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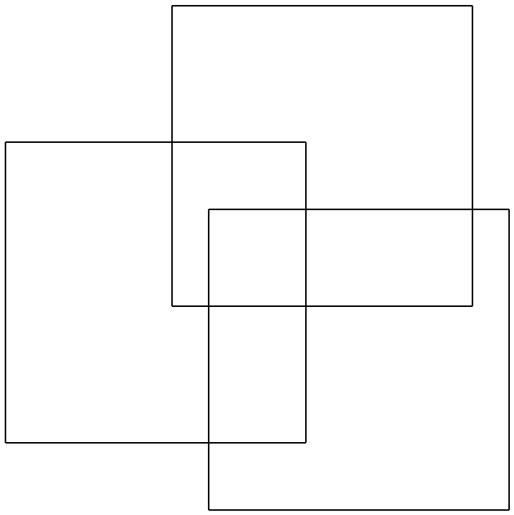
Promoting decent work and safety and health in forestry

Report for discussion at the Sectoral Meeting on Promoting Decent Work and Safety and Health in Forestry
(Geneva, 6–10 May 2019)



Geneva, 2019

Sectoral Policies Department

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Preface

At its 334th Session (October–November 2018), the Governing Body of the International Labour Organization (ILO) endorsed the proposal for including a Sectoral Meeting on Promoting Decent Work and Safety and Health in Forestry in the programme of sectoral meetings for 2019 (April–December). The purpose of the Meeting would be to discuss issues related to the promotion of decent work and safety and health in forestry. The Meeting may adopt conclusions and resolutions. [1]

This report has been prepared by the International Labour Office as a basis for discussions at the Meeting. It provides an overview of the current context of the global forestry sector, with a specific focus on decent work and occupational safety and health.

[1] GB.334/ POL/3.

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Abbreviations and acronyms

CO_2	carbon dioxide
CSR	corporate social responsibility
FAO	Food and Agriculture Organization of the United Nations
EU FLEGT	European Union Forest Law Enforcement, Governance and Trade
FSC	Forest Stewardship Council
NWFP	non-wood forest product
OSH	occupational safety and health
PEFC	Programme for the Endorsement of Forest Certification
PES	payments for ecosystem services
REDD+	Reducing emissions from deforestation and forest degradation and the sustainable management of forests and the enhancement of forest carbon stocks in developing countries
SDG	Sustainable Development Goal
SFM	sustainable forest management
SMFE	small and medium-sized forest enterprise
UNFCCC	United Nations Framework Convention on Climate Change
VPA	voluntary partnership agreement

Definitions

This report focuses on forestry production, which is defined as: "production and harvesting of wood and non-wood forest products" and corresponds with ISIC, Rev.4/NACE, Rev. 2 activity A02 (forestry and logging). [2] In line with the definitions of the Food and Agriculture Organization of the United Nations (FAO), this excludes "tree stands in agricultural production systems, such as fruit tree plantations, oil palm plantations, olive orchards and agroforestry systems when crops are grown under tree cover". [3] Secondary manufacturing industries (pulp and paper, sawn wood and wood panel production) following from (primary) forestry production, are outside of the scope of this report and are not therefore specifically discussed.

[2] United Nations: *International Standard Industrial Classification of All Economic Activities (ISIC), Rev.4* (New York, 2008), part three.

[3] FAO: *FRA 2015: Terms and Definitions*, Forest Resources Assessment Working Paper 180, 2012, p. 3.

1. Current context of the forestry sector

1. Forests are the source of about 1 per cent of the global gross domestic product [4] and provide food, income, employment and shelter to an estimated 1.5 billion people, at least half of whom are women. [5] About 350 million people, many of whom are indigenous and tribal peoples, depend largely on forests. [6] Forestry is being affected by global megatrends like globalization, technological advancement, demographic transition and climate change, all of which are key drivers of change in the world of work. [7]

1.1. Global policy agendas

2. The 2030 Agenda for Sustainable Development recognizes the dependence of social and economic development on the sustainable management of natural resources, including forests, noting the importance of their conservation and sustainable use. Target 15.2 of the Sustainable Development Goals (SDGs) states that countries should "promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally". Forests are also covered under SDG 6 on ensuring the availability and sustainable management of water and sanitation. Furthermore, the promotion of decent work in the sector contributes to the achievement of many other SDG goals and targets. [8]

3. Forests are high on the global climate change policy agenda: while healthy forests contribute to climate change mitigation through, for example, carbon sequestration, flood prevention and soil protection, by contrast deforestation and forest degradation greatly contribute to greenhouse gas emissions. The United Nations Framework Convention on Climate Change (UNFCCC) includes the sustainable management and conservation of forests as a key commitment [9] and the Paris Agreement of 2015 recognizes the impact of forests (or their absence or degradation) on climate change, calling on countries to conserve and enhance forests and highlighting the importance of considering "the imperatives of a just transition of the workforce and the creation of decent work and quality jobs". [10]

4. Under the UNFCCC work stream on land use, land-use change and forestry, the parties to the Convention are cooperating to mitigate climate change. Global approaches such as reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+), supported by the United Nations Collaborative Programme on

[4] "Forest Use & Logging", in Global Forest Atlas, Yale School of Forestry & Environmental Studies.

[5] M. Verdone: *The world's largest private sector? Recognising the cumulative economic value of small-scale forest and farm producers*, IUCN, FAO, IIED, AgriCord, 2018.

[6] World Bank: "Forests: Overview".

[7] ILO: *Inception Report for the Global Commission on the Future of Work* (Geneva, 2017.

[8] United Nations: *Transforming our world: The 2030 Agenda for Sustainable Development*, General Assembly resolution 70/1 of 25 September 2015 (New York, 2015), see also Sustainable Development Goals indicators website, https://unstats.un.org/sdgs/.

[9] *United Nations Framework Convention on Climate Change* (New York, 1992).

[10] United Nations: *Paris Agreement* (Paris, 2015).

Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD), as well as zero (net) deforestation commitments by the private sector, are among the initiatives for implementing work in this area. [11]

5. Within the United Nations system, several bodies, policies, instruments and partnerships have been developed to promote the sustainable development, governance, management and conservation of forests, strengthen long-term political commitment and seek solutions to emerging forest-related issues. [12]

6. In addition, the concept of sustainable forest management (SFM) has emerged from the increased understanding of the role of forests in the wider sustainable development agenda. The concept was first outlined by global consensus at the United Nations Conference on Environment and Development in 1992, which adopted the "Forest Principles" to underpin the sustainable management of forests worldwide. [13] Thereafter, SFM came to be seen as a "dynamic and evolving concept", which "aims to maintain and enhance the economic, social and environmental values of all types of forests, for the benefit of present and future generations". [14]

7. Many of the root causes of deforestation and forest degradation are linked to poverty resulting from inequalities, the lack of access to or control over productive resources and the lack of alternative livelihoods to subsistence agriculture. [15] The SFM concept provides an integrative approach to the use of forests, broadening the scope of forest management to include the objective that forests should provide a range of goods and services over the long term, including economic and social benefits. [16] Attention on SFM has increased, with more land designated as forest, more activities being undertaken to support SFM and legal frameworks promoting SFM being adopted across the globe. In 2015, 146 countries had policies in place supporting SFM. [17]

[11] REDD was negotiated at UNFCCC/COP11 (Montreal, Nov.–Dec. 2005); the zero deforestation commitments are based on the New York Declaration on Forests, negotiated at UNFCCC/COP24 (Katowice, Dec. 2018).

[12] Including the United Nations Forum on Forests, the Collaborative Partnerships on Forests, the FAO Committee on Forestry, the United Nations Forest Instrument and the United Nations Strategic Plan for Forests 2017-2030, among others.

[13] United Nations: *Non-legally binding authoritative statement of principles for a global consensus on the management, conservation and sustainable development of all types of forests*, Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3–14 June 1992, Annex III.

[14] United Nations: *Non-legally binding instrument on all types of forests*, General Assembly resolution 62/98 of 17 December 2007, para. 4.

[15] P. Poschen: *Social criteria and indicators for sustainable forest management: A guide to ILO texts*, Working Paper 3, ILO/GTZ, 2000.

[16] FAO: *Global Forest Resources Assessment 2015: How are the world's forests changing?* Second edition (Rome, 2016).

[17] ibid.

1.2. Developments and trends in forestry

Deforestation and climate change

8. Deforestation and forest degradation are among the main sources of greenhouse gas emissions and therefore climate change, producing an estimated 10 to 20 per cent of global carbon emissions. [18] Climate change affects forests through disturbances such as droughts, forest fires, landslides, species invasions or insect and disease outbreaks, which, when combined with increased temperatures, resulting water losses and higher levels of carbon dioxide (CO_2), may lead to decreased forest health and productivity. [19] Yet forestry has considerable potential to contribute to a just transition towards environmentally sustainable economies and societies and to create green jobs through activities such as reforestation, afforestation, ecosystem restoration and SFM. [20]

9. In addition to unsustainable logging, fuelwood harvesting and forest fires, deforestation results from the conversion of forests to other economic activities such as agriculture, cattle ranching, mining or biofuel production. [21] Globally the proportion of forest area relative to all land area has been in slow but steady decline since 1990, and countries with large tropical rainforest areas have experienced much more pronounced deforestation. [22] Indeed, it is estimated that as much as 80 per cent of all deforestation occurs in only 11 locations in South America, sub-Saharan Africa, South-East Asia and eastern Australia. [23]

10. Despite deforestation, the net carbon sink impact of forests remains positive, however, as they sequester 4 billion tons of CO_2 per year compared to the 2.9 billion tons of CO_2 per year that are released by deforestation and forest degradation. [24] Thanks to their carbon-storing and carbon-mitigation capacity, forests are crucial in addressing the impacts of climate change, making land use change a critical feature in most mitigation measures seeking to limit global warming to 1.5°C. [25] Natural climate solutions, including forest conservation, restoration and improved land management, could provide more than one third of the cost-effective CO_2 mitigation needed by 2030. [26]

[18] C. Pacheco-Angulo et al.: "Carbon Emissions from Deforestation and Degradation in a Forest Reserve in Venezuela between 1990 and 2015", in *Forests*, Vol. 8, Issue 8 (2017), No. 291.

[19] B. Moore and G. Allard: *Climate change impacts on forest health*, Working Paper FBS/34E, FAO (Rome, 2008).

[20] ILO: *The employment impact of climate change adaptation*, Input Document for the G20 Climate Sustainability Working Group (Geneva, 2018).

[21] WWF: see website Deforestation Causes.

[22] FAO: *Global Forest Resources Assessment 2015*, op. cit.

[23] For a list of these areas, see WWF: Deforestation Fronts; for countries reporting the greatest annual net loss of forest area, see FAO: *Global Forest Resources Assessment 2015*, op. cit.

[24] World Bank: "Forests Slow Climate Change and Increase Resilience", infographic.

[25] IPCC: *Global warming of 1.5°C*, Special Report (Geneva, 2018).

[26] B. Griscom et al.: "Natural climate solutions", in *PNAS*, Vol. 114 (2017), No. 44, pp. 11645–11650.

11. One of the measures to halt and revert the increase of greenhouse gas emissions is the introduction of the REDD+ mechanism. Developed by the parties to the UNFCCC, it aims to generate financial value for the carbon stored in forests by offering incentives for reducing emissions from forested areas. [27] The implementation of the REDD+ initiative has led to country-level progress in the development of forest reference emission levels and reporting, in addition to providing socio-economic benefits for local communities. [28] The participation of employers, workers and their representatives in climate change discussions at all levels is important.

