Targeting Natural Resource Corruption

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Understanding corruption risks in the global trade in wild plants

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Key takeaways

- Wild plants (often referred to as Non-Timber Forest Products, or NTFPs) are used as ingredients in thousands of products and are sourced from the wild all over the world. Ingredients are traded through complex supply chains, regulated both formally and through customary norms.
- A range of corruption types are documented throughout NTFP supply chains, including bribery, collusion, nepotism, and favoritism. However, corruption in NTFP supply chains remains an understudied subject.
- Three strategies are proposed to address the risks that corruption poses in the wild plant NTFPs trade sector: 1) improved resource governance, 2) increased use of appropriate voluntary certification standards, and 3) enhanced implementation of traceability approaches.
- Recommendations to natural resource management practitioners, businesses, government agencies, and voluntary certification standards owners include more in-depth assessment of current and potential corruption risks in NTFP supply chains and multi-stakeholder involvement in developing and implementing strategies to reduce them.

The challenge

Wild plants and fungi are a significant source of ingredients used in pharmaceuticals, cosmetics and food, in local medicines and other products supporting health and livelihoods. Global annual income from the production of Non-Timber Forest Products (NTFPs) has been conservatively valued at USD88 billion, coming mostly from the production of plant-based NTFPs (FAO 2014).[1] While estimates vary across geography and sector, 60–90 percent of plant NTFP species in trade are thought to be wild-harvested (Mulliken and Inskipp 2006, Jenkins, *et al.* 2018). These species make up an important part of rural livelihoods and are particularly important to ethnic minorities or indigenous peoples and local community (IPLC) groups.

Challenges around the trade in wild plants include increasing demand, insufficient knowledge about sustainable harvesting levels, over-harvesting, complex trade chains, lack of traceability, and corruption. **The scale and nature of corruption in wild plant supply chains is poorly understood, presenting important risks to livelihoods and the success of conservation efforts.** Practitioners in the conservation and natural resource management

[1] This is likely a substantial underestimate as NTFPs are rarely comprehensively captured in national statistics (Sorrenti 2017)

(NRM) sector can benefit from a stronger understanding of available evidence on NTFP supply chains to assess risk better and assure sustainability and legality of the trade.

The aim of this brief is to understand the corruption risks in NTFP supply chains and outline possible ways to address corruption effectively. The authors reviewed both grey and academic literature to identify different types of corruption in NTFP supply chains.

Box 1. Non-Timber Forest Products:

Wild-sourced resources (including plants and fungi) sourced from many types of ecosystems and habitats in addition to forests.[2] In this brief, NTFPs include a range of plant and fungi resources, excluding products of animal origin (e.g. game meat or honey).

Box 2. Wild at home: wild plant ingredients in everyday life

Adapted from Jenkins *et al.* 2018

Wild NTFPs are ingredients in thousands of consumer products, including food and beverages, cosmetics and health products. Everyday examples include:

Brazil nuts coming from wild trees in the South American rainforest

Chocolate which often contains shea butter from nuts harvested from a West African savannah tree (used as a cocoa butter equivalent)

Herbal teas containing nettles, liquorice root, and other wild plants

Shampoo which may contain argan oil, coming from nuts wild-harvested from endemic trees in Morocco

Cosmetic products which contain frankincense, a resin collected from wild trees, mostly in the Horn of Africa, or Candelilla wax, from a CITES Appendix II-listed species in Mexico.

Spices and alcoholic beverages (such as gin)

Most of the time, it is impossible to know whether the ingredients listed on products are wild-harvested, and in some cases, whether it is even from a plant. For instance, product ingredient "E414" (a common natural thickener used in chewing gums and fizzy drinks) actually comes from the resin of Acacia spp. trees, primarily collected from wild trees in the Sahel region of Africa, often in conflict or post-conflict regions.

[2] Terminology is often used interchangeably when characterizing this range of species, including "non-wood forest products," "non-timber forest products," "wild forest products," "wild edible plants," "wild food plants," and "neglected and underutilized species" among others, recognizing that there are several challenges to reconcile, including what constitutes "forest" and how to delineate "wild" (Muir *et al.* 2020). FAO defines non-wood forest products as "goods derived from forests and other wooded land that are tangible and physical objects of biological origin other than wood." (FAO 2015).

