

What is Choking Nepal's Domestic Timber Supply?

Shrabya Timsina¹, Madan Basyal¹, Kapil Dabal¹, Rabul Karki¹ and Naya Sharma Paudel¹

¹ForestAction Nepal, Bagdol, Lalitpur, Nepal

Corresponding author: shrabya.timsina@gmail.com

Abstract

Despite the huge potential, and the government's stated agenda and policy priorities to increase timber production in Nepal, timber resources are still underutilised and domestic timber supply has to be supplemented by imports. During the course of establishing silvicultural demonstration plots through the first and second phases of the Enhancing Livelihoods and Food Security from Agroforestry and Community Forestry in Nepal (EnLiFT), we uncovered the major constraints that limit timber supply in Nepal. Primarily, we find that: (i) uninformed discourses and uncertain policies around timber industry periodically halt production, and (ii) harvesting activity is generally discouraged by cumbersome regulatory and administrative procedures. Secondly, (i) the business environment is not friendly towards timber production, and (ii) a lack of technological and skill development also limits production. However, efforts to improve these secondary issues may not bear fruit, as long as the primary constraints remain in place. Though there is room for improvement within the organisation of community and private timber producers, central governmental agencies must play a proactive role in lifting legal and administrative constraints, creating a favourable business environment and supporting technological innovations.

Key words: Community forests, private forests, regulatory requirement, timber supply

INTRODUCTION

Over the past decade, scholarly and political discourse among forestry professionals and administrators prominently featured the potential of socioeconomically benefitting from Nepal's timber resources (Pandey *et al.* 2010; Paudel *et al.* 2017), and enhancing environmental health and community livelihoods. Though scholars, practitioners and advocates of Community Forests (CF) have shown that it is successful in restoring of greenery and enhancing growing stock, it is equally recognised that full economic potential of CF has not been realised. However, there is little study on the precise economic potential of timber management in Nepal's CFs. This paper assesses the total timber stock, its annual increment and total amount of allowable harvest in Nepal's CFs. In fact, timber became the key forest resource driving the administration's policy agenda 'forest for prosperity' (MoFSC 2015). Further, the inventories and operational plans of many CFs are usually entirely focused on timber production (Baral *et al.* 2020). However, despite this policy and

management outlook, Nepal has failed to materialise its timber production potential, estimated to be 60-120 million cubic feet (cft) per year with full-time employment of a million individuals (Nuberg *et al.* 2019). In the fiscal year of 2019/2020, Nepal produced 14.35 million cft (MoFE 2020), falling severely short of the estimated annual demand for 119 million cft of timber and derivative products (Kanel *et al.* 2012). This deficit is covered, to a lesser extent, by timber imports (0.51 million cft in 2019/2020 (MoFE 2020)), and mostly by finished wood and alternative plastic and metal products which could have been potentially produced using domestic timber.

Government interventions, such as the 'Scientific Community Forest Management (ScFM)' programme, sought to stimulate domestic timber production and supply through the introduction of intensive harvesting modalities (MoFSC 2014a). However, this narrow focus on production technology has been proven inadequate to

promote domestic timber supply, which is linked to a larger system influenced by forest policies, regulations, business environments, activism and public discourse. Here, we explore and analyse the various components of the system that governs Nepal's domestic timber supply, based on novel information, gathered during the implementation of the EnLiFT1 (Enhancing Livelihoods and Food Security from Agroforestry and Community Forestry in Nepal) and EnLiFT2 (Enhancing Livelihoods from Improved Forest Management in Nepal) forestry projects in Kavre and Sindhupalchowk, as well as secondary data from the literature.

UNINFORMED DISCOURSES AND UNCERTAIN POLICIES

The discourse on timber management in the Nepali media is dominated by the characterisation of timber harvesting as destructive extraction of natural resources, and often sensationalised as deforestation and degradation. A study of media coverage shows that virtually all reported stories about timber are limited to reprehensible acts like illegal logging, corruption and encroachment (Banjade 2012). The role of the media in shaping public and state opinion on timber management has become so influential that forest officials are hesitant about allowing timber harvests on national forests, especially in CFs. When the EnLiFT project sought to fell trees to demonstrate silvicultural harvests, the concerned Divisional Forest Officers (DFOs) were fearful of attracting negative coverage. They insisted that the project should start felling trees only after orienting journalists about the role of tree-felling in silviculture research. In 2015, when forest officials and journalists were taken together to observe EnLiFT's forest research

plot, one of the DFOs expressed his concerns about media personnel taking photographs of the trees felled by the silvicultural harvests. Strangely enough, their fear of media coverage is rational and justified. For instance, in at least two cases¹ (in 2010 and 2020), there was a directly traceable link that connects media coverage of timber operations to government oversight and eventually blanket national prohibitions on tree felling in community forests (Himalayan News Services 2010; Rastriya Samachar Samiti 2022; Zeldin 2010).

