Modern Slavery as a Threat to Forests: Reviewing the Links between Modern Slavery, Deforestation, and Potential Solutions

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Abstract

Modern slavery is a growing concern within the developmental space. There are an estimated 40.3 million people subjected to experiences of modern slavery according to the International Labour Organization (ILO), with 15-30% of those being linked to environmental activities (e.g., fishing, agriculture, forestry, mining and quarrying). The Sustainable Development Goals (SDGs) outline the need for both the ending of modern slavery (SDG target 8.7) and the protection of forest environments (SDG 15.2). Present thoughts around linking these two seemingly disparate social-ecological issues is beginning to draw the bi-directional links between modern slavery and the environment within the framing of the modern slavery-environmental degradation-climate change nexus.

In addressing the nexus, forest environments have been at the forefront of our understanding due to the many reported links between modern slavery and deforestation. This chapter outlines the connections between modern slavery and deforestation, highlighting those issues that are faced by communities, within and close to the natural resources protected by the forest, and solutions for the protection of both people and nature. A review of the previous literature and commonalities within both the antislavery and environmental literatures are drawn together to provide insight into the current knowledge, and additional understanding into the novel applications of methods to assess the nexus. The modern slavery-deforestation connection is outlined in detailed for four different sectors and geographies, demonstrating the scope of the co-occurrence: cattle ranching in Brazil, illegal logging in Russia, palm oil plantations in Southeast Asia, and mining in the Democratic Republic of the Congo.

Finally, a call for action is made which addresses the need for cooperation and collaboration between environmental and conservation organisations, and those which work to address modern slavery. The risks posed from deforestation are inherently linked to the vulnerabilities of modern slavery for individuals and communities. In order to support the achievement of the SDGs (both 8.7 and 15.2) policy actions will need to centre the ending of modern slavery for the good of society and the environment. This follows trends for centring the issue in the development sector, within the conservation space. Areas for possible policy integration are identified and solutions noted (such as the EU's *mandatory Human Rights and Environmental Due Diligence* (*mHREDD*) law).

Keywords: deforestation, modern slavery, environmental degradation

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INTRODUCTION

Understanding of the connections between modern slavery and environmental degradation are key to ensuring sustainability within ecosystems. Forests are no exception. Both themes are outlined within the 2015 Sustainable Development Goals (SDGs). Ending modern slavery is outlined in SDG target 8.7, which is the first time such provisions were included in global targets and standards. SDG 15 more widely references the protection of terrestrial ecosystems, with target 15.2 specifically highlighting the protection of forest ecosystems (UN 2015). As both are noted in the SDGs it is possible to begin drawing together such interconnected features to achieve sustainable development overall (Decker Sparks et al. 2021).

Forests are an extremely important ecosystem; around 1.6 billion people – mainly from rural communities – rely on the resources provided by the forest for either subsistence or income, and 300 million of those are reliant on forests for shelter (Resource Watch 2020). Forests provide food, fuel, timber and other products, as well as reducing the effects of climate change through carbon sequestration and housing a wealth of biodiversity. This can also be key to communities' identity and culture. Changes to these ecosystems can be felt profoundly by communities whose needs rely on the contents of the forest (Nnoko-Mewanu et al. 2021).

However, forest environments have been declining in area over the last three decades, with the Food and Agricultural Organization (FAO) and United Nations Environment Programme (UNEP) noting that losses are primarily caused by agricultural expansion (FAO and UNEP 2020). This is reflected in the recent figures that suggest commodity-driven deforestation and shifting agricultural practices – as outlined by Curtis et al. (2018) – were the leading drivers of tree cover loss globally in 2020; leading to an increased tree loss of 12% (Weisse and Goldman 2021). Ultimately, the expansion of agri-business is recognised as the largest single driver of deforestation globally, and is connected to the largest volume of greenhouse gas emissions associated with land-use change (Dummett et al. 2021). This follows trends in overall forest changes that are able to be assessed using satellite data (Hansen et al. 2013). These risks to forests not only limit the ability to achieve the SDGs, but also have a profound impact on limiting the effects of climate change.

For the purpose of successfully protecting forest environments and workers' rights, it is vital that we begin to identify and mitigate against the impacts of the so-called 'modern slavery-environmental degradation-climate change nexus' (Brown et al. 2019). This is vital, as according to the International Labour Organization (ILO) there are an estimated 40.3 million people subjected to modern slavery in both the forms of forced labour and forced marriage (ILO 2017). Between 15-30% of these individuals are likely engaged within activities that are likely to lead to environmentally degrading conditions. Forestry is specifically detailed within the ILO (2017) prevalence estimates, as are other sectors that have been associated with the degradation of forest ecosystems including agriculture, fishing (land-based and processing), quarrying and mining activities. This means an estimated 3.7 million people may be subjected to modern slavery globally linked to the degradation of forests (based on ILO 2017 forced labour figures).

Much of the research at present has focused on deforestation as a result of modern slavery but in this chapter, the wider need to account for the associated sectors that are linked to tree loss more generally are explored. Here, an exploration of the threats to forest ecosystems because of modern slavery are

highlighted, and the potential solutions the international antislavery community may contribute to, are noted.

First, definitions of both modern slavery and the modern slavery-environmental degradation-climate change nexus are supplied before a deeper exploration of the impact of modern slavery on forest ecosystems is undertaken. Several case studies to understand these dynamics are explored, before finally, potential solutions to end modern slavery and limit environmental degradation are highlighted.

Defining Modern Slavery

According to the Bellagio-Harvard Guidelines established in the early 2010s, modern slavery is defined as "the subjection of an individual(s) to control and coercion that is tantamount to possession, through either the threat of, and/or actual violence" (Research Network on the Legal Parameters of Slavery 2012). Modern slavery in this sense is an overarching term, as included in UK's *2015 Modern Slavery Act* legislation (UK Government 2015), to describe a number of exploitative labour practices visible on the continuum of labour exploitation (Skrivankova 2010). These practices can run from smaller infringements such as wage-underpayment to the most egregious practices including forced labour and slavery. All practices can have a profound impact on the individuals that are subjected to these actions, and transcend both geography and economic sectors. Henceforth these practices will be referred to as modern slavery throughout, with specific forms of exploitative practices defined where required.

The Modern Slavery-Environmental Degradation-Climate Change Nexus

The practices of subjecting people to modern slavery have a profound impact upon the environment, thus a potential threat to environmentally significant areas. Coelho (2016) and Bales (2016) both noted the nexus and explored the connections between climate change, emissions release and several sectors that lead to environmental degradation. Several researchers, including Brown et al. (2019), Brickell et al. (2018), O'Connell (2021), Decker Sparks et al. (2021), and Bales and Sovacool (2021) have expanded upon this idea, and have contributed to the growing body of research looking to address the connections between modern slavery, environmental degradation and climate change. These investigations have applied to a number of sectors including fishing, brick-manufacturing, agriculture, and forestry; and have included the recognition of a number of labour rights issues, as well as adaptive and resilience activities (Natarajan and Parsons 2021).

The nexus is cyclical. This means that the presence of modern slavery can lead to environmental degradation, and in turn the release of climate change emitting issues that can increase vulnerability again to modern slavery. For example, in the forestry sector, people may be subjected to modern slavery and forced to remove trees for the timber sector (environmental degradation); this in turn reduces the level of carbon sequestration that may occur and causes increased carbon emissions in the atmosphere leading to climate change. This can lead to displacement of communities due to heat stress and reduced land productivity (as seen in countries such as Cambodia) which may push individuals into situations where they are vulnerable to modern slavery. This cycle may continue in the forestry sector, and can be linked to other high-risk sectors, such as agriculture and manufacturing.

Further, the nexus is not only cyclical, but it is bidirectional, in that modern slavery may lead to environmental degradation, but environmental degradation can also lead to increased risk of modern slavery as noted in the example above. For example, the modern slavery may lead to the removal of trees and the degradation of soil, but the degradation of the soil and land grabbing to remove the trees can lead to displacement and increased vulnerability of communities to modern slavery in unfamiliar areas.

The complexity of these dynamics further increases as the nexus is viewed as both an adaptive and maladaptive measure. Movement into sectors where subjection to modern slavery is more likely has been associated with adaptive measures (Natarajan et al. 2019) – that may be maladaptive in the long-term, for both people and the environment, and yet are viewed as a necessary requirement in responding to climatic and environmental changes.

MODERN SLAVERY AND FORESTS

Recent work on forests and their association with modern slavery practices have been highlighted, with Cameron et al. (2021) noting that tree cover loss was one of the strongest and most significant indicators of modern slavery. Risk of modern slavery and tree cover loss are particularly high within the tropical regions (Jackson et al. 2020a). This reflects the higher levels of losses that are seen in these forest regions more generally (FAO and UNEP 2020). Drivers in these tropical regions are likely to be highlighted because of intense natural resources extraction, changing land use, and levels of research due to the biological and carbon sequestration potential of these environments. Other areas may also have increased levels of risk. Deforestation and illegal logging which are often noted as the reasons within which people may be subjected to modern slavery do not only drive these risks. Instead, the natural resources from the forests themselves, and the land on which they are situated can lead to the presence of a variety of exploitative practices.

Drivers of Forest Loss Associated with Modern Slavery

Modern slavery is often associated with the presence of deforestation, climate change and illegal logging (Bales 2016; Jackson et al. 2020a). However, the drivers of modern slavery practices are more complex with a number of factors leading to the presence of tree cover loss. Beyond deforestation alone, it is the development of land and the changing use of land that is key. For example, in Mozambique infrastructure development using Chinese investment has been linked to the illegal removal and exportation of timber goods associated with illicit logging (Verité 2020a). Further, drivers have been found in abundance in environmentally protected, or conservation areas, as their seclusion provides an area in which modern slavery can thrive. The coastal environment in Bangladesh is one such example, whereby issues of child labour have been noted, as have the removal of mangrove forests areas in order to accommodate land-based fish-processing activities (Jensen 2013; Bales 2016; Jackson et al. 2020b).