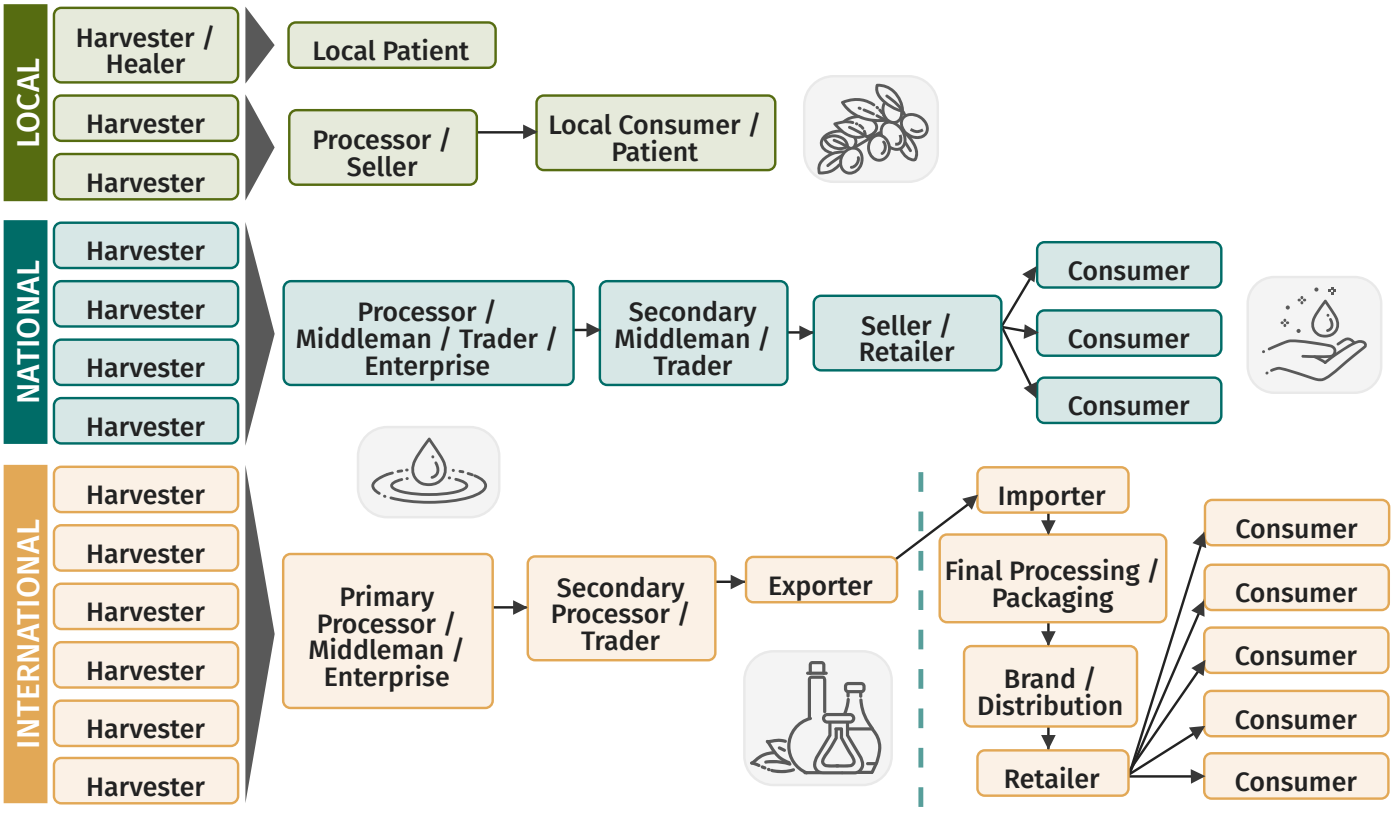
Scale, geography and features of the trade in NTFPs

Wild value chains

Millions of wild harvesters in poor and marginalized regions around the world are reliant on the trade in NTFPs. They often operate in conditions with complex legality (involving issues of tenure, access and benefit-sharing) meaning that much of the trade is informal and under-reported (Timoshyna and Hin Keong 2016). There are also identification issues; plants are mostly traded as parts, derivatives, and finished products, including in mixed and processed forms. Market awareness of sustainability issues is growing, and good practices are available (FairWild 2010; Jalonen *et al.* 2018), as well as policy and legislative frameworks that can create conditions for sustainable and legal trade in wild plants. **A range of features characterize wild NTFP value chains that are important for understanding potential corruption risks, and ways to mitigate those risks.**

- Value chains are typically long and complex, making it difficult to link products to the source of supply. Numerous value chains often run in parallel, feeding into local processing and consumption, national/domestic market processing and trade, and international trade as ingredients in final products (Booker *et al.* 2012). Figure 1 of this paper illustrates these parallel value chains.
- A large number of producers may harvest small quantities of raw plants, often selling those onwards through a range of traders/middlemen. Primary processing such as drying often takes place at this stage (see Corporale *et al.* 2020 for NTFPs processing stages).
- Harvesters are frequently rural and marginalized, often children, elderly, or women. High levels of out-migration from rural to urban areas is common, leading to decreases in the number of harvesters, and the loss of associated traditional knowledge related to use, sustainable harvest and resource management.
- While some countries (and industries) have

Figure 1. Parallel value chains of wild plants for local consumption and trade, national and international trade.
Adapted from Booker, Johnston and Heinrich 2012



prioritized cultivation programs on the grounds of conservation and quality, sustainable wild harvesting still presents an important livelihood and conservation strategy for a wide range of geographic areas, communities, and species. Some supply chains include ingredients from both wild-sourcing and cultivation, making traceability challenging.