Technological developments

12. Technological advances emerging at an unprecedented rate are expected to affect both the quality and quantity of jobs in the forest sector. [29] Biotechnology is having an impact on the forest industry and the environment through approaches such as clonal propagation, marker-aided selection and phytotechnology. Technology is also used in precision forestry, with remote sensing and drones supporting the measurement and improvement of forest inventory and management planning. [30] Geographic information systems, satellite imagery, machine learning and artificial intelligence are used to improve data availability and accessibility, which can increase productivity, support workers in their tasks and create a safer working environment.

13. The levels and speed of mechanization varies across regions and within countries. While the use of technology in forestry is widespread in many advanced economies, motor-manual forest work performed with chainsaws or other hand-held machines remains prevalent in small-scale forestry enterprises and operations [31] In developing countries, access to technology and the capacity of countries to take full advantage of them is a challenge. [32] There are emerging practices, however, such as the use of spatial modelling to improve understanding of the drivers of deforestation and the use of mobile technologies for the promotion of inclusive forest governance and climate change awareness among communities.

14. Technological transformation is influencing the forestry workforce in terms of both worker displacement and skills requirements. With increased mechanization, including robotization, some manual jobs are being made redundant and replaced by machines and while new types of forest jobs may become available in the future, this trend is likely to continue and should

[27] "About REDD+", see UN-REDD Programme website.

[28] FAO: *Forests and Climate Change Working Paper 17 – From reference levels to results reporting: REDD+ under the UNFCCC – 2018 update* (Rome, 2018), K. Lawlor et al.: "Community Participation and Benefits in REDD+: A review of initial outcomes and lessons", in *Forests*, Vol. 4 (2013), No. 2, pp. 296–318.

[29] ILO: *Inception Report*, op. cit.

[30] L. Hetemäki and G. Mery: "Implications of technological development to forestry", in Mery et al. (eds): *Forests and society: responding to global drivers of change*, IUFRO World Series Vol. 25, 2010.

[31] UNECE and FAO: *Green jobs in the forest sector*, Geneva Timber and Forest Discussion Paper 71 (New York and Geneva, 2018).

[32] ILO: *The impact of technology on the quality and quantity of jobs*, Issue Brief #6 prepared for the second meeting of the Global Commission on the Future of Work, 15–17 Feb. 2018.

follow the principles of just transition. Where transfers of production lead to major employment implications, negotiation between employers and workers is important to mitigate adverse effects as much as possible. [33]

Bioeconomy

15. Bioeconomy can be defined as "the production of renewable biological resources and the conversion of these resources and waste streams into value added products, such as food, feed, bio-based products and bioenergy". [34] A forest-based bioeconomy offers opportunities both through biomass use and through innovations related to ecosystem services, while taking into account sustainability boundaries, including biodiversity and climate change. [35]

16. The forest sector can contribute to energy security and climate change mitigation by replacing fossil fuels with renewable wood energy and by sequestering carbon in forests and forest products. [36] An integral part of the forest-based bioeconomy is biomass energy production from forest resources, in particular the utilization of wood-fuel, with an estimated 50 per cent of global roundwood production used for energy. [37]

17. If well managed under SFM practices, the use of wood energy can have positive climate implications through its capacity to substitute fossil fuels and reduce the net release of carbon into the atmosphere, as well as economic implications through the provision of income and employment. [38] However, the carbon neutrality of wood-fuel is contested and its use for indoor cooking on simple stoves or an open fire, for example, leads to serious health risks, with women and children at particular risk. [39]

18. Wood construction has recently experienced a resurgence as part of the forest-based bioeconomy. It has the potential to contribute to a reduction in greenhouse gas emissions, especially when replacing more energy-intensive iron and concrete construction. [40] Using more wood in construction can also secure a negative carbon contribution for some

[33] ILO: *Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy*, fifth edition (Geneva, 2017).

[34] EC: *Innovating for sustainable growth: A bioeconomy for Europe*, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, 13 Feb. 2012 (Brussels, 2012).

[35] G. Winkel (ed.): *Towards a sustainable European forest-based bioeconomy: Assessment and the way forward*, What Science Can Tell Us 8, European Forest Institute (Joensuu, Finland, 2017), Executive summary.

[36] UNECE and FAO: *Green jobs*, op. cit.

[37] FAO: *Global forest products: facts and figures, 2016*, 2017.

[38] UNECE and FAO: *Wood energy in the ECE region: Data, trends and outlook in Europe, the Commonwealth of Independent States and North America* (New York and Geneva, 2017).

[39] D. Brack: *Woody biomass for power and heat: Impacts on the global climate* (London, Chatham House, 2017); see WHO website: "Household air pollution and health", fact sheet.

[40] FAO: *Global Forest Resources Assessment 2015*, op. cit.

buildings. [41] In addition, bioproducts using wood-based fibres are being developed in a wide range of consumption domains such as housing, food, mobility and clothing, including as a replacement for plastic. [42]

19. Payment for ecosystem services (PES) schemes are an emerging policy instrument that promotes the shift of economic investments towards responsible forest stewardship. Forests provide ecosystem services, such as supply of timber, regulation of hydrological flows, erosion and sediment retention, nutrient cycling and recreational services. When adequately priced, these services can create jobs while incentivizing their continuous maintenance. In addition, PES schemes provide social and economic benefits for people in poverty and for indigenous and tribal peoples, among others. The REDD+ initiative promotes the development of local PES schemes with a poverty reduction focus. [43]

Trade and production

20. The volume and value of wood products trade has increased since the 1960s, owing to such factors as globalization, production costs and investments in technology, logistics and infrastructure. [44] After a brief decline in trade during the economic crisis of 2008, global production and trade of major wood products [45] has grown each year since 2010, at the fastest pace in Asia and the Pacific, Europe and North America. [46] Wood removal volumes are estimated to be three times higher in 2050 than in 2010, suggesting the need to enhance production efficiency, with 242 to 304 million additional hectares expected to be managed for commercial harvesting by 2050, requiring further mechanization and a skilled workforce. [47]

21. Other factors that affect the global production and trade of forest products include the emergence of new players in wood products manufacturing, the increasing consumption of wood and wood products, especially in developing and middle-income countries, the extensive development of forest plantations and the development of technologies such as wood-based composite materials. [48] The industry faces further challenges in meeting the

[41] BWI: *Towards a framework to combat climate change in the construction, building materials, forestry and wood sectors: A worker's perspective* (Geneva, 2015).

[42] Ministry of Economic Affairs and Employment of Finland: *Wood-Based Bioeconomy Solving Global Challenges* (Helsinki, 2017).

[43] ILO: *World Employment and Social Outlook 2018: Greening with jobs* (Geneva, 2018).

[44] O. Khazri, P. Poschen and B. Ramsay: "At loggerheads? Global production chains and sustainable development in the forest industry", in *International Journal of Labour Research*, Vol. 1 (2009), Issue 1 (Geneva, ILO, 2009), pp. 49–72.

[45] Industrial roundwood, sawnwood, wood-based panels, fibre furnish, paper and paperboard, and wood-fuel, charcoal and pellets.

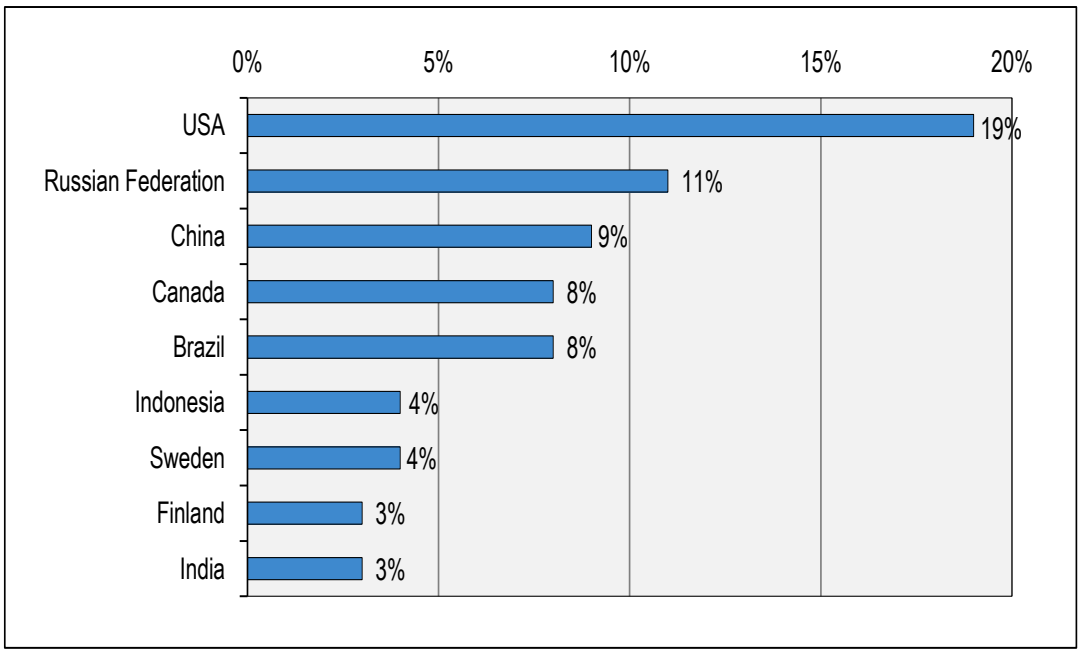
[46] FAO: *Global forest products – Facts and figures 2016*, op. cit.

[47] WWF: *WWF Living Forests Report: Chapter 4 – Forests and Wood Products* (Gland, 2012).

[48] A. Toppinen and Y. Zhang: "Changes in global markets for forest products and timberlands", Mery et al. in *Forests and society: responding to global drivers of change*, op. cit., pp. 137–156.

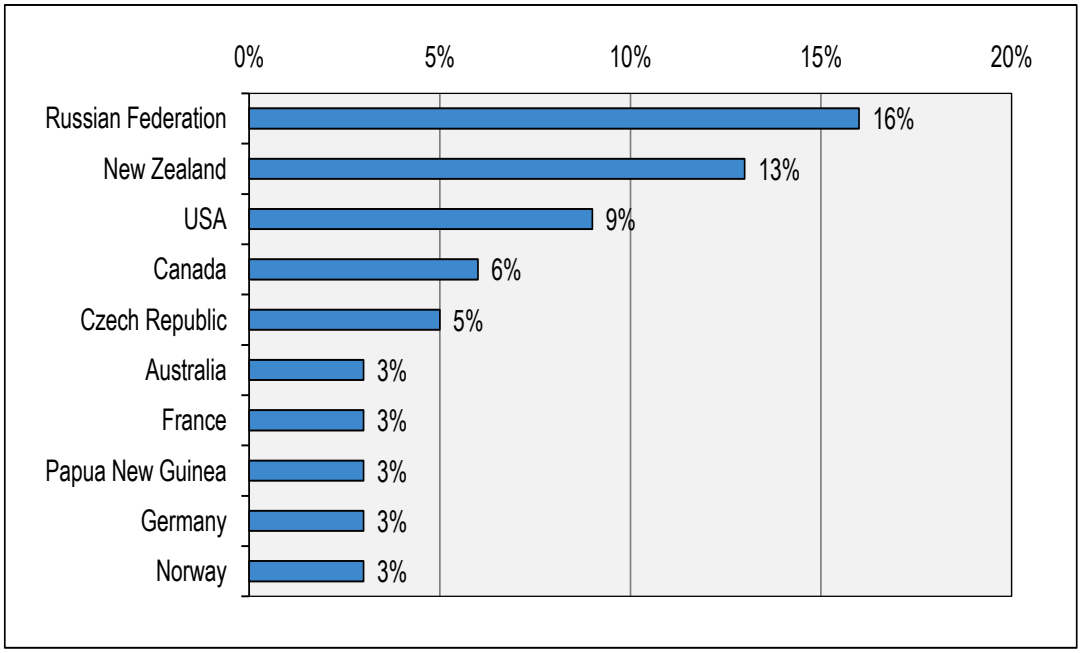
demand for increasing paper consumption, which cannot be sustained by traditionally managed forests only and is leading to the increased importance of planted forests. [49]

Figure 1. Percentage share of total global production of industrial roundwood, 2016



Source: FAO: "Forest product consumption and production", 2017.