The range of drivers can be designated into those that are may be considered ‘direct’ and ‘indirect’. In such cases ‘direct’ refers to the subjection of an individual to conditions of modern slavery, where the primary purpose of the exploitative practice is to remove the tree for the purpose of the timber. ‘Indirect’ on the other hand, refers to the subjection of a person(s) to modern slavery practices where the

exploitation may occur during the process of tree removal. However, the primary reason for the exploitative practice – and the continued practices from thereon – is associated with another sector that relies on access to the land for which the removal of tree cover is initially required. These drivers can be associated with a number of sectors including those that rely on natural resource extraction or generation, and those that are linked to the development of agricultural factors (Figure 1).

Unlike the grouping of forestry, fishing and agriculture, it is easy to distinguish and separate the drivers of these sectors and their potential impacts on forest ecosystems. As noted in Figure 1, the connection between modern slavery and the forestry sector for instance, is not only linked to illegal logging activities and deforestation, but can also be associated directly with the production of timber goods. Modern slavery in the timber production supply chain has been highlighted in Brazil for example (Pinheiro et al. 2019). Yet the illegality of logging can be linked to the wider timber supply chain in other locations as well, such as the illegal export of timber products from Mozambique (Verité 2020a) and the link to agri-business in Myanmar's banana plantations (Verité 2020b). Moreover, access to the forests and the removal of trees linked to exploitative behaviours reiterate the need for equitable access to the forests. Bales (1999, 2016) noted that charcoal production for fuel can be associated with modern slavery practices, and yet indigenous communities within the forests are reliant on such methods and access. Similar access issues and locations where drivers of modern slavery can occur alongside legitimate and necessary access to resources can be seen in the Sundarbans Reserve Forest in Bangladesh (Jackson et al. 2020b), a reserve forest upon which local communities rely.

Fishing is a minimal driver of risk within the terrestrial forest environment, but this does not mean that is does not exist. It is in the mangrove forests – some of the most sparse, and yet important ecosystems for both combatting climate change and due to their unique biodiversity – have been linked to modern slavery. The impacts of climate change on the forests and nearby communities have been associated with the movement of people and an increase in the risk of modern slavery cases of forced marriage for instance. Further, the direct removal of mangrove forests have been associated with child labour, lack of decent work, and hazardous working conditions where both fish-processing (Jensen 2013; Bales 2016; Jackson et al. 2020b) and aquaculture of mud crabs and shrimp are common (Ahmed et al. 2017; Rahman et al. 2017).

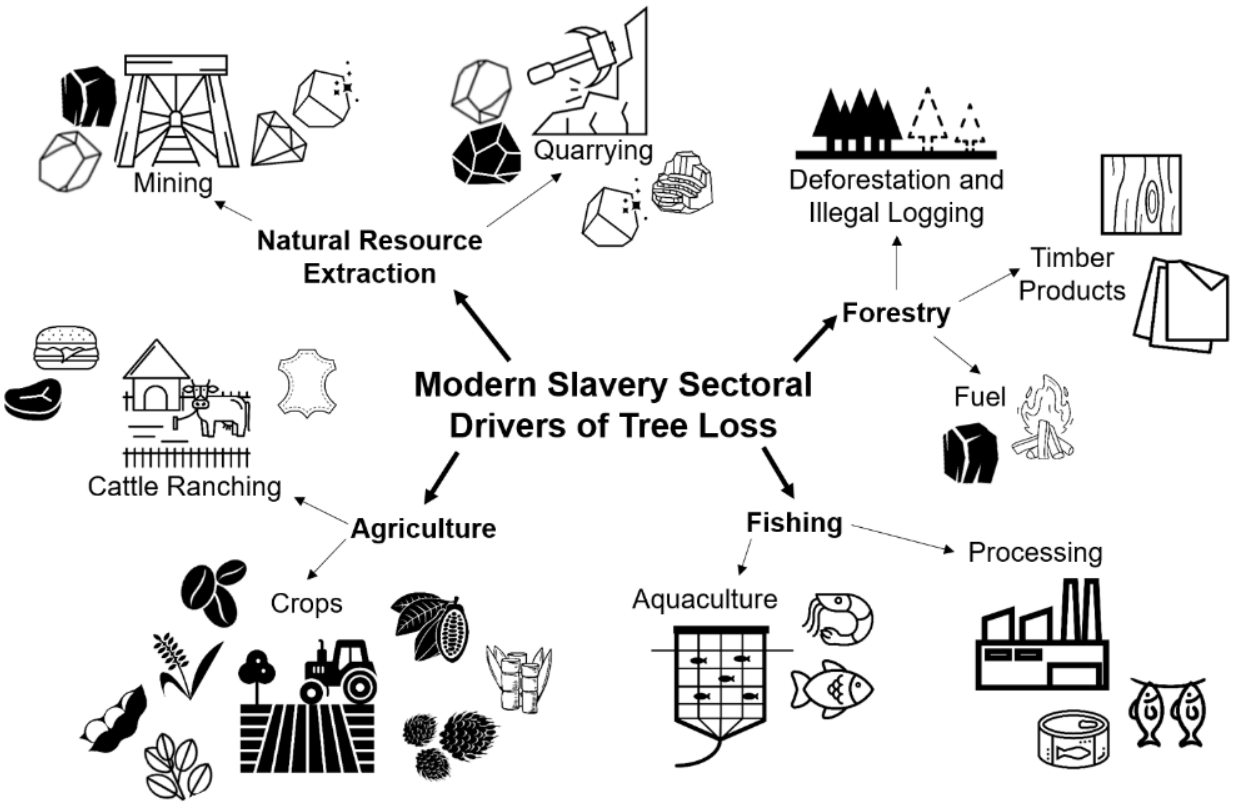

Figure 1: Sectors found to subject workers to modern slavery that have been associated with the removal of tree cover as noted in previous literature, narratives and media reports.

Natural resource extraction via both mining and quarrying have been noted. For mining most of the risk associated with removal of trees, comes from the access to vast areas of land for opencast mining activities. For example, in Ghana child labour at mining sites has been reported (Free the Slaves et al. 2013); and mining has been noted in the western regions of the country as the primary driver of forest losses (Schueler et al. 2011). There are also many links already noted between mining and modern slavery with the Democratic Republic of the Congo (DRC) regularly cited as an example of a nation where modern slavery is this sector is high, particularly through the provision of colbalt for battery technologies. These sites are now being investigated using novel methods including satellite data (Brown et al. 2020). Modern slavery linked to illegal mining and the removal of trees has most recently been linked to gold mining in Latin America. Peru and Colombia in particular have been connected to both deforestation and increased risks of human trafficking in rainforest regions (GIATOC 2016). Venezuela is also being impacted by such activities, with indigenous communities withstanding the worst of human rights and environmental abuses (Ruiz and Belo 2021; CDH UCAB 2020). Other precious metals that have been linked to issues of modern slavery include diamonds, iron, jade, rubies, coltan, tungsten, and tin (U.S. DoL 2010-2020); with child labour being noted in mica mines supplying the cosmetics industry (U.S. DoL 2020; Doherty and Whyte 2014). In Asia, both China and North Korea have been linked to modern slavery practices and the extraction of coal (U.S. DoL 2010-2020). Similar issues have been noted in the quarrying sector with narratives and data suggesting that granite and other types of rock (U.S. DoL 2011-2020) have links to the use of modern slavery.

Perhaps the largest driver of tree loss associated with modern slavery is that of agriculture. This primarily comes in two forms: 1) the production of crops, and 2) the raising of cattle for both beef and leather (Figure 1). A variety of crops are associated with modern slavery, some require more land than others. Palm oil for example, has been linked to forced labour, labour exploitation and a number of environmentally degrading practices within Malaysia and Indonesia (Amnesty International 2016; Verité 2017a). Furthermore, crops including coffee, cocoa, rice, rubber, sugarcane, and soybeans have also been linked to forced labour practices globally (Verité 2017a, 2017b; Anti-Slavery International 2017; Hall 2012; Greenpeace 2006). Many of these crops require extensive resources for their production, including land, but the latter is one of the top two leading causes of deforestation (WWF 2018) with much of the supply of soy directly feeding into the livestock supply chain to support cattle.

Cattle require land for the production of their food sources, but also vast amounts of space for their own growth. By addressing the supply chain, these co-occurring issues become more visible. Cattle ranching has been associated with land grabbing and deforestation (through illegal grazing) (Amnesty International 2020), forced displacement of communities (Randell 2016) and forced labour (Verité 2017a; Brown et al. 2019; Cockayne 2021). Modern slavery linked to the cattle industry can take two forms: those subjected to modern slavery directly within the supply chain from working upon the ranch to the production and processing stages (e.g., leather goods) (Verité 2017a; Amnesty International 2020; Know the Chain 2017). Or it may take place as a result of displacement associated with individuals being displaced and forced to migrate into areas (e.g., rural to urban migration); unfamiliarity with the location may increase the risks of subjection to modern slavery, alongside the impacts of the displacement itself (e.g., becoming embroiled in debt bondage) (David et al. 2019; Brickell et al. 2018).

The complex nature of the drivers of modern slavery are also linked to climatic conditions, as well as socio-economic and cultural conditions. They may manifest in alternate ways across different geographies, timescales and to different degrees depending on which sectors are being assessed. Hence, the identification and increased understanding of these complex occurrences requires collaborative thinking between those wrestling with modern slavery abuses, those tackling environmental crimes, and those working to tackle both concurrently.

Evidence of Drivers in Action

The geographical variation in these risks can be highlighted for the primary sector drivers associated with modern slavery practices. For example, the U.S. Department of Labour has highlighted several countries where forestry-related products have been associated with both forced and child labour practices. Between 2010 and 2020 the lists have been compiled almost biennially (U.S. DoL 2020). Those activities, which are linked to modern slavery and tree loss, are commonly found in several countries, many of which include repeat occurrences of 'high-risk' sectors. Figure 2 shows the commonly occurring countries where the U.S. Department of Labor has collated evidence of forced labour cases; these have been collated in the same ways as those sector drivers highlighted in Figure 1. Only one instance linked forced labour and fish-processing of any kind was identified – the production of dried fish in Bangladesh (noted from 2014 onwards in the assessment; U.S. DoL 2014-2020). Furthermore, agriculture has been separated into those

key sectors that are associated with tree loss, that can co-occur and operate alongside one another: growing crops, and raising cattle.