Recurring prohibitions on felling are one of the most important factors limiting domestic timber supply from CFs. It is the state's default response to major controversies, such as sensational media reports of over-harvesting or political resistance to forest governance schemes (Table 1). Even when irregularities are reported from a specific location, such as the Sal forests of western Terai in 2020, harvesting bans are often applied to forests throughout the country. The prohibition of timber harvesting from the Chure range, in 2014, was regional in nature – but this range was such an important source of domestic timber supply that the ban has significantly reduced national output (Thing *et al.* 2015). Prohibitions are provoked-not only by environmental concerns of deforestation and degradation - but also by conflicts between competing nexuses of contractors and politicians (Singh 2017). However, the government has even suspended harvesting activity for frivolous reasons such as the celebration of the International Year of Forests, erroneously equating anti-logging policy with informed forest stewardship (Table 1). These prohibitions preclude the production of timber for months to years, making it a risky illiquid business that cannot reliably produce financial returns on time.

1 In 2010, when Dipak Bohora was the Minister of Forest, media coverage of illegal logging across Terai prompted the parliament to form an investigation committee which made a major recommendation to control timber harvesting across forests, including in CFs (Zeldin 2010). In 2020, again the media coverage of massive clear felling in the implementation sites of the ScFM programme, led to three different committees, two formed by the parliament and one by the cabinet, which ultimately led to the halting of timber harvests and collection across the country (Rastriya Samachar Samiti 2022).

Even in the absence of prohibitions, forest policies and directives are continuously fluctuating with changes in government and bureaucratic leadership. For instance, when harvesting bans are eventually lifted, recurring government circulars may still prohibit the felling of live trees in community forests, limiting timber harvests to unmerchantable dead, dying, diseased and decayed trees (Sharma et al. 2020). Similarly, the forest ministry’s agenda to increase timber production, through ScFM, faced political opposition and was eventually scrapped by an unfavourable cabinet (GoN 2021). Once ScFM was dissolved in early 2021, EnLiFT was barred from establishing demonstration plots in CFs whose management plans were merely titled ‘Scientific Forest Operational Plan’ – even though their content did not follow the actual ScFM approach.

Despite sufficient financial resources and professional connections, EnLiFT’s silviculture research project struggled with immense bureaucratic hesitancy due to fluctuations in policy, the risk of media-backlash and legal oversight. It is only then logical to conclude how difficult it is for disparate remote community forest user groups (CFUGs) to convince forest officials for harvesting approval on their own. Meanwhile, operations on private forests do not suffer from prohibitions and the risk of media coverage, and can actually feature extensive and intensive clear-felling operations – often followed by conversion of land for agricultural and residential use. On the other hand, in CFs, timber operations are limited to low-intensity selective logging and ad-hoc harvesting – which yield a minimal output of timber and can have adverse consequences on forest regeneration, productivity and resiliency (Cedamon et al. 2017).

Table 1: A Timeline of Major Prohibitions and Restictions on Timber Harvesting in Nepal.

Date	Level of decision	Scope and rationale
1 November 1999	Ministry of Forests and Soil Conservation (MoFSC)	Ban on felling of live trees across all forests. In 1999, the Timber Corporation of Nepal was not able to sell loads of logs lying in the forest. This issue was communicated to then Prime Minister Krishna Prasad Bhattarai, who ordered the forest secretary to stop harvesting new live trees until the existing stock of logs was sold off. The ministry issued a nation-wide ban on cutting down standing live trees. Active resistance by civil society networks led to the withdrawal of the decision, with the caveat that the ban be lifted only for CFUGs whose management plans were revised/created on the basis of a scientific inventory (Ojha et al. 2007).
31 December 2001	N/A	Ban on the harvest and transport, for commercial sale and export, of logs from public forests of the following species – champ (<i>Magnolia champaca</i>), khayar (<i>Senegalia catechu</i>), sal (<i>Shorea robusta</i>), simal (<i>Bombax ceiba</i>), satsal (<i>Dalbergia latifolia</i>), bijaya sal (<i>Pterocarpus marsupium</i>) and okhar (<i>Juglans regia</i>). This ban exempted the harvest of trees whose harvesting plans had already been approved, harvests by future government priority projects, and the salvaging of logs from fallen trees. The ban was partially lifted on November 5 th , 2007 for the following species – champ, khayar and simal (Subedi et al. 2014).

26 May 2010	MoFSC – Dipak Bohora as Forest Minister	Ban on “cutting, selling and export of trees and other forest products for commercial purposes” across all government and community-managed forests. The ban was prompted by rampant forest encroachment and timber felling by smugglers in certain districts, including Panchthar and Sarlahi (Zeldin 2010).
16 June 2014	Mahesh Acharya as Forest Minister	Designation of the Chure region as the ‘Chure Environmental Conservation Area’, citing the geological fragility of the region. This restricted commercial harvesting of timber in Chure forests (DOF 2014). A cabinet meeting held on May 8, 2015 lifted the ban on commercial use of timber in the CFs in Chure, but still restricted harvest to fallen, dead, dying, diseases and deformed trees (Paudel <i>et al.</i> 2015)
28 May 2020	Prime Minister KP Oli	Ban on tree felling and transportation prompted by alleged financial irregularities involving the ScFM programme (Budhaair 2020). The ScFM programme was then later terminated by the cabinet (GoN 2021). New guidelines for forest management are under development.