Figure 2. Percentage share of total global exports of industrial roundwood, 2016



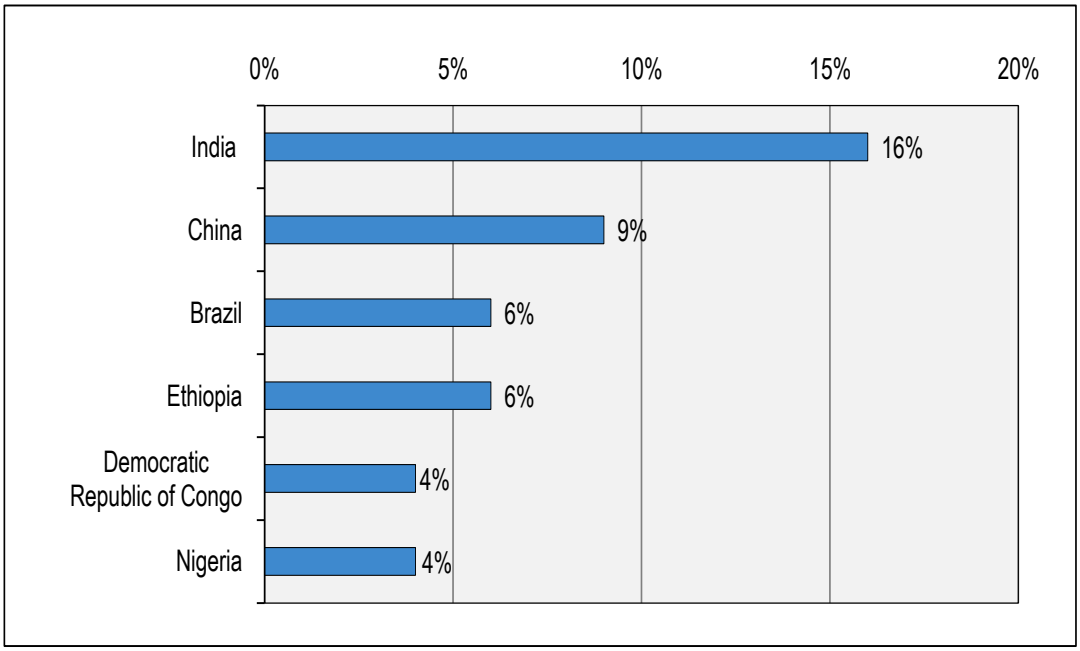
Source: FAO: "Forest products trade: Major exporters of forest products".

22. As shown in figures 1 and 2, the industrial roundwood production and trade is dominated by countries with large forest areas and/or highly developed forest industries. There are a number of emerging countries with increasing importance in terms of production, consumption and trade, including Brazil, China, India, Indonesia and the Russian Federation.

[49] Eurosif: *Forestry & Paper: Sector Report: 6th in a series* (Paris and Stockholm, 2007).

African countries contribute significantly to world trade in wood products, mainly in terms of the least processed products, with approximately 14 per cent of non-coniferous logs exported by nine African countries. [50] Most global wood-fuel production takes place in emerging economies and developing countries (figure 3). As many of these products are produced in the informal economy, they may not always be reflected in official statistics. [51]

Figure 3. Percentage share of total global production of wood-fuel, 2016



Source: FAO: "Forest product consumption and production", FAO website, loc. cit.

23. Forests provide a variety of non-wood forest products (NWFPs), including food products such as animal products, berries, mushrooms and nuts; chemical and pharmacological products; decorative materials; and non-wood fibre such as cork, rattan and thatching grasses. [52] It is estimated that, depending on the type of forest, 25 to 96 per cent of the value of forests is derived from NWFPs. [53] In previous decades, their commercialization was promoted with varied success, primarily as a contribution to the sustainable development of tropical forests, including through their potential for livelihood diversification. [54]

[50] M. Grieg-Gran et al.: *The role of forests in a green economy transformation in Africa* (UNEP, 2015).

[51] FAO: *Contribution of the forestry sector to national economies, 1990-2011*, Forest Finance Working Paper (Rome, 2014).

[52] R. Heinrich: "Harvesting of non-wood forest products", in *Encyclopaedia of Occupational Health and Safety* (Geneva, ILO, 2011).

[53] Millennium Ecosystem Assessment: *Ecosystems and human well-being: Synthesis* (Washington, DC, 2005).

[54] Forest types may be described on a continuum from natural primary forests to planted forest plantations. Planted forest is an overarching term for both planted areas within semi-natural forests and forest plantations planted for productive or protective purposes. See FAO website: "Planted forests".

Planted forests

24. One result of the globalization of wood production has been a shift towards planted forests as a source of wood and fibre. Their importance in the global timber supply, especially in industrial roundwood production and for pulp and paper industries, has increased. Productive forest plantations are commercial, often privately owned forests that can take different forms, from coppiced willow in temperate zones to mixed native species plantations and single fast-growing tree species such as pine, acacia or eucalyptus in the tropics. [55] Forest plantations with fast-growing tree varieties in tropical regions have disproportionally significant economic value thanks to the large amount of wood they can produce in short cutting cycles. [56]

25. Worldwide, planted forests account for 291 million hectares or about 7 per cent of the total forest area today, a marked increase from 186 million hectares or 4 per cent of total forest area in 1990. They produce about 60 per cent of the wood used by the forest industry and their increase is expected to continue in the future. [57] While most planted forests are in countries in temperate zones, their area is increasing in all regions and climatic domains. East Asia and Europe are the regions with the largest areas of planted forests, followed by North America and South and South-East Asia. [58]

26. Planted forests can reduce commercial logging pressures on natural forests and contribute to rural development, such as through employment creation and the provision of environmental services, in addition to providing export earnings. On the other hand, there are concerns about their environmental impact, linked to reduced biodiversity and the replacement of natural forests, the use of non-native species or cloned trees and social impacts related to their governance and tenure, social conflicts and their limited contribution to local economic development. [59]

Illegal logging

27. Illegal logging is a forestry crime, which means that timber is harvested, transported, processed, bought or sold in violation of laws. [60] While progress has recently been made in reducing illegality in the sector, it still accounts for 15 to 30 per cent of global timber

[55] WWF: *WWF Living Forests Report,* loc. cit.

[56] Fast-growing trees can produce up to twice the amount of wood per hectare per year and reach maturity two to three times faster as compared to other type of trees; see C. Cossalter and C. Pye-Smith: *Fast-Wood Forestry: Myths and Realities*, Forest Perspectives (Bogor, CIFOR, 2003).

[57] FAO: *Global Forest Resources Assessment 2015,* op. cit.

[58] T. Payn et al.: "Changes in planted forests and future global implications", in *Forest Ecology and Management*, Vol. 352 (2015), pp. 57–67.

[59] R. Pirard, H. Petit and H. Baral: "Local impacts of industrial tree plantations: An empirical analysis in Indonesia across plantation types", in *Land Use Policy*, Vol. 60 (2017), pp. 242–253; K. Andersson et al.: "More Trees, More Poverty? The Socioeconomic Effects of Tree Plantations in Chile, 2001–2011", in *Environmental Management*, Vol. 57 (2016), Issue 1, pp. 123–136; Khazri, Poschen and Ramsay, op. cit.

[60] WWF: "Illegal logging".

production and up to 90 per cent of all logging in some tropical countries. [61] It is estimated that illegal logging depresses world prices of timber products from 7 to 16 per cent, [62] causing annual losses of about US$10 to 15 billion in countries of origin. [63] The growing global demand for wood and wood products may lead to increased sourcing of timber from unsustainable and illegal sources. [64] Illegal and unsustainable logging typically involves poor working conditions and may lead to conflicts over tenure and the destruction of local livelihoods, causing deforestation, forest degradation and biodiversity loss. [65]

28. Initiatives to tackle illegal timber production and trade include the European Union (EU) Timber Regulation, which aims to reduce illegal logging by ensuring the legality of timber and timber products sold in the EU. This regulation is part of the EU Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan, which sets out the measures available for the EU Member States in tackling illegal logging, including the promotion of legal trade and sustainable procurement policies and support for the private sector. [66] To achieve its goals, the EU FLEGT initiative uses voluntary partnership agreements (VPAs) between the EU and timber-exporting countries as binding trade agreements. To date, seven countries have signed VPAs with the EU, while eight other countries are in the negotiation phase. [67] In the United States, the Lacey Act bans trade on illegally sourced wood products.[68] In Africa, five countries have signed the Zanzibar Declaration on Illegal Trade in Timber and Forest Products, which aims to combat illegal timber trade in the region by measures such as increasing collaboration between countries and improving national and regional regulatory mechanisms. [69]

[61] A. Hoare: *Tackling illegal logging and the related trade: What progress and where next?* Executive Summary and Recommendations (London, Chatham House, 2015).

[62] Seneca Creek Associates and Wood Resources International: *"Illegal" logging and global wood markets: The competitive impacts on the U.S. wood products industry*, Summary, 2004.

[63] World Bank: "Sustaining forests and livelihoods in a changing world" (2013).

[64] World Bank: *Forest Action Plan FY16–20: The WBG contribution to the Forest Agenda* (Washington, DC, 2016).

[65] Khazri, Poschen and Ramsay, op. cit.; C. Vasco et al.: "The socioeconomic determinants of legal and illegal smallholder logging: Evidence from the Ecuadorian Amazon", in *Forest Policy and Economics*, Vol. 78 (2017), pp. 133–140.

[66] "What is the EU FLEGT Action Plan?", in EU FLEGT Facility website.

[67] Cameroon, Central African Republic, Ghana, Indonesia, Liberia, Democratic Republic of the Congo and Viet Nam are countries that have signed VPAs; see EU FLEGT: "Voluntary partnership agreements", loc. cit.

[68] "U.S. Lacey Act", in Forest Legality Initiative, World Resources Institute.

[69] *Zanzibar Declaration on Illegal Trade in Timber and Forest Products*, 2015, signed by Kenya, Madagascar, Mozambique, Uganda and United Republic of Tanzania.