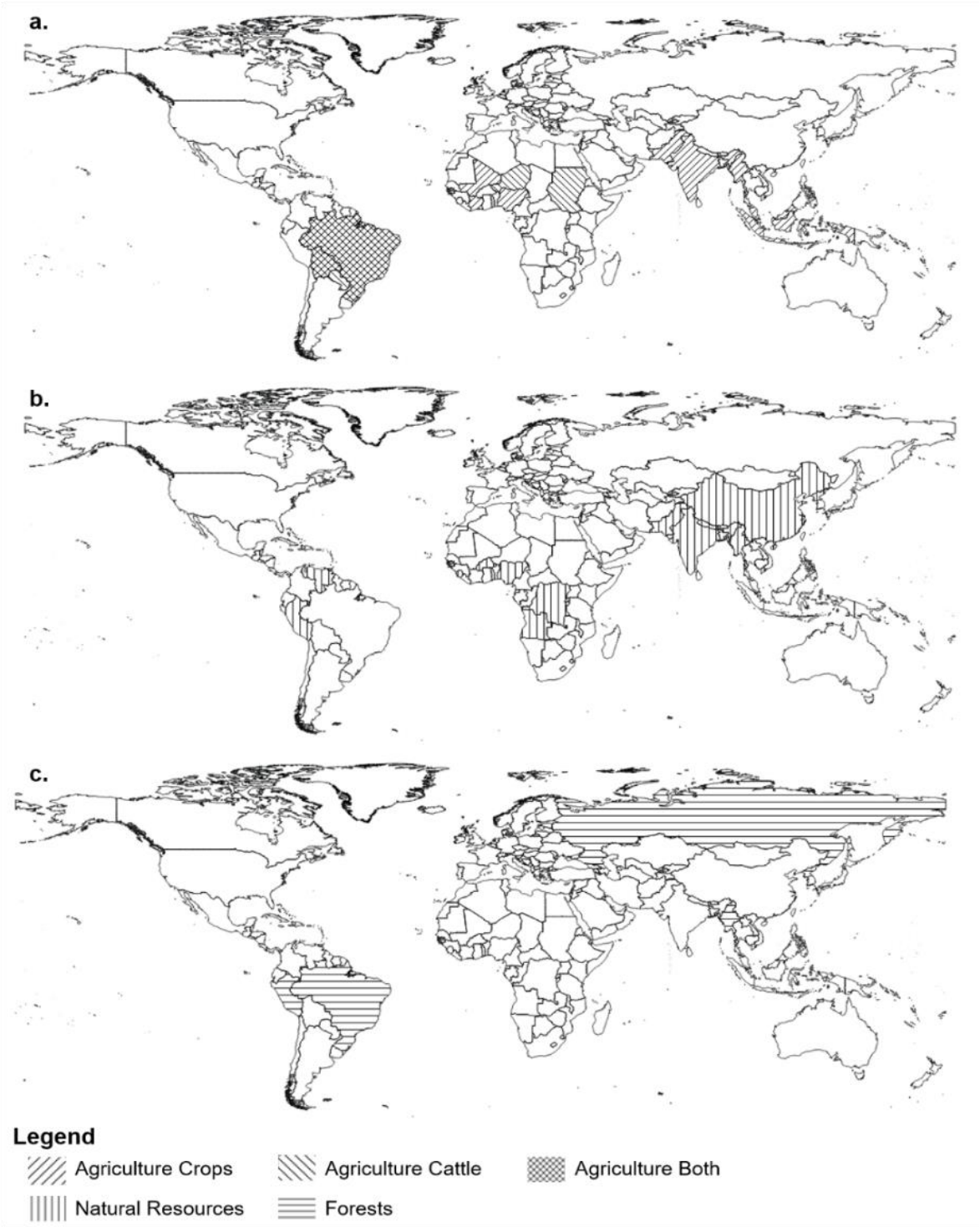

Figure 2: Countries with identified cases of forced labour noted by the U.S. Department of Labor between 2009-2020. Products linked to forced labour have been linked according to their status and connection to agriculture (a), natural resource extraction (b) and the forestry sector (c). Source: U.S. Department of Labor (2009-2020).

Agriculture (a) and resource extraction (b) have the most widespread implications and usage of forced labour practices according to the U.S. Department of Labor (Figure 2). For natural resource extraction (b), much of the mining associated with precious metals and gemstones (such as rubies, diamonds, and gold) occurs within West and Central Africa. However, Venezuela and Peru are also increasingly linked to forest degradation and human rights abuses, including forced labour, within their gold mining industries, which are concentrated in the Amazon rainforest (Human Rights Watch 2020; Verité 2016). In South and East Asia, it is quarrying for stones and coal products that dominate (U.S. DoL 2010-2020).

As shown in Figure 2a, agriculture has an equally varied distribution; however, forced labour is concentrated by not only the geographic locations, but also those areas where crops are most likely to grow. For example, forced labour in sugarcane and coffee production occurs in Brazil, which is also linked to forced labour in cattle ranching. Forced labour is noted in Southeast Asia exclusively for palm oil (Malaysia and Indonesia); this is despite the growth of this commodity in other locations in Latin American and Africa (Cardona 2019; Cernansky 2019). Concentrations of forced labour noted in agriculture are distributed geographically largely throughout the tropics, further reflected in the extraction of natural resources (Figure 2a and 2b).

This is in contrast to identified cases of forced labour associated with forestry (Figure 2c). Only five nations were connected to the nexus in these locations, but they do spread beyond the tropics – which is likely due to the varied needs and thus types of wood required when purchases of timber are made. However, the presence of forced labour in these commodity supply chains are associated with an abundance of forested areas. For example, large areas of forest are contained in both Brazil and Russia (FAO and UNEP 2020). Additionally, charcoal production has been noted as a risk for trees within Brazil (Bales 2016), and more specifically Myanmar's teak industry has been associated with forced labour on multiple occasions according to the U.S. DoL (2010-2020).

It is clear from Figure 2 that there is a lack of understanding of the links being made between forced labour within sectors associated with the degradation, and destruction of forest environments. Further, those locations and sectors where we have an abundance of data are skewed to regions that are tied to former colonisation, and that can be linked with the trans-Atlantic slave trade (Roy 2018; McQuade 2019; Mohamud and Whitburn 2018). According to the data collected by the U.S. DoL (Figure 2), North America is free from forced labour cases that may be associated with those industries known to drive forest loss (unless accounting for the Dominican Republic located in the Caribbean where forced labour in sugarcane production has been identified). The same is true for Europe (with the exception of Russia), and Oceania. In comparison there were nine Asian nations where forced labour linked to the drivers of modern slavery associated with tree cover loss were identified – 10 if including the Asian portion of Russia); a further nine nations identified across Africa (with most located in the Central and Western regions of the continent), and five countries noted across South America.

Thus, there are wider issues reflected in these trends, and surrounding research that asesses modern slavery more broadly: this is a hidden problem, and as such, it can be extremely difficult to identify areas and cases of modern slavery when they are occurring. Much evidence obtained is through narratives, media reports and grey literature. This is valuable as those working to research the nexus within the

forestry sector come across obstacles to move from assessing co-occurrence of these factors, and toward quantification. Such qualitative data will be powerful in identifying those areas for further research and future data-based policy and interventions.

Investigating the Nexus

In order to investigate the nexus in relation to forests, a number of techniques have been used. These include surveys, prevalence estimations and narrative collection methods traditional to the antislavery sector (Bermudez and Stewart 2020), to the application of more novel techniques, such as remotely sensed satellite data (or Earth Observation (EO) techniques). Such EO techniques are being applied in order to understand the co-occurrence of modern slavery and tree cover loss. For example, Jackson et al. (2020a) combined a global analysis of tree loss and modern slavery to identify those areas that may face high levels of risk of deforestation. These data can help to determine where further research should be undertaken. Mozambique was identified as 'high-risk' in this study, and has subsequently been researched with the building of infrastructure being linked to modern slavery, the establishment of illegal settlements and informal mining located close to areas where illegal logging and deforestation practices are occurring (Verité 2020a). All these findings were noted using EO data, and such a method can provide a unique insight into the presence of the modern slavery-environmental degradation-climate change nexus in relation to forest ecosystems.

Such methods so far have focused on the co-occurrence of the modern slavery-environmental degradation-climate change nexus; however, this does not begin to quantify the connection of those drivers. This is – at present – a major limitation of both the application of EO techniques, and the current understanding of the nexus concerning the association with deforestation. The application of methods to address the nexus further should work to move beyond co-occurrence toward quantification. In order to achieve this, it is likely that collaborative efforts between antislavery, community and environmental organisations will be necessary to gather ground-data safely in relation to modern slavery, in order to determine the direct impact upon deforestation.

CASE STUDIES

It is clear that the modern slavery-environmental degradation-climate change nexus has a presence across multiple sectors that are associated with deforestation and the degradation of forest environments. The continued presence of modern slavery is only set to futher enable these degrading actions. Without understanding the risk across varied geographies and sectors, ending modern slavery, protecting the environment, and achieving resilience toward climatic changes cannot be achieved.

Here the state of modern slavery associated with environmental degradation across several sectors and nations are explored, these include: 1) cattle in Brazil; 2) timber in Russia; 3) palm oil in Indonesia and Malaysia; and finally, 4) the impact of mining in the Democratic Republic of the Congo (DRC). These examples represent the diversity of risks associated with the nexus and tree loss, but do not cover all of the drivers and vulnerabilities present across the world.

The Case of Cattle in Brazil

Brazil has historically been one of the global leaders in the fight to end modern slavery, even before the inclusion of these efforts in the SDGs. Brazil has been seen as a hotspot for international and national research on the impacts of modern slavery. This is a result of good data collection and national policies including: 1) the presence of the national 'dirty list' (naming and shaming companies who have modern slavery practices within their supply chains); 2) a wide definition of 'slave labour'; 3) economic support for those who are assisted in leaving situations where they were subjected to modern slavery; and finally, 4) a National Decent Work Agenda (ILO 2009). The nation's geography also makes it a unique location to study the nexus; particularly as Brazil has a temporally significant modern slavery dataset (see SmartLab 2020) which enables us to track those cases where modern slavery may be linked to degradation and deforestation.