Note: All prohibitions could not be included because government agencies and prominent academics did not have a detailed record of all these events.

CUMBERSOME REGULATORY AND ADMINISTRATIVE REQUIREMENTS

The cumbersome, exhaustive and costly administrative procedures involved in harvesting and selling timber from community and private forests create a major bottleneck in timber supply. CFUGs seeking to legally harvest and commercially sell timber have to submit two separate applications, one for a felling permit and another for a sale permit, which are processed through the two hierarchical levels of the forest service in the district – the sub-Division (sub-DFO) and Division Forest Offices (MoFSC 2014b). These legal procedures and requirements are so time-consuming, duplicative and expensive that they make timber-harvesting and trading very risky and cost-ineffective. For instance, even when the EnLiFT project supported communities with external technical and administrative assistance, it took over 11 months and over a dozen visits to the forest offices, to complete the harvest and sale of timber produced from just three hectares of a single CF in Sindhupalchowk. This

is because regulatory procedures require repeated visits to forest offices, usually hours away from the settlements of the CFUGs or private forest owners. Even then, applicants may not receive a chance to process their applications – because the same forest officials tasked with reviewing applications are also responsible for several other duties including planning and monitoring harvest operations and are often away from their offices (Paudel *et al.* 2008). Many forest owners and users are simply unable to navigate the complicated procedures because they are not informed about the legal requirements.

Overburdened Forest Service

Forest officials are overburdened with responsibilities to closely regulate and assist operations that span the entire supply chain of the timber trade - including forest planning, harvesting, selling and transporting timber (Paudel *et al.* 2014). Consequently, harvest and selling applications may be stalled, unless communities have personal connections with these officers that

help push bureaucratic processes forward. For instance, in both Kavre and Sindhupalchowk, a single DFO, assisted by 9 to 11 Assistant Forest Officers (AFOs), must process the applications and other legal matters of over 500 CFs, not to even mention hundreds of private forests. Further, AFOs, and their team of foresters and rangers, must travel across the district to minutely assist with technical matters at harvesting sites. This unreasonable workload on the forest service provides space for them to demand or be offered extra-legal payments and favours in order to carry out responsibilities that they are legally mandated to do for free (Paudel *et al.* 2008). CFUGs are not able to produce receipts for these payments and other costs incurred in procuring snacks and meals for forest officials. Consequently, the executive committee has to make fake receipts to justify their expenses in their financial reports, sometimes encouraging corruption within CFUGs.

Government technicians are singularly involved with determining every technical input that goes into the main management document of the CFUG – their Operational Plans. This includes data collection for the forest inventory, calculation of the growing stock and annual allowable harvest volume, determining environmental and socioeconomic safeguards, prescribing silvicultural interventions, scheduling the harvest and selecting trees to be felled, and grading timber quality (Paudel *et al.* 2014). This immense technocratic power strips the CFUG of their ability to regulate the timing, location, volume and quality of their harvests, and affects the earnings of the group. The entire process is riddled with space for manipulation. If the DFOs discover that the growing stock of the forest is above the national average of 178 cft/ha, then they may deliberately falsify the data to produce a growing stock value below the average (Baral *et al.* 2018). This is because the Commission for the Investigation of Abuse of Authority (CIAA) may initiate an investigation into the inventory effort, under the suspicion that the

DFO is colluding to overharvest by deceptively calculating a high growing stock.

In a place, such as Nepal, with diverse forest types and geographies, this certain practice of the CIAA has threatened the job security of forest technicians, thereby often reducing forest productivity and CFUG earnings. The Department of Forests has failed to inform the CIAA that growing stock can vary across the country sometimes reaching as high as 400 cft/ha to as low as 50 cft/ha (Khadka *et al.* 2019). Further, CFUGs have complained that Division Forest Office staff usually ask forest users to include dead, dying, dry and fallen trees into the annual allowable harvest volume, even though these do not contribute to the forest's growing stock and are generally unmerchantable (Cedamon *et al.* 2018).

Timber Harvest in Community Forests

In order to be eligible for applying for a felling permit, the CF's operation plans must contain language indicating that the user-group intends to harvest timber for commercial purposes. The felling permit application is first submitted to the sub-DFO, which may forward it to the DFO if deemed acceptable or return it to the CFUG for amendments. While reviewing the application, the DFO may impose certain conditions on timber harvests, based on prevailing regulations, cabinet decisions or ministry circulars. Many regulations around harvesting have no basis on forest ecology and only serve to limit CFUG earnings and to restrict domestic timber supply. A major example includes the stipulation that if CFUGs wish to commercially sell timber outside the group, they are allowed to harvest only 85 per cent of the annual allowable cut (Paudel *et al.* 2015).

