TÍTULO

JATAMANSI IN NEPAL
IMPACTS OF REVIEW OF SIGNIFICANT TRADE ON SPECIES MANAGEMENT AND LIVELIHOODS

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Jatamansi in Nepal: Impacts of Review of Significant Trade on Species Management and Livelihoods

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List of Acronyms

AAH	**Annual Allowable Harvest**
ANSAB	**Asia Network for Sustainable Agriculture and Bioresources**
CECI	**Centre d'étude et de coopération internationale**
CFUG	**Community forest user group**
CIFOR	**Centre for International Forestry**
CITES	**Convention on International Trade in Endangered Species of Wild Flora and Fauna**
CoP	**Conference of the Parties**
DDC	**District Development Committee**
DFMP	**Divisional Forest Management Plan**
DFO	**District Forest Office (pre-2018)**
DFO	**Division Forest Office (post 2018)**
DoFSC	**Department of Forests and Soil Conservation**
DPR	**Department of Plant Resources**
EIA	**Environmental Impact Assessment**
FECOFUN	**Federation of Community Forestry Users Nepal**
GDP	**Gross Domestic Product**
HBTL	**Himalayan Bio Trade Limited**
IEE	**Initial Environmental Examination**
INGO	**International NGO**
JABAN	**Jadibuti Association Nepal**
KG	**Kilogram**
KTM	**Kathmandu**
LAF	**Legal Acquisition Finding**
MA	**Management Authority**
MAP	**Medicinal and Aromatic Plant**
MoFE	**Ministry of Forests and Environment**
NASA	**National Aeronautics and Space Administration**
NDF	**Non-detriment finding**
NGO	**Non-governmental Organization**
NPG	**Nepalgunj**
NPR	**Nepalese Rupee**
NTFP	**Non-timber forest product**
NWFP	**Non-wood forest product**
NYT	**New York Times**
OP	**Operating plan**
PC	**Plant Committee**
PROFOR	**The Program on Forests**
RST	**Review of Significant Trade**
SA	**Scientific Authority**
TRAFFIC	**Trade Records Analysis of Flora and Fauna in Commerce**
UNDP	**United Nations Development Programme**
UNEP-WCMC	**United Nations Environment Programme World Conservation Monitoring Centre**

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ABSTRACT

Nardostachys grandiflora (Jatamansi) is a critically endangered high-altitude Himalayan plant species included in CITES Appendix II. Jatamansi is used to produce herbal medicines, incense, and cosmetics, making it one of the most commercially valuable and heavily exploited species in Nepal. Its collection and trade provide at least 15,000 Nepalis with an average of 25% of their annual income. This research used interviews with experts in Jatamansi trade, research, or policy, along with household surveys of community forest users in 5 districts of Nepal, to test three hypotheses concerning the impacts of the Review of Significant Trade process and Nepal's CITES Act (2017), Forests Act (2019) and Environmental Protection Act (2019) on species management and livelihoods. Results show the species has regrown since 2017, but a zero-export quota was not the only cause, as delays in promulgating regulations for the CITES Act (2017) and COVID-19 pandemic restrictions also limited collection. Community forest user group operational plans mandated by the Forests Act (2019) that used local harvest management systems and were not consistently implemented failed to ensure that harvest did not exceed population growth rate. New Environmental Impact Assessment data increased the national annual allowable harvest quota, but used local harvest management protocols, necessitating a precautionary calculation for CITES export quotas. The new CITES Act (2017) negatively impacted collector incomes in the short term by delaying resumption of legal exports and recentralizing previously delegated authority to issue collection permits.

Keywords: Jatamansi, Review of Significant Trade, livelihoods, Nepal, CITES

Jatamansi in Nepal: Impacts of Review of Significant Trade on Species Management and Livelihood

1.1 The importance of Jatamansi in Nepal

Nepal is a landlocked country in South Asia located between China to the north and India to the south, with a total area of 147,180 km². The average length of the country is 885 km from east to west, and the width varies from 145 km to 241 km, with a mean of 193 km from north to south. Hills and high mountains cover about 86% of the total land area; the remaining 14% is composed of the Terai flatlands, which are less than 300m in elevation (Bhuju et al., 2007). Nepal is a lower-middle-income country with a 2021 gross domestic product (GDP) per capita of 1208.20 USD (World Bank, 2023).

Jatamansi is a species included in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The distribution of the species is in the high- altitude Himalayan ranges of Bhutan, China, India, Myanmar, and Nepal (Science Direct, 2023). Species of the genus *Nardostachys* described in the Himalayan region include *N. grandiflora*, *N. jatamansi* and *N. chinensis Batalin* (Kunwar et al., 2021). CITES considers these species to be synonyms (CITES, 2022). Common names in Nepal include Bhulte and Jatamansi, while the species is referred to in English as Spikenard or Nard.

Jatamansi is in the medicinal and aromatic plants (MAPs) category, a group of non-timber forest products (NTFPs) with significant cultural and economic value. MAPs are used not only for therapeutic and aromatic purposes but are components of cosmetics, food, and condiments (Schippmann et al., 2006). They have value as traditional medicines and as trade commodities in domestic and international markets. Wild-harvested Jatamansi is a source of income for collectors and other actors, particularly in the mountainous regions where opportunities are limited. The high trade value of Jatamansi can also provide an incentive to manage the harvest of plants sustainably and to maintain their habitat to benefit other species and whole ecosystems (Jenkins et al., 2018).

Challenging topography has limited systematic inventories of Jatamansi, and availability of data on its population distribution and size, reproductive biology, adaptability, and ecological niche models (Chauhan et al., 2021b). The species is listed in CITES Appendix

II since 1997, after three previous listing proposals by India in 1979, 1989, and 1994 were rejected or withdrawn. Despite this, several authors over the last three decades have identified overharvesting as a threat to the species in Nepal. Reports of overharvesting and illegal trade continue, notwithstanding the sustainability and management efforts of Management and Scientific Authorities in Nepal, the District/Division Forest Offices, Community Forest User Groups, and ethically minded traders. The Plants Committee has reviewed the range state status of Jatamansi several times over the years, culminating in the 2014 Review of Significant Trade (RST) for Jatamansi in Nepal.

1.2 Biology and Distribution of Jatamansi in Nepal

Jatamansi is an aromatic perennial rhizomatous herb growing 10 to 60 cm tall with an erect, slender stem. The harvested portion of the plant consists of a thick, long rootstock (rhizome) with a woody main root enclosed in fibres from the petioles of dead rootstock leaves (Chauhan et al., 2021a). The plant's common name refers to the appearance of the rhizomes (Figure 1), evoking matted, rolled-up hair like that of Himalayan wandering spiritual practitioner. 'Jata' is a Sanskrit word meaning twisted or matted lock of hair, while 'mansi' refers to the mind or mental state (Dhiman & Bhattacharya, 2020).

Figure 1

Jatamansi Rhizomes

Source: (Gurung & Pyakurel, 2017 p. 39)

Jatamansi has a short growing season from May to October and becomes dormant before snowfall. The plants grow in dense clumps of up to 21 clones, or ramets, in each cluster. Each ramet is composed of 2 to 10 linear-lanceolate to oblanceolate leaves and produces 1 to 3 inflorescences from June to July. The white, purple, or pink-tinged, scented flowers grow in umbellate heads (Figure 2). Each inflorescence can produce up to 25 seeds that mature in August to September, are passively dispersed in late September, and germinate by May/June of the following year. Seedlings grow into small rosettes during their first year (S. K. Ghimire et al., 2007).

Figure 2

Flowering Jatamansi Plant

Photo Credit: Khilendra Gurung. Source: (FairWild, 2018)

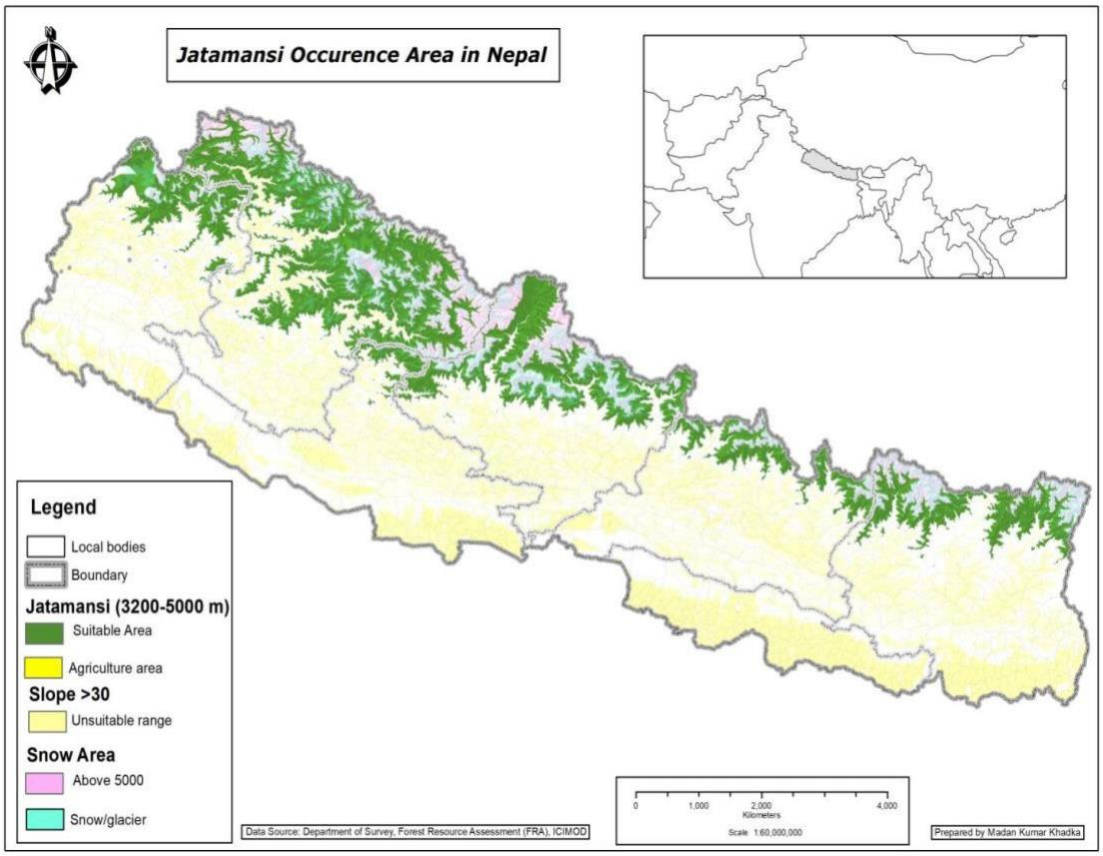
The plant reproduces through both vegetative means and seeds. It has a lengthy juvenile vegetative growth phase of 3 to 4 years followed by a short reproductive phase (Nautiyal et al., 2003). Studies reporting a range of seed germination rates between 10 and 80% were cited by Mulliken and Crofton (2008). Population growth rates are significantly higher in meadows than in rocky outcrops due to differences in flowering frequency, seed mass, and seedling recruitment (Ghimire et al., 2008).

Jatamansi grows on moist rocky and boulder surfaces, crevices, and dry rock surfaces. (Nautiyal et al., 2003). While its typical habitat is rocky outcrops, it is also common in alpine meadows, juniper scrubs, dwarf rhododendron forests, open pine forests, and glacial flats, characterized by typical monsoon precipitation (Raina, 2013). Its preferred

growing conditions are the shade and moisture of north and west-facing slopes (Airi et al., 2000) of 25-45 degrees (Pradhan & Paudel, 2014). It is generally found at elevations of 3200-5000 m and has been identified in 26 districts of Nepal, with the highest population in the Mid-Western Development Region, gradually decreasing to the east **(**Figure 3**)** (Department of Forests and Soil Conservation, Nepal, 2019).

Figure 3

Distribution of Jatamansi Across the Highlands of Nepal



Note: Reprinted from CITES SC71–12–A5: (Department of Forests and Soil Conservation, Nepal, 2019).

1.3 Collection Practices

Most Jatamansi is wild harvested rather than cultivated (Larsen & Olsen, 2008). Mature plants of 3-4 years are collected when leaves start turning yellow, and the rhizomes are brown and 7 to 10 cm in length (Figure 4). When Jatamansi is harvested for its rhizomes, the entire plant is destroyed. However, due to its tendency to grow in clusters of numerous clones, regrowth/population recovery can be facilitated if some rhizomes in each cluster remain in the soil (Mulliken & Crofton, 2008). Depending on the region and the elevation, the collection period is mid-August or September to mid-December, after the seeds have set, but the period may begin as early as July, depending on collector needs (Schindler et al., 2022). Jatamansi harvested in autumn is of higher quality than that harvested in summer. The Jatamansi harvested in summer contains high moisture, is likely to be damaged by fungi and produces poor-quality essential oils (ANSAB, 2010).

Figure 4

Harvested Jatamansi Plant

Photo credit: TRAFFIC.org

1.4 Uses of Jatamansi

In the traditional medicine of Nepal, Jatamansi is used to treat epilepsy, cholera, neurosis, convulsions, heart palpitations and intestinal colic. It is used as an analgesic, antispasmodic, antiseptic, carminative, diuretic, expectorant and sedative and is an important component in Ayurvedic and Tibetan medicinal formulas (Satyal et al., 2015). Hydro-distillation of the Jatamansi rhizome produces a highly aromatic essential oil of a greenish colour and odour similar to expensive musk at a yield of around 1-2% (Pradhan & Paudel, 2014). The marc, or residue after oil extraction, is used to make incense (ANSAB, 2022b). Incense made from Jatamansi is used widely in Nepal for religious and ritual purposes in the Dolpa region, Buddhist monasteries and Newar communities. Jatamansi is considered the best ingredient for traditional and higher-grade incense (Mulliken & Crofton, 2008).

Nepal has traded Jatamansi for centuries (Larsen & Olsen, 2008), yet the relative importance of end uses, and therefore the main trade drivers, still need to be determined (Chauhan, 2020). Contemporary uses of Jatamansi include the consumption of Jatamansi churna (powdered Jatamansi root) in Ayurveda (an Indian traditional medicine system) for balancing the doshas (bodily energies) (Toolika et al., 2015). It is also used to treat neurological disorders, insomnia, and cardiovascular disorders (Pandey et al., 2013) and is an ingredient in at least 26 Ayurvedic preparations (Nautiyal et al., 2003). In the past few decades, interest in Ayurveda has increased worldwide as India has successfully promoted its therapies with more scientific research (Nautiyal et al., 2003). Consumers in India are increasingly consuming medicinal plant products (Caporale et al., 2020). Since the COVID-19 pandemic, the market demand in India for Ayurvedic preparations has seen 50-90% growth (Awasthi, 2021). Publications appear in the contemporary scientific literature examining the medicinal and pharmacological value of Jatamansi (Tanaka & Komatsu, 2008, Satyal et al., 2015, Dhiman & Bhattacharya, 2020). Other uses for Jatamansi oil include perfumery, aromatherapy, and cosmetics, including hair oil treatments marketed to promote growth and treat premature greying.

1.5 Threats to Jatamansi Populations

Jatamansi was first listed on the IUCN Red List in 2014 and reassessed in 2020 as critically endangered under criteria A2c and A2d.[1], with the current population trend decreasing (Chauhan, 2020). In their 2008 case study, Larson and Olsen stated that Jatamansi populations in Nepal were reduced by more than 30% within the previous ten years. Overharvesting was assumed to be the cause, and the most significant threat to the population in Nepal was commercial trade. Excessive collection and harvesting of the plant without replanting a section of the rhizome reduces the population (Mulliken & Crofton, 2008). Premature harvesting before the seed has set also poses a threat, as it hampers the potential for sexual reproduction (Pyakurel et al., 2019). Ghimire et al. (2007) conclude that Jatamansi is extremely sensitive to rhizome harvestings due to its long recovery time, high seedling and juvenile mortality, and high vulnerability to the loss of adults in small, fragmented populations. Premature harvesting also contributes to soil erosion in Jatamansi habitats. Disturbed soils from plants collected in summer are more easily eroded by grazing animals and seasonal rains (Ojha et al., 2001). A 2019 study using a vulnerability assessment tool ranked Jatamansi as the most vulnerable commercial species in Nepal and confirmed that overharvesting underground parts, along with premature harvesting, leads to population decline (Pyakurel et al., 2019). ANSAB resource inventories indicate the growing incidence of forest fires is an increasing threat (ANSAB, 2020).

1.6 Importance of Trade and Income Potential for Collectors

Although trade figures indicate that Jatamansi contributes significantly to the Nepalese economy, national-level information on income and employment is not available. Information about contributions to livelihoods is derived primarily from project-level data (Subedi & Pandey, 2011). TRAFFIC reported in 2018 that collection and trade of Jatamansi in nine districts of Nepal provided at least 15,000 people with an average of 25% of their

[1] A2 indicates that the taxon has declined by 50% or more in the last 10 years or three generations (whichever is longer). The subcriteria indicate that the decline in mature individuals was caused by a decline in extent of occurrence, area of occupancy, and/or the quality of habitat, as well as exploitation (IUCN Standards and Petitions Committee, 2022).

annual income. A TRAFFIC-led project working with 2000 wild-harvesting households found that more than 75% of the households had earnings from Jatamansi collection, averaging 352 USD annually per household (ANSAB, 2022b). The 2021 GDP for Nepal was roughly 1,208 USD per capita, while the worldwide gross GDP was about 12,230 USD per capita (World Bank, 2023). Per capita incomes in the mountainous areas of Nepal are the lowest in the country, while the highest incomes occur in urban centres such as Kathmandu (Paul et al., 2012).