However, Brazil's leading stance on combatting modern slavery has been eroded by the actions of the Bolsonaro Administration; which have included altering the nation's modern slavery definitions, human rights legislation, and those laws associated with environmental protections (Mendes 2017; Amnesty International 2019; Abessa et al. 2019). Coupled with complex land tenure issues (Sparovek et al. 2019) and increasing unemployment following an economic downturn (Dobrovolski et al. 2018), the potential vulnerability of individuals to be subjected to modern slavery and become entwined with environmentally degrading activities is likely to be exacerbated. Deforestation has been fuelled by the financing system, in which Brazil has been the leading investing country linked to forest-risk commodity production between 2013 and 2020 (Global Witness 2021a). Further, sectors that have links to the presences of deforestation and modern slavery practices have become emboldened and circumvent agreements and legislation that are designed to protect the tropical forest. Carvalho et al. (2019) specifically address the soy, cattle ranching and timber industry as sectors that regularly subvert, and thus undermine, the measures put in place at a national and international level to curb deforestation.

These combined factors lead to increased risk levels associated with modern slavery leading to tree loss (Jackson et al. 2020a). The dominance of cattle ranching within Brazil has fuelled such losses (Cockayne 2021). Cattle production requires vast amounts of land and accounts for 62% of cases where workers are subjected to modern slavery (ILO 2009). In order to clear land, conditions of modern slavery and those in Brazilian Law considered 'analogous to modern slavery' are accompanied by environmental offences, which include the removal of native forests and gathering of land that has been previously cleared for the purpose of pasture (ILO 2009). This deforestation occurs alongside the accumulation of land (sometimes through land grabbing) and land-use conversion, which is expanding the agricultural land along the frontier of the Amazon (Carrero et al. 2020).

Much of the tree cover loss occurs in the so-called 'arc of deforestation' along the southern borders of the Amazon rainforest in Brazil. This area is at high-risk of deforestation as a direct result of weakened governance; cattle ranching thrives here as a driver of deforestation (Margulis 2004). Should these conditions continue, Leite-Filho et al. (2021) estimate that the fringe region of the Brazilian Amazon will have lost more than half of its forested area by 2050; whilst Campbell (2008) notes that forced labour is a key method applied to clear this land. These locations are easy to access; roads penetrate the forests,

and an explosion in illegal logging practices have been reported as having ravaged the region (Lawson et al. 2014; Dummett et al. 2021). The continued presence of modern slavery as an associated driver of deforestation will contribute to these losses, particularly as the weakening of Brazil's modern slavery legislation has occurred and many of these risks will continue.

As a function of removal, there are a number of stages leading up to the presence of cattle and the risk of modern slavery within cattle ranching. More the 80% of people subjected to modern slavery across Brazil between 2003 and 2018 faced exploitative practices within the agri-business sector – with general agricultural workers being the most common role in which people were subjected to such exploitative labour practices and those working with livestock (SmartLab 2020). In order to access the land for agricultural growth and pasture, the land-use must first be changed from forested land. Thus, this process primarily begins with the removal primary forests through slash and burn techniques – the presence of high-value timber is sold to companies, and the cleared land can be associated with the planting of crops until the land is no longer viable for production. This is reflected in evidence that found expansion of soy crops occurred on land that have already undergone deforestation and clearing (Macedo et al. 2012; Gollnow and Lakes 2014) – thus the stages of land clearing may be viewed as an indirect driver of deforestation. Agricultural production on these lands is also exposed to the risk of modern slavery following on from the risks associated with the illegal logging in the first instance, and the presence of cattle ranching that follows this agricultural production stage. Several crop types have been associated with the clearing of the land and have links to modern slavery within Brazil including: soy, cotton, maize, rice, beans, coffee, and sugarcane (ILO 2009; SmartLab 2020).

Following the removal of the crops at the end of the cycle, the land can be converted to pasture (Veiga et al. 2003). Workers may be subjected to modern slavery at all of these stages; during the land grabbing and land clearing processes, as agricultural workers and workers on cattle ranches. Human Rights Watch (2019) has documented the risks that those within the forest regions face as criminal organisations and actors drive illegal deforestation through violent measures. For example, in the state of Pará, data suggests that land grabbing, and land disputes more generally, were linked to a number of deaths, which have been directly linked to modern slavery cases (ILO 2009). Discrimination within indigenous and forest-based communities is profound across Brazil and Global Witness' (2012; 2014; 2015; 2016; 2017; 2018; 2019; 2020b) reporting of environmental defender murders Brazil has consistently rated highly in the numbers of those who are persecuted for protecting their land and their human rights (Figure 3). Thus, the cattle supply chain in Brazil is associated with the oppression of individuals and a culture of violent behaviour (Butt et al. 2019). However, these risks to both human and environmental rights are fuelled by the remote locations in which they are occurring (e.g., the Amazon rainforest) (Bales 2016; Jackson et al. 2020b), and the labour-intensive industries which take place on the deforested land. This can lead to a reduction in labour standards and has seen workers subjected to living and working conditions (McGrath 2013) that are firmly situated on the labour exploitation continuum.

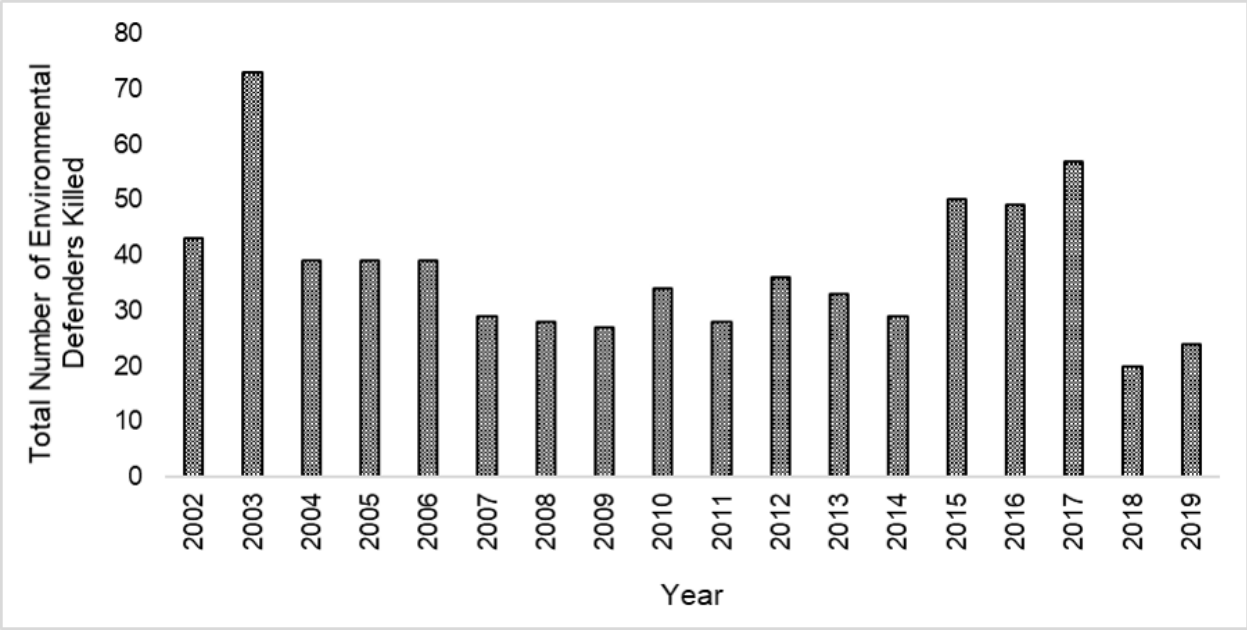

Figure 3: Total number of reported deaths of environmental defenders within Brazil between 2002 and 2019 according to Global Witness. Source: Global Witness (2012-2020b).

Due to this combination of forest and agri-business related land-use change there can be an associated increase in communities that require new forms of employment. Migration of landless communities toward the Amazon are common as work within the agriculture and cattle ranching sector is promised but often results in cases of forced labour (ILO 2009). Land grabbing and displacement associated with access to land has also led to the movement of indigenous communities into urban environments where forced displacement has been linked to cases of forced domestic work (ILO 2018; U.S. Department of Labor n.d.; Walk Free 2018). Displacement of this nature has been fuelled by crop production and cattle ranching which have implications for modern slavery and a changing climate. Drought in previously dominant agricultural areas, combined with a lack of jobs in local communities, has seen the migration of communities to the fringes of the Amazon where these variable labour conditions persist (Danwatch 2016).

Together these changes create a situation of double jeopardy where the potential effects of climate change can increase vulnerability to modern slavery and lead to the release of emissions including methane and carbon dioxide from the ranching of cattle and removal of trees respectively. Such impacts are only likely to increase as the Amazon begins to emit more carbon than it absorbs (Harris et al. 2021; Gatti et al. 2021; Qin et al. 2021).

For example, deforestation – contributed in part by the continued subjection of individuals to modern slavery – leads to losses in the agricultural sector, particularly through the reduction of rainfall (Leite-Filho et al. 2021). Such implications are associated with agricultural losses and the displacement of communities. These factors have been visible in other nations, such as Cambodia, where climate change impacts have affected the agricultural sector and subsequently led to the migration of communities to cities where they are vulnerable to conditions of debt bondage within the brick-manufacturing sector (Brickell et al. 2018).

Within Brazil, drought is also leading to increases in the supply of workers who may then be subjected to modern slavery (Danwatch 2016). Wider impacts from climate change are also reflected in the vast areas of cattle pasture that cover the deforested regions of Brazil (measuring approximately 80%), which are home to between 70 and 80 million cattle (Veiga et al. 2003) and are commonly noted as raising emissions levels and further enhancing climatic change (see Bogaerts et al. 2017; Caviglia-Harris 2018). Such impacts have been noted by Pendrill et al. (2019), whereby agriculture and forestry in the tropical regions account for between 29-39% of carbon emissions associated with deforestation in international trade routes. For Brazil, the predominant driver is cattle production, and other key drivers include palm oil in Southeast Asia.