If the application is approved, the sub-DFO deploys technicians to support the CFUG in determining harvest boundaries, and the selection, numbering and measurements of the trees to be felled. The work load involved in preparing for and conducting timber harvests in CFs is so

demanding that it is virtually impossible for forest service staff to carry out all their responsibilities legally and effectively. For example, in Deupokhari CF of Sindhupalchowk, where 719 trees were to be felled, a 3-person AFO team was legally obligated to mark every tree selected to be felled, and later, also every log produced from these trees that were to be transported and sold outside the CFUG. Additionally, they were being constantly asked to visit other forests on the same day, located hours away by motor-bike.

Measurements prepared by government technicians is used to produce yet another application – a harvest plan – processed again through the sub-DFO and DFO. If approved, technicians and CFUG members must hammer-mark the numbered trees using specified government and CFUG seals. These marks are then verified by other CFUG officials, DFO technicians and officials from the provincial government. CFUGs finally receive a felling permit once the verification report of the hammer-marks is approved by the DFO – who then deploys technicians to oversee the harvest operations. During the harvest, every stump and sawn log must be numbered, and the measurement of every log's diameter and length recorded. Technicians must also oversee the log collection process and ensure that logs are bundled according to grade and properly numbered. Timber contractors have argued that the government's grading system is impractical and gives space to its technicians to manipulate and delay the sale of timber. For instance, timber contractors have to pay unfairly high prices for poor quality logs due to improper grading by forest officials (Gritten *et al.* 2015). Higher grade logs are taxed more than lower grades, so DFOs tend to overvalue the logs to avoid facing legal action for manipulating government revenue collection.

If the harvest plans for the year fail due to administrative delays, internal conflicts or bans on felling, then the CFUG must repeat the entire

process. For instance, after Shreechhap and Deupokhari CFs failed to conduct a harvest within the fiscal year in which they had received approval, they were required to restart the application process from the measurement of the dimensions of the trees to be harvested.

Besides restricting income opportunities, delays and unwarranted restrictions on timber harvest can have serious financial and ecological consequences. The risk of severe crown fire in certain forest-types, such as pine forests, increases as fuel-load accumulates – in terms of standing tree density and inflammable debris on the forest floor. Current procedures and regulations also preclude timely sanitation interventions to prevent forest disease outbreaks and salvage harvests to reduce loss of timber assets following extreme weather events.

Timber Sale by Community Forests

The existing policy requires the timber produced by CFUGs to be sold through an auction process, which is similarly riddled with cumbersome requirements. This requirement means that CFUGs are legally restricted from funding their timber production through advanced investment from timber-contractors. The auction process takes so long that CFUGs are keen to dispose of the felled logs as quickly as possible, even if they fetch prices significantly below market rates (Gritten *et al.* 2015). Since slow bureaucratic processes usually push harvesting activities towards the end of the legal harvesting window in April and May, timber is usually stored in the open, exposed to quality-reducing monsoon rains of June/July while the auction is being prepared (see Box 1).

An auction must attract bids from at least three different contractors in order to proceed with the sale. If an auction fails to receive any bids because of a prohibitively high minimum sale price, CFUGs must organise up to two more auction with the same price and receive at least one bid. They are allowed to readjust the minimum price only if a

third auction with the original price fails to attract any contractors. However, even this readjustment requires approval from CFUGs' General Assembly. In CFUGs, where general assembly meetings take place at most once a year, the administrative requirement causes a loss of quality and volume when timber is stored openly for years.

Beyond their ability to influence technical inputs during harvest operations, DFO staff can also determine the timing and minimum pricing of timber auctions. In some cases, DFOs use their influence over the sale of timber with benevolent intentions, even if it means CFUGs and private forest owners are burdened with logistical and economic inconveniences (see Box 1). However, in the worst cases, government technicians form a nexus with timber contractors and local leaders of CFUGs, in order to profit from the transactions (Banjade 2012; Paudel *et al.* 2014).

Though government guidelines require that 25 per cent of the CFUG's annual income be invested in forest management, income from timber sales is almost never reinvested to improve timber resources (MoFE 2016). Users do not even categorise timber harvests as a forest management activity. Instead, these funds are allocated towards the construction of roads, temples, public buildings, drinking water infrastructure and livestock-rearing.

Private Forests

Due to their smaller acreages, individual private forests usually yield significantly lower volume of timber than CFs. Nonetheless, the administrative procedures required to register and harvest from private forests are still lengthy and confusingly involve two different government agencies. Private forest owners must first receive a recommendation from the sub-DFO or DFO, and then approach

Box 1: Minimum Tender Price for Timber in Community Forests

In Chappani CF, Kavre, after the harvesting of pine trees, the CFUG issued a tender with a minimum price per cft of Nepalese Rupess (NRs) 100, and was able to auction off the bucked logs at NRs. 131. However, upon seeking approval for the sale from the DFO, the CFUG was asked to reauction the logs at a minimum price of NRs. 150, with the benevolent intention of maximising the CFUG's earnings. Unfortunately, the CFUG received no bids at that minimum price, even after two more auctions. Finally, the DFO held a negotiation for the sale among its officers, Chappani CFUG, contractors and members of FenFIT (Federation of Forest based Industry and Trade, Nepal) – after which the minimum price was maintained at NRs. 100 and the CFUG finally sold the timber at NRs. 129, two rupees lower per cft that what they had been offered initially.