29. Since the EU FLEGT and REDD+ initiatives share a number of common objectives, and target and collaborate with the same actors in the sector, they have been able to complement one another: while the EU FLEGT initiative has addressed drivers contributing to forest degradation and loss, the REDD+ initiative supports the EU FLEGT initiative by promoting good governance, enhancing legal frameworks and establishing clear and equitable land tenure and use rights. [70]

2. Decent work in the forestry sector

2.1. Regulatory and policy framework for forestry

International labour standards

30. Although the International Labour Organization (ILO) does not have a specific labour standard on forestry, many of its Conventions and Recommendations as well as the fundamental principles and rights at work apply to the forestry sector. In accordance with the 1998 Declaration on Fundamental Principles and Rights at Work, all ILO member States have an obligation to promote and realize the fundamental principles and rights at work concerning child and forced labour, freedom of association and the effective recognition of the right to collective bargaining, and non-discrimination. In addition, States have the duty to adopt, implement and enforce national legislation, and to ensure that these fundamental principles and rights at work and ratified ILO Conventions protect and apply under the conditions set out in each Convention.

31. Several occupational safety and health (OSH) standards are relevant to forest work, including the Safety and Health in Agriculture Convention, 2001 (No. 184), and its accompanying Recommendation (No. 192); the Occupational Safety and Health Convention, 1981 (No. 155), its accompanying Recommendation (No. 164), and its Protocol of 2002; and the Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187), and its accompanying Recommendation (No. 197).

32. The Labour Inspection (Agriculture) Convention, 1969 (No. 129), covers forestry as a category of agriculture that must be covered by the national system of labour inspection. Countries with significant forest industries have sometimes opted to cover forestry through the general labour inspectorate under the Labour Inspection Convention, 1947 (No. 81), meaning that labour inspection activities should comprise forestry inspections. [71]

33. Social security standards, notably the Social Security (Minimum Standards) Convention, 1952 (No. 102), are globally recognized as a key reference for the design of rights-based, sound and sustainable social security systems. [72] The Social Protection Floors Recommendation, 2012 (No. 202), provides guidance for reaching universal protection by prioritizing the establishment of nationally defined social protection floors that guarantee at least access to essential health care and basic income security, as part of comprehensive social security systems providing the range and levels of benefits set out in Convention

[70] EUREDD Facility: *Linking FLEGT and REDD+*, Briefing, 2014; FAO*: FLEGT & REDD+: Working together to strengthen forest governance and mitigate climate change*, 2016.

[71] ILO: Guidelines for labour inspection in forestry (Geneva, 2005).

[72] ILO: *World Social Protection Report 2017–19: Universal Social Protection to Achieve the Sustainable Development Goals* (Geneva, 2017).

No. 102 or in other ILO social security Conventions and Recommendations that set out more advanced standards.

34. Forestry is also covered in the Employment Injury Benefits Convention, 1964 (No. 121). Each member State that has ratified the Convention is required to ensure that forestry workers and their dependants, to the extent provided in national law, are entitled to benefits, in accordance with national laws, regulations or practice, for work-related sickness, injury or death, and to take measures to provide forestry workers with the corresponding protections.

35. ILO instruments relevant to child labour include the Minimum Age Convention, 1973 (No. 138), and its accompanying Recommendation (No. 146), and the Worst Forms of Child Labour Convention, 1999 (No. 182), and its accompanying Recommendation (No. 190). While there are no data available specific to the forestry sector, more than 70 per cent of the current 152 million child labourers are found in the wider agriculture, forestry and fisheries sector. [73] In forestry, children may work in tasks requiring small size or agility, such as climbing trees for fruit, collecting honey or cutting rubber. These and other activities expose children to serious safety and health risks, such as extreme weather conditions, falling from trees, cuts and bruises, animal bites, exposure to chemical substances or contracting skin infections.

36. ILO Conventions on forced labour include the Forced Labour Convention, 1930 (No. 29), and the Abolition of Forced Labour Convention, 1957 (No. 105). In 2014, the ILO adopted the Protocol of 2014 to the Forced Labour Convention, 1930, which complements the Convention by providing specific guidance on effective measures to be taken to eliminate all forms of forced labour, as well as the Forced Labour (Supplementary Measures) Recommendation, 2014 (No. 203). Owing to the high levels of informality and the presence of illegal logging in some countries, there are likely to be cases of forced labour in forestry. Some groups of people, such as children, migrant workers, indigenous peoples and workers in the informal economy, are especially vulnerable to forced labour. [74]

Code of practice and guidelines

37. In addition to its international labour standards, the ILO has developed two forest-specific tools to support its member States: the Guidelines for labour inspection in forestry and the code of practice *Safety and health in forestry work*. Sectoral guidelines and codes of practice are not legally binding and they are not subject to ratification or to the ILO's supervisory mechanisms. Nonetheless, they are based on the full principles, rights and obligations set out in international labour standards and nothing set out in sectoral guidelines and codes of practice should be understood as lowering such standards.

38. The Guidelines for labour inspection in forestry, adopted by a Meeting of Experts in January 2005, address some of the main issues and general principles of labour standards and their inspection in the forestry sector from planting to logging and are aimed at three main groups of users: labour inspectors/certifiers, forest managers and training and educational organizations. [75]

[73] ILO: *Global Estimates of Child Labour: Results and trends, 2012-2106* (Geneva, 2017).

[74] ILO: Report and conclusions of the Tripartite Meeting of Experts on Forced Labour and Trafficking for Labour Exploitation, GB.317/INS/INF/3, Governing Body, 317th Session, Geneva, 2013.

[75] ILO: Guidelines for labour inspection in forestry, op. cit.

39. The ILO code of practice *Safety and health in forestry work*, adopted by a meeting of experts in November 1997, is designed to provide guidance to ILO constituents in their efforts to improve the safety and health performance of their national forestry sectors or enterprises. [76]

40. In order to facilitate the exchange of information among constituents on labour and social developments related to the forestry sector, the Tripartite Meeting on the Social and Labour Dimensions on the Forestry and Wood Industries on the Move, held in Geneva in 2001, adopted a resolution that called for the ILO to enhance its activities related to the promotion of various forms of social dialogue in forestry. [77]

Forest management certification

41. Businesses have the responsibility to respect human and labour rights throughout their operations, as laid out in both the ILO Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy (MNE Declaration) and the United Nations Guiding Principles on Business and Human Rights, and, as noted above, governments have the duty to implement and enforce national laws and regulations in this area. [78] Efforts of other stakeholders to promote workplace compliance in the forestry sector may support and/or supplement but cannot replace the effectiveness and efficiency of public governance systems.

42. Private compliance initiatives have been launched in the forestry sector by various industry stakeholders to promote environmentally and socially responsible forest supply chain management. Such initiatives focus on a wide array of issues, ranging from forest monitoring to product labelling, often using forest management certification as their main approach.

43. Unlike national labour laws and regulations, which are enforceable and often based on international labour standards, these initiatives are voluntary and are not legally binding. [79] While there are different national, regional and global certification schemes, the two most widely adopted are those of the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC), which provide voluntary standards for the environmentally and socially responsible management of forests.

44. Performance-based standards such as the FSC and the PEFC include specific social and labour content that refers to the adherence of international labour standards, including fundamental principles and rights at work, as the criteria for certification. They also refer to the ILO code of practice *Safety and health in forestry work* and the ILO Guidelines for labour inspection in forestry.

[76] ILO: *Safety and health in forestry work*: an ILO code of practice (Geneva, 1998).

[77] ILO: Note on the proceedings, Tripartite Meeting on the Social and Labour Dimensions of the Forestry and Wood Industries on the Move, Geneva, 17–21 Sep. 2001.

[78] United Nations: Guiding Principles on Business and Human Rights: Implementing the United Nations "Protect, Respect and Remedy" Framework, 2011.

[79] ILO: *Workplace Compliance in Global Supply Chains* (Geneva, 2016).

45. Forest management certification, particularly chain of custody certification, can allow consumers and advocacy groups to put pressure on retailers to adopt and comply with these voluntary standards, which can help consumers to select sustainable forest- and wood-based products. This has led to some major actors in the furniture and construction industries to source raw materials from certified forests. [80]

46. Since 2000, the total area of certified forests has increased substantively: in 2015 they covered 438 million hectares or 11 per cent of global forest area. [81] However, although certification was initially meant to halt deforestation in the tropics, in 2014 about 92 per cent of the certified forest area was located in the northern hemisphere: Canada and the United States accounted for 51 per cent, while 4 per cent was in Latin America, 3 per cent in Asia and 1 per cent in Africa. Of all tropical forests, approximately 2 per cent were certified. [82] The FSC estimates that 22.6 per cent of global industrial roundwood production is FSC-certified. [83]

47. In addition to their limited effect on addressing tropical deforestation, some forest certification schemes are criticized for their focus on planted forests and developed countries, while there is varying information on their impact on social and employment outcomes. In addition, the cost of certification can be high and the process burdensome, especially for small and medium-sized enterprises. In response, some certifiers have made efforts to improve the accessibility of the certification process.

48. Aside from third party certification schemes to promote SFM, country-driven national forest programmes aim to strengthen coherence within the sector and to develop policies promoting SFM. [84] They incorporate a wide range of approaches that contribute to policy development at different levels, and they provide a framework and guidance for topics such as SFM implementation, the national implementation of international commitments, including the REDD+ and EU FLEGT initiatives, and international cooperation. [85]

2.2. Employment in the forestry sector

Types of forest work

49. Forests provide a range of job opportunities directly for people living in or close to forests, as well as indirectly for those engaged in forest-related activities. Jobs in forests include those related to forest management, silviculture and forest protection, logging and wood harvesting, as well as those related to the collection and production of firewood charcoal and NWFPs.

50. Timber logging is the highest-value commercial forest activity, providing the majority of formal employment in the sector in occupations such as managers, fallers, machine operators

[80] Khazri, Poschen and Ramsay, op. cit.

[81] FAO: *Global Forest Resources Assessment 2015*, op. cit.

[82] "Forest certification" in Global Forest Atlas, Yale School of Forestry & Environmental Studies.

[83] FSC: *Global volume of FSC-certified wood*, 2018.

[84] "National Forest Programmes" in Forest Europe website.

[85] FAO: "National forest programme" in FAO website.

and technicians. The overall employment and economic impacts of the timber industry are higher than direct forest work because the transport, processing, furniture and construction industries are often closely linked to logging. [86]

51. In forest preservation and maintenance, there are different types of occupations: from tree planting and other silviculture activities to forest management and fire prevention. These workers are employed by governments at different levels or by private companies or forest owners, depending on the tenure and ownership of forests. Forest plantations, while less labour-intensive than plantation agriculture, are a source of wage employment, often in the formal economy.