It is clear that the co-occurrence between modern slavery and environmental degradation is linked to the cattle industry of Brazil. These risks to climatic variability are ingrained within supply chains. Agri-business is the key driver of deforestation in Brazil and is heavily reliant on the presence of workers subjected to modern slavery. Weakening of the environment and modern slavery legislation in Brazil is further increasing the risks of identifying and intervening in cases where these social-ecological issues may be co-occurring. Reversing these changes and further strengthening these legislative efforts could lead to major human rights and environmental protections. Working with indigenous community experts, and pooling of expertise and resources between the antislavery and environmental communities (e.g., the *Comissão Pastoral da Terra* (CPT) (aka. the Pastoral Land Commission) who are extremely active in reporting and supporting workers who have experience abuses within Pará state – primarily linked to cattle and deforestation), may be one way of beginning to address such issues across the most vulnerable states and municipalities of Brazil.

Risk in the Russian Logging Sector

Whilst not all tree cover loss is deforestation, in the same way not all modern slavery activities are associated with illegal environmental activities. This has been the case as noted in Brazil where the promotion of agricultural expansion may be legitimate in accordance with the Bolsonaro administrations' current position on forest protections. On the other hand, the situation within Russia is very much entwined with illegality in the environmental sector.

Russia has one of the highest estimated number of individuals subjected to modern slavery of European nations; 794,000 people (Walk Free 2018). Moreover, according to Jackson et al. (2020a) Russia has a high level of industries associated with modern slavery that are known drivers of tree loss and deforestation. However, it is the logging sector in the far east of the country, where illegal logging – amongst other sectors – has been associated with the presence of modern slavery (Maltseva et al. 2014).

Further labour trafficking into the logging sector more generally have been reported, as well as those added-value activities further along the supply chain, including within saw mills (U.S. Department of State 2020). The difficulty of tracking the supply of timber that may be associated with modern slavery increases as timber are transported into other nations. For example, 96% of wood from Russia that is associated with illegal logging is transported to China (Verité 2017a). China itself has a history of being connected with the receipt of illegal timber smuggling and illegally logged goods (e.g., from Russia and other nations

targeted as part of the 'Belt and Road Initiative' such as Mozambique) (Verité 2017a, 2020a, 2020b). In addition, according to Global Witness, China is one of the leaders in funding sectors that are heavily associated with deforestation globally (Global Witness 2021a). When timber is combined with other goods it means tracking the risk of modern slavery and attaching it to the social-ecological impacts that are created becomes limited, and transparency is then lacking (Jackson and Decker Sparks 2020).

Human trafficking and associated environmental crimes (e.g., illegal timber trafficking, wildlife trafficking; Wyatt 2013, 2009) have also been noted in the Asian region of Russia. The illegal timber trade in particular has been associated with the presence of organised crime, fuelled by the corruption within the Russian political sphere (Wyatt 2014). The presence of illegal logging is often reported in the far-eastern regions, but it is also noted within the north-western area of the country as well (Maltseva et al. 2014; Johansson 2010). The U.S. Department of Labor has stated that "Corruption among some government officials and within some state agencies creates and environment enabling trafficking crimes" (U.S. Department of State 2020). Such corruption includes: the payment of bribes, financial extortion, decisions favouring certain groups (e.g., organised criminal actors), and timber companies evading national regulations as a result of protections from powerful individuals (Lindsay et al. 2002; Johansson 2010). In addition, modern slavery has been associated with the use of compulsory prison labour (a form of state-imposed forced labour) to enable the continued logging of the far-eastern forests within Russia (Buckley 2018; Walk Free 2018).

Actions have been taken by governments to address the environmental impacts associated with illegal logging that have affected the habitats and protected species, such as the U.S. enacting the *Lacey Act*, which prohibits the import of timber products associated with the violations of laws within the origin country (Huerbsch 2016). The EU has a similar policy as part of its EU *Timber Regulation* (Huerbsch 2016) and the *FLEGT* processes ('Forest Law, Enforcement, Governance and Trade licensing scheme'), and yet the majority of timber imported into the EU are sourced from Russia (Johansson 2010). Whilst there are efforts to tackle the issues of illegal timber which is likely associated with modern slavery in other countries, there is very little political will within Russia to combat modern slavery overall (Waid 2020). Whilst this lack of political will – and overall isolation of Russia geopolitically – continues, it is unlikely that the co-occurring illegality of modern slavery and illegal logging practices will be stemmed within the Russian Federation.

Problems with Palm Oil in Southeast Asia

The roots of palm oil production in Southeast Asia are associated with the history of colonialism, the degradation of land for production, and the movement of workers who faced a lack of decent working conditions (Robins 2021). Whilst governance practices may have altered, concerns around the production of palm oil on plantations continued to persist.

Palm oil has long been an environmental concern, with increasing risks associated with the continued expansion of crops across the world in countries such as Brazil (Mendes 2021; Watkins 2021) and Nigeria (Gurden 2017; Ojo 2017). The land-use change associated with increased palm oil production has been linked to: increased deforestation rates; biodiversity loss; forest fires and associated levels of air pollution; carbon emissions and the release of volatile organic compounds; water abstraction and changes to water

quality; invasive pests; and land conflict (both between communities, and between humans and wildlife) (Shigetomi et al. 2020; Meijaard et al. 2018).

It is within the heart of Southeast Asia where the dominant production of such crops have been highlighted as both environmentally and socially concerning. Forty-five percent of sampled palm oil plantations in Southeast Asia had been forested as recently as 1989 according to Vijay et al. (2016). Indonesia and Malaysia are the two leading producers of palm oil globally with 85 percent of global palm oil production being consolidated within these nations (Zuckerman 2021), and growth in the planted areas increasing by 40% and 150% respectively (Pirker et al. 2016). Consistently, Indonesia is ranked the top producer of palm oil with estimated levels of production, followed by Malaysia (Figure 4). Whilst other types of oil crops – viewed as replacements (Parsons et al. 2020) – are also being considered by some as environmentally degrading (Meijaard et al. 2020a), palm oil remains the bastion of deforestation (around 50% of deforestation in Malaysian Borneo was contributed to by palm oil between 1972 and 2015; Meijaard et al. 2020b), forced labour and environmental degradation. This is reflected in the investment and financial generation of such products. Both nations are also listed Global Witness' (2021a) top ten nations for the financing of risky forest commodity production and trade associated with deforestation; with Malaysia ranked second (with US $30.44 billion of financing) and Indonesia ranked fourth (US $23.4 billion) between 2013 and 2020.

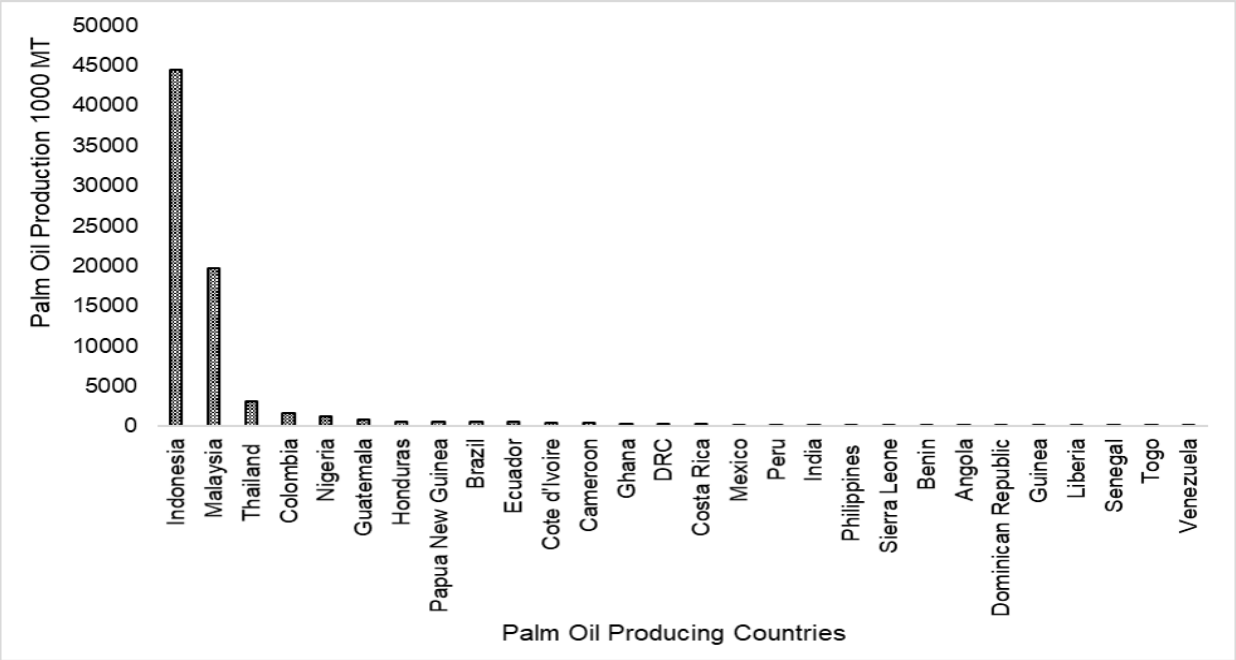

Figure 4: Total estimated palm oil production for the main producing countries as noted by the United States Department of Agriculture (USDA) for 2021 as updated in May 2021. Source: USDA (2021).

The palm oil industry in Southeast Asia has historically been associated with peatland drying, wildfires, deforestation and endangerment to biodiversity (Fitzherbert et al. 2008; Koh and Wilcove 2008a, 2008b; Zuckerman 2021). Further, Teng et al. (2020) note that public opinion is negative towards palm oil overall,

with drivers of environmental degradation being highlighted as being linked to greed, corrupt practices, and a drive for increased profits in the global capitalist system.