A similar case was observed in Deupokhari CF, Sindhupalchowk, where the CFUG failed to receive a single bid, even after three tender notices, because of the high minimum price. The quality of the log degraded as it was stored in the forest over the monsoon, and the CFUG eventually sold it after the fourth notice for NRs. 365 per cft – 44 rupees below their original minimum price.

Also, as seen in Sansaridanda CF, timber contractors may collude with one another to decrease the minimum price. Even upon three notices, the first one in 2018, no contractors bid for the timber set at a minimum price of NRs. 550/cft. Finally, in the 4th attempt two years later, the CFUG lowered the minimum price to NRs. 436 and was able to sell the timber at this price to one of its own forest users acting as a bidding contractor. However, at this point, timber quality and quantity had significantly decreased due to moisture-induced decay.

the municipal government's ward office to register their forests. If owners seek to sell their timber products locally, they can receive approval from the ward office, but if they seek to sell to other municipalities and districts, they must seek permission from the District Forest Office (GoN 2019).

UNFAVOURABLE BUSINESS ENVIRONMENT

Timber is inherently a risky business in the sense that it features a long moratorium period (10-15 years) during which forest timber resources must develop. There are minimal to no financial returns during this development period and, instead, the investor faces multiple risks that can destroy their assets - such as herbivory, pestilence, disease, extreme weather events and wildfire. However, in addition to the risk-laden nature of timber production world-wide, Nepali timber producers and traders face additional risks that limit their commercial opportunities. Besides dealing with cumbersome procedures and prohibitions, they also have to deal with lawlessness and uncertain and prohibitive taxation. Nepali timber suppliers are also constrained by the lack of finance and insurance options and their own limited financial literacy.

Poor Governance: Insecurity and Collusion

The weak governance of the economic and administrative actors, engaged in the timber market, has encouraged corruption and collusion – driving up lumber prices and disenfranchising timber producers and processors. From the very beginning of the value chain, timber producers like CFUG's are out-muscled and pressured to reduce their sale price by colluding timber contractors (See Box 1). Then, once the contractors collect their purchase from timber producers, it is their turn to face many difficulties during the transport of timber from one location to another. For instance, contractors transporting timber, from Sansaridanda CFUG in Sindhupalchowk to a depot

in Bhaktapur, paid NRs. 500-1500 per truckload at every one of the five check-posts in between. Additionally, CFUGs and contractors may even be extorted by local gangs who do not allow timber-carrying vehicles to pass through unless they are paid off. In Sansaridanda, gang members arrived during the timber sale on over 30 motorbikes, and demanded a cut from the sale. In Chaubas, gang members chased and beat up a contractor who refused to pay them off, while a rival contractor set a lot of timber on fire after failing to win the auction. Consequently, usually only pre-made nexuses of forest officials, contractors, gangs and local elites are able to commercially supply timber, discouraging many communities and individuals from investing in commercial timber production.

Taxation

High taxes and uncertainty of taxation policy has also made the timber market unwelcoming to private and community actors (Table 2). The accumulation of these taxes make domestic timber very uncompetitive in comparison to imported timber logs, on which the federal government imposes a mere 5 per cent customs tariff (DoC 2020). Meanwhile, contractors that collect domestic timber must pay 13 per cent federal-level Value Added Tax (VAT) (MoFSC 2005) for their timber purchases. In Sindhupalchowk, the DFO asked the contractor to pay a further 13 per cent VAT on the wages paid during harvesting by Shreechhap CFUG – a requirement which exemplifies the lack of uniformity in taxation between forest service offices in different districts. The savings of CFUGs (including from timber sales) with registered tax-payer identification numbers, called Permanent Account Numbers (PANs), is considered as annual income, and charged an additional 25 per cent federal income tax (Mandal 2020). Since most timber harvesting activities occur through November-May, CFUGs usually only start collecting income from timber sales in June. Therefore, they have little time to spend this income before it is taxed at the end of the tax-year in mid-July. Moreover, tax officers often engage

in malpractice such as retrospective imposition of taxes. For instance, when Deupokhari CFUG registered for a PAN, it was pressured to pay back-taxes for the 18 years since the registration of the CFUG.