52. Forests account for an important share of household income for people living in or close to them. Based on data from 33 developing countries, natural forests account for more than 21 per cent of total rural household income, while agricultural crops account for 29 per cent. [87] The levels of contribution of NWFPs to the total household income varies widely, depending on household conditions and wealth, and is often proportionally higher in poorer households. [88] NWFPs can complement subsistence or the main income source, which is often agriculture, through the collection of food, fodder, construction materials, medicines and other products, which are sometimes commercialized and become part of forest product value chains. [89]

53. Forests will continue to provide direct and indirect job opportunities in the changing world of work and have the potential to generate additional income in areas such as climate change adaptation and mitigation, bioeconomy, community forestry, wood construction, and health, recreation and tourism, among others. Many forest jobs may already be classified as green jobs, provided that they are decent and reduce the consumption of raw materials, limit greenhouse gas emissions, protect and restore ecosystems, and enable enterprises and communities to adapt to climate change. There is a potential to create more job opportunities that are aligned with the principles of just transition towards environmentally sustainable economies and societies: for example, it is estimated that if the international investment flow into the REDD+ mechanism reaches US$30 billion per year, it could sustain up to 8 million additional full-time workers in developing countries. [90]

Employment trends

54. Statistics on employment and labour issues in forestry are limited, especially in the informal economy and outside the more developed regions. Where data exist, it may not always be comparable owing to differences in applying statistical definitions and data collection methods, as well as the limited number of reporting countries. Forest data is often compiled

[86] P. Poschen, M. Sievers and A. A. Abtew: "Creating rural employment and generating income in forest-based value chains", in J. Pretzch et al. (eds): *Forests and Rural Development*, SpringerLink, 2014, pp. 145–166.

[87] A. Angelsen et al.: "Environmental Income and Rural Livelihoods: A Global-Comparative Analysis", in *World Development*, Vol. 64 (2014), Supplement 1, pp. S12–S28.

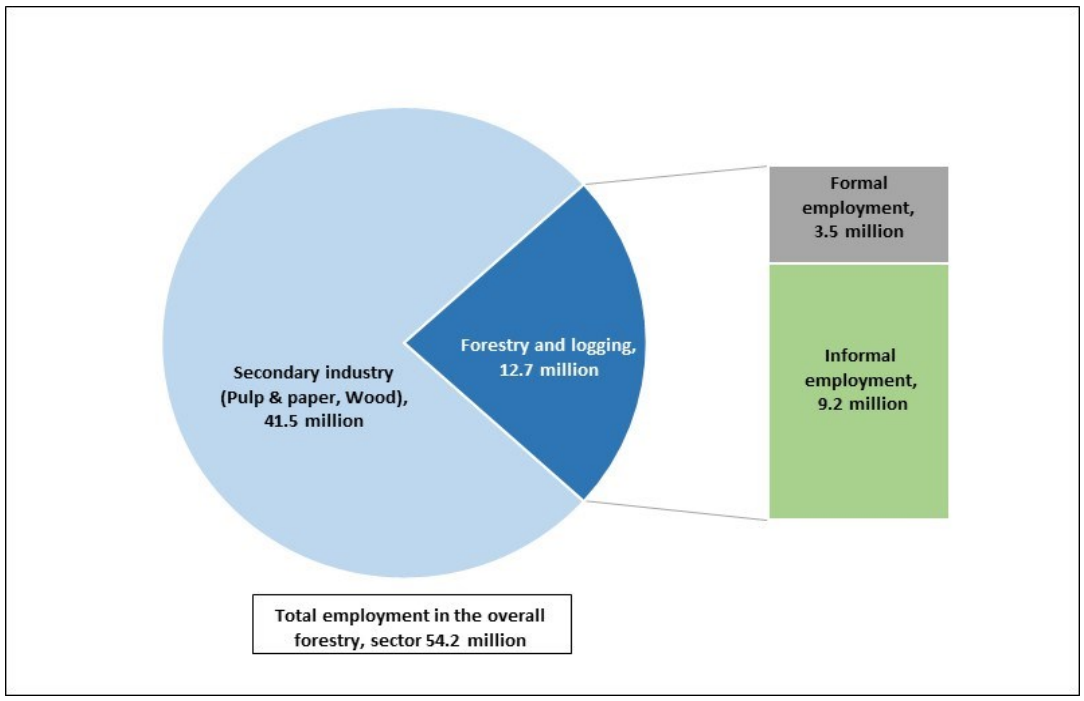
[88] B. Vira, C. Wildburger and S. Mansourian (eds): *Forests, Trees and Landscapes for Food Security and Nutrition: A Global Assessment Report*, IUFRO World Series Vol. 33, 2015.

[89] Poschen, Sievers and Abtew, op. cit.

[90] ILO: *Working towards sustainable development: Opportunities for decent work and social inclusion in a green economy* (Geneva, 2012).

within the larger category of "agriculture, forestry and fisheries" or within a more broadly defined forestry sector that includes wood and paper processing and manufacturing. In addition, data is not always disaggregated and reported by sex and age, which makes it a challenge to develop gender-responsive and age-sensitive policy interventions. [91] The prevalence of informality poses a further challenge for data collection because its extent is often either underestimated or inadequately recorded. [92]

Figure 4. Estimated global employment in forestry, 2010–11 (in millions of full-time equivalent (FTE))



Source: FAO: *Contribution of the forestry sector to national economies*, 1990–2011, op. cit.; FAO: *State of the World's Forests 2014: Enhancing the socioeconomic benefits from forests*, 2014; FAO: *Global Forestry Resources Assessment 2015*, op. cit.

55. As presented in figure 4, the FAO estimates that, worldwide in 2010–11, there were 54.2 million people employed in the overall formal and informal forest sector in the subcategories of forestry and logging and secondary manufacturing, including sawn wood and wood-based panel production and pulp and paper production. [93]

56. For the forestry and logging subsector in 2010–11, total global employment in both the formal and informal economy was estimated at 12.7 million people. [94] Of these, 3.5 million people were employed in the formal economy and 9.2 million in the informal economy, the latter mainly in wood-fuel and charcoal production in developing countries. [95] Based on the reported data, more than 70 per cent of global employment in forestry is attributed to only

[91] FAO: *Global Forest Resources Assessment 2015*, op. cit.

[92] ILO: *Women and men in the informal economy: A statistical picture*, Third Edition (Geneva, 2018); FAO: *Contribution of the forestry sector to national economies, 1990–2011*, op. cit.

[93] FAO: *Contribution of the forestry sector to national economies, 1990–2011*, op. cit.

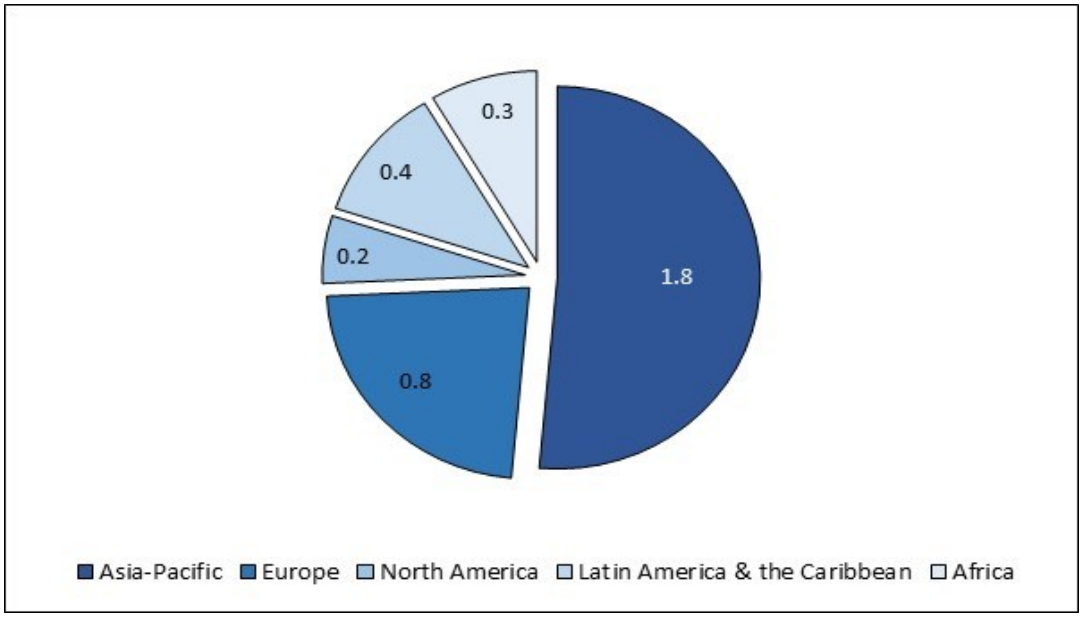
[94] FAO: *Global Forestry Resources Assessment 2015*, op. cit.

[95] FAO: *State of the World's Forests 2014*, op. cit.

three countries, India, Bangladesh and China. [96] A recent ILO report estimated the total number of forestry jobs relying on ecosystem services at 16.7 million. [97]

57. Between 2000 and 2010, total employment in the forestry and logging subsector decreased slightly from 12.9 million to 12.7 million, with most of the decline occurring in Europe and Central and North America while employment increased in South America and parts of Asia and Africa. [98] Looking at formal employment only in the forestry and logging subsector, there was a decrease of 21 per cent between 2000 and 2011, from 4.4 million to 3.5 million jobs, half of them located in Asia and the Pacific (figure 5). [99] The share of forestry employment in overall employment has been decreasing since 1990 and varies among regions, from 0.2 per cent in sub-Saharan Africa to 1 per cent in Eastern Europe. [100] Globally, there are 12 countries whose overall forestry sector employs more than 2 per cent of the workforce but in most countries that figure is well below 0.5 per cent. [101]

Figure 5. Formal employment in the forestry and logging subsector, by region, 2011
(in millions of FTE)



Source: FAO: *State of the World's Forests 2014*, op. cit.

58. Forest work is characterized by a large amount of seasonal, temporary part-time and contractual work, which may in some cases be inadequately covered by labour regulations and inspections. Small and medium-sized forest enterprises (SMFEs) make up the majority of enterprises in the sector, in both the formal and informal economy. SMFEs range from

[96] Calculations based on the FAO Global Forest Resources Assessment 2015 database.

[97] ILO: *World Employment and Social Outlook 2018*, op. cit.; variations in estimates are due to differences in data and the methodology used to analyse them; for the purposes of this report, FAO estimates are used as a basis.

[98] Calculations based on the FAO Forest Resources Assessment 2015 database.

[99] FAO: *Contribution of the forestry sector to national economies, 1990-2011*, op. cit.

[100] ibid.

[101] FAO: *State of the World's Forests 2014*, op. cit.

micro-sized one-person operations to firms of up to 100 employees. An estimated 40 million people are employed by SMFEs in the overall forest sector, providing approximately 75 per cent of all jobs in the sector. [102]

59. Forest work is often carried out through contractual arrangements involving multiple parties, and much work is done using a temporary and seasonal workforce. Outsourcing and contracting are common contractual arrangements for forestry work. Contractors, and in many cases subcontractors, may be self-employed workers or SMFEs and are mostly hired for logging activities. In Europe, the number of contractors is estimated at 50,000 enterprises, accounting for over 90 per cent of wood harvesting in countries such as Finland, Portugal and Sweden. [103]

60. In forest plantations, wage employment depends on the location and type of tree that is cultivated and is often seasonal in nature; for example, the cultivation of eucalyptus trees involves work mostly during the establishment and harvesting stages, while the cultivation of pine trees involves additional phases, such as tending during their growth, that require more work. [104] Similarly, workers can have different types of contracts for different tasks, depending on the type of tree and its product. [105] In general, plantations are estimated to create between one and three jobs per 100 hectares of plantation. [106]

61. Part-time work is especially prevalent in wood-fuel and charcoal production, which consists almost entirely of part-time self-employment, often complementing other income-generating activities. [107] It is estimated that more than 95 per cent of such activities are part-time. [108]

Employment in the informal economy

62. Informality is highly prevalent in the forestry sector, especially in developing countries, and official statistics often include only "visible" formal employment, while an estimated 75 per cent of work in the sector takes place in the informal economy. [109] This presents a major challenge for the rights of workers and has negative impacts on the development of

[102] PROFOR: "Unlocking the potential of forest sector small and medium enterprises (SMEs)", fact sheet.

