m^3)	Total GS (m^3)	GS per ha (m^3)	Seedlings per ha	Saplings per ha
Kurchinekharkha CF	1506.63	270.31	1776.94	102.41	8291.5	4213.4
Sisneridopare CF	1393.20	529.72	1922.92	71.96	7555.66	2733.33

DISCUSSION

Forest development and regeneration

The forest inventory results indicate that both Kurchinekharkha and Sisneridopare community forests are still in the developing phase. The growing stock per hectare for Kurchinekharkha CF and Sisneridopare CF is 102.41 m^3 and 71.96 m^3, respectively. This is significantly lower than the national average of 164.78 m^3 per hectare (DFRS, 2015). This finding aligns with observations in other developing community forests in Nepal, where biomass accumulation is often lower in the initial phases of management (Branney et al., 2001). The lower growing stock could be attributed to previous harvesting practices, forest degradation before community handover, or the relatively short period of active management.

However, the presence of abundant seedlings and saplings in both CFs suggests a strong potential for future growth and development. According to the Community Forest Inventory Guideline (2004), a forest is considered well-regenerating if it has more than 5000 seedlings and 2000 saplings per hectare. Both CFs meet these criteria, indicating good regeneration. This positive regeneration trend could be a result of limited interventions and improved protection after the establishment of community forestry, promoting natural regeneration processes. This is consistent with findings by Nagendra and Karna (2009), who highlighted the positive impact of community forestry on forest regeneration in the middle hills of Nepal.

Timber demand and management

The demand for timber in Kurchinekharka CF is minimal, largely due to its proximity to the main market where people can purchase ready-made furniture. Additionally, traditional houses are increasingly being replaced by modern RCC houses, further reducing the need for timber. Similarly, in Sisneridopare CF, timber demand remains low, though some households require timber for constructing and repairing animal sheds. This trend mirrors a broader shift observed in many rural areas of Nepal, where access to alternative building materials and changing lifestyles are reducing the reliance on timber from community forests (Thoms, 2008). The inability of both CFs to fulfill timber demand indicates that community forest management plans may need to explore sustainable extraction strategies to meet future requirements or focus on other forest products. Strategies could include implementing sustainable harvesting regimes based on growth rates and yield, or exploring niche markets for sustainably sourced timber products as suggested by Kanel (2006).

Fuelwood consumption patterns

Approximately 66.66% of respondents reported a decreasing trend in fuelwood consumption, particularly for cooking food. This decline can be attributed to the increased

use of alternative energy sources such as LP gas and electricity. In Sisneridopare CF, the availability of improved cooking stoves has further reduced reliance on firewood. This aligns with national energy policies promoting the adoption of cleaner cooking technologies (KC et al., 2024). Similar trends have been reported in other community forest areas, where access to alternative energy sources leads to a reduction in fuelwood consumption (Shrestha & Gautam, 2014).

However, while fuelwood use for household cooking has decreased, its consumption for preparing animal feed has risen due to an increase in livestock numbers. This reflects a shifting demand for forest resources, suggesting that community forest management should consider these evolving needs in their planning. This highlights the importance of integrating livestock management considerations into community forestry plans, as emphasized by Puri et al. (2020), to ensure sustainable resource utilization.

Fodder availability and demand

Fodder availability and demand present another important aspect of forest resource management. With increasing livestock numbers, the demand for fodder has also risen. However, community forest policies restrict fodder tree collection to only 2-3 days per year. As a result, households with limited landholdings often rent marginal land to meet their fodder needs. The forest inventory revealed a scarcity of fodder trees, emphasizing the need for both CFs to incorporate more fodder species into their forest management plans. Encouraging the planting of high-yield fodder trees could help alleviate shortages and improve the sustainability of livestock-rearing practices in the region. Similar recommendations have been made by Acharya (2002), who advocated for integrating fodder production into community forestry to support local livelihoods. This could involve planting fodder trees on degraded land, promoting agroforestry practices, or establishing fodder banks.

Socioeconomic considerations

The socioeconomic characteristics of forest user groups play a crucial role in shaping forest management practices. Although the study provides an overview of land ownership, ethnicity, and education levels, it lacks detailed insights into income levels, which are a key indicator of socioeconomic status. Income influences households' dependency on forest resources, their ability to adopt alternative energy sources, and their overall engagement in forest conservation activities. Future research should incorporate a more comprehensive analysis of income dynamics to provide a clearer understanding of the relationship between economic status and forest resource utilization. Studies by Agrawal and Ostrom (2001) have shown that the effectiveness of community forest management is often influenced by the socioeconomic heterogeneity of user groups. Understanding income disparities can help tailor forest management strategies to better address the needs of different user groups and promote equitable resource distribution.