- Harvesters may have limited knowledge of the complexities of value chains and the final markets, or the value added along the chain. Prices increase significantly from harvesters to consumers, with very limited efforts to ensure equitable sharing of benefits through the value chains (see e.g. Jensen 2009). Quite often, NTFPs cost very little when harvested and first sold.
- Species are traded in different forms (raw and processed) and are often aggregated in export codes. These complexities make comprehensive trade monitoring, identification or separation by species or origin (wild or cultivated stocks) very challenging (Shanley *et al.* 2015).
- End users (including both consumers and brand companies manufacturing final products) may be unaware of wild harvesting being the source of ingredients, or even of the country of origin.
- End industries are diverse and develop very quickly, fuelled by the interest in "natural" products. These developments include bringing plants traditionally used as medicines into food and cosmetic industries.

Value, trade, and threats to NTFPs

Approximately 26,000 plants have well-documented use for medicinal and aromatic purposes alone, with about 3,000 of these in international trade (Schippmann *et al.* 2006, Jenkins *et al.* 2018), many wild-harvested. The global threat has been assessed for ~19 percent of these species, with ~11 percent of them considered threatened with extinction in the wild according to the IUCN Red List criteria (Timoshyna *et al.* 2020). Unsustainable harvesting, land use changes, habitat degradation, and climate change are key threats. The increase in the trade in plant resources is an important factor to consider in discussing the threats and trends to this group of species.

The value of the global trade in medicinal and aromatic plant species[3] has almost tripled in recent years (from USD1.3 billion in 1998 to USD3.3 billion in 2018 (Timoshyna *et al.* 2020). The top exporters are China, India, Germany, USA, and Hong Kong SAR and the top importers USA, Hong Kong SAR, Germany, and Japan.

However, estimates of the scale of international trade are dependent on customs codes, which presents a challenge given the variety of species involved and how they are captured in national reporting. Therefore estimates of the value of NTFP trade are likely to be substantial underestimates (Sorrenti 2017). The inaccuracies in trade data, alongside unreported trade and subsistence use, make regulating their sustainable use even more challenging.

Wild harvesters

Often, wild-harvesting is linked to traditional knowledge of what parts can be collected, when, how much and how often. Wild plants can provide a supplementary income for households, providing seasonal work in rural areas. In the Chaudabise valley of the Jumla District in Nepal, a survey estimated the income from selling wild-collected medicinal plants constituted around 58 percent of total annual household income and around 78 percent of cash income (Timmermann and Smith-Hall 2020). NTFP harvesting and trade is a common market activity in many of the economically stressed, forested regions of the eastern United States (Kruger *et al.* 2020) and has major economic importance in European countries (Lovrić *et al.* 2020).

Regulating wild harvest and trade

The legality and sustainability of NTFPs are generally less regulated than timber, and management planning for the majority of NTFPs is lacking.

[3] Reported in the United Nations Commodity Trade Statistics Database (UN COMTRADE Database), Harmonised System (HS) code 1211: Plants, plant parts for perfumery, pharmacy, etc. Description: Plants and parts of plants (including seeds and fruits), of a kind used primarily in perfumery, in pharmacy or for insecticidal, fungicidal or similar purposes, fresh or dried, whether or not cut, crushed or powdered.

Traditionally the harvest of wild NTFPs has been an economic activity with little or no formal regulation, but with complex informal regulation and management by local communities (Laird *et al.* 2010, Shanley et al. 2015, Timoshyna *et al.* 2016). Over the past few decades, the harvest and trade of NTFPs has become better incorporated into legislation, for example through the expansion of forestry law. However, legislation can lead to bottlenecks and bureaucracy which incentivizes corruption and bribery to by-pass bureaucratic processes (Nygren *et al.* 2006; Tieguhong *et al.* 2015).

Commonly, the basic resource management controls involve harvesting permits, usually restricted to specific geographic areas. Harvesting permits are frequently based on annual quota setting, especially for more valuable species, but these quotas may not be based on robust science. A range of transport and export permits may also be required. Use and trade of NTFPs are also becoming more regulated internationally.