[103] CEETTAR: *European Panorama of the agricultural, rural and forestry contractors*, 2018.

[104] CIFOR: *Employment in industrial timber plantations: An Ethiopian case supported by a global review*, Infobrief No. 122, May 2015.

[105] Pirard, Petit and Baral, op. cit.

[106] Cossalter and Pye-Smith, op. cit.

[107] FAO: *Promoting decent employment in forestry for improved nutrition and food security*, Background paper, International Conference on Forests for Food Security and Nutrition, Rome, 13–15 May 2013.

[108] FAO: *State of the World's Forests 2014*, op. cit.

[109] According to the ILO definition, the term informal economy refers to all economic activities by workers and economic units that are not – in law or in practice – covered or insufficiently covered by formal arrangements; see the ILO's Transition from the Informal to the Formal Economy Recommendation, 2015 (No. 204) and FAO: *State of the World's Forests 2014*, op. cit.

sustainable enterprises, public revenues and governments' scope of action. [110] Informal forestry operations, in particular logging, are often associated with decent work deficits, outdated technology, weak management systems and unsustainable use of resources. [111] Promoting transitions from the informal to the formal economy and an enabling environment for sustainable enterprises are therefore important.

63. In many sub-Saharan African countries, for example, a large majority of rural populations rely on solid biomass for cooking and heating, with much of the fuelwood gathered from standing forests and land cleared for agriculture. This contributes to deforestation, but at the same time is an important source of income for millions of people. In Kinshasa, Democratic Republic of the Congo, more than 300,000 people are involved in charcoal markets.[112] In Zambia, more than 94 per cent of employment in forestry is for charcoal and wood-fuel production. [113]

64. Informal small-scale logging is a significant source of income for many people, especially in developing countries, and informal production and trade is entrenched in timber supply chains. [114] Informal timber production, which mainly serves local markets, surpasses formal logging in many developing countries and even when undertaken on a small scale, contributes to deforestation and degradation of forest resources. [115] While such artisanal logging or informal chainsaw milling is illegal, governments often do not have the capacity to provide or enforce regulations for such activities. Informal employment is also prevalent in some tree plantations, where training opportunities and information about safety procedures and protective equipment for workers may be scarce. [116]

65. Informality in forestry is primarily the consequence of inadequate policy frameworks and their insufficient enforcement and implementation, as well as the lack of support for small-scale operators. [117] For many local producers in the informal economy, the estimated average price of US$14 per hectare for the certification and implementation of legality may be too high and the process of obtaining legal permits too complicated. [118]

[110] ILO: Transition from the Informal to the Formal Economy Recommendation, 2015 (No. 204).

[111] A. Hoare: *Improving Legality Among Small-Scale Enterprises: The Role of National-Level Indicators Within the Sustainable Development Goals*, Research Paper (London, Chatham House, 2016).

[112] J. Schure, P. Levang and K. F. Wiersum: "Producing woodfuel for urban centers in the Democratic Republic of Congo: a path out of poverty for rural households? in *World Development*, Vol. 64 (2014), Supplement 1, pp. S80–S90.

[113] E. Puustjärvi, G. Mickels-Kokwe and M. Chakanga: *The contribution of the forest sector to the national economy and poverty reduction in Zambia*, Forestry Department of Zambia and Ministry for Foreign Affairs of Finland, 2005.

[114] Hoare: *Improving Legality Among Small-Scale Enterprises*, op. cit.

[115] G. Lescuyer and P. Cerutti: Sustainable forest management policies in Central Africa: Taking the informal sector into account, in Perspective: *Forest Policies* No. 21 (Paris, CIRAD, 2013).

[116] ILO: *Labour conditions in forestry in Indonesia* (Jakarta, 2010).

[117] Hoare: *Improving Legality Among Small-Scale Enterprises*, op. cit.

[118] X. Weng: *The rural informal economy: Understanding drivers and livelihood impacts in agriculture, timber and mining*, Working Paper, IIED, 2015, citing R. Ebaa Atyi et al: "Impacts of

66. Informality is also related to forest ownership and tenure rights, especially for forest-dependent communities. Acquiring formally recognized and enforced legal tenure and ownership of land and forests is a prerequisite for many communities to enable them to fully benefit economically from forests. The absence of formal tenure, on the other hand, prevents people from making full and sustainable use of the resources on which their livelihoods depend. The threat of access to forest resources being denied by state-imposed changes in tenure arrangements may incentivize unsustainable resource use. [119]

2.2.1. Workers vulnerable to discrimination

67. The elimination of discrimination in respect of employment and occupation is identified as one of the four fundamental principles and rights at work. Women, young workers, indigenous and tribal peoples and migrants are among the groups of workers that are vulnerable to infringements of ILO labour standards, including being more prone to discrimination and over-represented in non-standard and new and emerging forms of employment. [120]

Women in forest employment

68. As stated in the 2008 Declaration on Social Justice for a Fair Globalization, gender equality and non-discrimination must be cross-cutting themes for achieving decent work objectives. Women are a high-potential group and while the global recognition of women's participation in forestry employment has been increasing since 1990, women remain under-represented in all levels of forestry work, especially in the management and decision-making positions of forest authorities, organizations, enterprises and industry bodies. [121] In Europe, it is estimated that women account for 20 per cent of the overall workforce in forestry, while globally an estimated 25 per cent of all workers in the formal forestry sector are women. [122] In Mali by contrast, women make up 90 per cent of forest workers, while in Bangladesh, Mongolia and Namibia they make up more than 40 per cent. [123]

69. Women participate in forestry activities in different ways, including by collecting NWFPs and fuelwood and by working as farmers, technicians and professionals. In developing countries, women often work in supportive tasks in sawmills and plantations and are often involved in reforestation and silviculture activities that can involve heavy labour and high exposure to chemicals. [124] As with many other sectors, women are disproportionately

international timber procurement policies on Central Africa's forestry sector: The case of Cameroon", in *Forest Policy and Economics*, Vol. 32 (2013), pp.30–48.

[119] ibid.

[120] ILO: Conclusions of the Meeting of Experts on Non-Standard Forms of Employment, GB.323/POL/3, Governing Body, 323rd Session, Geneva, 2015.

[121] ITTO: Policy Guidelines on Gender Equality and Empowering Women (GEEW), Decision 6 (LIII), International Tropical Timber Council (ITTC), Fifty-Third Session, 26 Nov. 2017 (Lima, Peru).

[122] UNECE and FAO: *Green jobs*, op. cit.; FAO: Income, employment and livelihoods from forests, Committee on Forestry, Twenty-Second Session, Rome, 23–24 June, 2014.

[123] FAO: *Global Forestry Resources Assessment 2015*, op. cit.

[124] P. Blombäck, and P. Poschen: Decent work in forestry? Enhancing forestry work and forest-based livelihoods, paper submitted to the XII World Forestry Congress, Quebec City, Canada, 21–28 Sep. 2003.

represented in low-paying jobs subject to decent work deficits, including in the lower tiers of global supply chains.

70. In many countries, women own only 10 to 30 per cent of land in rural areas, and even when women have the formal ownership of land they may not enjoy access to financial and technical support services or markets. [125] Owing to customary laws on women's land ownership and management, women are less likely to have control over the most valuable forest resources, such as timber, and are more likely to have control over NWFPs. [126]

71. To enable the full participation of women in forestry activities, the structural barriers preventing women in rural areas from access to, ownership of and control over productive resources will need to be eliminated. [127] Women also tend to be under-represented in forest user groups and forest producer organizations, partly as a result of rules allowing only one member of the household to be presented in them. [128]

72. Women bear a disproportionate share of unpaid care and household work. Owing to gender role divisions in households, women are often responsible for meeting household food and fuel needs, with an estimated 80 per cent of unpaid fuelwood collection done by women and girls. Activities related to NWFPs, such as collection, processing and sale, are often the responsibility of women and may be their primary source of subsistence. [129]

73. National programmes on REDD+ can provide women with additional employment and income opportunities. At the same time, these programmes can benefit from the knowledge, skills and experience of women thanks to their close engagement with forests. [130]

Young workers

74. The average age of forest workers is increasing. In Europe, about 30 per cent of people employed in forest-related activities are at least 49 years old. [131] While forest work requires new skills and new entrants to the labour market, fewer younger people are pursuing careers

[125] P. Bose et al.: "Women's rights to land and communal forest tenure: A way forward for research and policy agenda in Latin America", in *Women's Studies International Forum*, Vol. 65 (2017), pp. 53–59.

[126] A. Beaujon Marin and A.T. Kuriakose: *Gender and sustainable forest management: Entry points for design and implementation*, Climate Investment Funds, 2017.

[127] United Nations: "*Challenges and opportunities in achieving gender equality and the empowerment of rural women and girls"*, Agreed conclusions, Commission on the Status of Women, Sixty-Second Session, 12–24 March, 2018.

[128] FAO: *Women in forestry: Challenges and opportunities* (undated).

[129] FAO: *State of the World's Forests 2014*, op. cit.

[130] FAO: *State of the World's Forests 2018: Forest pathways to sustainable development* (Rome, 2018).

[131] Forest Europe: *State of Europe's Forests 2015* (Madrid, 2015).

in forestry, [132] potentially leading to labour shortages. [133] Young people may find the sector unattractive owing to decent work deficits such as high levels of informality, OSH risks, low productivity, low wages and perceived low social status. [134] They are at risk from the physical work involved since, while they may be physically fit, their lack of experience combined with often low levels of awareness of OSH issues and lack of training can make them more prone to accidents. In addition, the public perception of the forest industry may not always be positive. Promoting improved access to quality education and training, relevant skills and access to land, finance, markets and technology has the potential to increase the attractiveness of the sector for young people. [135]

Migrant workers

75. Although there are no reliable global data on the number of migrant workers in the forestry sector, it is estimated that more than 11 per cent of the 150 million migrant workers worldwide are employed in the agriculture sector, including forestry and fisheries. [136] Assuming that forest workers migrate in the same proportion as agricultural workers, it can be estimated that there are about 250,000 migrant workers in the forestry and logging subsector. [137] For example, about 700 forestry jobs were offered to migrants and other groups vulnerable to discrimination in Sweden in 2017, with plans to more than double the number in 2018. [138] To facilitate their integration, some countries with large forest industries provide practical sector-specific guidance in English for migrant forest workers about the rights and obligations of employers and workers.

76. Migrant workers tend to be concentrated in physically demanding and labour-intensive manual tasks, such as planting, cutting and weeding or collecting and selling wood-fuel or charcoal, often facing poor working conditions. [139] In addition, migrants may encounter challenges such as language barriers, limited access to protection, lack of contracts, isolated workplaces, workplace abuse and higher levels of informality. [140] Many migrant workers move to work temporarily in another country or region on a seasonal basis.

[132] C. Ackerknecht: "Work in the forestry sector: some issues for a changing workforce", in *Unasylva*, Vol. 61 (2010), Nos 234/235, pp. 60–65.

[133] ILO: *Globalization and sustainability: The forestry and wood industries on the move*, Report for discussion at the Tripartite Meeting on the Social and Labour Dimensions of the Forestry and Wood Industries on the Move, 17–21 Sep. 2001 (Geneva, 2001).