In western Nepal, Jatamansi collection occurs in remote, high-altitude areas with poor road access. Poor infrastructure, few employment opportunities, and low agricultural productivity result in a low standard of living for residents of these areas, whose main occupations are farming and livestock rearing. Jatamansi collection has traditionally contributed to the subsistence of poor and marginalized collectors who have few opportunities for income diversification (DOFSC, Nepal, 2019). For most communities, NTFP collection, including Jatamansi, is one of the limited ways to earn cash income with low capital investment and without engaging in seasonal migration (Pokharel et al., 2006). The forest sector may contribute up to 28% of the total GDP, and due to international trade in more than 100 plant species, NTFP-based enterprises contribute almost one-third of the forestry GDP (Bhatt et al., 2021).

NTFPs such as Jatamansi play an essential role in stabilizing household economies, providing supplemental income or acting as a safety net for households entering new economic activities and markets (Bista & Webb, 2006). In Nepal, harvesting NTFPs is an integral part of livelihood strategies, and its importance depends on the ownership of other capital assets, such as land and livestock (Smith Olsen & Overgaard Larsen, 2003). The significance of specific NTFPs to livelihoods depend on the opportunity cost of time and labour (Bista & Webb, 2006). The 2006 USAID-funded FRAME report stated that an individual could collect 100-150 kilograms of Jatamansi in a season, with average earnings of NPR 5,000-7,500. Collectors also harvested other herbal products at the same time. The three to five kilograms of Jatamansi collected daily, with a local value of NPR 150 to 250, was significantly higher than the local wage labour rate of NPR 100 (Pokharel et al., 2006).

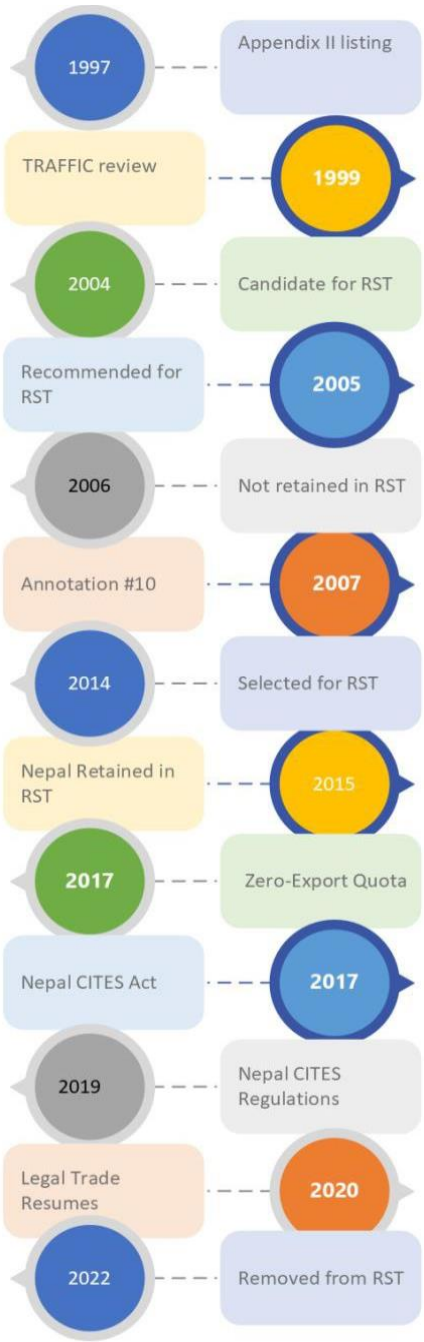
1.7 The Problems that Diminishing Populations of Jatamansi Create for Conservation and their Importance

Trade in Himalayan medicinal plants has existed for millennia (Jacob & Jacob, 1993). However, only in recent years have commercially traded Himalayan plant species received scientific attention for contributing to rural livelihoods and the conservation consequences of harvest and trade (Olsen, 2004). Several authors have identified systemic problems with NTFP value chains that impact livelihoods. Collectors are often the weakest stakeholders in the value chain due to their limited market information, lack of market access, and low levels of group organization. They may also experience irregular market demand and high collection competition (ANSAB, 2022b; Bista & Webb, 2006; Pokharel et al., 2006; Subedi & Pandey, 2011; TRAFFIC, 2018). Collectors mainly sell Jatamansi to district or village-level traders. Transportation to other markets is often difficult due to the distance from collection areas and the need for roads and transportation infrastructure. Some poor and marginalized families receive advance payment from traders to collect Jatamansi in the next season. This practice forces the harvesters to supply the trader at a predetermined price to cover their advances, promoting unhealthy competition. It also leads to the collection of immature rhizomes without considering sustainability or quality (Subedi & Pandey, 2011).

Diminishing populations of Jatamansi could exacerbate these problems. Collection areas near settlements are known to become depleted, and collectors must travel further afield. Increased competition could increase premature harvesting. Collectors who access collection areas before the seed has set will reduce the chance of population increase. Harvesters pushed to higher altitudes reported that the soil freezes during the biological harvest period in October after seed dispersal, making harvesting virtually impossible (Pyakurel et al., 2019). Furthermore, as collectors move from meadow to outcrop collection areas, the sensitivity to harvest increases, as there are constraints to population growth due to demographic variation across habits (S. K. Ghimire et al., 2007). The 2006 FRAME study noted that the increased economic importance of Jatamansi has led to overall biodiversity conservation in areas where management plans are in place. The practice of pasture burning, which destroyed many plant species and decreased habitat for fauna, was discontinued in Humla District when it was understood it also impacted the Jatamansi populations (Pokharel

Figure 5

History of CITES Listing for Jatamansi and Nepal 1997-2022



et al., 2006).

Jatamansi and the high-value MAPs sub-sector have been an increasing area of discourse for both rural local people and the private sector with its linkages to the global market. Several stakeholder groups, including collectors, local mediators, rural traders, urban traders, exporters, government agencies, private sectors, and INGOs, have interests in promoting conservation and livelihoods. Tackling the conservation problem by creating sustainable resource use management plans, guiding local communities, collectors, and harvesters towards sustainable harvesting practices, and conducting training on product development and value-addition processes may add marketing opportunities for Jatamansi (Bhatt et al., 2021).

1.8 CITES and the Review of Significant Trade

CITES is an international agreement between governments. It establishes a framework to ensure that international trade in specimens of animals and plants does not threaten their survival in the wild. According to its Appendix listings, CITES largely prohibits commercial trade for wild-sourced specimens in Appendix I, while Appendix II species requires an export permit that is issued if a country determines that the trade is sustainable and legal. A non-detriment finding (NDF) assessment verifies sustainability, while a legal acquisition finding (LAF) assessment verifies legality (Foster & Vincent, 2021). Parties to the Convention commit to adopting domestic legislation to ensure CITES implementation at the national level. Nepal became Party to CITES on 18th June 1975, with entry into force on 16th

September, 1975. CITES (Flora) is implemented in Nepal by the Department of Forests and Soil Conservation (DoFSC) as Management Authority and the Department of Plant Resources (DPR) as Scientific Authority.

1.8.1 History of CITES Listing for the Species.

Nardostachys grandiflora was included in CITES Appendix II during the 10th meeting of the Conference of the Parties (CoP) at Harare in June 1997. The listing included an annotation to designate "whole and sliced roots and parts of the roots, excluding manufactured parts or derivatives such as powders, pills, extracts, tonics, teas and confectionery", though the main parts in trade are rhizomes, or underground stems, rather than roots (TRAFFIC International, 1999). A 2000 report published by TRAFFIC identified exports of unprocessed rhizomes from Nepal despite a national ban. The report recommended an assessment of the sustainability of harvesting for trade and adopting national CITES legislation to allow export controls (Mulliken, 2000).

In June 2007 (CoP14), Switzerland proposed an annotation (#10) to designate "all parts and derivatives except: a) seeds and pollen; and b) finished products packaged and ready for retail trade"(CITES, 2007). The rationale for the proposal was as follows:

> The main commodities in international trade are unprocessed rhizomes, with smaller amounts of trade in processed products such as oil. Quantitative information on trade volumes is limited, however, much of the trade is apparently unregulated and/or occurring outside established trade controls, and therefore undocumented. With annotation #3, CITES permits are only requested for the trade in whole and sliced or parts of “roots”. As a result, oil and powder are excluded from CITES controls. In recent years, the technology used to produce essential oils was introduced in Nepal, which has led to an increase in local production of and trade in “Jatamansi oil”. The proposed annotation #10 rev. will include these commodities in CITES controls. Oil appears to be a significant product, as well as a commodity, that first appears in

international trade as exports from range states (CITES, 2007).

1.8.2 History of Nepali National CITES Legislation

Until recently Nepal had no national legislation to implement CITES regulations. The Forest Act (1993) and Forest Regulations (1995) prohibited the export of unprocessed Jatamansi. In 2017, the Government of Nepal promulgated the CITES Act to strengthen national CITES implementation. The law took immediate effect, but trade in Appendix II species was not legal until amendments and regulations were passed in parliament. The first amendment and new regulations were introduced in 2019 and legal trade restarted in 2020 (ANSAB, 2022b).

1.9 The Review of Significant Trade Process

1.9.1 Why is a Review of Significant Trade Important?

"CITES is highly unusual among multilateral environmental agreements because it has a mechanism for remedial action to help ensure countries are meeting their obligations for sustainability" (Foster & Vincent, 2021, p. 2). The Review of Significant Trade (RST) process is defined in CITES Resolution Conf. 12.8 (Rev. CoP18). It is designed to identify species that may be subject to unsustainable levels of legal international trade and to identify problems and solutions concerning the effective implementation of the Convention (CITES, 2023a). The process intends to ensure that countries make defensible non-detriment findings (NDFs) and formally monitor exports (Foster & Vincent, 2021). The RST process, if implemented correctly, acts as a safety net to ensure that species do not decline because of legal international trade while listed in Appendix II (CITES, 2023a).

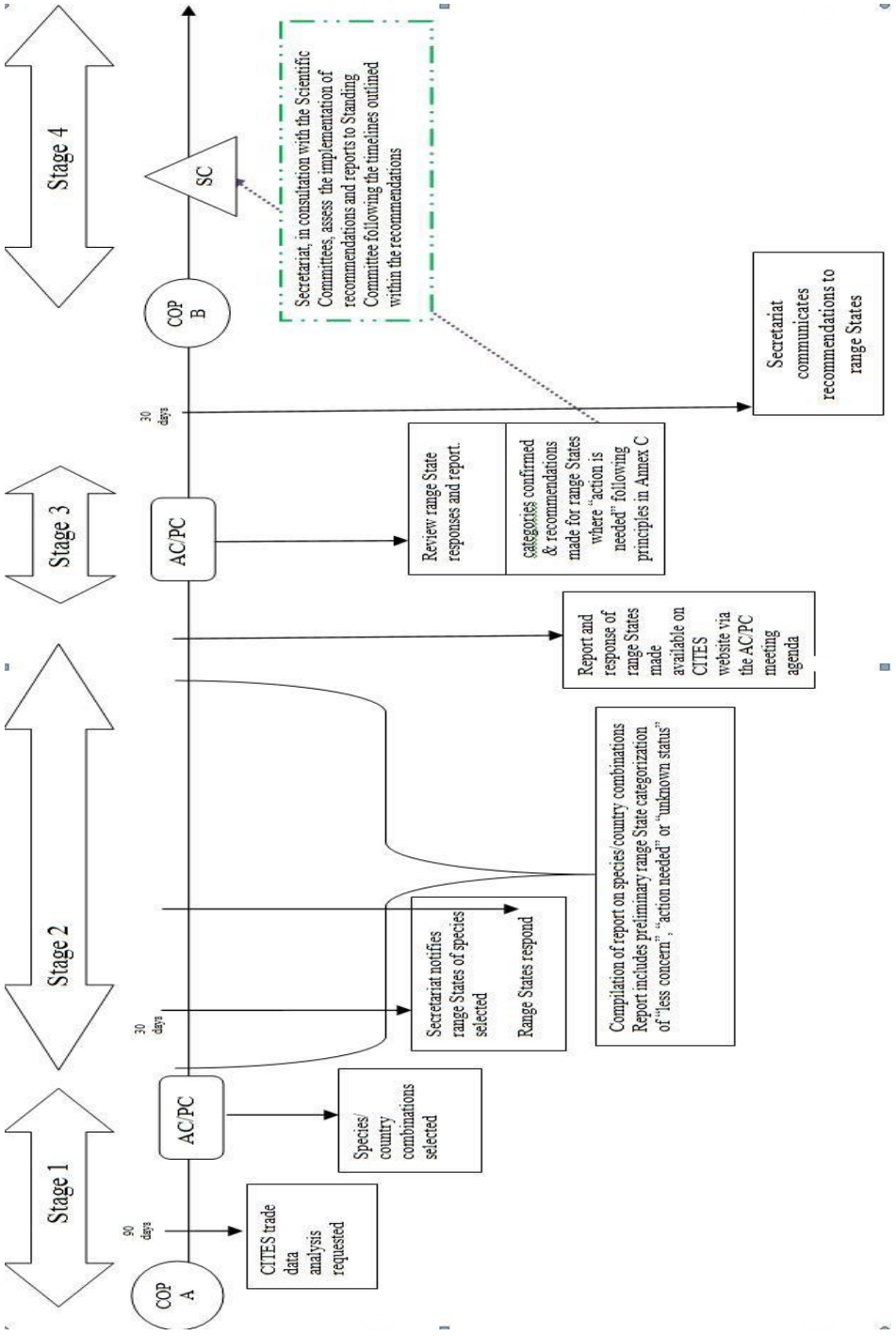
1.9.2 What are the Expected Outcomes of a Review of Significant Trade

Through timely corrective measures as part of the RST process, the species should be prevented from moving to Appendix I (CITES, 2023a). After a species/country combination is selected for review, the initial stages of the RST process focus on capacity-building, technical assistance, and compiling and reviewing information. The Scientific

Committees make recommendations to the Party, including timelines for demonstrating compliance. The party should collect the necessary biological information and implement any necessary trade controls, such as export quotas. If the Party has implemented the recommendations to the satisfaction of the appropriate Scientific Committee, the species/country combinations can be removed from the RST process (Figure 6) (Thorson & Wold, 2010).

Figure 6

Timeline for the Review of Significant Trade



Note: Reprinted from E-Res-12-08-R18. Source (CITES, 2019a).

1.9.3 History of the Review of Significant Trade for Jatamansi and Nepal

Following Jatamansi's listing in CITES Appendix II, effective 18 September 1997, an early review of the species was considered a priority by the Plant Committee (PC). The results of a review by TRAFFIC, showing large-scale trade in the species from Nepal to India outside of CITES trade controls, were presented to the Plant Committee's 9th meeting (PC9) in June 1999 (TRAFFIC International, 1999). Jatamansi was a possible candidate for inclusion in the RST process following PC14 in February 2004. At PC15 in May 2005, it was recommended for review, as Nepal's export of Jatamansi oil was increasing and could represent up to a third of international trade. Prior to the 2007 proposal for annotation #10, which included all parts and derivatives, CITES did not regulate the trade of Jatamansi oil. At PC16, held in July 2006, the species was not retained in the RST process (UNEP-WCMC, 2017).

Jatamansi was selected for the Review of Significant Trade (RST) as a priority species for review in all range states, post-CoP16, at the 21st meeting of the Plants Committee in May 2014 (CITES, 2014). The United Nations Environment Programme - World Conservation Monitoring Centre (UNEP-WCMC) conducted a trade analysis to assist the Plant Committee in selecting species for Review of Significant Trade (UNEP-WCMC, 2017). It showed the species as having reached a high-volume trade threshold from 2007 to 2011, with a sharp increase in 2011. At the 22nd meeting of the Plants Committee in October 2015, responses were submitted by China and Nepal (CITES, 2015). Bhutan, China, and India were removed from the RST process, while Nepal was retained.

A zero-export quote for Jatamansi and Nepal was recommended at PC23 in 2017 (CITES, 2017) and remained in place until the CITES Act regulations were promulgated and trade resumed in 2020. The Plants Committee also recommended implementation of the non-detriment finding referred to in Article IV of the Convention. The status of the implementation of the Plants Committee recommendations for this case was reported in detail by the Secretariat to the Standing Committee at SC70, SC71 and SC74. At SC74, the Standing Committee commended Nepal for its commitment to establishing precautionary export quotas for Jatamansi and requested Nepal to continue to consult with the Secretariat and the Chair of the Plants Committee on any quota for 2022 onwards. At SC75, the

Standing Committee agreed that Nepal had complied with all recommendations for Jatamansi and could be removed from the RST process (CITES, 2022b).