At the subnational level, customary law and traditional use systems remain important for governing use of wild resources through less formal controls. While traditional use systems and customary laws prove very effective in managing harvest at local levels, without formal legal status they may be overwhelmed by sudden increases in demand (Timoshyna *et al.* 2016). Traditional systems are also vulnerable to loss of knowledge and weakening of local institutions and customary management due to high levels of rural-urban migration occurring in many parts of the world.

At the national level, resource management and trade are often covered by different and overlapping legislative requirements, including regimes governing access and use, species and habitat protection, consumer protection, and intellectual property. An example of importing country legislation is the United States (US) Lacey Act (16 U.S.C. §§ 3371-3378), which requires a declaration of legal sourcing at the time of import of certain plants and products. From October 2020, phase six of the Act will also include certain essential oils (USDA 2020). The United Kingdom's (UK) Anti-Bribery Act places the responsibility on business to reduce the risk of corruption in business transactions and supply chains (UK Government 2010).

At the international level, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (**CITES**) provides an important level of trade regulation with over 800 species of medicinal and aromatic plants listed in Appendix II. There is a high level of trade in NTFPs through legal pathways, for example between 2006 and 2015, there was a significant legal trade of 43 species of CITES Appendix II listed wild medicinal and aromatic plants—25 million kg in total (Furnell *et al.* 2019). There is also evidence of illicit trade of CITES listed species. For example, during 2018, 23 percent of all seizures of CITES-listed wildlife products made by EU member states were of medicinal plant and animal products and parts/derivatives for medicinal use. This was the largest category of all reported seizures (TRAFFIC 2019).
Commitments under the Convention on Biological Diversity (CBD) also affect the use and trade of wild plant resources, reflecting the Convention's multiple objectives of biodiversity conservation, sustainable use and benefit-sharing, arising through mechanisms including the implementation of the CBD's Nagoya Protocol on Access and Benefit Sharing (ABS).

Where regulations are in place they are often overly general, have a poor scientific basis regarding ecology, harvesting and production thresholds, as well as a lack of clarity on governmental responsibilities for implementation and enforcement. In many cases, aspects of management and trade are covered by different sectoral government agencies, often with no co-ordination among them (Laird *et al.* 2010, Morgan and Timoshyna 2016). Regulations may also be developed without stakeholder consultation or reference to existing customary laws and institutions or to current industry practice, additionally the broader support necessary for implementation may also be lacking.

Poorly designed and/or implemented regulations can exacerbate levels of unsustainable harvesting,

and potentially result in increased levels of inequity in resource access (Mulliken and Crofton 2008, Wynberg *et al.* 2015, Tieguhong *et al.* 2015). New incentives and systems can be established that undermine effective local institutions and traditional controls on access and use, taking ownership away from communities. In some cases, resource management and permit systems designed for timber have been extended to NTFPs without consideration of feasibility, appropriateness and availability of resources for implementation (Shanley *et al.* 2015).

Corruption risks in the trade in NTFPs

Corruption can be defined as the *abuse of entrusted power for private gain* (Transparency International 2020). It can involve government officials or private individuals who use a position of power for their own or other private gain. Corruption undermines efforts to ensure sustainable management of natural resources (WWF/TRAFFIC 2015) and is a recognized problem in the forestry sector (Smith et al. 2003, Søreide and Williams 2013, Kaimowitz 2003, Koyuncu and Yilmaz 2009).

Despite its impact, there are still significant gaps in understanding corruption in relation to NTFP trade chains. Given the gaps in research on this topic and the pervasiveness of corruption in the forestry sector, it is possible that the incidences and types of corruption in NTFPs are likely to be more extensive than is reflected in literature reviewed in this brief, and merits further investigation.

As described below, formal Government regulations and customary norms regarding NTFPs often overlap (Tieguhong *et al.* 2015, Weirsum *et al.* 2014), potentially leading to multiple layers of corruption even at one stage of the supply chain. Indeed, high levels of corruption are found both in places where the trade in NTFPs is subject to Government regulation and in parts of trade where the access and use of NTFPs are governed by customary norms (Tieguhong *et al.* 2015).

While trade chains for NTFPs are as diverse as the products traded, several overarching themes emerge from research on corruption associated with NTFP

Box 3. Identifying corruption risks along wild plant NTFP supply chains

Access to NTFP resources

Obtaining harvest permits

- Harvesting permits issued to individuals with political or business connections (favoritism, cronyism, turning a blind eye, bribery or nepotism), re-sold onwards for much higher prices
- Government official issuing harvest permits for greater quantities of products than legally permitted (bribery, favouritism)

Customary access norms and agreements

- Bribes or collusion with local leaders or communities for illegal access to lands and resources controlled through customary norms

Purchasing from harvesters

Price-setting and payments

- Middlemen (traders), in a position of power and using it for personal gain are able to collude to purchase raw materials from harvesters' communities at prices far lower than market value