[134] UNECE and FAO: *Green jobs*, op. cit.

[135] FAO: *State of the World's Forests 2018*, op. cit.

[136] ILO: *Global estimates of migrant workers and migrant domestic workers: Results and methodology* (Geneva, 2015).

[137] Own calculations based on available ILO data.

[138] Skogsstyrelsen: *Tillvarata jobbpotentialen i de gröna näringarna: Naturnära job,* Delredovisning av regeringsuppdrag (Stockholm, 2018).

[139] M. Arnold et al.: "Editorial: Forests, biodiversity and food security", in *International Forestry Review*, Vol. 13 (2011), No. 3, pp. 259–264; ILO: Guidelines for labour inspection in forestry, op. cit.

[140] ILO: Guidelines for labour inspection in forestry, op. cit.; S. Moyce and M. Schenker: "Migrant workers and their occupational health and safety", in *Annual Review of Public Health*, Vol. 39 (2018), pp. 351–365.

Indigenous and tribal peoples

77. Through their livelihood systems and traditional knowledge, indigenous and tribal peoples play an important role as change agents in adapting to and mitigating the impacts of climate change and preventing deforestation. An estimated 70 million indigenous people depend largely on forests for their livelihood needs, thanks to the various products and services that forests offer. [141] In addition to forest products, forests may have aesthetic and spiritual importance for indigenous and tribal peoples. While they may have formal or customary rights to the forests they live in and depend on, the land issue remains a challenge owing to conflicting claims and uses of such forest lands. [142]

78. The Indigenous and Tribal Peoples Convention, 1989 (No. 169), calls for the recognition of the rights of ownership and possession of the peoples concerned over the lands which they traditionally occupy. If the relocation of these peoples is considered necessary as an exceptional measure, this should take place only with their free and informed consent. Convention No. 169 also deals directly with the environment, specifying the obligations of ratifying States, including the adoption of measures, in cooperation with indigenous and tribal peoples, to protect and preserve the environment of the territories inhabited by them.

79. Many indigenous and tribal peoples are challenged by the impacts of climate change and by land tenure insecurity and conflicts, which have infringed on their customary rights, retarded local economic and social development and hindered sustainable forest management. [143] This has led to economic and political marginalization, often excluding indigenous and tribal peoples from decision-making processes at different levels, in particular with regard to the exploitation of natural resources, including forestry activities. [144]

80. Indigenous women face a particularly challenging situation owing to multiple forms of discrimination both within and outside their communities. While increased participation and decision-making are considered as key issues for improving indigenous women's well-being and livelihoods, they face barriers in access and property rights to forests and other productive lands. [145] At the same time, as custodians of traditional knowledge, they have a unique role to play in climate action related to the forestry sector. In communities where women have equal rights regarding the formulation, implementation and monitoring of regulations governing forests, they participate more fully in governance processes and the

[141] ILO: *Indigenous peoples and climate change: From victims to change agents through decent work* (Geneva, 2017).

[142] Collaborative Partnerships on Forests (CPF): "SFM and indigenous peoples", fact sheet 4.

[143] Rights and Resources Initiative: *What future for reform? Progress and slowdown in forest tenure reform since 2002* (Washington, DC, 2014).

[144] A. Lazarte: *Understanding the drivers of rural vulnerability: Towards building resilience, promoting socio-economic empowerment and enhancing the socio-economic inclusion of vulnerable, disadvantaged and marginalized populations for an effective promotion of decent work in rural economies*, Employment Working Paper No. 214 (Geneva, ILO, 2017).

[145] P. Bose: "Land tenure and forest rights of rural and indigenous women in Latin America: Empirical evidence", in *Women's Studies International Forum*, Vol. 65 (2017), pp. 1–8.

protection of income and livelihoods. In such cases, indigenous women have also played an active role in discovering, reporting and preventing illegal forest activities. [146]

2.2.2. An enabling environment for sustainable forest enterprises

81. Enterprises play a key role in ensuring that forest resources are sustainably managed. The promotion of sustainable enterprises in the forest sector is a major tool for achieving decent work, sustainable development and innovation that will improve working and living conditions over time. [147] The ILO's MNE Declaration calls for enterprises to "seek to prevent or mitigate adverse human rights impacts that are directly linked to their operations, products or services by their business relationships, even if they have not contributed to those impacts".

82. The availability of reliable statistics on entrepreneurship in forestry is limited, making it challenging to quantify its overall importance. In 2010 worldwide, 76 per cent of forests were publicly owned. [148] State-owned forests are managed either through a state forest service or by granting licences of different lengths to private operators. Over the last few decades, states have improved the access of non-state actors, including local communities, to allow them to manage and benefit from forest resources. [149]

83. It is estimated that there are at least 29 million private forest owners in the world, although the actual figure is likely to be higher. [150] Of the total forest area worldwide, 11 per cent is estimated to be privately owned. [151] Different private sector actors are found in forestry, with varying interests and objectives and sizes of operation, including large multinational companies, local companies of different sizes, individual private investors, community or cooperative enterprises and small-scale forest owners. Enterprises in forestry are involved in various steps of forest product value chains, including forest management, timber harvesting, forest protection, fire protection, maintenance operations, the transportation of wood materials and secondary processing, among others.

84. Large companies involved in forestry are often linked to the paper and pulp industry through the production of wood fibre as a component of the production of paper and other products, with forest plantations being their primary source of raw material. In some developing countries, they participate in forestry through logging concessions granted by the government to exploit publicly owned forests. [152] The companies frequently oversee all the

[146] V.T. Hien et al.: "Ethnic minority women in traditional forest management at Binh Son Village, Thai Nguyen Province, Vietnam", in Tebtebba Foundation: *Indigenous women, climate change and forests*, 2011, pp. 247–266; ILO: Gender, labour and a just transition towards environmentally sustainable economies and societies for all (Geneva, 2017).

[147] ILO: Conclusions concerning the promotion of sustainable enterprises, International Labour Conference, Geneva, June 2007.

[148] FAO: *State of the World's Forests 2018*, op. cit.

[149] FAO: *State of the World's Forests 2014*, op. cit.; FAO: *State of the World's Forests 2018*, op. cit.

[150] FAO: *State of the World's Forests 2014*, op. cit.

[151] ibid.

[152] "Commercial logging", in Global Forest Atlas, Yale School of Forestry & Environmental Studies.

main processes of paper production: plantation management, harvesting and pulp and paper production. European companies in particular have been investing in increasing their production capacities in developing regions such as Latin America and Asia. [153]

85. The business practices of companies should adhere to national legislation and may be influenced by initiatives such as the ILO's MNE Declaration, the United Nations Guiding Principles on Business and Human Rights and private compliance initiatives, as well as their own corporate social responsibility (CSR) policies. As stated above, the efforts of other stakeholders to promote workplace compliance in the forestry sector can support and/or supplement but not replace the effectiveness and efficiency of public governance systems.

86. Owing to the nature of the forestry sector, the importance of consultation and dialogue with local stakeholders, including women and indigenous peoples, as outlined in Convention No. 169, is particularly important, as is the application of SFM practices, in order to ensure the applicability of any CSR activities to local contexts. [154] There are examples of enterprises in related sectors, such as palm oil, soy, cattle, timber and pulp and paper, that are making zero deforestation commitments with a view to eliminating deforestation from their supply chains. [155]

87. An inadequate enabling business environment for promoting sustainable forest enterprises is a constraint in numerous countries. Many SMFEs operating in the informal economy are typically not registered and do not contribute to tax revenues, nor are they able to access support services such as business development, extension or financial services. [156] In addition, they may not possess the permits and documentation required for processing and transporting timber, which renders such activities illegal. [157] The lack of an enabling environment often relates to land tenure and resource access; in order to fully enable forest enterprises to operate to their potential, governments may address this issue by granting and enforcing legal access to forest resources and curbing the illegal logging and harvesting of NWFPs and by simplifying bureaucratic procedures for SMFE registration and providing financial incentives for start-up SMFEs. Finally, to improve their own competitiveness in the markets, SMFEs may upgrade their technical, business and financial capacities and organize into associations of SMFEs. [158]

88. Private forest owners and operators form cooperative enterprises to strengthen their negotiating power and advance their forest management and businesses. Forestry cooperatives across the world involve at least 3.6 million people and more than 24 million hectares of forest. In addition to forest owners, some forestry cooperatives include forest workers and other community stakeholders as members. By joining a cooperative, members

[153] Eurosif, op. cit.

[154] R. Panwar and E. Hansen: "Corporate social responsibility in forestry", in *Unasylva*, Vol. 59 (2008), No. 230.

[155] FAO: *Potential implications for the forest industry of corporate zero-deforestation commitments*, Discussion paper prepared for the 58th Session of the FAO Advisory Committee on Sustainable Forest-based Industries (Rome, 2017).

[156] Hoare: *Improving Legality Among Small-Scale Enterprises*, op. cit.

[157] K. Obidzinski et al.: *Timber legality verification and small-scale forestry enterprises in Indonesia: Lessons learned and policy options*, Infobrief No. 76, CIFOR, Sep. 2014.

[158] J. Donovan et al.: *Towards an enabling environment for small and medium forest enterprise development*. Policy brief, CATIE, FAO, IIED, SNV and ICCO, 2006.

gain access to services such as design of forest management plans, joint procurement of inputs for production, processing and marketing of timber and other wood products, financial services and insurance, and training, among others. [159]

89. Community-owned forests are estimated to represent 3 per cent of all forests worldwide. However, the actual level is likely to be higher because of the different methodologies used to define and collect information on community ownership and forests that are de facto either fully or partially managed by communities. [160] Forest-dependent communities have sometimes established community-based forest enterprises to manage and safeguard forest resources. Such enterprises generate income by engaging in production and processing and trade in timber, wood products and commercial NWFPs, as well as by entering the market for environmental services. [161]

2.2.3. Skills development, education and training

90. Skills development is key for improving the productivity and sustainability of forest enterprises as well as the working conditions and employability of workers in the sector. [162]

91. Skills deficits are prevalent in the global forest sector and are more pronounced in countries with high levels of informality, low education levels and limited quantity and quality of training institutions. [163] While many countries have adequate training systems for engineering and other high-level technical skills, there are fewer programmes for developing the skills needed by timber-workers and woodworkers to perform their tasks safely and productively while protecting the environment. [164] Lack of adequate skills and qualifications is a particular concern for lower-level positions and semi-skilled workers, who would benefit from training to improve their productivity, OSH and business and marketing skills, among others.

92. There is a trend towards longer and well-structured training, especially in more developed countries, including different methods appropriate to different levels, such as longer-term formal apprenticeships for forest workers, training of trainers and individual scholarships for highly skilled positions. [165] Challenges remain, however, in responding to the needs of groups such as the self-employed, contractors and their workers and farmers working in their

[159] R. Bruce Hull and S. Ashton: "Forest cooperatives revisited", in *Journal of Forestry*, Vol. 106 (2008) No. 2, pp. 100–105; D. Kittredge: "The cooperation of private forest owners on scales larger than one individual property: international examples and potential application in the United States", in *Forest Policy and Economics*, Vol. 7 (2005), No. 4, pp. 671–688.

[160] FAO: *State of the World's Forests 2018*, op. cit.

[161] A. Molnar et al.: *Community-based forest enterprises: Their status and potential in tropical countries*, ITTO Technical Series #28, 2007.