Human rights abuses have been documented across the palm oil sector with a focus on Southeast Asia due to the dominance of the region's production. Indonesia, in particular, has been the focus of such investigations by Human Rights Watch (2019) and Amnesty International (2016). Human rights issues and forced labour have been the focus of investigations by such organisations, sometimes with the inclusion of content on environmental crimes and their intersection. This is in contrast to the work being undertaken by environmental organisations, which is often perceived as having focused solely on the ecological impact of the sector and often ignore the effects that these issues have on the social and economic rights of people to the environment. There are however, some exceptions with organisations taking similar approaches but with different focuses. For example, WWF-Malaysia is implementing what they term a 'landscape approach' within the palm oil sector that focuses on conservation and human-environment interactions (WWF 2020). Whereas Earthworm Foundation are also undertaking a 'landscape approach' in the same region but with more focus on the combined social-ecological implications of the palm oil sector which focused more on labour and livelihoods (Earthworm Foundation 2021). These similar and yet divergent approaches demonstrate the complexity and varied impacts associated with the presence of palm oil across nations such as Malaysia.

However, the risks of forced labour and a lack of decent work are pervasive (Cockayne 2021) – reflecting the continuum of labour exploitation seen across the world. For example, there are risks for those living across Southeast Asia – for the environment, economically, and for the health of communities – linked to the tropical fires that have been associated with slash and burn practices across the palm oil sector when clearing land (Dhandapani and Evers 2020; Goldstein et al. 2020; Tang and Yap 2020). Thus, releasing emissions that ultimately have an impact on global climatic change. The negative view of palm oil across Southeast Asia (Teng et al. 2020) is also linked to the health implications associated with the smog and emissions released during the tropical forest fires. Further, a lack of decent work is found in the application of farming techniques by workers. The spraying of fertilizers, herbicides, and pesticides upon palm oil plantations have impacted negatively on the health of workers – and in particular those female workers that are often overlooked when antislavery organisations work to address forced labour more specifically. These factors cause dizziness, poisoning, burns, respiratory problems, and miscarriages (World Rainforest Movement 2018). Women workers also face additional discrimination from male employers and have faced sexual abuses and rape upon plantations (World Rainforest Movement 2019; Zuckerman 2021).

Severe cases of forced labour have also been noted in the palm oil industry, along this labour exploitation continuum; with trading partners working to take action against deforestation and human rights abuses noted in the sector (Speechly and Ozinga 2019). This is noted in both Indonesia and Malaysia. For example, narratives from 2015 highlighted how migrant communities have been recruited from countries in South Asia and moved to Malaysia where they experienced violence and debt bondage (Al-Mahmood 2015). Some of these plantations are directly linked to government investment (Zuckerman 2021). Similar circumstances have been noted in Indonesia (see Amnesty International 2016). Such issues associated with recruitment require interventions to support those who are at risk of exploitative labour practices. Ethical

recruitment schemes have seen the implementation of standards to support the Malaysian business sector in order to adhere to international standards (Earthworm Foundation 2019a, 2019b). These standards mean migrant workers are aware of the full breakdown of costs involved, the work that is expected, and provide protections that have not previously been made available to those who may have been subjected to conditions of forced labour in the palm oil sector.

Impacts are also faced by indigenous communities; with land-tenure issues, and conflicts associated with the palm oil sector highlighted (Human Rights Watch 2019). For example, Global Witness (2020c) have again highlighted how environmental defenders have been sidelined by large palm oil companies thus leading to continued discrimination of indigenous communities. Tribes including the Orang Rimba and Batin Sembilan have lost tens of thousands of acres of land to the Indonesian palm oil sector (Zuckerman 2021). Further, cultural changes have occurred with tribes reporting that deforestation associated with the palm oil sector have altered their natural ability to hunt, and even their diets as the animals, fruits and insects that they previously relied upon are no longer available (Zuckerman 2021).

The presence of palm oil expansion should be viewed as both an ecological and socially important issue which can not only lead to environmental degradation and deforestation – thus contributing to climate change impacts more broadly; but they are also drivers of social and cultural destruction. This social change affects those working on the plantations via the subjection of individuals to modern slavery, but also those who have been displaced or seen their access to resources stripped. By increasing displacement, and the overarching impacts of climate change the cycle of the modern slavery-environmental degradation-climate change nexus (Brown et al. 2019; Decker Sparks et al. 2021; Bales and Sovacool 2021) is likely to increase leading to further vulnerabilities for communities who may already be at a higher risk of exposure to modern slavery. What is key to note is that palm oil is likely to continue its expansion in this region, but it is important that in order to become fully sustainable the impacts of deforestation and the drivers of deforestation (in some cases forced labour) be addressed concurrently.

Mining in the DRC

Practices of mining have been associated with the degradation of forest environments across the globe. The link to modern slavery have also been noted in countries including Ghana, Venezuela and Peru among many others; with the additional risk of child labour being highlighted in several countries (Jackson et al. 2020a; Ruiz and Belo 2021; Wells 2014; Verité 2017a, 2017b). One of the dominant mining communities is that of the Democratic Republic of the Congo (hereafter referred to as the DRC) which is home to an abundance of natural resources and the presence of expansive tropical forests. Mining in the DRC has a history of association with degradation – whether socially, through the funding of conflict, or environmentally, as a driver of deforestation (Hund et al. 2013).

In order to gain access to the mines, the removal of trees can take place. Further, Molinario et al. (2020) note that the presence of logging and mining practices may have a smaller influence on deforestation overall in the DRC, however, they require a change in land-use that has the scope to stretch far beyond the confines of the mining site. Such change in land-use also increased rates of migration, thus exacerbating the scale of tree loss (Kaye 2012). As a result, this has an influence on the social-ecological systems as a

whole placing people in conflict with the environment and can lead to further degradation of forest environments as people migrate to sites of work.

Such degradation has occurred recently in the Okapi Wildlife Reserve where illegal mining has been noted along the river Ituri; and a large increase in the levels of deforestation associated with this mining has been linked to the COVID-19 pandemic (Darbyshire 2021). Such development along infrastructure and key landscape pathways is often associated with mining landscapes; the development of roads coinciding with deforestation has also been noted in the Congo basin (Kleinschroth et al. 2019) with similar trends linked to illegal logging and informal mining noted in Mozambique (Verité 2020a).

In the DRC mining sector the primary extraction of resources relies on the abundant cobalt supplies along the so-called 'cobalt belt'. Other minerals that dominate across the Congo Basin include: copper, gold, iron ore, aluminium, potassium chloride, coltan, tantalum and nobium (Hund et al. 2013). Such minerals are required to support the development of battery technologies for solar power and electric vehicles (Schneider 2020). This represents a constraining relationship between combatting climate change, providing sustainable work for communities that are free of modern slavery, and protection of forest environments (Decker Sparks et al. 2021). Yet monitoring of this sector and its deep-rooted connections to modern slavery are beginning to be investigated using satellite radar applications (Brown et al. 2020). This technique may be particularly important for those forms of mining occurring in regions where perpetrators of illegal mining and perhaps modern slavery seeks to hide illicit activities using the remaining tree canopy coverage.

However, with DRC the role of conflict has also played a large part in the variable effects of deforestation. Overall, an estimated 21% of all conflicts globally between 1989 and 2016 contained the usage of modern slavery practices within the act of warfare (Smith et al. 2020); this is beyond the subjection of individuals to sex trafficking or child soldiering. Modern slavery itself often increases during times of conflict (UNODC 2018; Wheeler 2016), and the levels of tree loss have increased over those periods of conflict (Schneider 2020). On the one hand, conflicts lead to hotspots of violence associated with conservation and environmentally protected lands (Darbyshire 2021). Yet on the other, Butsic et al. (2015) noted that in times of high conflict mining associated with deforestation lessened, suggesting that the complex presence of deforestation and modern slavery impacts can vary even across landscapes and times of social-ecological change. These scenarios demonstrate both the use of the forests by communities for survival during conflicts, but also the use of resources – both natural and those of people – as a factor that enables conflict to thrive.

Once again, China and its 'Belt and Road Initiative' has a role to play in the extraction of natural resources that may be linked to modern slavery and deforestation practices. China as a nation dominates investment within the DRC's mining sector, constituting around 70% of total investment (Kinch 2020). However, local shifts in agriculture and fuelwood collection because of population growth, movement and the impacts of the COVID-19 pandemic limiting access have also driven increases in deforestation and land clearing in the Congo Basin (Schneider 2020). Moreover, in order to tackle such co-occurrences between social-ecological issues, the implementation of innovative remote sensing techniques are being applied (see Brown et al. 2020).

Much like in Russia, there are gaps in the governance mechanisms of the DRC which enable the continuation of deforestation (Schneider 2020), and more specifically the continuation of mining associated with tree loss to take place that support the global demand for precious metals. Protected areas – known to be at increased risk of modern slavery occurrence (Bales 2016; Jackson et al. 2020b) – are areas where deforestation and industrial activities (including mining and oil extraction) are able to continue with impunity (WWF 2017; Global Witness 2020a). With the continued population growth and predicted reliance on timber harvesting, as well as mining expansion to fuel demand for batteries associated with 'green' energy technologies, the DRC faces continued increase in risk to the management and protection of the tropical forests (Tyukavina et al. 2018). It is vital that the co-occurring risks of deforestation and modern slavery are addressed. Without adequate conservation, sustainable access to resources, and an end to modern slavery, the predicted impacts of climatic change upon the world's second largest tropical forest are likely to lead to significant threats to both people and nature by the end of the 21st Century (Réjou-Méchain et al. 2021).

POTENTIAL SOLUTIONS

So far, a range of risks and endangering factors that have been noted throughout this chapter. Here the potential efforts to protect both people and the forests are outlined.

Engagement with Forest Communities and Environmental Defenders

Protecting the rights of forest communities should be a priority for both slowing deforestation and ending modern slavery. Broadly, this should include the securing of land rights, ensuring equitable access and protections to forest communities, and engaging with those forest communities who have the most extensive experience in protecting forest ecosystems (Nnoko-Mewanu et al. 2021).

Conservation policy needs to move beyond the proposal of equality and move toward the alignment of equitability. This is particularly important for those communities who live with, or rely on the forest, as their needs have, in the past, been ignored by current conservation efforts where nature has been prioritised over people. For example, human rights abuses toward communities by environmental organisations have been reported (WWF 2020); alongside the persecution faced from criminal actors (Global Witness 2021b; Butt et al. 2019). The drivers of such persecution can be linked – but are not limited – to first, an increased demand and a reliance on extraction of natural resources (e.g., DRC). Secondly, impunity on the behalf of perpetrators (for example labour inspections and access to remote locations are increasingly difficult in Brazil as workers' rights and environmental laws have been stripped back meaning criminal actors can grab land, and undertake human rights abuses without the state taking active steps to prevent this from occurring). Finally, socio-economic conflicts between groups requiring access to the forests in areas where there are both limited resources, and a perceived underutilized resource (Le Billion and Lujala 2020; Zeng et al. 2021).