Constantly changing and unclear taxation systems in the transition to federalism further complicate financial management for timber producers. Local government tax rates are still in the process of being revised. At our field site in Chautara Sangachowkgadhi Municipality, Sindhupalchowk claims that CFUGs should pay 10 per cent taxes on timber sales (Chautara Sangachowkgadhi Municipality 2019), however in practice contractors pay Rs. 20/cft on behalf of the CFUGs. This rate is expected to be reduced to 5 percent. CFUG

networks have asked for a single taxation process, because separate and uncertain taxation by the multiple layers of government causes confusion and unnecessary effort (Mandal 2020). For instance, there were significant administrative delays caused by the confusion about the payment of 2% provincial taxes after timber harvests in EnLiFT’s three community forest research sites in Sindhupalchowk. Though, the concerning legal document mentions this tax provision, it does not clarify who the liable party is (BPMoFE 2019). The DFO asked the CFUGs to pay provincial taxes, while the CFUG believed it was the responsibility of the timber contractor. The issue was settled in an ad-hoc basis through an informal agreement between the CFUGs DFO, contractors and local government.

Table 2: Taxation rates on timber sales and purchases for community forests (CF) and private forests (PF) at Different Government Levels

Jurisdiction		Tax rate	Internalised by	
Federal (Value Added Tax)	Both PF and CF	13% (MoFSC 2005)	Buyer (contractor)	
Provincial tax	PF	2% (BPMoFE 2019)	Unclear in law - but in practice, the buyer (contractor)	
	CF	0.5% (sale within CFUG) 10% (sale outside CFUG) (BPMoFE 2019)	Seller (CFUG) - but in practice, for sales outside CFUG, the buyer (contractor)	
Local Government Tax	PF	<u>Chautara</u>	Unclear in law - but in practice, the buyer (contractor)	
		<u>Bhumlu</u>		NRs. 4/cft (sale within municipality) NRs. 5/cft (sale outside municipality) (Bhumlu Rural Municipality 2021)
	CF	<u>Chautara</u>	NRs. 5/cft (sale within district) NRs. 20/cft (sale outside district) (Chautara Sangachowkgadhi Municipality 2021)	
			10% annual income tax on commercial sale of all forest products (Chautara Sangachowkgadhi Municipality 2021)	Seller (CFUG) – but not yet enforced
		<u>Bhumlu</u>	NRs. 5/cft (sale within and outside municipality) (Bhumlu Rural Municipality 2021)	Unclear in law - but in practice, the buyer (contractor)

Small Scale of Production/Business among Producers

The lack of organisational efforts to foster market cooperation between small and geographically scattered community and private forests also limits commercial timber production. With their small irregular production volumes, these dispersed and unorganised producers have little bargaining power against contractors, and are unable to achieve economies of scale (Magrath *et al.* 2013; Paudyal *et al.* 2020). This limits their ability to add value to their products, such as by acquiring technicians to produce sawn timber from logs (however, note that the sale of sawn timber by CFUGs is not encouraged by the law (MoFSC 2014c, 2003). The small scale of timber production in Nepal also means that producers seldom have direct access to retail markets, where they could fetch the highest value. Instead, they are dependent on marketing channels composed of a long chain of unreliable intermediaries, who take the largest share of profits from timber trade (Lamsal *et al.* 2017). Producers also have limited access to market information, such as trending consumer preferences, and are prone to misinformation about the suitability and profitability of different species. For example, even though consumers prefer *Pinus roxburgii* for its durability and aesthetics, many mid-hills communities planted the less lucrative *Pinus patula* following the ill-informed advice of development programmes (*personal communication with Shambhu Dangal*). Today, producers are investing in Teak and *Paulownia* plantations following deceptive marketing by private nurseries (Magar *et al.* 2016).

Financial Illiteracy and Lack of Finance and Insurance Options

Most CFUGs have limited knowledge on the taxation system, revenue management and account

keeping. First of all, the Executive Committee of CFUGs is mostly comprised of middle-aged to elderly individuals with little formal education and financial experience and knowledge (Figure 1), due to either the absence or marginalisation of experienced and learned youth in rural communities. Secondly accountants are required to meet the government's requirement of two-way account keeping, but CFUGs are unable to recruit and fund skilled personnel in rural settings (Bhandari *et al.* 2019).

There is no dedicated service in Nepal that provides finance, through grants, loans, or co-investment, to fund forest resource production, including timber. Consequently, timber producers in Nepal, who are generally of informal and unorganised in nature and often financially illiterate, are unable to navigate through existing finance options developed for investment into other sectors, such as agriculture, and adapt these to timber production. More importantly, rural and small-scale timber producers may not even be able to produce the collateral required to obtain this finance from large banking institutions, even if they are able to manage other logistics. Though local cooperatives and money-lenders may be interested in financing them, their exorbitant interest rates (2-4% per month) discourage them seeking loans for a risky venture like timber production in Nepal.

Although standing timber is naturally exposed to disease, extreme weather and wildfire, Nepali investors also need to consider the risk of losing felled and sawn timber assets to fire and rain while waiting for the slow cumbersome administrative processes in harvesting and transport. Large investors generally seek an insurance policy to mitigate such risks, but there are currently no provisions for insurance against these disasters in Nepal, making timber production and trade largely unattractive in comparison to insured sectors like tourism, manufacturing and transportation.