1.9.4 The Importance of Measuring the Impacts of the RST process on Species Management and Livelihoods

While regulating livelihoods is not part of CITES, Resolution Conf 16.6 (Rev. CoP18) recognizes that "effective implementation of CITES listing decisions can form part of a strategy to provide sustainable livelihoods for rural communities" (CITES, 2019b). Changes in trade levels associated with an RST process can change access to trade opportunities and consumer attitudes to trade. These changes can impact the livelihoods of households in the value chain for a species, both directly through their ability to benefit from trade opportunities and indirectly by allowing the species population to recover and sustain long- term use. Impacts may differ in the long and short term. An RST process may have negative impacts on livelihoods in the short term but deliver positive outcomes in the longer term (UNEP-WCMC, 2010).

Just as RST recommendations are intended to be measurable, and their result determines retention or removal of the RST process for a country/species combination, so should impacts on conservation and livelihoods be measured and evaluated. "Actions for conservation and sustainable use need to be judged on their efficacy in achieving declared objectives" (Foster & Vincent, 2021, p.1). Trade in endangered species impacts both conservation and livelihoods. The implementation of CITES is better achieved through the engagement of rural communities. It is important to measure the impacts of the decision-making process on the communities of people living alongside the plants and animals CITES protects (General Secretariat of the Organization of American States (GS/OAS) & Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 2015).

2. Hypotheses

2.1 Hypothesis 1

Harvest and export quotas for Jatamansi since 2017/18 have led to a regrowth of the species population in Nepal.

2.1.1 Importance of the Hypothesis

The Review of Significant Trade (RST) process was recommended for Jatamansi and Nepal, post CoP16, when Jatamansi overharvesting was suspected. Nepal adopted a zero-export quota in 2017 which was in force until 2020. At present in 2023, it can be argued that there has been sufficient time for population regrowth to occur, as Jatamansi plants require between 3 and 5 years to reach reproductive maturity (Nautiyal et al., 2003). Testing this hypothesis is important to demonstrate the effectiveness of export quotas associated with the Review of Significant Trade. Since the beginning of research for this project, at its 75th meeting, the CITES Standing Committee agreed to release Nepal from the RST process.

2.1 Hypothesis 2

New government regulations and species management since 2017/18 are ensuring that harvest does not exceed population growth rate.

2.1.1 Importance of the Hypothesis

Three new national legal instruments, the CITES Act (2017), Forests Act (2019) and Environmental Protection Act (2019), impact species management, along with a group of associated acts, guidelines, and policy directives. Testing this hypothesis is important to determine that new legislation has meaningfully impacted forest management plans, so that harvesting does not exceed the population growth rate. This hypothesis is important to demonstrate how national interventions can support, or work in concert with, international CITES measures to conserve species.

2.3 Hypothesis 3

New government regulations and species management leading towards sustainability have positively impacted livelihoods by increasing collector incomes.

2.3.1 Importance of the hypothesis

Livelihoods are important to CITES. When collectors receive more income for their work, there is less incentive to engage in illegal trade or overharvesting. The more a species is of imminent value to local communities, the higher is their incentive to use it sustainably. This hypothesis is important to demonstrate that conservation efforts can succeed at the same time as collector incomes increase, and to demonstrate that species use, rather than its prohibition, can contribute to species conservation.

Together the three hypotheses explore the complex interaction between zero-export quotas imposed in 2017 as part of the RST process, Nepal's new CITES Act promulgated in the same year, the Forests Act (2019) and the Environmental Protection Act (2019), the three main legal instruments that regulate export and management of the species, and thereby impact livelihoods of Jatamansi collectors.

3.Materials and Methods

3.1 Materials

The hypotheses will be tested using a combination of qualitative information from expert interviews, quantitative data, and literature research.

3.1.1 Qualitative Data

3.1.1.1 Expert Interviews. Expert interviews were conducted with the following stakeholders involved in Jatamansi research, policy, and trade: Experts were chosen to provide a range of perspectives and information on the topic.

a. Asia Network for Sustainable Agriculture and Bioresources (ANSAB)
   i) Sudershan Khanal – Manager, Research, Planning and Communication
   ii) Dr. Nabin Joshi – Research Officer
b. Himalayan Bio Trade Pvt. Ltd. (HBTL)
   i) Khilendra Gurung – Technical and Export Manager
c. German Federal Agency for Nature Conservation (BfN) –
   i) David Harter - Division of Plant Conservation, Scientific Authority, Flora
d. Federation of Community Forest Users, Nepal (FECOFUN)
   i) Dil Raj Khanal – Policy Coordinator
e. Ministry of Forests and Environment, Nepal
   i) Dr. Rajendra K.C., Joint Secretary and
      National Project Director Building Resilient
      Churia Region Nepal Project
f. Jadibuti Association Nepal (JABAN)
   i) Rabindra Nath Shukla - CEO, Satya International
g. United Nations Development Programme Nepal (UNDP Nepal)
   i) Kamal Bahadur Mahat - Planning and Capacity Development Advisor
h. Department of Plant Resources, Biodiversity and CITES Section
   i) Jwala Shrestha – Scientific Officer

The expert interviews were semi-structured and used open-ended questions (Annex). Interviews were conducted online using the Zoom.us platform and transcribed using Zoom's transcription software. Questions elicited information about the following topics: i) Species Management ii) Livelihoods iii) FairWild standards iv) National legislation, CITES and the RST. The use of expert interviews uncovered institutional knowledge, undocumented sources, project data, and information about local collectors, their harvesting practices, and livelihoods.

3.1.1.2 National Legislation.

a. Nepal's National Legislation national legislation and policies published in English on the Nepal Law Commission and Ministry of Forests and Environment websites.

3.1.2 Quantitative Data

a. Documentation on the Review of Significant Trade process available on the CITES website.
b. Asia Network for Sustainable Agriculture and Bioresources (ANSAB)
    (a) ANSAB NTFPs price list
    (b) Baseline Survey Report, Jatamansi Harvesters in Mugu and Jumla Districts (2019).

        The survey gathered data on the current socio-economic status and forest management practices of 313 households (225 from Jumla and 88 from Mugu) in 8 community forest user groups (CFUGs).
    (c) Baseline survey of high value high conservation priority NTFPs harvesters in five key production districts of Nepal (2022).

        The survey gathered data on the current socio-economic status of harvesters and forest management practices of 410 households in 27 CFUGs in Humla, Mugu, Jumla, Darchula and Bajhang Districts of Nepal.
    (d) Resources Inventory of Jatamansi (*Nardostachys jatamansi* DC.) in the Targeted Community Forests of Jumla and Mugu (2020).

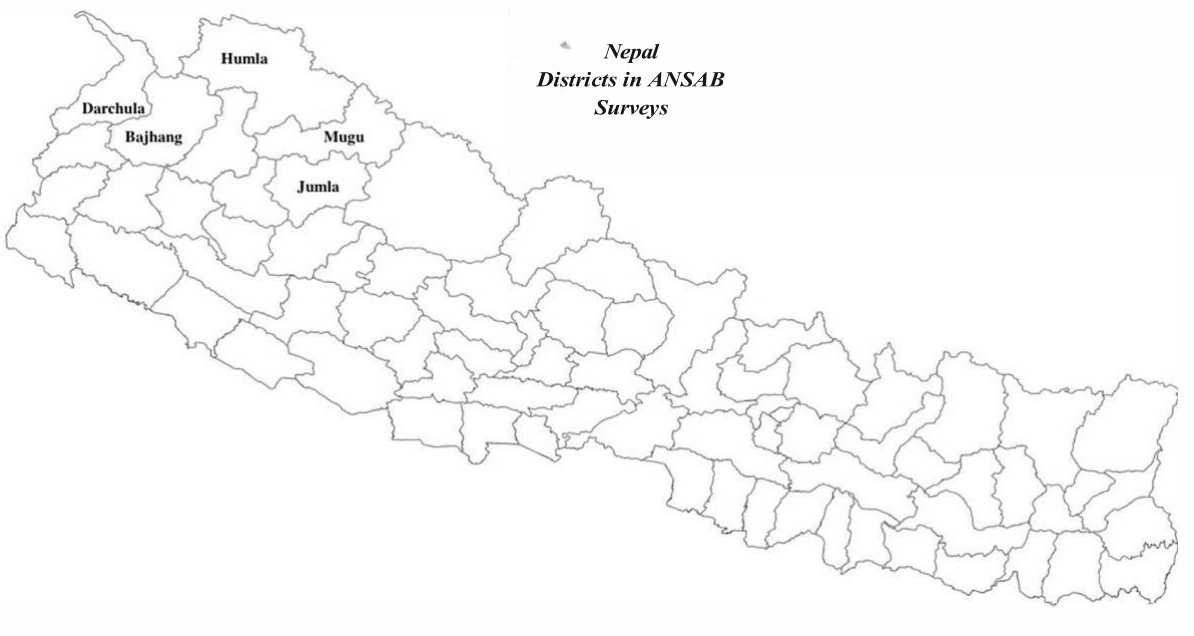
        The resources inventory was carried out in collaboration with the

Divisional Forest Offices and 8 CFUGs in Jumla and Mugu Districts and was intended as a baseline to be used in developing sustainable management plans.

ANSAB reports (b) and (d) were prepared for the "Succeeding with CITES" project, funded by the UK Government's Darwin Initiative, and led by TRAFFIC International, with key implementation in Nepal by ANSAB. The major objective of the project was to promote legal and sustainable international trade in Jatamansi through use of the FairWild standard and certification. ANSAB's report (c) was prepared for "Himalayan plants for people: sustainable trade for biodiversity and development", also funded by the UK Government's Darwin Initiative, led by TRAFFIC International, promoting the FairWild Standard, and currently in implementation by ANSAB.

Figure 7

Districts used in ANSAB's Quantitative Surveys.



Nepal is divided into 7 provinces containing 77 districts and 293 municipalities.

Humla, Mugu (both bordering China) and Jumla are districts located in Karnali Province in Western Nepal. Humla is the second-largest district in Nepal yet had a population of only 50,858 in 2011. Both Jumla and Mugu are more populous, with 108,921 and 55,286 residents respectively ("Karnali Province," 2023).

Bajhang and Darchula Districts are in Sudurpashchim Province and have populations of 195,159 and 133,274 respectively. ("Sudurpashchim Province," 2023) Darchula is the only district in ANSAB's surveys to border India.

The districts in ANSAB surveys are in the region of Nepal where the highest concentration of Jatamansi populations is found (Figure 3).

3.2 Methods

3.2.1 Methods for Hypothesis 1

To test this hypothesis, data from ANSAB household survey data was supplemented with expert interviews and available scientific literature. Questions used in semi-structured expert interviews addressed the regrowth of the species during the past 5 years, the effectiveness of the RST process, and the timing of its release. Additionally, a qualitative baseline survey conducted by ANSAB (3.1.2 (b)(c)) specifically covers community forest user group households' perceptions of species regrowth during the period in question. Requests for field survey data on the population and distribution of the species were made to each of the experts interviewed. Experts kindly handed over survey reports and other data when available (see 3.1.2 b(d)). Yet it was not possible to establish a quantitative baseline and comparison for the roughly 5-year period covered by the RST to track the regrowth of the species, since difficult topography has limited systemic inventories of Jatamansi (Chauhan et al., 2021b) and COVID- 19 further limited project access to field sites since 2020.

3.2.2 Methods of Hypothesis 2

To test this hypothesis, literature was reviewed for the details and status of national legislation and policies relating to species management published on the Nepal Law Commission and Ministry of Forests and Environment websites in English. The details were summarized into a table to show a clear picture of the governing office, relevant actions, status of the new legislation, repealed legislation, and the associated regulations, policies, directives, and strategies. Expert interviews and literature were used to analyze the changes to the three main national legislative instruments impacting the species management of Jatamansi, the CITES Act (2017), the Forests Act (2019) and the Environmental Protection Act (2019). Data from ANSAB household surveys (3.1.2 (b)(b), and 3.1.2 (b)(c)) and expert interview data were then used to analyze species management practices and their compliance with CFUG management plans regulated by the Forests Act (2019). Annual Allowable Harvest figures drawn from the Nepal's NDF assessment report were used to analyze the impacts of the Environmental Act (2019) on species management.

3.2.3 Methods for Hypothesis 3

To test this hypothesis, literature and expert interviews were used to analyze the value chain for Jatamansi and identify impacts that occurred due to new national legislation. A table was compiled from literature and expert interviews to detail the baseline and post-2017 changes to the power map of market actors, their access status, and mechanisms for exercising access. Expert interviews were used to analyze details of changes to permitting processes and benefit-sharing. Historical data from ANSAB's price list and household survey data (3.1.2 (b)(b), and 3.1.2 (b)(c)) regarding market prices (3.1.2 (b)(a)), mean household incomes and the contribution of Jatamansi to household incomes were analyzed to assess impacts on livelihoods.

4. Analysis

4.1 Hypothesis 1 Analysis

4.1.1 ANSAB Survey Household Perceptions of Jatamansi Population Regrowth

ANSAB surveyed households in 27 CFUGs from the Jumla, Mugu, Bajhang and Darchula districts of Nepal (ANSAB, 2022a). Households were asked for their perceptions of the availability of Jatamansi in community forests during the past 5 years. As these households were comprised of CFUG members that have depended on Jatamansi for income, they had detailed knowledge of the distribution and status of the species in their collection grounds. Table 1 shows the number and percentage of responses for each district in the survey.

Overall, 44.1% of respondents indicated that Jatamansi populations were increasing, and 11% perceived there was no change. There was, however, considerable variation by district. The majority of Mugu respondents (93%) and 50% of the Jumla respondents perceived that the Jatamansi population was increasing a little, whereas about 56% of Bajhang respondents perceived that the population was decreasing a little, and 56% of Darchula residents perceived rapid decreases in their community forests.

Table 1

Jatamansi householder's perceptions of changes to Jatamansi availability in community forests in five districts of Nepal from 2017 to 2021.

Response	Humla		Jumla		Mugu		Darchula		Bajhang		Total	
	n	%	n	%	n	%	n	%	n	%	N	%
Increasing a lot	2	1.5	0	0.0	3	5.0	0	0.0	0	0.0	5	1.2
Increasing a little	52	39.7	30	50.0	56	93.3	2	2.8	36	41.4	176	42.9
No change	33	25.2	5	8.3	0	0.0	7	9.7	0	0.0	45	11.0
Decreasing a little	40	30.5	25	41.7	1	1.7	23	31.9	49	56.3	138	33.7
Decreasing a lot	4	3.1	0	0.0	0	0.0	40	55.6	2	2.3	46	11.2

Note: Adapted from (ANSAB, 2022).

Respondents were also asked their opinion of future availability of Jatamansi in community forests (Table 2). The overall results were more positive, with a total of 61.9% predicting the population to be sustainable. Again, there were regional differences. Darchula residents felt strongly that the resource would decrease. 59.7% believed it would decrease a lot, and 27.8% believed it would decrease a little. Mugu residents were the most positive, with 35% believing the resource would increase a lot, and 53.3% believing it would increase a little.

Table 2

Householders' opinions of future availability of Jatamansi in community forests in five districts of Nepal, 2021

Response	Humla		Jumla		Mugu		Darchula		Bajhang		Total	
	n	%	n	%	n	%	n	%	n	%	N	%
Will increase a lot	8	6.1	2	3.3	21	35.0	1	1.4	0	0.0	32	7.8
Will increase a little	71	54.2	25	41.7	32	53.3	3	4.2	61	70.1	192	46.8
Will be no change	19	14.5	5	8.3	0	0.0	5	6.9	1	1.1	30	7.3
Will decrease a little	16	12.2	27	45.0	0	0.0	20	27.8	24	27.6	87	21.2
Will decrease a lot	17	13.0	1	1.7	7	11.7	43	59.7	1	1.1	69	16.8

Note: Adapted from (ANSAB, 2022)

4.1.2 Impact of COVID-19 on Jatamansi Collector Activity

COVID-19 began impacting forest visits and collection activity a few years after the CITES Review of Significant Trade and the Nepal CITES Act (2017) took effect. ANSAB surveyed Jatamansi collector households about the impacts of COVID-19 on their visits to the community forest (ANSAB, 2022a). 57% of respondents reported a change in frequency of visits to the community forest for collection. 42% of respondents reported visiting the community forest less frequently, and 11% stopped completely (see Table 3). Again, there were regional differences. Jumla District seemed nearly unaffected, with 93% of respondents responding that they had no change in frequency of visits to the community forest for collection (ANSAB, 2022a).

Table 3

Impacts of COVID-19 on collector visits to Community Forests (CFs) for Non-timber forest product (NTFP) collection.

Effects	Response	Humla		Jumla		Mugu		Darchula		Bajhang		Total	
		n	%	n	%	n	%	n	%	n	%	N	%
Change in CF visit frequency for NTFP collection	Yes	73	56	4	7	31	52	61	85	64	74	233	57
	No	58	44	56	93	29	48	11	15	23	26	177	43
How often did you visit CF during COVID-19 lockdown?	More frequently	10	8	0	0	6	10	0	0	18	21	34	8
	Same as before	51	39	38	63	53	88	10	14	7	8	159	39
	Less frequently	28	21	20	33	1	2	62	86	61	70	172	42
	Completely stopped	42	32	2	3	0	0%	0	0	1	1	45	11

Note: Adapted from (ANSAB, 2022).

4.1.3 Semi-Structured Expert Interviews Undertaken in the Framework of this Thesis.

During semi-structured interviews with experts, the following questions addressed the regrowth of Jatamansi in the last 5 years:

In the past 5 years, has there been a regrowth of Jatamansi in the management area?