Trade permits

- Traders choosing to pay bribes to avoid complexity of the permitting system
- Corrupt forestry officials accepting bribes for not reporting goods being traded

Processing/production

Payments to processing staff

- Corruption, value capture, low and intermittent pay for personal gain by co-operative managers, based on lack of knowledge of product value by staff

trade chains, many of which are focused around following corruption types: **bribery**, **collusion**, **nepotism** and **favoritism** (Tieguhong *et al.* 2015). The following description of evidence is summarized in *Box 3. Identifying corruption risks along wild plant NTFP supply chains.*

Access to NTFP resources

In NTFP chains, **abuses of harvesting permits are regularly reported** (Larsen *et al.* 2005, Nygren *et al.* 2006, Tieguhong *et al.* 2015). The abuses of power associated with permitting may fall into multiple categories of corruption, including small-scale corrupt actions among police or minor officials, or grand corruption with involvement from high-ranking senior Government officials.

Alleged Government corruption associated with NTFP permits has been documented in a range of countries. It has been reported that in Cameroon the bulk of NTFP harvesting permits were given to individuals with political connections or connections to large businesses who then re-sold the permits for prices up to 500 percent higher than the cost of the original permit (Tieguhong *et al.* 2015). **Favoritism, cronyism, turning a blind eye, bribery or nepotism** could all be involved, while informal arrangements could prevent legitimate traders from buying the permits directly from the Government (Foundjem Tita 2013). In Honduras, a similar situation was reported, where networks of favoritism and bribery led to permitting abuses, with the corrupt practices resulting in greater quantities of products than legally permitted being extracted (Nygren *et al.* 2006).

In many cases, access to and use of NTPFs are also regulated through customary norms, which are not immune to corruption. In the Bengkulu Province of Sumatra, for example, access to some areas of the forest are controlled traditionally by the headmen of local villages, who determine access to the resources. It was found that, despite local headmen knowing that extraction of certain NTFPs was illegal, they allowed people from outside the village access to harvesting sites (Lucas 2016). The reported reasons varied from sympathy for the poverty of collectors to the acceptance of bribes and kickbacks in return for turning a blind eye (Lucas 2016). A similar pattern has been recorded in Cameroon, where historically "bark poachers" have been reported to bribe local communities to access *Prunus africana* (Page 2003).

Box 3. Identifying corruption risks along wild plant NTFP supply chains (cont.)

Trading and transportation

Transport permits

» Bribes or other corrupt actions to change documentation of species, volumes or origin

Checkpoints along trade routes

» Checkpoints demand payments, to allow or expedite transport of products

Export and import

International checkpoints/customs

» Bribes or other corrupt action to avoid inspections/refuse to check a consignment

Trade permits

» Bribes for officials to "lose" documents

» Issuing or expediting export permits in return for a bribe or other benefit

» Falsifying CITES export permits in return of bribes of other benefits

Final products manufacturing and sale

Authenticity of ingredients in final products

» Risk of corruption related to allowing to produce and trade adulterated final products containing NTFPs

Consumption

NTFP products as bribes

» High-value NTFPs used as objects of corruption (bribes)

Box 4. Gendered experiences of corruption along NTFP value chains

In addition to the economic costs of bribery in NTFP trade chains, links to sexual extortion—a form of corruption—have been recorded. In Southern Africa, border guards have allegedly requested sexual favors from female traders in exchange for waiving border permits for trading baobab (Wynberg *et al.* 2015). Similar cases have been reported by women trading shea across borders. These cases have had serious livelihood implications, driving some women to move away from cross-border trading and into less lucrative professions (Wynberg *et al.* 2015)

Bribery can have detrimental impacts on harvesters' livelihoods, as traders may reduce their rates of pay in order to absorb the costs of bribes (Tieguhong *et al.* 2015). Corruption can also deter collectors and traders from applying for permits (Foundjem Tita 2013) or deter actors from following established cultural norms. This can have important ecological implications and lead to overharvesting of resources (WWF/TRAFFIC 2015).

Purchasing from harvesters (primary producers)

Collusion has been reported in NTFP supply chains. Where rural harvesters have little way of knowing accurate market prices, middlemen (traders) are able to collude to purchase goods at prices far lower than market value. A study in Bangladesh found that harvesters sold NTFPs either for cash or were paid by them in advance, but due to a lack of knowledge about end market prices, harvesters were vulnerable to exploitation by middlemen (Kar and Jacobson 2012). The same vulnerabilities related to lack of market knowledge have also been identified in Agarwood trade chains in Lao PDR (Jensen 2009).