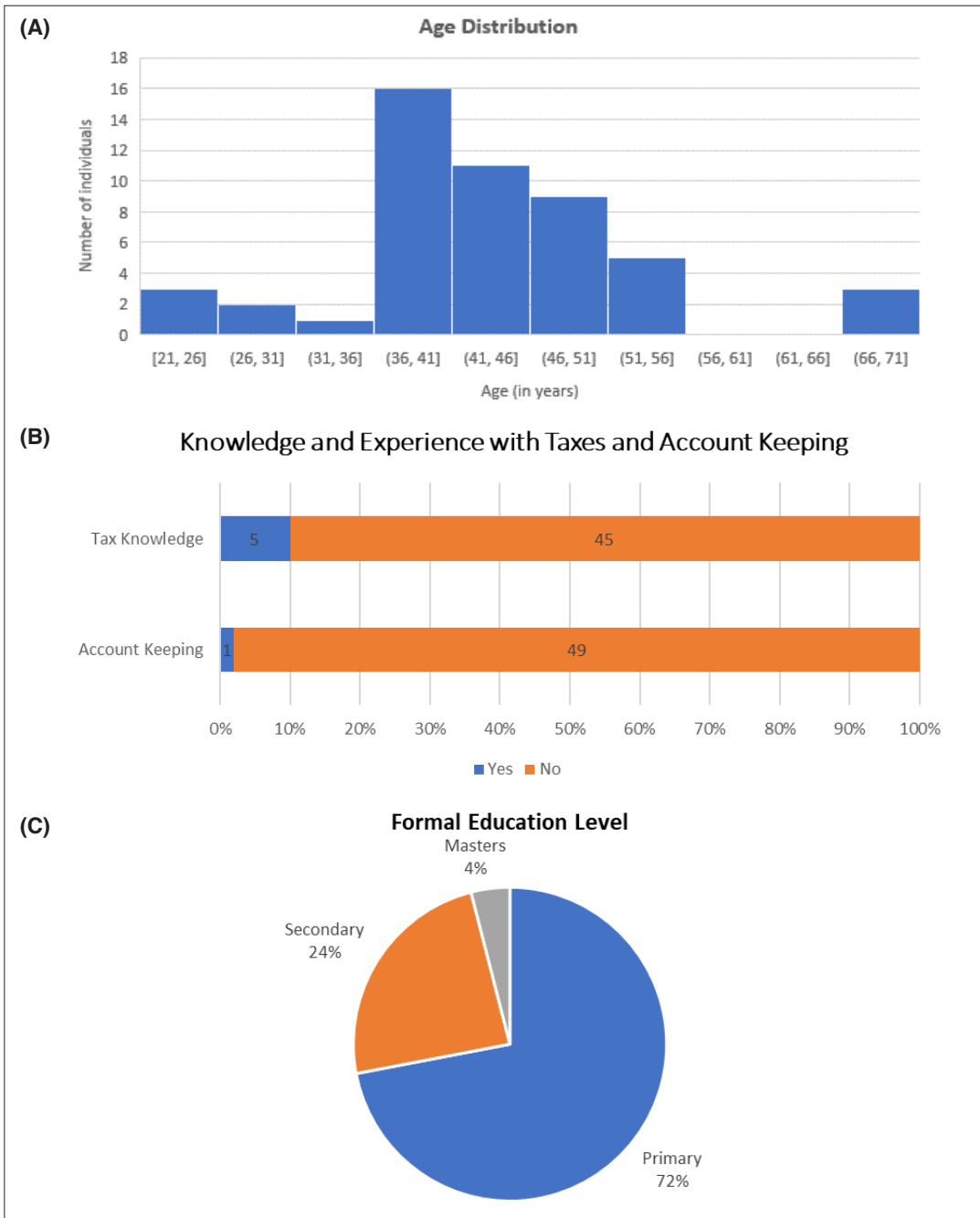


Figure 1: The Distribution of Ages (A), Formal Education Levels (B) and the Percentage and Counts of Fifty Members and Position-Holders who are Have Knowledge of and Experience With Taxation Requirements and Formal Account Keeping (C)

Note: This data was taken across 7 CFUG executive committees, namely Chuatara Sangachowkgadhi Municipality, Shreechhap, Sansari Danda, Tarebhir, Bajhe Kapase, Bajhbesuna and Deurali Chihan Danda.

TECHNOLOGICAL CONSTRAINTS

The major technological barriers to increasing domestic timber production in Nepal are of two types: (i) the difficulty of mechanising production, (ii) the lack of technical training and reference materials, and (ii) the lack of storage and seasoning options.