Has there been more collection than regrowth in the management area?

Can you name 2 regions where the populations have regrown? Have you seen regions where the population has declined?

Table 4

Expert interview results on Jatamansi regrowth since 2017

Has the Jatamansi population increased in the past 5 years?		
Response	Number	Context
Yes	7	Working in Jatamansi research, policy, or trade
No	0	
N/A	2	Inadequate data to form a response

Of the 9 interviewees, 7 replied that the population had regrown, and 2 were unsure. The 7 replying "yes" worked directly in Jatamansi research, policy, or trade, and the 2 "N/A" responses came from individuals who reported they did not have sufficient data to reply (Table 4). The 7 interviewees who replied positively were quick to explain that the CITES Act (2017) had banned legal export of Jatamansi from the time of its promulgation until 2020, after the first amendments were made and the regulations required for legal export were passed by parliament in 2019. There would have been no need to harvest Jatamansi from 2017 until 2020. There is little domestic trade in the species, and there was a sizeable stockpile of Jatamansi in 2017 that three interviewees discreetly explained away as being easily traded over the border to India. In the 2022 harvest season, some CFUGs were refusing to collect Jatamansi as part of a dispute with the central government over royalties (K. Gurung, personal communication, January 5, 2023). All this points to little harvest and plenty of opportunity for regrowth.

Only 2 of the interviewees could name a region where the population had declined, one due to urbanization, the other with unknown causes. Trader and advocate for the Jabibuti[2] Association of Nepal (JABAN) Rabindra Shukla (personal communication, February 5, 2023) reported knowledge of areas in Humla District where the encroachment of urbanization on forested areas had caused a shift in population distribution. ANSAB's Nabin Joshi, a PhD researcher engaged in field study, described having visited alpine meadows at 3000 metres elevation. Based on the literature describing the availability and distribution pattern of the species, he expected to find Jatamansi at 3000 metres, but could not find a single example of the species below 3400 metres. He believed the distribution had shifted to higher elevations in both Humla and Jumla Districts. He did not know whether the cause of the shift was climate change, a biological factor, or overharvesting, and pointed to the need for research. He described being puzzled by the absence of Jatamansi at elevations where it should have been, according to the description of the species, and turned to the local people in search of an explanation:

[2] Nepali language word meaning "herbal"

> I asked the local people, elderly people. They also mentioned the same thing that before five, ten years ago they [found the] species by level in the lower elevation as well, but now … this is only available in the three thousand four hundred meters. … I said, "Why, has this happened?" Then they said that before five, ten years, the market value of these species is very low, so people are not much interested in that. And in the current year, the species is very good, valuable, and more people go to harvest (N. Joshi, personal communication, November 19, 2022).

The following questions regarding the effectiveness of the Review of Significant Trade (RST) for Jatamansi were included in the semi-structured interview:

> *Was the review of significant trade necessary?*
>
> *At the recent CITES Standing Committee meeting, the removal of Nepal from the review of significant trade process for Jatamansi was recommended. Would you agree with that recommendation? Why or why not?*
>
> *Was this the correct time to remove Nepal from the review of significant trade?*

All 9 experts responded that the RST was necessary (Table 5). It was acknowledged by all that overharvesting was decreasing Jatamansi populations in Nepal. Five experts agreed that the recommendation to release the RST was correct. "Yes, nowadays Nepal is managing the supply of Jatamansi better than before" (R. Shukla, personal communication, February 5, 2023) and "Yes, if it was removed it means there must be a scientifically calculated quota for Nepal" (S. Khanal, personal communication, 16 November 2023). Three interviewees disagreed with the recommendation to remove Nepal from the RST process at this time. When asked if it was the correct time to release the RST, Khilendra Gurung, Export Manager at Himalayan Bio Trade Ltd. responded as follows:

> No, no, not now. I think it's not now, because there has not been a significant trade. After the CITES [Act] has been amended, and then ban has been lifted. Yeah, I think we need … to wait for couple of years and see what happens, you know, with that quota, and then all those implications (K. Gurung, personal communication, January 5, 2023).

Table 5

Expert interview results on timing of removing Nepal from the RST process.

Was it the correct time to release the RST?		
Response	Number	Context
Yes	6	Working in Jatamansi research, policy, or trade
No	3	Working in Jatamansi research or trade
N/A	0	

4.2 Hypothesis 2 Analysis

4.2.1 Impacts of National Legislation and Regulations on Jatamansi species management

To analyze the impacts of recent national legislation on species management, it is useful to map the relevant actions and status of national regulations and policies surrounding resource tenure and conservation (Table 6). Nepal has been progressive in conservation initiatives and has amended conservation legislation many times to include more participatory approaches that have had measurable success, including comprehensive legislation for community forestry and the inclusion of NTFPs in forest policy (Heinen & Shrestha-Acharya, 2011). Three main national legal instruments, the CITES Act (2017), Forests Act (2019) and Environmental Protection Act (2019) impact species management, along with a group of associated acts, guidelines, and policy directives.

Table 6

Nepal's National Legislation and Policy Summary for Jatamansi, March 2023

Name	Year	Governing Office	Relevance to species management	Status
Export Import Control Act	1957	Ministry of Industry	Indirect	Updated 2013
Panchayat Forest Rules	1978	Ministry of Forest & Soil Conservation	The Rules regulate the creation of Panchayat Forests, upon application to be submitted by the Village Panchayat (council) to the appropriate District Forest Office.	Amended 1980 and 1988. Repealed by Forest Regulation 1995.
Master Plan for the Forestry Sector	1989	Ministry of Forest & Soil Conservation	Initiation of programme approach in the forestry sector Provision of users' committees and community forest management.	In effect 1989-2011
Forest Act	1993	Ministry of Forest & Soil Conservation	Prohibits export of Jatamansi without processing.	Repealed by Forests Act 2019
Forest Regulation	1995	Ministry of Forest & Soil Conservation	Prohibits export of Jatamansi without processing Specifies royalty rates.	Updated 2022
Community Forestry Directives	1995	Ministry of Forest & Soil Conservation	Additional provision concerning registration and recognition of community forests, establishment of user groups and handing over of community forests, operations plans, establishment of industries, transportation of forest products, termination of a community forest.	Current
Police Act	1955	Ministry of Home Affairs	Authorizes police to control illegal trade.	Updated 2012
Environment Protection Act (EPA)	1997	Ministry of Forest and Environment	Initial Environmental Examination (IEE) and	Repealed by Environment

			Environmental Impact Assessment (EIA) reports.	Protection Act 2019
Guidelines for Inventory of Community Forests	2004	Ministry of Forests and Environment	Provision of taking forest inventory in community forests of Nepal.	Current
Customs Act	2007	Ministry of Finance	Indirect	Current
Constitution of Nepal	2015	Government of Nepal	Grants concurrent powers over forests and royalties from natural resources to federal, provincial, and local levels of government.	Current First amendment 2016, Second Amendment 2020
Forestry Sector Strategy	2016	Ministry of Forests and Environment	Replaces 1989 Master Plan for the Forestry Sector.	2016-2025
Control of International Trade of Endangered Wild Fauna and Flora Act (CITES Act)	2017	Ministry of Forests and Environment	7 Chapters: Preliminary (I); Provisions concerning Transactions of Endangered wild fauna or flora or specimen thereof (II); Provisions concerning Registration of the Endangered wild fauna or flora or specimen thereof (III); Provisions concerning Management Authority and Scientific Authority (IV); Offences and Punishment (V); Investigation and filing of cases (VI); Miscellaneous provisions (VII).	Current
CITES Regulations	2019	Ministry of Forests and Environment	English translation unavailable.	Current
Environment Protection Act	2019	Ministry of Forests and Environment	Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) report	Current – repeals EPA 1997
Forests Act	2019	Ministry of Forests and Environment	Implementation of district forestry sector plans and scientific forest management plans.	Current – repeals Forest Act (1993)

			Management of protected areas and forests based on management plans. Mandates environmental assessments for land use. Expands the provisions related to community forests, forest protection and enterprise development. Details enforcement and imprisonment, offences, and punishment. Defines "Division Forest Office" and "Divisional Forest Officer".	

Note: Data from (FAO, 2023; Ministry of Forests and Environment, Nepal, 2019; Ministry of Forests and Soil Conservation, 2016; *Nepal Law Commission – NLC*, 2023; UNEP, 2023).

4.2.1.1The Forest Acts

4.2.1.1.1 Definition of District/Divisional Forest Offices. In 2015, the new Constitution of Nepal granted concurrent powers over forests and royalties from natural resources to federal, provincial, and local levels of government (Constitution of Nepal 2015, 2015). In July 2018, the Government of Nepal created a new organizational structure for its forest offices. Eighty-four division offices and 528 sub-division offices were established to replace 77 district forest offices (Sapkota, 2018). The Forests Act (2019) redefined the DFO as "Division Forest Office" under the Provincial Government. "Divisional Forest Officer" was established as chief of the Division Forest Office and was deputed by the Government of Nepal under the prevailing law (The Forests Act 2019, 2019).

4.2.1.1.2 Establishment of Community Forest User Groups. Nepal's community forest management program is one of the most prominent and long-standing examples of forest management decentralization. The concept of community forestry was introduced to Nepal in the 1970s in response to perceptions that state control led to forest degradation and the exclusion of forest-dependent people (Smith et al., 2023). The Panchayat Forest Rules (1978) and the Community Forestry Programme (1980) handed forests over to

local governments for protection, with benefit sharing between the central and local governments. The Master Plan for the Forestry Sector (1989) reformulated the concept of community forestry and emphasized the handing over of forests to local communities (Basnyat et al., 2018). The Forest Sector Strategy (FSS) (2015) replaced the Master Plan for the Forestry Sector (1989-2011) and defines community-based forest management as "a set of forest management modalities that involve local people in planning, implementation and benefit-sharing" (Ministry of Forests and Soil Conservation, 2016, p. xiii).

The Forest Act of 1993 and its subsequent amendments, together with the Forest Regulations of 1995 and the Community Forest Directives of 1995, established community forest user groups (CFUGs) as self-sustained legal entities authorized to harvest and trade resources from community forests with approval from District Forest Offices (DFOs) (Kanel, 2006). As of 2018, there were more than 22,000 CFUGs associated with more than 2.9 million households (about 50% of the total rural population), managing 37.5% of the total forest area of Nepal (K. Acharya et al., 2022). The Forest Sector Strategy (2015) aims to increase the percentage of Nepal's forest area under community-based management, with the desired outcome of 60% by 2025 (Ministry of Forests and Soil Conservation, 2016).

4.2.1.1.3 Community Forest Operation Plans and Division Forest Management Plans. CFUG operational plans, and 5-year divisional forest management plans (DFMPs) for government-managed forests should reference the Annual Allowable Harvest (AAH) for each species harvested. AAH is designed to achieve a balance between harvest and regrowth and provides information on the amount of Jatamansi expected to enter the market. In community forests, AAH is calculated according to inventory guidelines (Magrath et al., 2013). In government-managed forests, periodic inventories are conducted to establish district 5-year forest management plans of which AAH calculations are a part (Thapa & Mandal, 2021). DFMP inventories for Jatamansi may be calculated using the Non-Timber Forest Products Inventory Guideline 2012 (M. D. Ghimire & Shrestha, 2019). This MoFE document is not available in English language translation.

4.2.1.1.4 The Forest Act Permits and Royalties. The Forest Act restricts NTFP use by imposing (a) a permitting system for product removal, sale, transportation, and export; (b) a royalty system; (c) a controlling authority at the local DFO; and (d) punishments for unauthorized product collection (Magrath et al., 2013). Prior to the CITES Act (2017), collection permits for Jatamansi were issued by the DFO to independent collectors in government-managed forests. A CFUG could also provide collection permits if Jatamansi was mentioned in its operational plan. Permits specified collection sites and harvesting periods according to the operational plans, and the harvests were weighed to ensure that they corresponded to the amount specified. There was regular monitoring from the issuing offices to ensure adherence to the permits. After harvest, Jatamansi from community forests could be transported only after informing the DFO. In government-managed forests, collectors were required to submit a detailed application to the DFO, and their harvests were inspected and weighed to confirm compliance with the permit. The right to collect, sell, and distribute could be auctioned to the highest bidder (Magrath et al., 2013). All DFOs were required to carry out an inventory to identify the population trend and conservation status of species and include maximum harvest quotas as part of their Five-Year District Forest Management Plans (Department of Forests, 2019).

4.2.1.2. Environmental Protection Act (2019). The Environmental Protection Act (1996) introduced two assessment tools to examine unintended environmental impacts and regulate the collection of NTFPs. The Initial Environmental Examination (IEE) and the Environmental Impact Assessment (EIA) regulate the extraction of Jatamansi based on quantity. Annual extraction of up to 50 metric tons of roots/rhizomes from each district requires IEE, and over 50 metric tons requires EIA. These tools are intended to ensure that environmental impacts are carefully considered before decisions are made, but in practice, IEE or EIA provisions have delayed the process of handing over forests to communities (Magrath et al., 2013). IEEs require 5-6 months to prepare, and IEAs about one year and the labour of at least 3 consultants.

The Forests Act (2019) mandates implementation of divisional forestry sector plans and scientific forest management plans, including IEEs for new land use and environmental EIA for AAH over 50 metric tons. However, they are not always prepared

due to the lack of financial resources and independent consultants to prepare the reports. There is also confusion about whether the responsibility to prepare the report lies with the trader or the government, or whether the assessments are even required if a 5-year management plan is in place (D. Khanal, personal communication, 3 January 2023). A World Bank Program on Forests (PROFOR) study of the forest sector in Nepal concluded that they were not needed and often not used in the decision-making process: "As a practical matter, environmental assessment requirements add little to what would be met by reasonable standards of professional forestry planning and practice, and are, in any case, totally bypassed for most government-managed forest use decisions" (Magrath et al., 2013, p. 24).

4.2.1.3 Nepal CITES Act (2017). In 2017 the CITES Plants Committee recommended Nepal establish a three-month zero export quota for Jatamansi while it was demonstrated how Nepal determined that export levels were not detrimental to species survival (CITES, 2017). In the same year, the Government of Nepal promulgated the CITES Act (2017), which was intended to strengthen CITES implementation in the country. The Act had been long anticipated, as Nepal formerly had no clear domestic policy on how to enforce articles of the Convention. The promulgation of the CITES Act (2017) effectively banned the trade of Appendix II species such as Jatamansi. There were problems with definitions and provisions in Sections 3 and 6, and the Act was promulgated without associated regulations. The first amendment to the Act and new regulations were introduced in 2019, and legal trade restarted in 2020 (ANSAB, 2022b).

Nepal's new national CITES legislation has been submitted to the CITES Secretariat for analysis and as of November 2022 is classified as Category 2, "legislation that is believed generally to meet one to three of the four requirements for effective implementation of CITES". The four requirements are:

i. designate at least one Management Authority and one Scientific Authority;
ii. prohibit trade in specimens in violation of the Convention;
iii. penalize such trade; or
iv. confiscate specimens illegally traded or possessed.

The Secretariat is awaiting submission of an English translation of the implementing regulations for analysis. There is agreement between Nepal and Secretariat on revised legislative analysis, including possible Category 1 status "legislation that is believed generally to meet all four requirements for effective implementation of CITES" (CITES, 2023b).

4.2.2 Regulations for Sustainable Jatamansi management: Implementation and compliance

4.4.4.1 Sustainable Harvest Management Practices in Community Forests. A Ministry of Forests and Soil Conservation circular in March 2000 established the requirement for community forest inventories and the practice of setting harvest levels. Community Forest Resource inventory guidelines were established in 2004, beginning the scientific forestry practice in community forests and defining the identity of professional foresters and their authority to make decisions on forest management (Baral et al., 2018). ANSAB's *Toolkit 2, Participatory Inventory of Non-timber Forest Products*, is used for inventories in their project community forests (ANSAB, 2010). It recommends the optimal harvesting practices for each species. In the case of Jatamansi, rhizomes should be harvested in the fall, with 20% of plants left undisturbed and collection areas rotated on a 5-year interval. The optimal harvesting methods are to pull whole plants from bushy areas and carefully dig out plants from open grasslands using a kuto (spade). According to these recommended practices, Jatamansi AAH for each community forest operation plan should be developed using data from inventories, the optimal harvesting interval and percentage of plants not harvested.

ANSAB's surveys collected data about harvesting practices to assess compliance with the CFUG operational plans required by the Forests Act (2019). Participants in ANSAB's 2022 focus group identified the main issues in sustainable management and harvesting as:

- early harvesting and over-harvesting
- increasing incidence of forest fires
- ineffective implementation of rotational period outlined in the management plan.

- illegal harvesting by both villagers and outsiders
- lack of trust regarding the total allowable harvest calculated by the authority (in cases where people think availability is high)
- increasing number of harvesters

All the issues identified were found to be covered by the forest management and harvesting rules in CFUG operational plans. In community forests, operational plans specify the open harvest period, harvesting practices, and group sustainable management activities. CFUGs announce the open harvest period in a meeting where they outline the timing, total number of harvest days, rules, and safety measures. The community forest committee also publishes a notice for circulation among the user households. Harvesting seasons vary depending on local ecological contexts. For example, in Jumla, the Jatamansi harvesting period is from mid-September in the steep slope areas, and to the end of December in the grassland areas, while in Mugu, it is from October to December. Fire and grazing control, and forest patrols for the protection of Jatamansi are conducted as sustainable management activities in both districts (Table 7) (ANSAB, 2019).