Complex permit systems are another common point where corruption can occur. Such systems have been flagged as facilitating corruption in NTFP trade in Nepal, with reports of corrupt forestry officials accepting **bribes** for not reporting goods being traded (Larsen *et al.* 2005), as well as traders choosing to pay a bribe to avoid the complexity of the permitting systems. Traders reportedly can see this as an investment in making sure that trade runs smoothly (Larsen *et al.* 2005).

Transport, export and import

Bribery appears to be endemic in some supply chains, both at in-country checkpoints and at checkpoints for international trade, particularly in cases where permits (including CITES permits for the international trade of CITES-listed species (Outhwaite 2020)) are needed. Work in Cameroon has shown corruption in transport chains can be very costly; for middlemen trading NTFPs, paying **bribes** made up 34 percent of costs from moving their goods through checkpoints to the point of sale (Tieguhong *et al.* 2015).

Corruption at checkpoints and during transport has also been highlighted as a problem faced by NTFP traders in Nepal, with reports that at checkpoints traders are expected to pay a bribe in addition to making a formal payment (Banjade and Paudel 2008; Kunwar, *et al.* 2009). Corruption was also alleged at international checkpoints by officials who may "lose" documents or refuse to check a consignment (Betti 2008).

Processing/production

NTFPs are both exported for processing overseas and processed in countries of origin. This has also been identified as an area subject to corruption.

Co-operatives of female argan oil producers funded by overseas aid in rural Morocco have been hailed as a beneficial step forward for women's rights and self-sufficiency within Berber communities (Perry *et al.* 2019). Along with these reported benefits, however, there have been suggestions of possible **corruption and value capture**, with reports in some cases of poor working conditions and intermittent pay. In one report, for example, a woman claimed to have been working at a co-operative for a year and a half without pay (Perry *et al.* 2019). In these cases, the managers of the co-operatives could be taking advantage of the reported lack of knowledge among women of the value of argan oil for personal gain.[4]

In Nepal, interviews with individuals in senior roles in companies processing medicinal plants identified widespread rent-seeking by officials as an issue hampering trade and processing of medicinal plants (Caporale *et al.* 2020).

Final products manufacturing and sale

Food fraud is estimated to cost the global food industry up to USD40 billion a year (Galvin-King *et al.* 2018). High-value NTFPs such as spices are more likely to be targeted by fraud, including bulking a product with cheaper contaminates for financial gain. A recent global survey showed that 27 percent of successfully analysed commercial herbal products were not authentic against their labelled, claimed, and expected composition (Ichim 2019). This has clear health risks due to the potential toxicity, side effects and negative interaction with other ingredients, as well as negative conservation impacts with the potential of threatened species being included in final products. While no documented evidence of corruption in relation to food fraud was found, the lucrative nature of some of these goods and financial benefits associated with adulteration of products create strong incentives to circumvent regulations through corrupt means, and this corruption in turn can endanger the public.

High-value NTFPs as objects of corruption

One interesting aspect of bribery and NTFPs is the reported use of **NTFPs as bribes** or lavish gifts themselves, with examples including American Ginseng root *Panax quinquefolius* (Khimm 2016) and caterpillar fungus *Ophiocordyceps sinensis* (Cunningham and Long 2019). *O. sinensis* infects and grows inside caterpillars before killing the insect and sprouting a fruiting body. In China this fungus would be given as a lavish gift, or in some cases a bribe. Since the Chinese Government initiated an anti-corruption campaign in 2012 that encouraged influential individuals not to receive or give significant gifts, the price of this fungus has dropped (Cunningham and Long 2019).

Potential approaches and tools to address corruption in NTFP supply chains

General principles for enabling sustainable and equitable NTFP supply chains may prove useful to address corruption risks. These principles include introducing more opportunities for the users of wild resources (communities) to establish more direct links to consumers and benefit from value-addition (such as certification, products processing), well-considered decentralization of regulations to retain control of NTFPs with local communities, as well as multi-level and multi-actor governance (Grivins 2016).

While there are multiple approaches which could be beneficial to addressing NRM sector corruption in general, this report focuses on three approaches in more detail. These are considered of specific relevance to NTFPs trade: (1) improved resource governance, (2) increased use of appropriate voluntary certification standards, and (3) enhanced implementation of traceability approaches.

Improved resource governance, transparency and community empowerment

A review of existing regulatory mechanisms and community-based approaches suggests **some key principles that should guide the development of regulatory systems for NTFPs** to reduce corruption risks:

- community practices and knowledge of the resource
- incorporation of appropriate science-based methods
- use of accurate information about value and status of the resource
- cost effectiveness to ensure implementation

These principles would encourage greater adherence to the regulations and reduce the opportunities for corruption. Flexibility according to the local situation is important, while also maintaining respect for traditional-use systems, local institutions, customary norms, and community ownership. Formalization

[4] Although this behavior could be called corruption, other channels of redress related to labor law or human rights might be more effective, particularly if anti-corruption laws do not cover such behaviors.