Equitable access and protections of forest environment must thus move beyond the colonial lens that is often applied; and provide support to those who are experts in protecting the forests. These same people may be subjected to the persecution of perpetrators of modern slavery, criminal actors and companies

engaging in land grabbing which is linked to an increased risk of human trafficking (Bales and Sovacool 2021). Ultimately, they may be further impacted by the conservation measures put in place to protect the environment at the expense of community and indigenous peoples (Domínguez and Luoma 2020).

More efforts need to be put into ensure indigenous communities are given a leading role in the protection of forest ecosystems globally, with the recognition that they're access to the forest is also linked to the economic needs they require for which the forests can provide. Increasing awareness of the potential presence of modern slavery occurrences in these locations from local communities should inform interventions; with such communities provided with avenues to report issues of modern slavery they may experience or identify within their local forests. This is important as legitimate access to the forest can occur alongside cases of modern slavery – the Sundarbans Reserve Forest is one such example of this, whereby the working forest co-exists in parallel with the subjection of individuals to modern slavery (Jensen 2013; Bales 2016; Jackson et al. 2020a). Regular collaboration, the enhanced protections of indigenous peoples and their rightful access to land, and support from inspection and law enforcement to attend to instances of modern slavery when they are reported by local communities would go some way to limiting the social-ecological implications that modern slavery can have on the forest and forest-dwelling communities.

Remuneration and Job Provision

It has been suggested by some scholars, that one way of re-engaging workers who have previously been subjected to modern slavery within employment is to engage with those communities in practices of conservation and environmental regeneration. Bales (2016) for example proposed in his seminal work *Blood and Earth* such an idea. In this proposal, those who are no longer living under conditions in which they are subjected to modern slavery could be provided with meaningful work that provides legal remuneration for the work that is being undertaken but that can also benefit the environment. This may include regenerative re-foresting of areas or sustainable agriculture. For example, this could include the re-planting of native tree species which is included in the SDGs as a method of mitigating the impacts of climate change (see SDG 15.2 which states: "restore degraded forests and substantially increase afforestation and reforestation globally") (UN 2016).

This engagement with survivors of modern slavery post-subjection to exploitation is reiterated in Bales and Sovacool (2021) and expanded upon. They propose that the ending of modern slavery needs to lead to the presence of legitimate and economically fulfilling jobs for those who have been subjected to modern slavery in the past. By ending modern slavery, the cost of ending this issue can be transferred to the process of developing mitigating and adaptive strategies to address anthropogenic climate change. The authors note that the skills of formerly subjected workers can be used to assist in processes which aim to "rebuild, replant, support, and protect the natural areas that they have been previously forced to exploit and destroy" (Bales and Sovacool 2021: 8). There are examples of reforestation programmes have led to the release of individuals from situations of debt bondage within the fishery sector (Barkham 2019). Bales and Sovacool (2021) caveat their suggestion with a note that only those who wish to engage in these activities wilfully can do so should they wish for appropriate remuneration. However, such an idea faces critiques for not being sensitive to the needs of survivors; or considering the overall impact that replanting

could have on climate change impacts (Popkin 2019). Any such scheme should be developed and led by survivors of modern slavery, and should be a trauma-informed process with the appropriate support available.

Such socially oriented ideas can also be linked to the current international usage of carbon crediting associated with the 'Reducing Emissions from Deforestation and Forest Degradation (Plus)' (REDD+) (UNFCCC 2021). The inclusion of social protections associated with ending modern slavery and establishing interventions to protect both people and the forest environment should be integrated within national REDD+ programming (Jackson and Decker Sparks 2020). It is further suggested that such protections of forests and the gaining of economic benefits via carbon crediting programmes, could be reinvested in the further rehabilitation of survivor communities into paid employment (Bales and Sovacool 2021). Thus generating funds in the form of a financial incentive for governments to limit environmental degradation within forests, end modern slavery, and maintain protections for people and the planet. Fully integrating the antislavery community within that of development legislation and programming could provide an additional method in which to connect these issues of modern slavery and environmental degradation of forests within the wider international governance and financial communities' minds (Cockayne 2021).

Collaborative Action by Antislavery and Environmental Organisations

There is a need to move beyond the siloed nature of addressing the modern slavery-environmental degradation-climate change nexus. This requires collaborative efforts, and those with relevant expertise to take the lead on such issues of modern slavery. In the past, environmental organisations have entered the labour exploitation space and dominated leaving experts and local community groups who have focused on modern slavery and labour exploitation sidelined in an area where they have much to contribute. This can lead to detrimental impacts for both the environment and people – as modern slavery is a driver of deforestation, and other environmental degrading activities can persist.

Therefore, in aiming to address the nexus, the centring of antislavery actors and organisations need to be undertaken (Jackson and Decker Sparks 2020). Engaging actively with experts in the labour space can lead to the provision of social and financial support to those who may have been subjected to modern slavery. This can prevent the transferal of vulnerabilities into other areas and sectors, which is a risk when the conservation of forests may be prioritised over the protection of people –instead they should be addressed equally.

There are examples where the environment and labour abuses have been addressed equally. For example Earthworm Foundation aims to address the economic issues faced in forest-adjacent sectors, such as the Malaysian palm oil industry, linked with land degradation whilst also aiming to address labour issues that migrant workers face, such as poor recruiting practices and labour exploitation (Earthworm Foundation 2019a; 2019b). They aim to achieve this by implementing a holistic 'landscape-wide' approach to tackle social-ecological issues (Earthworm Foundation n.d.; Favorini-Csorba et al. 2020). Furthermore, the presence of the *Comissão Pastoral da Terra* (CPT) in Brazil have made many gains supporting workers through their inspection processes in Pará State (Figuerira and Prado 2014; Silva 2016; CDVDH et al.

2016; Santos et al. 2020), and the implementation of the *Campanha de Prevenção e Combate ao Trabalho Escravo* (National Campaign to Prevent and Combat Slave Labour) (CPT n.d.). The CPT also have great knowledge of the environment and are another example of where combined expertise can have greater benefits for people and the natural environment (CPT n.d.).

It is not to say that antislavery organisations and actors should take the lead in environmental issues, but there should be mutual respect and engagement of expertise from both sides. If this occurs there is much more chance of successfully tackling the issues associated with the nexus and instituting interventions that maintain environmental standards in line with the SDGs – in particular SDG 15.2 regarding the protection of forests (UN 2016) – and making sure that modern slavery is not a driver of future forest degradation. Nor are those at risk of modern slavery forced into exploitation in other sectors. By working collaboratively, the sharing of expertise, resources, and tackling of mutual problems can be achieved as promoted in the SDGs, but has rarely been undertaking in the past due to competition, limited resources, and gatekeeping on both sides.

Centring of Modern Slavery Advocacy and Voices

Survivors of modern slavery have – in the past – been left on the periphery of policy and interventions in relation to the support and conditions that have faced both during and post their experiences of being subjected to modern slavery. This is something that it important to address; investigating the nexus should be no different.

When addressing the connections between modern slavery, environmental degradation and climate change those communities, workers and survivors of modern slavery who have direct experience in such forest ecosystems must lead the interventions and protection methods put in place. For example, indigenous-led conservation providing the capacity to protect areas against deforestation and ensure positive land-management practices (Garnett et al. 2018). The Amazonian region has perhaps one of the largest opportunities for such centring of voices, due to the stewardship shown by communities in protecting these lands for centuries (Webb 2021). In Brazil access to property rights and land tenure are linked to a reduction in the levels of deforestation occurring in such communities (Baragwanath and Bayi 2020). Land grabbing is one of the drivers of deforestation that has been linked to the presence of modern slavery in the region. By reinforcing the protection of land for indigenous communities in such areas, local communities stand a greater chance of successfully reducing deforestation in these lands and thus help to limit the potential impact of modern slavery within these areas. Lack of political enforcement and the current COVID-19 pandemic is playing a role in the further destruction of forests environments (Branford 2020).

However, the lessons that could be learned from the centring of indigenous communities to protect their communities and the environment are also applicable to survivors of modern slavery and workers in leading change to empower people economically, and maintain the integrity of ecosystems. Worker voices and leadership have become an increasingly important avenue of accountability and protections. The centring of labour organisations and workers who rely on these environments has been successful in other sectors and countries (Gausman et al. 2016; Avins et al. 2018). Whilst there are valid criticisms of the

limitations of 'worker voice' initiatives (Kyritsis et al. 2019) it is more important to raise the valuable experiences and expertise of such groups in order to introduce strategies that support workers, and in those sectors impacting ecosystems such as the forest, can also lead to insightful initiatives which may protect their ecological integrity.

The centring of such voices should also extend in this capacity to that of survivors of modern slavery. Survivor leaders should be at the forefront of leading the antislavery movement (Dang 2018; Hutchinson et al. 2020). This would work to ensure interventions are culturally appropriate, effective, and based on expertise that shape appropriate actions (Lockyer 2020). Often these calls are linked to the provision of support services, but they can also be applied to the application of environmental protections and conservation efforts, which can be informed by the expertise of those who were formerly subjected to modern slavery. This may help to intervene in areas where modern slavery drives deforestation, helping to identify those driving forces, at risk areas, and lead in the implementation of strategies to prevent perpetrators from undertaking criminal activities whether impacting individuals experiencing labour abuses, or the environment being impacted by degrading practices.

Improved Supply Chain Due Diligence

Movement is needed beyond certification which has been relied upon particularly by those linked to the forestry sector as a method of upholding environmental standards, but has often failed in limiting environmental degradation. Nor does certification often address those social drivers of deforestation and degradation. Certification as a sole application has been highlighted as providing a false picture of the success that sectors linked to environmental degradation in particular (Greenpeace 2021). Further, these issues have been highlighted with Zukerman (2021: 227) noting that stakeholders consider "that RSPO (Roundtable on Sustainable Palm Oil) certification too often serves as a fig leaf for companies looking to obscure their unsustainable (and, in some cases, illegal) practices while continuing to secure investment and market access." Such issues suggest that the current focus on certification alone by companies – often as the only means of mitigating issues of modern slavery within their supply chains – is too limited and thus need to be combined with other ground-based actions that actively monitor and establish interventions to tackle modern slavery and/or environmental damage.