Table 7

Jatamansi harvesting practices in Jumla and Mugu Districts, 2018

Jatamansi harvesting practices	**Jumla**	**Mugu**
Harvest months	Mid-September to December	October to December
Tools used for harvesting	Hoe, Spade	Hoe, Spade, sickle
Parts of Jatamansi harvested	Rhizome, whole plant to whole plant without root	Rhizome and whole plant
Jatamansi harvested in a day by male (wet weight kg)	10	15
Jatamansi harvested in a day by female (wet weight kg)	12	17
Rotation period of the Jatamansi harvesting (years)	Every year to every two years	Every year
Sustainable Jatamansi management activities	Grazing control, fire control, patrolling in the forest	Fire control, grazing control, patrolling for illegal collection

Note: Adapted from (ANSAB, 2019).

Despite the rules shared at CFUG meetings, ANSAB's survey team noted a lack of consistency among the harvesters regarding the parts of Jatamansi harvested. Whole plants, rhizomes, and whole plants without roots all might be harvested. In many cases, implementation of the operational plan was weak overall, and capacity building was needed. There was inadequate monitoring to implement the plan, internal competition among collectors, and lack of sustainable harvesting tools (ANSAB, 2019).

4.2.2.2 Harvest rotation cycles. Table 8 represents the responses to ANSAB's 2022 survey of harvest rotation cycles. Overall, 41% of households returned to the same collection location every year, but this varied widely by district. 93% of households in Humla used the same location annually, while only 1% of households in Bajhang did so. The survey report did not detail reasons for the different rotational practices between districts, nor did it specify what percentage of the plant population was left undisturbed. It appears that local management systems are in use, rather than government or ANSAB guidelines. The study did not report whether the rotation complied with the CFUG operational plan, or whether the plan was current or expired.

Table 8

Rotational harvest of Jatamansi in the community forests (number (#) and percentage (%) of households (HH) within district)

District												
Rotation frequency	Humla		Jumla		Mugu		Darchula		Bajhang		Total	
	# HH	% HH	# HH	% HH	# HH	% HH	# HH	% HH	# HH	% HH	# HH	% HH
Every year	93	71.0	19	31.7	14	23.3	41	56.9	1	1.1	168	41.0
Every two years	20	15.3	2	3.3	32	53.3	1	1.4	61	70.1	116	28.3
Every three years	9	6.9	26	43.3	0	0.0	0	0.0	25	28.7	60	14.6
Every four years	6	4.	2	3.3	1	1.7	0	0.0	0	0.0	9	2.2
Other (specify)	3	2.3	11	18.3	13	21.7	30	41.7	0	0.0	57	13.9

Note: Adapted from (ANSAB, 2022a).

4.2.2.2 Harvest period. The harvest period also varied between districts, as detailed in Table 9. Although ANSAB recommends harvesting in fall, 66% of Humla households report harvesting as early as mid-June. Premature harvesting may occur for several reasons. Local businessmen send collectors early, even in community forests (ANSAB, 2022a). Collectors may be driven by market demands or their own available time for harvesting (ANSAB, 2020). Households feel competition from other collectors and expect an easy and higher harvest, even though they may be aware of the implications of premature harvesting (ANSAB, 2022a).

Table 9

Preferred months for harvesting (% of Households in each district)

District	Month											
	Baisakh (mid-April to mid-May)	Jestha (mid-May to mid-June)	Asar (mid-June to mid-July	Sawan (mid-July to mid-Aug)	Bhadra (mid-Aug to mid-Sept)	Asoj (mid-Sept to mid-Oct)	Kartik (mid-Oct to mid-Nov)	Mansir (mid-Nov to mid-Dec)	Push (mid-Dec to mid-Jan)	Magh (mid-Jan to mid-Feb)	Falgun (mid-Feb to mid-Mar)	Chaitra (mid-Mar to mid-April)
Humla	0%	15%	66%	83%	92%	66%	23%	3%	0%	1%	1%	0%
Jumla	17%	10%	22%	27%	37%	52%	48%	0%	0%	0%	0%	0%
Mugu	0%	0%	0%	27%	43%	63%	53%	0%	0%	0%	0%	0%
Darchula	0%	3%	10%	57%	92%	63%	39%	0%	0%	0%	0%	0%
Bajhang	5%	6%	31%	46%	91%	67%	45%	1%	0%	0%	0%	0%

Note: adapted from (ANSAB, 2022a).

Table 10 presents the percentage of respondents answering “yes” when asked if their CFUG carries out promotion of sustainable NTFP harvesting for 3 high-value species. Overall, more households reported that their CFUG did not promote sustainable harvesting. The responses are similar for each species, but there are differences between districts. A higher percentage of Humla, Jumla, and Mugu respondents report that their CFUG is carrying out sustainable harvest promotion of Jatamansi compared to Bajhang and Darchula.

Table 10

Does CFUG promote sustainable harvesting of NTFPs ("yes" responses)

NTFPs	Humla		Jumla		Mugu		Darchula		Bajhang		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
Jatamansi	85	64.9	36	60.0	32	53.3	1	1.4	23	26.4	177	43.2
Kutki	85	64.9	36	60.0	31	51.7	0	0.0	15	17.2	167	40.7
Banlasun	78	59.5	38	63.3	31	51.7	33	45.8	19	21.8	199	48.5

Note: Adapted from (ANSAB, 2022a).

4.2.2.3 Local Conservation Management Systems. While there may be inconsistencies and deviation from forest management plans or CFUG operational plans, it was also observed that community forest users knew their forests well, recognized the value of the NTFPs on their land, and were engaged in their own conservation systems. Nabin Joshi describes a field trip to Bajhang District:

> It's mid-October, after October twenty we went up, and Jatamansi is available in a very good quantity in the harvesting area, even [though] it's like a cultivated land. Not only this but the associated species, this is a fertile area. One species is called Banlasun and another is Kutki. That species is in a good distribution. … I asked the villagers of the local forest user group how frequently you used to harvest. "This is", they said, "three years interval", they used to harvest. … They showed me an area of twenty to thirty hectares forest, from that area they collected about two million Nepali rupees amount equivalent in that fertile area. So, they have their own management system or control over the resources. Also, the government is strictly … saying to manage these species based on the management plan. But one thing we are very complaining [about] is we conserve our resources. But the neighboring district, or some other people, used to come illegally, and they harvested before the season, and sometimes it may make conflict, or extinction of the resources. But those

> who are the one owner of this species, or the forest, they are doing very well. They are performing well because this is one of the major sources of income. They love it, you know, they care it like their child, you know. So that's why Jatamansi is also one species to contribute their livelihood, around thirty percent or forty percent of income source is from that species. So that's why they are really aware of that species, specifically for the conservative and in the long run. (N. Joshi, personal communication, November 19, 2022).

Rabindra Shukla described a similar management system for Humla District:

> So, they have their own management system in village areas that once it has been collected from the area, and the people leave it for 2 years, and only they are going to that place, that particular place, and then collect it. So, there is a cycle up to 3 years, one place (R. Shukla, personal communication, February 5, 2023).

4.2.2.4 Annual Allowable Harvest and CITES Quota Calculation. Annual Allowable Harvest (AAH) figures from division forest management plans are used in calculating Nepal's annual CITES export quota requests submitted to the CITES Secretariat. In 2017, Nepal calculated a 487.8 metric ton AAH quota for Jatamansi (UNEP-WCMC, 2017). In 2018, this figure increased to 935 metric tons, and by 2019 it increased further to 979 metric tons (Table 11), nearly doubling in two years. The 2019, 44 metric ton increment was said to be due to the strong restriction for collection of the species since 2017 (M. D. Ghimire & Shrestha, 2019).

However, the largest increment between 2017 and 2019 was the change in Humla District's AAH in 2018. A Jatamansi harvesting plan and Environmental Impact Assessment (EIA) study for Humla had recently been completed, making it the only district with an EIA. Humla's AAH increased from the 50 metric ton threshold allowable under an Initial Environmental Assessment (IEE) to 425 metric tons. EIA studies were also being

carried out in other districts, including Jumla, Dolpa, Kalikot, Bajura, and Manang, but not yet reported as complete (Department of Forests and Soil Conservation, Nepal, 2019). DoFSC stated that a higher potential harvest is also expected for these districts. It remains to be seen if the EIA assessments for Jumla, Dolpa, Kalikot, Bajura and Manang Districts show AAH increases on the same scale as Humla. In that case, Nepal's quota requests may continue to increase.

Furthermore, the 2019 quota request was based on a rotation cycle of 3 years for 11 districts and 4 years for one other (rotation information was not available for all districts). Humla's EIA report used a 3-year rotation cycle, with 20% of plants left undisturbed. As the harvest management systems were not sustainable, Nepal was advised to revise their quota request. After adjusting the harvest rotation to 5 years and allowable harvest to 10% of the total growing stock of each available district using a precautionary quota, Nepal's NDF assessment (M. D. Ghimire & Shrestha, 2019) adjusted its export quota to 382.7 metric tons, accepted by the Chair of the CITES Plants Committee as in line with the requirements formulated within the RST process, and subsequently published by the CITES Secretariat for the information of all CITES Parties.

Table 11

Annual Allowable Harvest (AAH), Rotation Period, Environmental Study Information for 26 Districts and 2 Conservation Areas of Nepal, 2019

S.N.	Name of District	AAH (dry weight in metric tons)	Rotation Period (years)	Environment Studies (Approved)	Remarks
a. Jurisdiction of Department of Forests and Soil Conservation					
Western Region of Nepal					
1	Jumla	50	3	IEE	DFMP, 2013
2	Humla	425	4	EIA	EIA Report 2018
3	Mugu	48.6	3	IEE	DFMP, 2015
4	Bajhang	47		IEE	
5	Bajura	42.6	3	IEE	DFMP, 2014
6	Dolpa	44.4*	3	IEE	DFMP, 2018
7	Kalikot	49.5*	3	IEE	DFMP, 2018
8	Rukum East	22	-	IEE	DFMP, 2017
9	Rukum West	8	-	IEE	DFMP, 2017
10	Rolpa	20.5	3	IEE	DFMP, 2015
11	Jajarkot	30.7*	3	IEE	DFMP, 2018
12	Dailekh	49.7	-	IEE	DFMP, 2018
13	Doti	5		IEE	
14	Pyuthan	3	-	IEE	DFMP, 2014
Central Region of Nepal					
15	Manang	18.2	-	IEE	DFMP, 2018
16	Baglung	1.7	3	IEE	DFMP, 2014

17	Myagdi	1.1	3	IEE	DFMP, 2018
18	Lamjung	20.2	3	IEE	DFMP, 2018
19	Gorkha	4.9	-	IEE	DFMP, 2014
20	Dhading	2	-	IEE	DFMP, 2018
21	Nuwakot	1	-	IEE	DFMP, 2014
22	Rasuwa	0.7	-	IEE	DFMP, 2017
23	Sindhupalchok	2.3	-	IEE	DFMP, 2017
24	Ramechhap	1.5	-	IEE	DFMP, 2017
Eastern Region of Nepal					
25	Taplejung	25.5	3	IEE	DFMP, 2017
26	Solukhumbu	1.2	-	IEE	DFMP, 2015
b. Jurisdictions of Department of National Parks and Wildlife Conservation					
1	Api NampaConservation Area, Darchula	1.7	-	IEE	MP (2015-2019)
2	Shey Phoksundo NP, Dolpa	50		IEE	
Total		978			

Note: Adapted from (M. D. Ghimire & Shrestha, 2019).

4.3 Hypothesis 3 Analysis

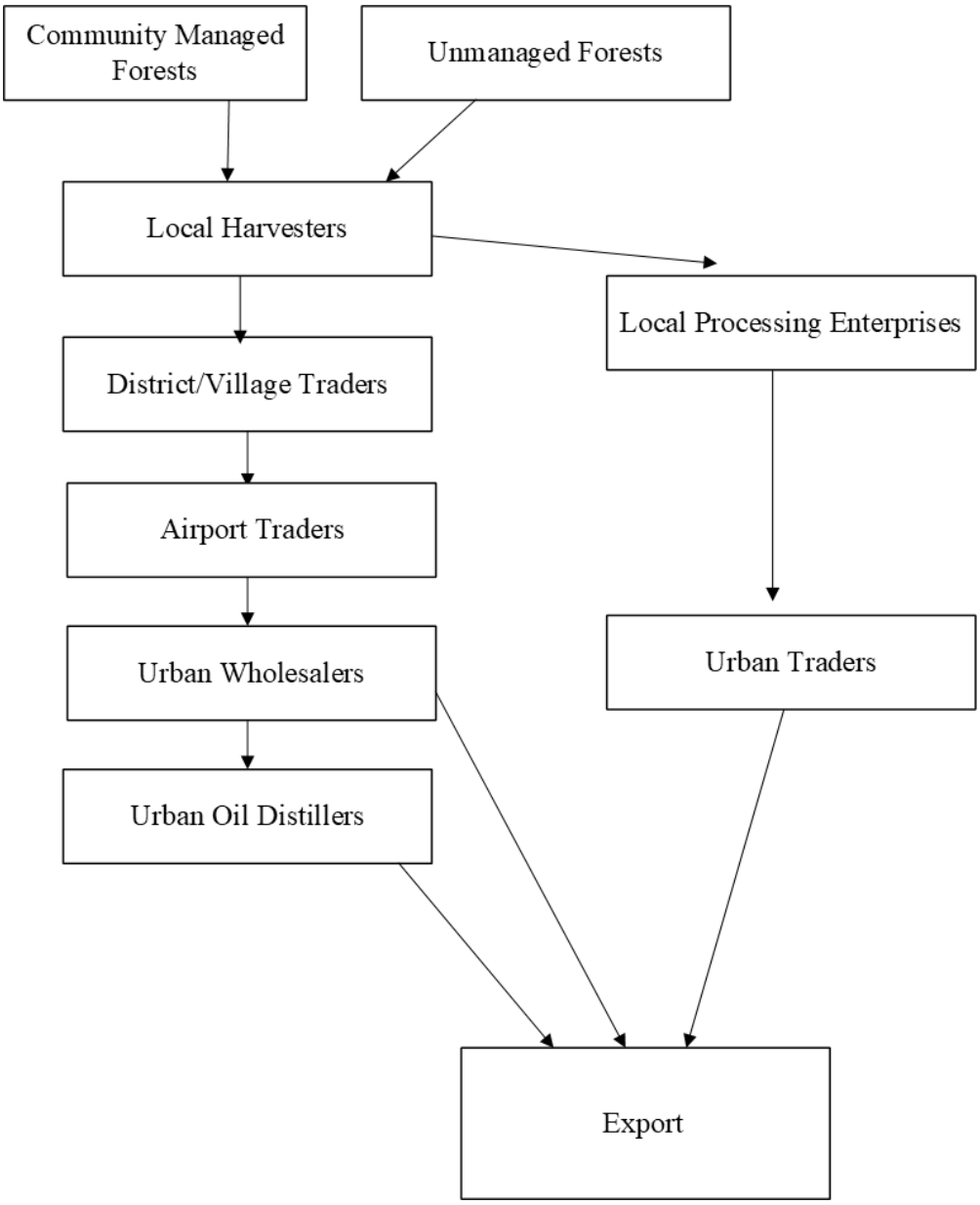
4.3.1 The Value Chain and its Actors

Understanding the value chain for Jatamansi in Nepal is important when discussing the impacts of changes in national policy and legislations on livelihoods. There are five main types of actors involved in the essential oil value chain: 1) Collectors or harvesters; 2) community forest user groups (CFUGs); 3) local distillers/processors; 4)

traders (district/village traders/agents, airport traders/contractors, urban wholesalers); and 5) urban distillers/processors/traders/exporters. Figure 8 represents the flow of Jatamansi from collection to export.

Figure 8

Value Chain of Jatamansi in Nepal



Note: Adapted from FRAME: Role of Natural Products in Resource Management, Poverty Alleviation, and Good Governance. A Case Study of Jatamansi and Wintergreen Value Chains in Nepal (Pokharel et al., 2006).

In 2006, the Department of Forests stated there were a total of 7,772 Jatamansi collectors in Nepal. However, based on discussions with key stakeholders involved at various stages of the chain, the FRAME report estimated the number to be about 15,000 (Pokharel et al., 2006). TRAFFIC's "Succeeding with CITES" project has created a registration system for collectors that may provide a more accurate estimate in the future.

Collectors may be independent and collect on government-managed land or be part of a CFUG. After harvesting, they minimally process Jatamansi rhizomes at the collection site by removing excess soil and drying them. They sell the dried rhizomes mainly to district/village-level traders. The traders package the rhizomes for sale to either local distillation plants or regional traders. There are advantages to using local distillation plants. When Jatamansi oil is distilled locally, distillation plants can benefit the collectors by paying a higher price for raw Jatamansi than traders. Jobs are created at the distillation plant, and individual collectors who are shareholders collect dividends. Local distillation reduces the transport cost of the product (about 1 to 2 kilos of oil is transported to Nepal market centers in contrast to 100 kilos of the raw herb) (Pokharel et al., 2006).