Mechanisation

Hand-held power chain-saws are increasingly replacing the use of axes in logging, but formal training for this dangerous occupation is limited or non-existent. While it is difficult to find skilled chain-saw operators, mechanics that can maintain and repairing these machines are even rarer. In Shreechhap CFUG in 2019, the failure to find operators pushed the harvest to the next fiscal year, forcing the CFUG to restart the entire administrative process. Most loggers are also not skilled at minimising wastage during tree felling, often lowering the log's length category (e.g., from 8ft to 6ft) and decreasing its value. Trained loggers are able to maximise the volume of sawn timber produced from a single felled tree and minimise the impact that felling has on the quality of the felled tree and its neighbouring canopy trees and regeneration. A major portion of savings in the logging business is generated using the knowledge of minimising waste while bucking logs. There is limited training on directional felling and optimal bucking available to loggers in Nepal to increase their capacity.

The forwarding of felled logs from harvest sites to the landing (collection depot besides the forest road) is done manually using human labour. This means that CFUGs in hilly regions with steep slopes are forced to cut their logs into smaller sections and reduce their sale price, or completely abandon them in the forest due to the difficulty of carrying logs uphill. In Sindhupalchowk in 2021, Deupokhari CFUG cut logs down to smaller sizes, but were still unable to collect from sites furthest from the forest road, leaving them exposed to

monsoon rains for months. Unfortunately, timber contractors avoid buying small short logs, because they have a greater wastage-to-output ratio after milling and are therefore less profitable than larger logs. They generally prefer 8 feet (ft) long logs and do not accept logs shorter than 6 ft or smaller than 6 inches in diameter. The use of advanced harvesting and forwarding machines in the Terai and the adoption of cable logging in the hills and mountains would significantly increase the rate of timber production. However, this advancement in mechanisation is hindered by the massive initial capital required as well as lack of technical knowledge and training in operating mechanised equipment. The current transportation system of logs from the forest road to the sawmill and markets also makes timber production inefficient. Usually, only trucks with a capacity of 100-400 cft, can access forest roads.

Technical Training and Reference Materials

Surveys have revealed that the forestry sector needs to substantially invest in strengthening the capacity of both government and non-government forest technicians and managers (MoFSC 2016). Until the inception of the ScFM programme, even government technicians did not have the opportunity to practice developing and implementing silvicultural systems (Jayasawal and Bishwokarma 2016). Timber producers themselves, including CFUGs and private-forest owners, are also not trained in the important aspects of forest management and in implementing silvicultural treatments. In fact, even the use of these skills is restricted via regulations to government forest technicians only. Such constraints have hindered the development of thousands of non-governmental forest professionals and managers.

The lack of site - and species-specific official guidelines to estimate standing tree volume, as well to convert these to estimates of timber volumes, is also problematic. Forest officials usually apply

a form factor of '0.5' to calculate standing tree volumes, regardless of the species, diameter classes and height classes of the trees (Baral *et al.* 2020; Subedi *et al.* 2021). The inaccuracy of these estimations makes it very difficult for CFUGs and private forest owners to make reliable business plans and conduct cost-benefit analyses. Most discouragingly, if the actual output is greater than the estimated volume, forest bureaucrats do not allow CFUGs to sell the excess timber, and if this is not consumed internally by users, then it is left to decay, or be consumed by fire – such as in Shreechhap CFUG.

Storage and Seasoning

Timber producers in Nepal seldom have storage space and technology that could allow them to safeguard the quality of their products, while waiting for market conditions to be favourable – such as an increase in demand or prices. Instead, they leave stacked logs outdoors exposed to rainfall, which can significantly reduce the value of their products. Because of difficulties in storage, timber producers are usually forced to sell their products before the onset of the monsoon in Nepal, regardless of what the prices are at that moment.

There are no facilities in Nepal to treat and season wood to increase the quality of timber products, such as strength, durability and water-resistance. Nepali timber must therefore compete with seasoned imported products of better quality and design (Paudyal *et al.* 2020). Encouragingly, the Bagmati Province government has recently allocated NRs. 150 million for timber seasoning and treatment plant in Dandapakhar, Sindhupalchowk. The plant has been registered as a joint company involving six CFUGs, and site preparation and purchases of few machines have already been completed.

CONCLUSION

Nepal's timber economy suffers from supply-side constraints that limit the generation of material benefits to communal and private producers

as well as domestic consumers. This limited supply can be attributed largely to: (i) regulatory, administrative and institutional procedures that discourage timber harvests, and (ii) unpredictable policies and administrative decisions resulting from uninformed discourses, which further limit domestic harvest and trade. Small-scale private and community-based timber producers are highly disincentivised by the unpredictable legal environment and costly procedures. The various concerns associated with unfavorable business environments and technological constraints, seem to be secondary to legal, policy and administrative restrictions. For instance, financial institutions will most likely never be interested in developing tailored services to timber production, as long as they know that the entire industry in a locality can collapse following a single decision of a DFO. Though there are various internal issues associated with timber producers - such as a lack of technical capacity, financial mismanagement, and illicit harvesting - it is ultimately the federal and provincial forest ministries that can ease the major legal and administrative constraints to radically reshape the domestic timber industry and increase supply. If the government's agenda of 'forestry for prosperity' is to be realised, it must swiftly find more efficient and producer-friendly approaches to governing the timber industry.

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