This is not to say that certification schemes should incorporate actions to tackle modern slavery and labour abuses where they may tackle deforestation. Instead, certification should be used as a first step in order to take concrete actions on the ground to support those who may be subjected to modern slavery, and as a result lead to environmentally degrading practices in the forestry and adjacent sectors, including deforestation. For this to be improved practical ground-applications need to be undertaken at a holistic 'landscape' level approach, such as those being undertaken by Earthworm Foundation (Favorini-Csorba et al. 2020; Earthworm Foundation n.d.) and WWF (n.d.). Both organisations have applied this approach to the palm oil sector both from a labour and environmental perspective respectively (Earthworm Foundation 2019a, 2019b; WWF 2021a, 2021b). However, movement beyond voluntary certifications and regulations that have previously been implemented with moderate success in some sectors such as limiting deforestation linked to soybean production and livestock rearing in Brazil, have at the same time had a limited impact in the palm oil sector of Southeast Asia (Taheripour et al. 2019). What is therefore required

are mandatory regulations. Action needs to be undertaken legislatively to provide governments, financial bodies and regulatory bodies a substantial role in tackling both the environmental and social implications of modern slavery upon forest ecosystems.

Legislative consequences are required in order to make sure that companies are working toward transparent supply chains that can provide protections for both workers and the environment. There are current legislations in place, which work to protect ecosystems, including forests through legislations including the EU *Timber Regulation* and *FLEGT* ('Forest Law Enforcement, Governance and Trade licensing scheme') (European Parliament 2010; European Council 2005). Additionally, there are regulations in place, which support the protection of modern slavery and reference supply chains in these cases. For example, the UK *Modern Slavery Act* (2015) includes Section 54, which specifically references companies making efforts to mitigate cases of modern slavery within their supply chains (UK Government 2015). However, there is no requirement for smaller companies, and there is no requirement to take actionable steps to end modern slavery within their supply chains or take any meaningful action to do so. This is something later versions of the legislation in other countries have worked to improve upon including the *Australian Modern Slavery Act* (Parliament of Australia 2018) which includes financial penalties for those companies who do not actively take steps to mitigate modern slavery with their supply chains. This is something that is pertinent to all companies, but includes those who may be associated with modern slavery linked to the timber sector and those sectors associated with tree loss including agriculture.

One potential legislative change that could strengthen supply chain due diligence across all sectors including those linked directly – and associated with – deforestation and modern slavery is that of the EU's proposed *mandatory Human Rights and Environmental Due Diligence* (*mHREDD*) law. The *mHREDD* aims to place human rights and environmental degradation on an equal standing (McCroquodale and Scheltema 2020; GBI and Clifford Chance 2021), and the legislation is currently making its way through the European Parliamentary system (at the time of writing). Members across the environmental and antislavery communities have cited their needs for the legislation in relation to the issues of environmental degradation – including deforestation – and modern slavery (Global Witness 2021c; Anti-Slavery International 2021). Such a law would place environmental crimes and human rights abuses on an equal footing, and would move beyond the separate penalties and coverage of those companies in siloed sectors with specific legislation to encompass all sectors and companies who operate or have markets within the EU. This provides global coverage and importantly the plans include financial penalties for those companies that do not take actions to end modern slavery or environmental degradation within their supply chains.

Legislation such as the *mHREDD* could prove to be revolutionary in the tackling of social-ecological issues that occur in tandem by not situating either as more important to tackle than the other, but instead taking a holistic approach. This could prove important for key countries, which have large trading capabilities with the EU. For example, Brazil is the eleventh-largest trading partner of the EU, with trade accounting for 18.3% of the country's total trade (in 2017) including exports of food products, tobacco products, and minerals (European Commission n.d.). Furthermore, Indonesia and Malaysia – whose primary markets for palm oil products are located in Asian geographies (WWF 2021a) – also contribute to the national total of €20.6 billion and €24.7 billion in trade with the EU in 2020 (European Commission 2020a, 2020b). Such

scope for the *mHREDD* mean there have been calls for similar legislation to be adopted in other jurisdictions, which include direct references to the impact of deforestation (e.g., UK see Global Witness and ClientEarth 2020; Watson 2020; Siddique 2021). This is something that could be used as a governmental response to actively tackling modern slavery and environmental degradation including deforestation within supply chains, particularly as companies are penalised for not taking active steps to end such abuses within their supply chains when they are noted.

Global Monitoring

Monitoring of deforestation alerts have become a common way of tracking deforestation in national and global contexts. One way in which this has been possible is due to the presence of satellite remote sensing. For countries such as Brazil their PRODES system provides alerts of primary deforestation and can be used to identify cases in which environmental degradation is occurring. This can ultimately feed into biome system assessments, which enable the monitoring of changes driven by specific sectors – for example tracking agricultural change in the Cerrado, or primary forest loss for mining and agriculture in Amazonia (INPE 2020). By tracking these changes to ecosystems using satellite data, more focus can be used to combine with ground-based intelligence to understand the overarching drivers of such deforestation and highlight areas where social-ecological interventions may be put in place (Jackson et al. 2020a; Verité 2020).

These examples are on a national basis, but global monitoring of tree loss and its potential links to modern slavery could be conducted. Several tools are available that take advantage of the vast time-series of data available from satellite acquisition. This includes the Hansen et al. (2013) *Global Forest Watch* annual tree loss dataset, which monitors the losses and gains of all forest types globally. This has also been converted into other datasets that assess the key drivers of deforestation globally, such as urbanisation, shifting agriculture, and wildfires (Curtis et al. 2018). Such global datasets have been used to identify areas of potential risks where modern slavery and tree loss may subsequently co-occur (see Jackson et al. 2020a). Further assessment of the co-occurrence of modern slavery and deforestation and identify those areas where interventions may be undertaken at varied temporal and spatial scales to provide equitable protections to both people and the environment.

By monitoring such change and occurrence at a global level, multiple SDGs and targets to mitigate environmental degradation and climate change may be achieved. A global system within which to identify modern slavery has been touted previously within the static and enduring brick-manufacturing sector of South Asia (Boyd et al. 2018; Boyd et al. 2021). Yet there has been little movement so far into establishing such monitoring beyond the environmental effects of tree loss at a global scale. In particular those losses, which may be associated with the subjection of individuals to modern slavery. Global monitoring of modern slavery is currently sporadic and in order to successfully address the impact of deforestation linked to exploitative labour, more data on the location, occurrences, and socio-economic factors which contribute to modern slavery need to be identified using carefully collected and detailed ground-based records. These may be supplemented and scaled up to provide predictive monitoring of areas where modern slavery may be high-risk. In order to achieve this for the forestry sector, ideas around collaborative monitoring at the global scale could feed into global real-time monitoring systems (such as

the UN Environment Programme's 'Digital Ecosystem for the Planet'; UNEP 2018) which would actively monitor and make globally available access to vast amounts of environmental data.

The key will be combining these often large-scale ecological datasets with small-scale localised and situation specific details surrounding the subjection of individuals to modern slavery in order to identify cases where the nexus may be present and establish interventions in those areas where such drivers are predicted to occur (Jackson 2020c). In order to overcome this gap in the social-ecological datasets, a holistic monitoring system for investigating modern slavery and environmental degradation, which covers multiple sectors including forests, could be developed. However, in order to move beyond the systems – such as the Global Forest Watch – that are currently in place, it is necessary to combine data and expertise from both the environmental and antislavery sectors. Further, to avoid overemphasis on one issue rather than equally addressing both stakeholders should work together to identify common aims and shared visions to support workers and ecosystems. However, it is vital that the development of any global monitoring system to tackle the links between modern slavery and deforestation should be led by the experiences and expertise that local communities, workers, and survivors who have often been neglected from such conversations can provide.

CONCLUSION

Forest ecosystems are under great pressure from a changing climate, and deforestation associated with illegal activity. These threats also contain a socially destructive pattern – the risk of modern slavery. Modern slavery is both a driver and can be a resulting outcome of the degradation of the forests. Whilst this relationship is becoming more common amongst those that directly investigate the modern slavery-environmental degradation-climate change nexus, it is clear that such understanding is required in the mainstream environmental and conservation sphere in order to design and implement solutions that support both the forest and people impacted by the continued presence of modern slavery.

The SDGs provide a mandate for assessing such commonalities concurrently; with target 8.7 striving toward ending modern slavery, and target 15.2 that seeks to protect forest environments. Without actively acknowledging and intervening in cases of modern slavery, full protection of the forests and the reversal of environmentally degrading practices cannot be achieved.

Throughout this chapter, it has been made clear the links between modern slavery and forest degradation – including deforestation – with the global scale of such impacts outlined. From mining practices to illegal logging, and cattle ranching to palm oil, the impact of modern slavery upon forests is far-reaching and diverse. Solutions are being explored within the antislavery space to assess the co-occurrence of such issues, with additional efforts made to move beyond these initial assessments into quantification of the nexus in forest environments, and implement solutions in alignment with the achievement of social and environmental SDGs.

Such a widespread issue requires innovative solutions. This should include the centring of survivors of modern slavery and local communities who have successfully been protecting forests for millennia. Those working to address the nexus should be included in conservation activities operated by environmental

organisations where modern slavery may be occurring. This is necessary in order to design and establish interventions that successfully address both social and ecological conditions – rather than one or the other – thus risking movement of such problems into other regions and communities. We need to think of the bigger picture and pool resources, to establish effective monitoring and evaluation.

It is clear that modern slavery and deforestation are inextricably linked. Modern slavery can drive deforestation, and deforestation can increase the vulnerability of people being subjected to modern slavery. Acting to end modern slavery will have benefits for forest ecosystems, however, action needs to be taken sooner rather than later, otherwise the benefits that can be gained by ending modern slavery to the forests, may be outweighed by the damage that has already been done.

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