An increase in the number of traders and the availability of some market information has provided collectors with more outlets for their products. Collectors have the weakest access to market price information, despite programs designed to promote access, and they report that prices are mostly pre-determined by the trader (ANSAB, 2022b; Heinen & Shrestha-Acharya, 2011). District and village-level traders who do not sell to local distillation plants trade must transport the Jatamansi rhizomes. Village-level traders transport within the district, and district- level traders transport to airport traders. Transporters need to show evidence of collection permits and must have funds available to pay taxes and royalties due at airport collection points. All transporters are dependent on national airlines to transport to Nepal's urban centres (Figure 9), as road infrastructure is under-developed. CFUGs are the dominant actors for Jatamansi harvesting and initial sales in the domestic market but do not participate in the international market, as the export of unprocessed Jatamansi rhizomes is illegal (Pokharel et al., 2006).

Figure 9

Sacks of Jatamansi being Loaded at Airport

Photo credit: Rabindra Shukla. Source: (Shukla, 2021)

Prior to the Forest Act of 1993, it was estimated that over 90% of Jatamansi was traded illegally in raw form to India. That figure changed by 2006 to 75% processed into essential oil in Nepal (Pokharel et al., 2006). The Forest Act (1993) made the distillation of Jatamansi mandatory for trade to international markets. Mandatory processing generated local employment, reduced the cost of transportation, and decreased the amount of illegal trade of raw Jatamansi to India (R. Shukla, personal communication, 5 February 2023). Product quality was initially a challenge, as technology, skills, and the capacity to test products were limited. Due to product quality variation, district-level processing units often face problems competing with the regional-level processing units for export to international markets (Subedi & Pandey, 2011). Technological and training interventions have been a focus for aid organizations that recognize the opportunity presented by the Jatamansi essential oil, which represents a low- volume, high-value product ideal for shipping by air from landlocked Nepal.

Since 1993 there has been growth in the distillation industry in Nepal. According to an urban processor/exporter, the value chain remains the same, but the number of essential oil distillers and processing companies has grown, providing more opportunities for local collectors, and decreasing illegal trade of raw Jatamansi to India. Rabindra Shukla described how trading opportunities have changed for processors and collectors:

> Yes, there came so many processors since 1993…before that there was only one government company, and they were only doing that. But after 1993 there are only around 7 to 8 companies. Now we are around 10 companies…we are consuming the thing, and we are paying it. So why should they go elsewhere? (R. Shukla, personal communication, February 5, 2023).

Figure 10

Distillation Units

Photo credit: Rabindra Shukla. Source: (Shukla, 2021)

4.3.2 Changes for Value Chain Actors Since New National Legislation

Changes to the process for Jatamansi collection and export permits due to the CITES Act (2017) have created conflict between some actors in the value chain. Some changes to the Forests Act (2019) impact the tenure of community forests. To analyze the changes to livelihoods due to new national legislation, Table 12 summarizes changes in access status for value chain actors that came about in the last 5 years.

Table 12

Power-mapping of Jatamansi Value Chain Actors

Market Actors	Access rights before 2017	Mechanisms for Exercising Access	Changes after 2017
Local harvesters	CFUG members: direct access to CFUG forests and resources, indirect access to national forests (must obtain collection permit from DFO). CFUG non-member: must be affiliated with a contractor who holds a collection permit for community forests, must obtain collection permit from DFO for national forest	DFO approval of operational plans or collection permits, CFUG membership, traditional member of communities, social groups, traditional collection practices.	Collection permits issued by Management Authority (DoFSC) in Kathmandu, difficult independent access. Must obtain collection permit via trader's local agent.
Community Forest User Groups	Access to forests, direct access to CFUG resources, access to royalties (25% of revenues to be invested in forest management, 75% on community development and other activities).	DFO approval of operational plans or collection permits.	Forests Act of 2019 revenue requirements (25% must be invested in forest management activities, and 50% in poverty reduction, enterprise development and women empowerment). No longer issue collection permits. No longer collect Jatamansi royalties - now paid to DoFSC.

Village traders/agents	Access, trust, relationship with local harvesters, networks, market information.	CFUG membership, obtain collection license from DFO, networking with government, finance to local harvesters, linkage with airport traders.	Must now obtain collection permit from DoFSC in Kathmandu or via urban trader.
Local distillers	Access to village traders and local harvesters, local networks, access to CFUG resources, access to national and international buyers.	Built on community systems including Village Development Committees, CFUG membership, permission from DFO to distill, employing local community members, provide economic incentives for locals.	2 distillation units permanently closed in Jumla in the last 5 years due to lack of market.
Airport traders	Access to DFO and local harvesters, linkage with urban wholesalers and urban distillers.	Hold trade license for NTFPs, financial resources to invest in NTFPs trade, networking with local harvesters and government.	Transportation restrictions during COVID-19 pandemic limited trade.
Urban wholesalers (raw Jatamansi)	Access to urban distillers and airport traders, access to national and international buyers, access to working capital and trade credit.	Good network with custom office and security personnel, access to current market prices of raw NTFPs in national and international markets, know how to smuggle across border (buy in from customs).	Now apply for collection permit on behalf of collectors.
Urban distillers, mainly oil distillers	Access to urban wholesalers and exporters, access to regional, national, and international market, access to credit and loan, access to labor.	Permission certificate of distillation, influence the market price of raw Jatamansi and marc, networking with government officials and security personnel, have quality testing equipment for oils.	Now apply for collection permit on behalf of collectors.

Urban traders, mainly oil exporters	Access to local and urban distillers, access to national and international buyers/importers/ exporters.	Export license, knowledge of international markets and price variation, skills of value addition.	Now apply for collection permit on behalf of collectors.
International buyers	Have international market linkages.	Good ties with Nepali traders and buy a range of NTFPs to retain their patronage.	Buyers in European Union waiting on positive decision.
District/Division Forest Office	Holds overall authority to grant access to forests and utilization of forest products. Restructured in 2018 – Federal District Forest Office redefined as Provincial Division Forest Office.	Issues operational plans (OPs), monitors and supervises implementation of OPs, enforces forest related legislation within the district, collects royalties.	No longer issues collection permit or collects royalties.
Customs officials	N/A	Verify tax payment documents issued by the DFO	N/A
Government testing laboratories	N/A	Analyze and certify authenticity, genuineness, and quality of forest products	N/A

Note: Adapted from FRAME (Pokharel et al., 2006) with data from (R. Shukla, personal communication, February 5, 2023, K. Mahat, personal communication, February 24, 2023) and (*Nepal Law Commission – NLC*, 2023)

4.3.3 Changes in Permitting Processes and Their Impact on Value Chain Actors.

4.3.3.1 Collection Permits. Under the CITES Act (2017), the collection permit issuing authority was transferred from the DFO level to the CITES Management Authority (MA), the Department of Forests and Soil Conservation, located in Kathmandu. Royalties of 75 NPR per kg are also collected at the MA when permits are issued, while these royalties were previously collected at the local level and used for local benefits. FECOFUN reports that many collectors and local traders engaged at the ground level are unable to travel to the Management Authority (MA) in Kathmandu to obtain collection permits, and this has

created conflict between local traders and exporters (D. Khanal, personal communication, 3 January 2023).

To mitigate this problem, urban traders/exporters now apply for collection permits on behalf of local collectors, communicating via agents (R. Shukla, personal communication, February 5, 2023). Traders/exporters now pay royalties to the MA in advance of collection, based on the specifications of the permit issued. If, however, the collectors for whom they have arranged collection permits ultimately sell the Jatamansi to someone else instead, the royalty payment made to the MA cannot be refunded, and the exporter has lost 75 NPR per kg and their reputation as a trader. Rabindra Shukla explained that he would need to defend the situation to his customers: “Companies will ask “Why you have not collected things, because they have given this much quantity permitted?”" (R. Shukla, personal communication, 5 February 2023). In the past, collectors were free to sell to any trader, and if accustomed to this practice, they may not appreciate the loss to the trader under the new royalty practices.

It is also reported that illegal collection is occurring because of the difficulty in obtaining a collection permit, and that enforcement of permits and permitted quantities is now more difficult, because the DFO is no longer the permitting authority (D. Khanal, personal communication, 3 January 2023).

There is a contradiction between the CITES Act and the Forests Act (2019), which states that collection permits should be issued by the DFO. FECOFUN, on behalf of CFUGs, has registered a memorandum to the Ministry of Forest and Environment and the Management Authority to revert the permitting process (D. Khanal, personal communication, 3 January 2023). JABAN is also advocating on behalf of traders (R. Shukla, 5 February 2023), and a case was registered in the Supreme Court of Nepal. Dil Raj Khanal provided an update in early March of 2023:

> Recently, the Supreme Court has given an order to the central government to specify the management authority at the district level in regard to any particular CITES species, particularly to issue a collection permit from the district level considering

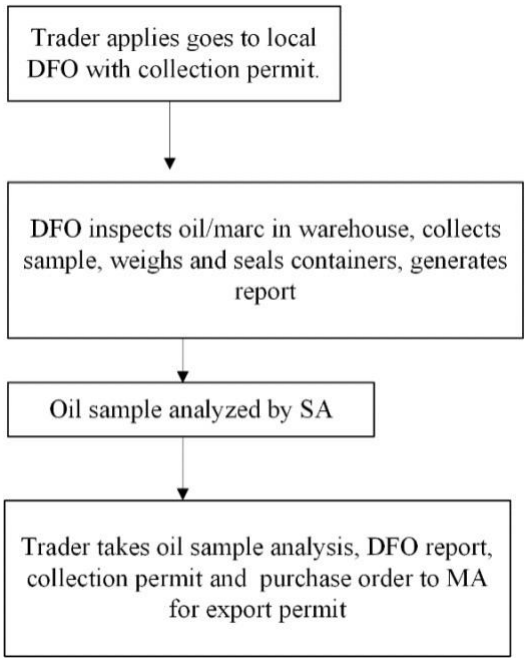
> the geographical difficulties. However, the CFUGs are still not satisfied with the legal provisions and the decision of the Supreme Court, because they are not getting the price of CITES species and the Management Authority is issuing the collection permit without consultation with CFUGs. Therefore, they are interested to go to court for securing their rights over the CITES species and its price (D. Khanal, personal communication, March 1, 2023).

The issue is expected to be resolved by a second amendment bill that will need to be passed in parliament and the House of Representatives, then published in the budget.

4.3.3.2 Export Permits. Exporters report that waits of 1-2 months for export permits are now reduced to 2 weeks or less. Previously the permits were issued with short expiry dates, from 15 to 30 days, but are now issued for six months, providing more time to transact international shipments, and leaving time to resolve any custom clearance issues (K. Gurung, personal communication, 5 January 2023). Figure 11 describes the current export permit process.

Figure 11

Export Permit Process



Note: derived from (R. Shukla, personal communication, February 5, 2023)

4.3.4.1 Changes in Community Forest User Groups' Royalty Collection and Benefit- sharing. Changes to benefit-sharing brought on by the new CITES Act are a source of conflict between CFUGs and the central government. Previously, CFUGs had the right to collect royalties for Jatamansi at the time when they issued permits under approved operational plans. It is reported that, in reaction to the MA collecting royalties under the new permitting system, some CFUGs did not collect Jatamansi in the 2022 season. Regarding the reaction of ANSAB's CFUG project sites in Jumla, Khilendra Gurung said the following:

> They think their rights have been violated by the central government. "It's our right to issue the permit because we are managing that resource. Why, central government, are you?" So, there is a petition in court" (K. Gurung, personal communication, January 5, 2123).

He added that CFUGs are discussing benefit-sharing and are willing to return to collecting if traders pay them their minimum royalty rate (K. Gurung, personal communication, January 5, 2023).

The Centre for International Forestry (CIFOR) observed that Nepal's community forestry institutions were the only functioning rural bodies to support livelihoods in the roughly 20-year period between the Maoist Insurgency in 1996 and the adoption of Nepal's Constitution in 2015 (Banjade et al., 2020). Under Nepal's new Constitution, provincial and local governments enjoy substantial power, particularly in development activities, service provisioning and natural resource management. Even with a decentralized administration, some argue that natural resources are still controlled by the central government, and increasingly so (UBC Wiki, 2020). It is unclear what benefits and services local and municipal governments offer to CFUGs, but the provision of benefits has become more important than ever since CFUGs lost direct access to the royalty payments they used to receive when issuing Jatamansi collection permits. Livelihoods depend on the continued tenure of community forests, which is established through the validity of operational plans and forest group constitutions.

The Forests Act (2019) has new provisions for the handover, take back and re-handover of forests to CFUGs, and punishment for contravening the operational plan and expenditure for community forest development (UBC Wiki, 2020). Operational plans, while establishing tenure of community forests, have been observed as "more political than technical documents guiding actual forest management" (Baral et al., 2020, p. 501). While no legislation stipulates regular revisions of operational plans, the Community Forest Guidelines (1995) state that the plans should be updated every five or ten years. The periodic update of plans purports to have a scientific basis but has become a bureaucratic process used to uphold the legal effect of the plans (Basnyat et al., 2018). CFUGs report delays in approval of new operational plans, despite beginning the renewal process well in advance, and requesting technical assistance (Paudel et al., 2008). The demanding technical requirements for renewal of the plans disempowers CFUGs while empowering the forestry bureaucracy, which can use the law to its advantage. "In this way, the forest bureaucracy re-centralizes decentralized forest governance in a legal-sounding way" (Basnyat et al., 2018, p. 16).

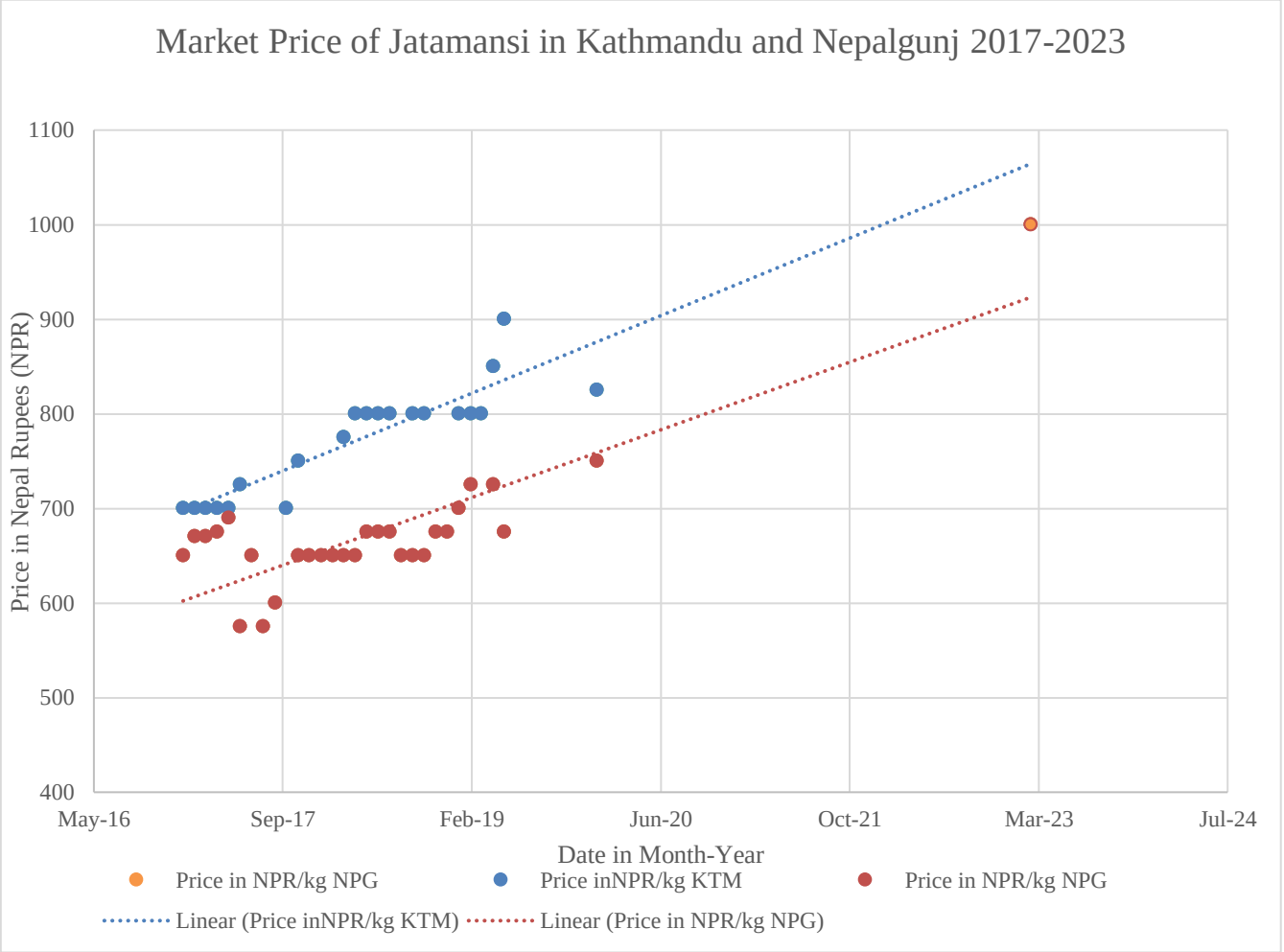
4.3.4.2 Changes to Collector Livelihoods Since 2017. In the short term, the zero- quota imposed by the RST process, and the promulgation of the CITES Act in 2017 created a shock in the local collector economy. Nabin Joshi describes some of the impact:

> It is the CITES. This law was imposed before in two thousand and seventeen in Nepal. Then the collection, transport, processing, everything has been stopped because of that and at that time the local people's economy was really, you know, changed. It means they … suffer from that, you know. And … the local people, the local harvester, some of them are not able to celebrate their festivals like Dashain and Tihar (N. Joshi, personal communication, November 19, 2022).