Overall, the findings suggest that while both community forests exhibit good regeneration capacity, they face challenges in meeting user demands for timber, fuelwood, and fodder. Changes in household consumption patterns, influenced by shifting socioeconomic factors, indicate the need for adaptive forest management approaches. Strengthening sustainable extraction policies, promoting alternative fodder sources, and incorporating economic indicators into forest management plans will be crucial in ensuring the long-term sustainability of community forests in the region.

CONCLUSION

The study reveals a shifting landscape of forest product demand in Kurchinekharkha and Sisneridopare CFs, with declining fuelwood and fodder needs due to alternative

sources and reduced livestock. Timber demand remains low due to market alternatives. However, an imbalance exists between sustainable supply and demand, particularly for fuelwood, necessitating regulated harvesting. Strengthening CF management through sustainable policies, monitoring, and user awareness, alongside promoting alternative energy sources and efficient cooking, is crucial for balancing resource sustainability with local needs. Future research should expand the scope, incorporate longitudinal data, analyze non-timber products, explore socioeconomic factors influencing energy transitions, assess climate change impacts, and engage communities for tailored management strategies to improve community forest management practices.

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REFERENCES

Acharya, K. P. (2002). Twenty-five years of community forestry in Nepal. *Banko Janakari*, 12(1), 3-10.

Agrawal, A., & Ostrom, E. (2001). Collective action, property rights, and decentralization in resource use in India and Nepal. *World Development*, 29(9), 1491-1512.

Branney, P., Malla, Y. B., Bhattarai, B., Tamrakar, P. R., Neupane, H. R., & Kathmandu, N. (2001). Innovative forestry: A synthesis of smallscale forest management practice from Nepal. *A field worker's guidebook for supporting community forest management*.

Community Forest Inventory Guideline. (2004). Kathmandu: Department of Forest.

Department of Forest Research and Survey (DFRS). (2015). *State of Nepal's forests: Forest resource assessment (FRA) Nepal.* Kathmandu, Nepal.

Gautam, N. P., Bhusal, P., Raut, N. K., Chhetri, B. B. K., Raut, N., Rashid, M. H. U., & Wu, P. (2023). Nepal's community forestry: Critical reflection from the governance perspective. *Scandinavian Journal of Forest Research*, 38(7–8), 529–541.

Kanel, K. R. (2006). Devolution and donor dependence in community forestry in Nepal. *Development Policy Review*, 24(6), 671-689.

KC, D., Lohani, S. P., Shrestha, P., & Xue, C. (2024). Expert perspective on technological choice for cooking energy transition in Nepal. *Clean Energy*, 8(4), 40-48.

McDougall, C., Ojha, H., Banjade, M. R., Pandit, B. H., Bhattarai, T., Maharjan, M., & Rana, S. (2008). *Forests of learning: Experiences from research on an adaptive collaborative approach to community forestry in Nepal.* CIFOR.

Nagendra, H., & Karna, B. (2009). The impacts of community forestry on livelihoods in the middle hills of Nepal. *Environmental Management*, 43(1), 23-34.

Ojha, H., Persha, L., & Chhatre, A. (2009). *Community forestry in Nepal: A policy innovation for local livelihoods. IFPRI Discussion Paper 00913*.

Paudel, G. P. (2023). *The absence of community in community forestry: The politics of science and ethics in Nepali forestry policy* (Doctoral dissertation, UNSW Sydney). UNSW Sydney.

Pokharel, R., Poudel, J., Adhikari, R. K., & Sharma, A. R. (2018). Demand and supply of forest products in Bandevi buffer zone community forest, Chitwan National Park, Nepal. *Sustainability in Environment*, 3(4), 305-328.

Poudel, N. R., Fuwa, N., & Otsuka, K. (2015). The impacts of a community forestry program on forest conditions, management intensity, and revenue generation in the Dang district of Nepal. *Environment and Development Economics*, 20(2), 259–281.

Puri, L., Nuberg, I., Ostendorf, B., & Cedamon, E. (2020). Locally perceived social and biophysical factors shaping the effective implementation of community forest management operations in Nepal. *Small-scale Forestry*, 19, 291-317.

Sapkota, L. M., Dhungana, H., Poudyal, B. H., Chapagain, B., & Gritten, D. (2020). Understanding the barriers to community forestry delivering on its potential: An illustration from two heterogeneous districts in Nepal. *Environmental Management*, 65(4), 463–477.

Shrestha, R. K., & Gautam, A. P. (2014). Impact of improved cooking stoves on fuelwood consumption and forest conservation in Nepal. *Energy for Sustainable Development*, 21, 10-17.

Thoms, C. A. (2008). Community control of forests in Nepal: Impacts and future challenges. *Journal of Forest Policy and Economics*, 10(6), 521-530.