Box 5. FairWild Standard

The FairWild Standard is a unique standard focusing only on wild-harvested plants, lichen and fungi and covering the ecological as well as economic and social principles of sustainable harvesting, trade and benefit-sharing (FairWild 2010). The standard provides a basis for a FairWild certification system, with third-party audits required to verify compliance with the FairWild Standard in order to receive certification. The standard has a range of requirements covering compliance with both legislation and customary norms, as well as requiring traceability of goods and finances. The FairWild Standard also requires compliance with the equitable trade principles, ensuring that benefits are shared fairly, which is an important incentive to support the integrity of supply chains. Much of this is facilitated by traceability requirements simplifying supply chains and strengthening communication between harvesters and end-use buyers.

of the trade in NTFPs through state-sponsored regulatory systems may have negative conservation and livelihood consequences (Wynberg *et al.* 2015, Basnyat *et al.* 2020); some suggest that NTFPs may be best governed through local and customary norms (Van Den Berg *et al.* 2007, Laird *et al.* 2010).

A community-based approach trialled in Senegal (facilitated by USAID), for example, aimed to decentralize forest management. This initiative involved assigning defined areas of forest to particular villages and assigning spokesmen and watchmen to ensure forest management rules were kept. **Corruption was disincentivized** by fining or firing watchmen seen to be accepting bribes (Faye *et al.* 2018). While overall the impacts were positive, it was found that this initiative was partially successful as management rules were only in-part enforced, or only enforced for certain groups (Faye *et al.* 2018). Decentralized forest-management is not without risks itself. For example, the decentralization of forestry management to elected regional regents in Indonesia has been linked to the development of corrupt arrangements between private individuals and these regents, with forestry interests being traded for campaign support (Baker 2020). Therefore, while decentralization can be an anti-corruption tool, the right conditions need to be in place to ensure local governance is accountable and transparent.

In collaboration with community-based projects, civil society organizations (CSOs) can play an important role in reducing the opportunities for corruption, for example by **facilitating access to legal harvest permits** and supporting **harvesters' organization into groups**. A TRAFFIC-led project in Bac Kan province of Viet Nam supported the establishment and formal registration of collectors' groups, as well as the application for harvest permits by collectors. This support allowed compliance with legal requirements and facilitated direct transparent relations between communities and government authorities (Indenbaum and Nguyen 2017). Collectors group membership also allowed for transparent and accountable practices within the community, reducing the risk of corruption.

Another strategy adopted by CSOs to reduce corruption is to **provide accurate market price information for NTFPs**. In an illustration of the latter, Nepalese NGO Asia Network for Sustainable Agriculture and Bioresources (ANSAB) provides monthly price information for major NTFPs in Nepal and India markets to community forest user groups (CFUGs), enabling community negotiation of prices with middlemen (UNCAD 2017). Improved telecommunication infrastructure (due to availability of mobile phones in the Darchula District in Nepal) has been found to allow harvesters to have better access to market price information and therefore secure better prices for their NTFPs (Pyakurel *et al.* 2018).

Increased use of voluntary certification standards

Voluntary certification standards (VCS) have been highlighted as having the potential to reduce corruption in NTFP supply chains through greater transparency as well as increased resources and capacity to monitor the trade (Timoshyna *et al.* 2019).

Recent research (Timoshyna *et al.* 2019) found several benefits of applying VCSs to CITES Appendix-II listed medicinal and plant species, as a means to reduce corruption:

- clear mapping of supply chains,
- supporting greater capacity in government authorities and the certification body involved,
- greater number of stakeholders being involved in VCS set-up and quality controls (in comparison to the compliance with CITES requirements),
- assurance of the traceability and mechanisms to address non-compliance.

However, there are several limitations of VCSs (Søreide and Williams 2013):

- their primary objective often is not to reduce corruption, so there may be no specific control points covering anti-corruption measures, e.g. understanding processes by which permits were received,
- they are limited in their ability to address broader, systemic corruption issues, as they are designed to assess elements of particular supply chains rather than the systems in which those supply chains operate.

While there are benefits of well-regulated VCSs in reducing corruption, there is also evidence to suggest that they are not immune to corruption themselves (Van der Ven *et al.* 2018). A recent report (Earthsight 2020) has identified corruption in timber supply chains, likely linked to bribery within government circles. This occurred despite the products being covered by Forest Stewardship Council (FSC) certification, which should guarantee that wood has not been harvested illegally. This indicates care needs to be taken to prevent corruption within certified trade chains. Legal frameworks focussed on anti-bribery and anti-corruption, developing in many parts of the world, could help to clarify and inform specific anti-corruption control points in VCSs.