4.3.3.2.1 Changes to Market Prices Impacting Collector Livelihoods. The impact of new national legislation on livelihoods can be first be explored by reviewing ANSAB's price lists for the markets in Kathmandu and Nepalgunj. Unfortunately, ANSAB's ability to maintain its online NTFP price list, active since 2010, has lapsed since the COVID-19 pandemic. The following graph (Figure 12) shows the trend in the market price of Jatamansi in the Kathmandu and Nepalgunj markets (the two major urban markets in Nepal) from 2017 to 2020. There was a steady increase in the market price in both markets, which has continued until February 2023, when the market price was reported as 1,000 NPR per kg, as represented by the orange-coloured data point in Figure 12 (R. Shukla, personal communication, February 5, 2023).

Figure 12

Market price of Jatamansi in Kathmandu (KTM) and Nepalgunj (NPG) 2017-2023



Note: data from ANSAB NTFP Price List (ANSAB, 2023).

ANSAB's 2022 household survey collected data from the last season (2021/22) compared to 5 years prior (2016/17) (Table 13). Local market prices in Humla increased from 55 NPR per kilogram to 500 NPR per kilogram, a more than 9-fold increase. Local market prices in Jumla increased from 60 NPR per kg to 1000 kg, over 16-fold increase.

Table 13

Market price of high-value NTFPs by district (2021/22 and 2016/17).

Districts		Darchula	Humla	Jumla
Market price (2021-22) NPR/kg	Jatamansi (*Nardostachys grandiflora*)	400	500	1,000
	Kutki (*Neopicrorhiza scrophulariiflora)rhiza kurroa*)	900	1,750	1,500
	Banlasun (*Fritillaria cirrhosa*)	20,000	25,000	18,000
Market price (2016-17) NPR/kg	Jatamansi (*Nardostachys grandiflora*)	n/a	55	60
	Kutki (*Neopicrorhiza scrophulariiflora)rhiza kurroa*)	n/a	350	10
	Banlasun (*Fritillaria cirrhosa*)	No market	6,500	No market

Note: Adapted from Baseline Survey (ANSAB, 2022b)

4.3.4.2.1 Changes in contribution of Jatamansi to Livelihoods compared to other high value NTFPs. ANSAB's 2019 baseline survey of collector households in Nepal's Mugu and Jumla Districts compared the income from various NTFPs during 2015-16 and 2018 (ANSAB, 2019). In 2018, the CITES Act (2017) was in effect without regulations, and legal export was not possible. As the domestic market for Jatamansi is minimal, collectors did not harvest. Table 14 lists income from various NTFPs during the two time periods surveyed.

Table 14

Mean annual income in NPR of high value NTFPs at HH level in Mugu and Jumla Districts in 2015 and 2018

Species	Jumla		Mugu	
	2015-16	2018	2015-16	2018
Jatamansi (*Nardostachys grandiflora*)	53,027	0	30,875	0
Yarsagumba (*Ophiocordyceps sinensis*)	20,092	19,476	26,993	53,864
Banlasun (*Fritillaria cirrhosa*)	7,791	10,702	10,890	16,875
Kutki (*Neopicrorhiza scrophulariiflora)*	0	0	2,920	7,454
Khiraulo (*Moringa oleifera)*	2,307	10,577	6,156	14,909
Total	83,217	40,755	77,834	93,102

Note: Adapted from (ANSAB, 2019)

Over 75% of the total surveyed households earned income from Jatamansi collection and trade in 2015/16, but incomes from Jatamansi in 2018 were 0. In 2015-16, each household generated an average annual income of about NPR 42,000 from Jatamansi (NPR 53,027 in Jumla and NPR 30,875 in Mugu). Jatamansi contributed the most to household incomes from high-values NTFPs during that period, representing 63.7% of the total from high-value NTFPs in Jumla and 39.8% in Mugu.

When asked how incomes were impacted by the CITES Act (2017), 4 experts familiar with conditions in the field responded that although no Jatamansi was collected, incomes from collecting other NTFPs, casual labour and migrating to work elsewhere in Nepal or India took their place. In Mugu district, Kutki, which can be collected at the same altitude and the same season as Jatamansi, replaced some of the Jatamansi income in 2018. More lost income was replaced with Yarsagumba, which is collected in the spring. In Jumla, the market for Jatamansi collapsed, and two distillation units closed (K. Matha, personal communication, February 25, 2023).

ANSAB's 2022 baseline survey for a second NTFP project yielded the following results for contributions of NTFPs to household incomes (Table 15). As the survey used different CFUGs than the 2019 survey, the two cannot be used for a longitudinal study over the entire 5-year period of this research. Regardless, it is interesting to observe how much lower incomes from Jatamansi are in 2021/22 compared to 2015/16 levels in Jumla District (Table 14). This corresponds with K. Matha's report that the market for Jatamansi in Jumla collapsed during the first 5 years of new CITES legislation, and that other NTFPS were collected in its place.

Table 15

Contribution of NTFPs income to the total household income in 5 districts of Nepal (2021/22)

District	NTFPs types and earnings (2021/22) (NPR)						NTFPs share (%)
	Jatamansi	Kutki	Banlasun	Other NTFPs	Total income from NTFPs	Total income from all sources	
Humla	5,013	29,759	20,567	16,498	82,420	192,243	58.05
Jumla	15,307	21,300	23,767	27,452	48,834	83,979	50.39
Mugu	31,787	44,717	33,133	21,538	107,417	139,435	76.12
Darchula	14,158	20,353	0	40,831	51,254	162,636	45.61
Bajhang	8,793	6,918	10,143	9,241	22,965	133,195	30.14
Average	15,011	24,609	17,522	23,112	62,578	142,297	52

Note: Adapted from (ANSAB, 2022a)

4.3.4.2.4 Changes to Collector Livelihoods due to COVID-19. It is difficult to separate the impacts of national legislation on livelihoods from those of the COVID-19 pandemic. Table 16 shows district wise information on the effect of COVID-19 on NTFPs income, and the percentage change as compared to NTFPs income from 5 years ago. The highest COVID-19 induced NTFPs income loss was reported from Humla (43%) and the lowest from Jumla (7%). Individual respondents reported as high as 95% loss of NTFPs income due to COVID-19 pandemic.

Table 16

Effect of COVID-19 pandemic on average household incomes from NTFPs

District	Income reduction (%)
Humla	43
Jumla	7
Mugu	27
Darchula	38
Bajhang	30
Total	31

Note: Adapted from (ANSAB, 2022a)

5. Discussion

5.1 Interpretation and Implications of the Findings

5.1.1 Interpretation and Implications of the Findings - Hypothesis 1

The timing of Nepal's decision to implement the new CITES Act (2017) appears to be the result of the zero-export quota, as suggested by 2 experts. When asked about the delay in promulgating Nepal's CITES regulations that prevented export permits from being issued, Rajendra KC pointed out that a zero quota was in place, regardless, and that parliamentary processes take time (R. K.C., personal communication, January 5, 2023).

If that was the case, then the RST process successfully prompted the promulgation of legislation that had been in development for years (Ministry of Forests and Soil Conservation, 2011; Shukla, 2017). The long delay was not entirely unwarranted. Nepal experienced a Maoist Insurgency from 1996-2006, became a republic in 2008, and finally ratified a constitution in 2015. The zero-export quota associated with the RST remained in place until Nepal could deliver a scientific NDF and request a revised quota, which coincided with the promulgation of Nepal CITES Regulations (2019).

While most experts agreed that the RST process was necessary and removed at the correct time, two experts stated that it was released too early, and one stated it should have been removed sooner. Khilendra Gurung of HBTL, both an export manager and a botanist, was cautious and preferred waiting to see the quota fixation for upcoming years. Kamal Matha of UNDP stated that the RST needed to be released earlier to protect collector incomes and maintain the market for Jatamansi in Jumla. From the point of view of Rabindra Shukla, an urban trader/processor who sources Jatamansi from Humla, once trade returns to full force, there will be extra harvesting to compensate.

There were district level variations in CFUG householders' perceptions of Jatamansi regrowth. Darchula District residents stood out as perceiving rapid decreases of Jatamansi in their community forests. Darchula is the district closest to the India border, where there is an increased probability of illegal trade, and therefore increased possibility of illegal harvesting. Another district level variation was revealed by ANSAB's Nabin Joshi, who was unable to find Jatamansi growing at 3000 metres altitude in Humla and Jumla. As he

suggested, further research is required to determine how the population distribution has changed, and the causes. This research should be conducted at the district level. Jwala Shrestha of the Department of Plant Resources (personal communication, March 11, 2023) indicated that her colleagues in Jumla will be undertaking research on the population in that district. However, research is particularly necessary in Eastern Nepal, as Jumla and all other districts in ANSAB's surveys are in the west, where population density is known to be higher.

Finally, the RST zero-quota was not the only factor influencing Jatamansi population regrowth. The regrowth observed by 7 of 9 experts can also be attributed to the promulgation of the CITES Act (2017) without regulations, which delayed legal export until 2020, and the COVID-19 pandemic that restricted forest visits and transport. These three factors have recently and concurrently changed, and monitoring will be required to ensure that the regrowth will not be quickly reversed.

5.1.2 Interpretation and Implications of the Findings - Hypothesis 2

ANSAB's data shows that rotational harvesting systems employed in CFUG operating plans appear to be based more on local management systems than on guidelines provided by the government or NGOs such as ANSAB. Some of these reportedly use very short rotation cycles of only one year. Two experts confirmed that local management systems were in use with a 3-year rotation, which in both cases was considered by locals to be enough to allow regrowth. Nepal's NDF assessment report showed that 11 of 26 districts were using a 3-year rotation, one was using a 4-year rotation, and no information was available for the others. Harvest ratios also need to be known to determine sustainability of the harvest management systems.

ANSAB's Resource Inventory in Jumla used a 40% AAH factor. When questioned about it, Khilendra Gurung, who participated in the survey, confirmed that the modified rate used was location-specific and precautionary. DFMPs and CFUG operational plans could benefit by applying this level of precision, as there are reports in the literature and from the UNDP expert interviewed that management plans are ritualized, bureaucratic measures, more political than technical. Both forest fires and urban encroachment are increasing in Nepal, and it needs to be clarified whether traditional systems of species management are

adapting to these events and adjusting rotations and harvest quotas.

Despite CFUGs' intentions to manage species using operational plans, ANSAB found inconsistencies in implementing the plans. The range of responses households provided when questioned about the best months for harvesting shows that many households believe it is best to harvest prematurely. Demand was one of the reasons for premature harvesting. Locals report the intrusion of collectors from other communities harvesting prematurely and illegally on their land. Expert interviews confirm this practice exists, and Khilendra Gurung stated that collectors are willing to risk paying a 10,000 NPR fine to harvest illegally (personal communication, January 5, 2023). Households understandably feel competition from other collectors and expect an easy and higher harvest when they harvest prematurely, even though they may be aware of the implications for species management (ANSAB, 2022). The frequency of households conducting premature harvesting suggests that monitoring, one of the administrative tasks of CFUGs, is being poorly implemented. Yet monitoring is critical to maintain exclusion rights and protect tenure.

The Ministry of Forests and Environment and NGOs such as ANSAB provide guidelines for participatory forest inventories. District forest management plans, however, are often based on substandard forest inventories or copied from a standard plan paradigm (Baral et al., 2018, 2020; Basnyat et al., 2018). Many of the forests were never inventoried, and the numbers in the operational plans were set to match government requirements (Baral et al., 2018). If DFOs are falling short, it is certainly unrealistic for the Ministry of Forests and Environment (MoFE) to expect CFUGs to possess the technical capacity to conduct high- quality scientific inventories and write relevant operational plans, even if they are subject to DFO revision. It is also unrealistic for the MoFE to use inventory results based on standard plan paradigms in calculating AAH for annual quota fixation.

Baral et al. (2018) suggested reconsidering the ritualized planning processes and rethinking inventory-based management's role in community forest operation plans. They suggested considering the ecological situation rather than employing unavailable technical processes, and empowering the CFUGs to have actual management objectives rather than objectives that satisfy the bureaucratic process (Baral et al., 2018). In the current scenario, overly technical operational plans are difficult for CFUG members to understand (Puri et al., 2021), and ANSAB has shown that CFUG inventories and operational plans are

often inconsistently implemented. In that case, Nepal's CITES export quotas calculations are almost certainly incorrect.

Nepal's 2018 quota fixation document included a substantial increase in AAH for Humla District, after an Environmental Impact Assessment (EIA) was completed. The report stated that EIAs were underway for several other districts. Jwala Shrestha from the Department of Plant Resources acknowledged that the AAH for most districts was indeed limited to 50 metric tons by the legal extraction threshold for Initial Environmental Examinations. When asked if similar increases were expected for other districts when EIAs were complete, she replied:

> I think definitely it has to be, you know, if the community follow the approved environmental assessment report thoroughly. Definitely they have to be large annual allowable harvest because they have to comply. They have to just take on all the procedure of the environmental assessment report. They have to only harvest that much of amount, or they have to collect only that much of amount which is return in environmental assessment report. I think so. It will increase. It will definitely help to increase… (J. Shrestha, personal communication, March 11, 2023).

The potential increase in AAH after EIAs are completed in the major Jatamansi producing districts would be unsustainable unless district forest 5-year management plans and CFUG operational plans reflect new harvest management systems. The CITES export quota calculation for 2019 required a precautionary re-calculation using a 5-year rotation and 10% harvest, rather than the commonly used 3-year rotation. Four Nepali experts stated that they were aware that Nepal's initial calculations were perceived as unscientific, and the reason behind the European Union's negative trade opinion for Jatamansi.

The majority of CFUGs and District Forests are not following scientific inventory and harvesting guidelines such as those available from ANSAB (ANSAB, 2010). New government guidelines are being written (J. Shrestha, personal communication, March 11, 2023), suggesting that the 2012 guidelines (unavailable in translation) do not follow

precautionary rotation cycles or harvest ratios. The "Succeeding with CITES" project conducted trainings on harvesting practices and operational plan development for CFUGs. These actions take important steps towards sustainable species management; however, the trainings were limited to two Jatamansi producing districts, and the new government guidelines are yet to be circulated. Traditional practices likely take time and effort to change. It is critical that training on creating operational plans, new harvest management systems, new inventory guidelines, and improved monitoring proceed as quickly as possible to prevent any population regrowth from being decimated when the market for Jatamansi recovers fully.

5.1.3 Interpretation and Implications of the Findings - Hypothesis 3

At the 74th Meeting of the Standing Committee, on the matter of livelihoods, Nepal's new national legislation was presented as a lesson learned. "Wildlife trade policy in both producer and consumer countries can, intentionally or unintentionally, undermine opportunities for indigenous peoples and local communities to benefit from sustainable wildlife trade" (CITES, 2022b p. 25). While the price per kg of Jatamansi rose during the 5 years from 2017 to 2022, the delay in promulgating national CITES regulations meant that exports were not legal until 2020. Private sector associations claimed the CITES Act (2017) was passed without any private sector consultation and estimated that 200 metric tons of perishable unprocessed Jatamansi were immediately made commercially unviable. A World Bank report states that an estimated 30,000 households reliant on incomes from Jatamansi, including those of low-income collectors, were impacted by the legislative change (McKenna, 2018). Household incomes from Jatamansi in Mugu and Jumla were zero in 2018. Collectors turned to other labour or other NTFPs and some, such as Kutki and Banlasun, rose in value and replaced Jatamansi in 2020/21 as the highest NTFP contributor to household incomes. It is not clear to what extent the new national legislation may have damaged the market for Jatamansi, however, the lack of interest in the Jatamansi markets in Jumla and Humla 5 years ago, described by 2 experts, has reversed. It remains to be seen if this trend continues, and if this is in fact a long-term positive impact on livelihoods caused by Nepal's new CITES legislation.

The Management Authority's decision to issue collection permits for Jatamansi also initially impacted collector incomes negatively. With the new process, traders' and collectors' livelihoods were disadvantaged. Collectors could no longer access collection permits without spending time and money to travel to the Management Authority in Kathmandu. Traders assumed more risk in paying royalties when applying for collection permits on behalf of local collectors. An urban trader called for a return of the previous system, where DFOs issued permits, and pointed out that it might allow collectors to receive a more competitive price for their harvests:

> If he [Management Authority] can delegate to the District Forest Office, then they [collectors] can take the collection permit, and all the collectors are free to sell to anyone. There are so many processors, so there will be a competition in between these processors, and the collectors can get more benefit than they are getting now (R. Shukla, personal communication, February 5, 2023).