As with other supply chain commodities, the success of the implementation and uptake of VCSs is based on market demand and the integration of costs of compliance into value chains. It has so far been limited for wild plant products, and efforts need to be supported further to encourage consumers and companies in the implementation of appropriate certification schemes.

Methods for improving traceability in NTFP trade chains

Traceability may help deter corruption in supply chains, but ensuring traceability in NTFPs is challenging. Small quantities of plants may be collected by large numbers of collectors, supply chains are highly complex with multiple middlemen, plants can be sourced from both wild and cultivated sources, and many traders would be unable to afford

Box 6. What is blockchain technology and how can it reduce corruption in NTFP supply chains?

From the perspective of its potential to reduce risks of corruption in supply chains, blockchain's reliance on non-centralized storage of data, where more information can be added in "blocks" to existing records about each product, holds promise (Heinrich et al. 2019). Unlike a centralized data storage system or analogue record keeping, which can be edited by individuals along the supply chain, a non-centralized data system keeps multiple copies of each record, preventing any individual user from altering records about a particular product (Heinrich et al. 2019).

Potential benefits of blockchain technology have been highlighted for NTFPs, including for species like *Prunus africana* (Heinrich et al. 2019) and frankincense producing trees *Boswellia carteri* (Beeyo) and *Boswellia frereana* (Maydi) (DeCarlo et al. 2020). Improved traceability can reduce the opportunities for details about the traded goods to be falsified by corrupt means, while better connections between primary producers and consumers can make producers less vulnerable to corrupt actions of middlemen such as deception about prices (Heinrich et al. 2019).

expensive traceability systems (Lehr and Jaramillo 2017, Heinrich *et al.* 2019). Despite these challenges, traceability needs to be improved in these supply chains if there is to be any hope of reducing the corruption and other negative practices that threaten sustainability and the safety of consumers.

Some examples exist of steps to improve traceability of NTFPs at a national level. Thailand, for example, has implemented an electronic system for tracing the trade of medicinal and ornamental plants which records parental stock, export and operating permits. Peru is also reported to have started a limited traceability system for the trade of orchids (UNCAD 2017). One possible method to improve traceability in the NTFP sector is blockchain technology (see Box 6). However, there is debate about whether this technology is feasible or beneficial for local harvesters. Web-based technologies like blockchain would require reliable internet access and computer literacy (Radanović and Likić 2018) and collectors may lack the capital to invest and may lose out to more organized large-scale operations.

Practical steps to reduce opportunities for corruption in NTFPs trade

- Natural resource management (NRM) practitioners and government agencies should follow the key principles for multi-actor supply chains when implementing NTFPs programmes. This can be done through e.g. considering decentralized resource governance (if local governance is accountable and transparent, and the intervention is appropriate) and lobbying for policy changes to clarify and simplify government regulations and permitting processes. Such regulations need to be underpinned by research, data collection, and documentation on ecological capacity for sustainable harvesting of wild plants and plant parts.
- NRM practitioners, businesses and government agencies should pilot traceability approaches for high-risk NTFPs, such as *Prunus africana* or *Nardostachys jatamansi*, and document impacts on the likelihood of corruption occurring.
- NRM practitioners and businesses should further increase the use of appropriate voluntary certification schemes (such as FairWild) and document impacts on the risk of corruption.
- Owners of voluntary certification standards should undertake corruption risk assessments, and integrate, as appropriate, mechanisms to reduce opportunities for corruption and to monitor and incentivize compliance among members.

Recommendations on further knowledge generation

- There are many gaps in the study of NTFPs and corruption. While there are numerous studies covering the issues of weak and complex governance in value chains, corruption case studies are not consistently documented. Where appropriate, researchers and practitioners in the NTFPs field should document and publish corruption examples and solutions.
- A specific area requiring further understanding is the impact of corruption on women in NTFP supply chains. Women are often key players in NTFP chains. They can be disproportionately affected by the effects of corrupt practices in the natural resources use sectors (Kirya 2019; Kramer *et al.* 2020). Researchers with expertise in anti-corruption and in gender studies can contribute to more effective work in this area. NRM practitioners should ensure that indicators for the involvement of women are incorporated into projects involving NTFPs and corruption reduction.
- NRM researchers should incorporate measurable markers of success to determine the efficacy of different anti-corruption measures on NTFP supply chains as there is currently very little information available on which anti-corruption methods are most successful in NTFP supply chains.

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About Targeting Natural Resource Corruption

The Targeting Natural Resource Corruption (TNRC) project is working to improve biodiversity outcomes by helping practitioners to address the threats posed by corruption to wildlife, fisheries and forests. TNRC harnesses existing knowledge, generates new evidence, and supports innovative policy and practice for more effective anti-corruption programming. Learn more at tnrcproject.org.

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