The Management Authority recentralized aspects of species management for Jatamansi when it took over the permitting process. However, in creating more difficulty for collectors to receive permits, they may have inadvertently increased illegal harvesting and trade. When Heinen & Shrestha (2011) interviewed stakeholders in the NTFP value chain, they identified administrative barriers as a major issue. Many traders found it easier to sell materials at the Indian border and avoid the Nepali bureaucracy entirely. Heinen & Shrestha's stakeholders stated that the government's role should be that of facilitator in sustainable management and trade, but instead, it sometimes creates barriers.

Experts now report a similar attitude being applied to collection permits by some local collectors, who will harvest now without them because they are more challenging to obtain. Kahal Mahat of UNDP reported that in Humla District last season collection was occurring widely in national forests without permits and not according to any management plan. "They collected what they found there because there is not any resting on any rules. They collected everywhere, and every quantity here" (K. Mahat, personal communication,

February 25, 2023). R. Shukla (personal communication, February 5, 2023) stated that it is independent collectors, rather than CFUG members, who tend to harvest from national forests.

The Management Authority issuing collection permits and collecting royalties contradicts the Forests Act (2019) (D. Khanal, personal communication, 3 January 2023) and has created conflict and negatively impacted livelihoods. Some CFUGs refused to collect Jatamansi in the 2022 season over the new procedure. The loss of immediate access to royalty revenues for Jatamansi harvests included in their operational plan impacts livelihoods. These funds are critical to CFUGs' work to promote livelihoods and alleviate poverty. They have long worked to distribute forest products at low or no cost to low-income families and families headed by women (Ojha, 2009). CFUGs were essential in supporting families when migrant workers were forced to return from abroad due to COVID-19 restrictions (Gentle et al., 2020). It is still unclear how benefits from Jatamansi and other forest royalties collected by the Management Authority are now being distributed to CFUGs, and what other benefits are available from local governments under concurrent power-sharing described by the 2015 Constitution.

CFUGs are also concerned about the tenure of their forests under the new Forests Act (2019). The Forests Act (2019) contains provisions to hand take back and re-hand over community forests at the decision of the Divisional Forest Officer. Provincial and municipal governments now have greater authority and responsibility in community forestry, and CFUGs are concerned that this will impact their existence as self-governing units (Banjade et al., 2020). While CFUGs are critical actors in sustainable management and rural livelihoods, they are subject to complex bureaucratic processes through their operational plans, and these need to be clarified or simplified. While CFUG members often do not understand the technical content of the plans, they do perceive them as documents securing their tenure and linking them to benefits and for that reason are reluctant to dismiss them (Puri et al., 2021). Renewal of the plans every 5 to 10 years, however, is a political rather than technical or legal requirement (Baral et al., 2020; Basnyat et al., 2018) and should not be a condition to CFUG tenure.

The handover of community forests to local communities in Nepal is recognized internationally as an environmental success story, even drawing the attention of the New

York Times (NYT), which published “How Nepal Grew Back Its Forests” in November 2022 (Singh & Sharma, 2022). Community tenure security through the handover of community forests to local communities is recognized as the sole factor in these positive changes (Pokharel et al. 2007). While the NYT feature and a recent blog from the U.S. National Aeronautics and Space Administration (NASA) Earth Observatory (Cassidy, 2023) describe forest cover that almost doubled between 1992 and 2016, NTFPs are also involved. Tenure security is the most critical factor in community involvement in conserving medicinal plants such as Jatamansi (Abensperg-Traun, 2009). Without secure land tenure, communities will often be unwilling to refrain from exploiting resources, as if they do, they will be exploited by someone else (Lewis, 2009).

5.1.4 Interactions between the Hypotheses

The COVID-19 pandemic contributed to regrowth of the Jatamansi populations in Nepal by temporarily limiting collector access to collection and limiting transportation options for moving harvests to urban areas. Collectors in Humla reporting the greatest loss of NTFP incomes due to COVID-19, while Jumla residents reported the least. This may be due to the improved road infrastructure reported for Jumla by Kamal Matha, providing more vehicle transportation options and less dependence on limited air transport.

The perception held by some experts and CFUG householders that there has been a high level of regrowth of Jatamansi populations may lead to a rebound effect of higher AAH levels included in operational and forest management plans. This, combined with possible manyfold increases in AAH for districts after completion of EIAs, as was the case with Humla, may lead to overharvesting once again if Ministry of Forest and Environment officials are not careful to issue revised harvest guidelines. When asked about the 2012 guidelines unavailable in English translation, Jwala Shresta of the Department of Plant Resources replied that new guidelines and translation were in progress. At the same time, CFUGs require training not only in the preparation of their operation plans to reflect government guidelines, but also in harvest techniques and better collection monitoring and enforcement. Such training is underway with ANSAB’s implementation of TRAFFIC/FairWild projects.

The perception of abundant regrowth also hinders sustainable management when it combines with the real need for collector livelihoods. As Rabindra Shukla pointed out, there may be considerable harvesting once the market picks up, and it is important that there be some checks to ensure that collection is legal. Traders pointed out that illegal export to India was possible at the land borders, and the difficulty in accessing collection permits from the Management Authority may have inadvertently increased illegal harvest and trade. It is critical that the Ministry of Forests and Environment and the Government of Nepal carefully review the CITES Act (2017), CITES Regulations (2019) and the new Forests Act (2019), Environmental Protection Act (2019) and all the associated policies and directives to ensure that they are harmonized so that further conflicts do not impede sustainable species management and livelihood from Jatamansi collection and trade.

5.1.5 Interpretation and Implications of the Findings - FairWild Certification impacts on species management and livelihoods

TRAFFIC's "Succeeding with CITES" 3-year project (2018-2021) aimed to promote legal and sustainable international trade in Jatamansi through the FairWild certification scheme (TRAFFIC, 2018). The project provided a CITES and Livelihoods Case Study (ANSAB, 2022b) which showed that the use of voluntary certification schemes has the potential to improve consumer confidence by providing additional proof of sustainable and ethical sourcing. FairWild certification ensured fairer prices for harvesters and enhanced livelihood benefits without compromising ecological sustainability. It offered sustainable harvesting practices training to CFUG members in Jumla and Mugu Districts, who then went on to train nearly 1,000 Jatamansi harvesters (TRAFFIC, 2020). Through its involvement with species management, collection practices, livelihoods and the Nepal CITES Act, the project touched on all aspects of this research. Many of the recommendations for action resulting from this research are addressed by FairWild's projects in Nepal. Three of the interviewed experts were directly involved with the project, and two others were indirectly involved. Himalayan Bio Trade Ltd. (HBTL) became certified under the FairWild Standard in 2021 (FairWild, 2021).

Figure 13

Succeeding With CITES Training

Photo Credit: ANSAB

During interviews, experts were asked what they knew of the third-party FairWild Standard and Certification and how they thought such certification might work together with CITES. After thinking briefly about the question, Khilendra Gurung responded:

> The overall principles that is included within the pure value standard, it address[es] the requirement of CITES. Once we have organized the collectors in a proper manner, and if there is demand in the international market, now, many, many, many customers, they are interested with FairWild. Because in the past many of them, they don't know they were looking for … something like that. But for wild plants, FairWild is the complete package. But not easy for us, and costly (K. Gurung, personal communication, January 5, 2023).

A report on CITES and Livelihoods (SC74 Doc. 21.2) presented to the 74th Meeting of the Standing Committee discussed multi-stakeholder voluntary sustainability standards, noting that there are already many wild species subject to certification and traceability provisions under applicable standards. The report recognized that such standards reference environmental and socio-economic indicators relevant to livelihood and conservation outcomes from trade in CITES-listed species. A disadvantage, as noted in the interview with HBTL, is the cost to traders and producers. Beyond the onset costs of certifying, annual audits are required. In addition, the agreement between target CFUGs and HBTL stipulates a 5% over market price premium to be paid to collectors. HBTL is a consortium of community-based producers which has adopted several certification schemes, generally with financial assistance from the certifying body. Buyers in North American and European Markets are attracted by certifications, incentivizing participation in the standard. Traders in Nepal are eager to restore trade in the European Union. However, the main market for Jatamansi is India. India's National Environmental Policy mentions eco-labelling and certifications as modes of achieving sustainable consumption, and older, highly literate urban millennials, particularly women, were found to engage more with sustainable consumption (Francis & Sarangi, 2022). More research is required to determine if FairWild is attractive to Indian buyers.

TRAFFIC's final report on "Succeeding with CITES" (Timoshyna et al., 2021) details several ways in which the project addressed gaps identified by this research. Sustainable harvesting training was conducted, and a harvester's registry system was created. CFUGs themselves now maintain the registry system, which should allow the groups to make joint decisions on harvesting times and distribution of benefits. The project also aided in updating CFUGs' operational plans based on resource inventories and FairWild standard best practices. The revised operational plans included an estimated AAH for major NTFPs, time and method of harvesting, and a benefit-sharing mechanism. It was intended that this model be replicated in other CFUGs in Nepal, allowing for a decentralized approach and community-based governance of resource management.

The project also supported Kutki to be added to the Fair Wild certification, demonstrating the landscape-conservation benefit by documenting the species harvested in

the same management area. This also aided in developing a market for an NTFP collected in the same season as Jatamansi, to mitigate any future economic shocks caused by export quotas. The project also supported the upgrade of an existing distillation unit in Jumla which will help generate income for local people through employment and the sale of raw materials beyond Jatamansi.

6. Conclusion

The timing of the CITES RST process for Jatamansi in Nepal coincided with other events that restricted collection, promoting its population regrowth. In 2017, CITES imposed a zero-export quota for Jatamansi, and in the same year, Nepal promulgated the CITES Act (2017). The Act required amendments, and parliamentary approval of regulations before the export of Appendix II species could become legal, and those did not take place until 2019. When export resumed in 2020, COVID-19 restrictions prevented some collectors from visiting community forests as frequently as before. Some completely stopped collecting. COVID-19 prevention measures restricted transportation in Nepal, and collectors could not move their harvest to traders, processors, and exporters. Ultimately, regrowth of the species was reported for most but not all regions for which information is available. Given these circumstances, however, it is impossible to say that the review of significant trade alone effectively promoted the reported regrowth of Jatamansi.

New government regulations have not yet ensured that Jatamansi harvest does not exceed population growth. CFUG operational plans mandated by the Forests Act (2019) are often difficult for the community to understand and do not reflect guidelines for species management but are valued by communities as a document affirming their tenure. Annual allowable harvest figures for districts appear to be based on a 3-year rotation cycle, and it is not clear much of the plant population is left undisturbed. Furthermore, the plans may be based on substandard forest inventories and harvest practice seems to substantially deviate from them in at least some regions. Nepal's CITES export requests based on these figures required recalculation using a precautionary formula.

The delay in promulgating regulations for the CITES Act (2019) meant that the export of Jatamansi was not legal from 2017-2020. Collection was banned, and livelihood contributions from Jatamansi dropped to zero, negatively impacting local livelihoods. When export resumed, changes to the collection permitting system negatively impacted collector and trader livelihoods, created conflict, and may have increased illegal harvesting and trade. While a Supreme Court ruling has now directed the Management Authority to return permitting authority to the division forest office level, community forest user groups continue to dispute royalty collection, further diminishing livelihoods. Even though the

market price of Jatamansi rose over the last five years, some collectors shifted to other labour or to collecting other high-value NTFPs which now have more importance to livelihoods than Jatamansi.

6.1 Limitations of the Study

This research used expert interviews as one of its methods. All but one of the experts interviewed was a Nepali national engaged in Jatamansi trade or working with governance, policy, and research about Jatamansi and Jatamansi collectors. These individuals likely had vested interests that influenced their interview responses. At the same time, they provided valuable information about the national policy and legal environment, species management, harvesting practices, livelihoods, and the value chain for Jatamansi. The interviews were instrumental in understanding the current situation in Nepal, interpreting ANSAB's survey data, understanding implications of the findings, and formulating recommendations.

ANSAB's survey data was limited to CFUGs in Karnali and Sudurpashchim Provinces in Western Nepal, where the most important harvesting areas are located, and is not necessarily representative of the Jatamansi populations and species management practices in the entire country.

7. Recommendations for Future Action

1. Update S.K. Ghimire's 2007 study with research on Jatamansi biology and populations, considering impacts of forest fires and climate change, to improve forest management plans by setting district-level AAH quotas, harvest rotation schedules and ratio of plants left undisturbed.
2. Develop species management and harvest guidelines adapted to CFUGs and DFOs to provide community leaders and forestry officers with updated and understandable information for effective management plans.
3. Conduct research on cultivation in line with the Nepal Agroforestry Policy (2019) and in collaboration with community forest user groups to remove pressure from wild populations and create livelihood opportunities for CFUG members.
4. Develop markets for other high value NTFPs collected in the fall season to prepare for future market shocks, provide essential income and help collectors to pay debt, a pressure that may prompt them to harvest prematurely or illegally.
5. Engage children in the classroom on species identification and management, conservation and CITES principles. Training on the impacts of premature and illegal harvesting is particularly needed.
6. Develop regional post-secondary forestry training institutes to provide scientific expertise for forest inventories and management plans to residents who would also benefit from local employment opportunities.
7. Better monitor premature harvesting and illegal harvesting and enforce operational and forest management rules with heavier fines. There are provisions in the Forests Act (2019) Chapter 15, Sections 49 and 50 on offences and punishment that could be expanded.
8. Nepal's CITES Act (2017), Forest Act (2019) and Environmental Protection Act (2019) need to be harmonized to prevent conflicts, such as the recent one over the authority to issue collection permits.
9. Community forest groups' tenure must be guaranteed to continue their role in species management and poverty alleviation. The Forests Act (2019) has

provisions for the handover, take-back and re-handover of land in Chapter 5. Renewal of operational plans is a bureaucratic (not a legal) requirement for tenure, and this directive should be clarified or removed from the Community Forest Directives.

10. Not only tenure, but full species management rights for community forests need to be established, outside of the current ritualized bureaucratic operational plans. Further research is required on the shared responsibility for species management between CFUGs and Divisional Forest Offices, and the role of the Divisional Forest Officer.
11. Close the gap between the DFO input and approval process for CFUGs operational plans and the community need for both sustainable species management and livelihoods. Operational plans need to be made simple to understand, relevant to local communities and linked to the livelihood practices of local communities (Puri et al., 2021).
12. FECOFUN recommended a trader code of conduct that focuses on sustainability and a reliable, legally harvested supply to support their businesses. The gap between traders and the Management Authority must be addressed and formulated in national policy. There must be good options for and the appropriate provisions to maintain sustainability.
13. The Forests Act (2019) requires CFUGs to spend income on poverty alleviation and other social programs. Financial support should be provided for collectors to prevent early harvesting prompted by debt from trader advances or pressure from other creditors.
14. CFUGs and local governments should fund value addition technology, including air- drying, storage structures and distillation units, training in their operation and quality testing technology. Such technology creates local employment, and distilling oil locally cuts transport costs to urban centres.
15. Nepal should develop export markets for Jatamansi oil by supporting quality analysis at the local distillery level, and by adopting quality assurance, traceability, and chain of custody certification systems, all of which integrate with CITES principles of conservation and sustainable trade.

16. India is still the largest export market for Jatamansi. Research on the receptiveness of the Indian market to certification systems or standards could determine how such schemes could support species conservation efforts and reduce illegal trade.

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Annex

List of questions for expert interviews:

Species Management:

Which management area/community are you familiar with/have you worked with? What species management plans are in place in the area? What harvest management?

In the past 5 years, have you observed a change in the managed areas? If so what change?

In the past five years, are collectors reporting needing to walk further from their community to collect Jatamansi?

In the past 5 years, has there been a regrowth of Jatamansi in the management area? Can you name 2 regions where the populations have regrown?

Have you seen regions where the population has declined?

In the past five years, has there been more collection than regrowth in the management area?

In the past five years, has collector activity decreased? Are the number of rhizomes/kg collected lower?

Chain of Custody/Traceability:

How do the collectors you work with trade the Jatamansi? Is there a middleman/highway or airport trader/community group or consortium?

Is it possible to trace a batch of Jatamansi rhizome from the collection area to trader or export?

Has the FairWild program made an impact on Jatamansi collection in Nepal? If so, how?

How do you think 3rd party certifications such as FairWild could work with CITES?

What benefits has FairWild provided to Jatamansi to collectors/to Jatamansi species management?

Livelihoods:

In the past 5 years, has the per kg rate paid to collectors increased or decreased? In the past 5 years, has there been a stockpile of Jatamansi rhizomes or oil?

In the past 5 years, are the collectors more able or less able to send their children to school?

In the past 5 years, are the collectors more able to less able to purchase vegetable oil, salt and other cooking supplies?

In the past five year the collectors more able or less able to repay loans? Have they taken more loans during this time?

CITES and the RST process:

Were you aware of the CITES appendix II listing for Jatamansi? Of the Review of Significant
Trade?

Was the review of significant trade necessary?

At the recent CITES Standing Committee meeting, the removal of Nepal from the review of significant trade process for Jatamansi was recommended. Would you agree with that recommendation? Why or why not?

Was this the correct time to remove Nepal from the review of significant trade*?*

National CITES Legislation:

What can you tell me about Nepal's new CITES legislation? Was it effective? Has it been improved?