[162] ILO: *Conclusions on skills for improved productivity, employment growth and development*, International Labour Conference (Geneva, 2008).

[163] ILO: *Globalization and sustainability*, op. cit.

[164] Ackerknecht, op. cit.

[165] FAO et al.: "Learning for the future: forestry training and education", Asia-Pacific Forests and Forestry to 2020, Forest Policy Brief 05 (undated).

own forest, [166] including through specific training offers for small-scale logging and wood-processing and for certification and the provision of ecosystem services. [167]

93. Women face particular challenges in accessing formal and informal forestry training. Both the public and private sectors may enhance women's opportunities and participation in forestry by, for example, increasing their efforts in providing gender-responsive training and job placements, as well as by promoting their entrepreneurial, advocacy and representational skills. [168]

94. In the future, highly skilled forest workers will be required for very specialized forest work. [169] As forestry is among the sectors that are likely to be most seriously affected by structural change in the wake of the green transition, forest workers will need to have the right skills and access to meaningful and high-quality training and skills upgrading in order to successfully adapt to changes in the forestry sector and to ensure a just transition. [170] This should include the adoption of new technologies and other relevant skills in areas such as renewable energy, products for wood construction, low-impact logging, carbon accounting and biodiversity protection, among others. [171] It is important to enhance coordination between vocational training providers and decision-makers in order to ensure worker engagement. [172] In addition, education and training systems should be designed to meet the needs of population groups who are vulnerable to discrimination, enabling them to contribute to and benefit from economic diversification and empowerment. [173] In that regard, indigenous and tribal peoples' knowledge about sustainable forest management should be further included in skills development programmes for enhanced sustainability. [174]

2.3. Social protection (labour protection and social security)

95. Labour protection and social security are complementary means of protecting workers and their families. [175] Social security is a human right recognized by the Universal Declaration of Human Rights in 1948 and the Covenant on Economic, Social and Cultural Rights of

[166] P. Poschen: "Skills and training", in ILO: *Encyclopedia of Occupational Health and Safety*, op. cit.

[167] FAO: *Promoting decent employment in forestry for improved nutrition and food security*, op. cit.

[168] FAO: *Time for action: Changing the gender situation in forestry*, Report of the UNECE/FAO Team of Specialists on Gender and Forestry (Rome, 2006).

[169] UNECE and FAO 2018. *Green jobs*, op. cit.

[170] ILO et al.: *Meeting skill needs for green jobs: Policy recommendations*, 2013.

[171] ILO: *Working towards sustainable development*, op. cit.

[172] BWI: *Towards a framework to combat climate change in the construction, building materials, forestry and wood sectors*, op. cit.

[173] ILO: Resolution concerning sustainable development, decent work and green jobs, adopted at the 102nd Session of the International Labour Conference, Geneva, 2013.

[174] ILO: *World Employment and Social Outlook 2018*, op. cit.

[175] ILO: Resolution concerning the recurrent discussion on social protection (labour protection), Resolution III adopted at the 104th Session of the International Labour Conference, Geneva, 2015.

1966. ILO social security standards provide a comprehensive basis for social protection, as recognized in the 2030 Agenda for Sustainable Development.

96. Gaps in protection and implementation affect the realization of fundamental principles and rights at work as well as other workers' rights related to wages, working time, OSH and social security, among others. [176] In the forestry sector, high levels of self-employment and temporary and casual work, as well as the prevalence of informal economy workers, create challenges to ensuring labour and social protection for workers, especially those vulnerable to discrimination. The promotion of a transition from the informal to the formal economy is crucial to improve the situation of the majority of workers. This demonstrates in turn the relevance and importance of measures to promote effective access to social security, including to health care, maternity, unemployment, employment injury and disability benefits, as well as old-age pensions, including by adapting social insurance schemes to the needs of various categories of workers. [177] Social protection may be one of the tools for recognizing and rewarding environmental services and to support the just transition to a greener economy. [178] Special attention should be given to providing access to social protection for groups vulnerable to discrimination, including indigenous and tribal peoples. [179]

97. In addition, supportive labour market policies, such as an appropriate minimum wage, skills upgrading policies and appropriate OSH standards and their enforcement, may be used to improve the working conditions of forest workers and may thereby contribute to increased job security and stable incomes. [180]

98. In addition to protecting safety and health, ensuring income security in various situations is important in the forestry sector. Cash for work and other public works programmes on reforestation may provide skills development and improved understanding about the importance of reforestation and sustainable management of natural resources. [181] Cash transfer programmes also support adaptation and mitigation strategies: following China's ban on unsustainable logging, a cash transfer programme helped affected rural households to find new jobs, while also providing cash payments for conservation activities, resulting in significant afforestation. [182] Maternity protection requires special attention, including by considering the exposure of working women to chemicals or physically demanding tasks, ensuring their effective access to maternity health care and providing them with income security before and after childbirth. [183]

[176] ILO: Resolution concerning promotion of rural employment for poverty reduction, Resolution II adopted at the 97th Session of the International Labour Conference, Geneva, 2008.

[177] ILO: *World Social Protection Report 2017–19*, op. cit.

[178] ILO: *World Employment and Social Outlook 2018*, op. cit.

[179] ILO: *Social protection for indigenous peoples*, Social Protection for All Issue Brief (Geneva, 2018).

[180] FAO: Social protection for building the resilience of forest dependent people, Background document, 2015.

[181] FAO: *Social protection for forest-dependent communities*, Policy Brief, 2017.

[182] ILO: *World Employment and Social Outlook 2018*, op. cit.

[183] ILO: Guidelines for labour inspection in forestry, op. cit.

99. Owing to the hazardous nature of the sector, in addition to preventive measures it is important to establish provisions for adequate financial compensation for the loss of income and the cost of treatment in the case of work-related fatalities, injuries and diseases. In this light, employment injury benefit schemes that ensure the provision of fair, equitable and effective compensation to workers in the event of accidents are important. [184] The provision of compensation should be well coordinated with accident prevention through OSH measures, which may be partially financed from contributions to such schemes, as well as the physical and vocational rehabilitation of disabled workers, which may constitute an important element of benefits provided by the schemes.

Working and living conditions

100. Working conditions in the forestry sector are often characterized by relatively high accident rates and a high incidence of occupational diseases. [185] However, the experience of several countries and forest enterprises shows that, through practical efforts, the standard of OSH can be improved considerably. [186]

101. Wage levels in the sector vary remarkably between countries and regions, as well as by tasks. Globally forestry wages tend to be below average in comparison with other sectors, but are more in parity in countries with high levels of mechanization. [187] In many countries, forestry is a low-paid industry, characterized by seasonality and leading to low annual income even when daily rates may be relatively high. [188] Figure 6 presents a mixed picture of trends in annual salary change between 2005 and 2017 for forestry workers in selected countries.

[184] ILO: *World Social Protection Report 2017–19*, op. cit.

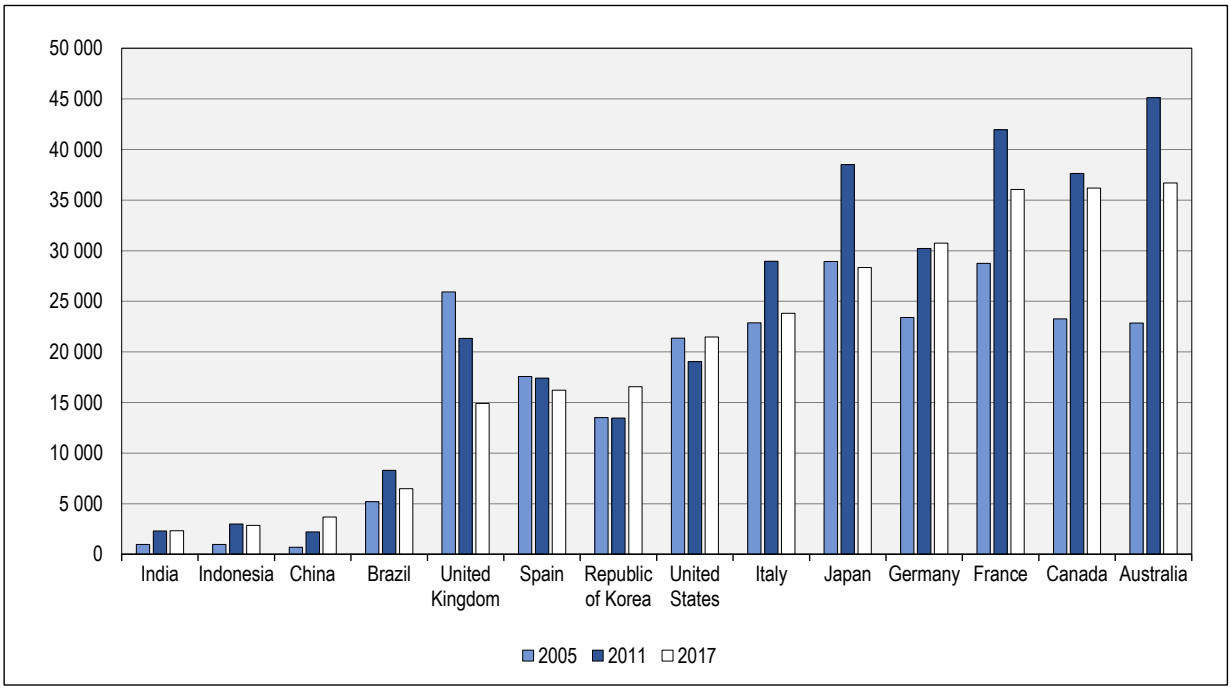
[185] ILO: *Good practices in labour inspection: The rural sector with special attention to agriculture* (Geneva, 2012).

[186] ILO: Guidelines for labour inspection in forestry, op. cit.

[187] P. Blombäck, P. Poschen and M. Lövgren: *Employment trends and prospects in the European forest sector*, Geneva Timber and Forest Discussion Papers No. 29, UNECE and FAO, 2003.

[188] ILO: Guidelines for labour inspection in forestry, op. cit.

Figure 6. Average annual salary in forestry in selected countries, 2005–17 (US$)



Source: Euromonitor International database.

102. Much of the lower paid work in forestry relates to production, that is, harvesting of produce. Remuneration may be agreed between the employer and workers or their organizations and may be based on piece rates, time wage or combinations of these. Since much forestry work is contracted on a piece rate, the income derived from a given task may be divided among a group of workers rather than paid to an individual, increasing the importance of clear contracts and supervisory arrangements. [189]

103. Owing to the nature of forestry operations, its working hours are often more flexible than in other sectors as its tasks can often be performed relatively independently and sometimes depend on external factors such as the season, weather conditions or required tasks. [190]

104. Living conditions in the forestry sector may be challenging. Especially in developing countries, forestry operations are often temporary and seasonal and are located in isolated camps, where housing, water and food supply, recreational opportunities and medical attention may be limited. Isolation and limited accessibility make labour inspection and the enforcement of labour standards more challenging, leading to potentially high labour turnover, especially in camps with poor working and living conditions. [191]

2.4. The role of social dialogue

105. The high number of informal workers, self-employed workers and small and medium-sized enterprises, in addition to the seasonality and geographic isolation that characterize the forestry sector, together complicate the organization of workers and consequently the

[189] ILO: Guidelines for labour inspection in forestry, op. cit.

[190] ibid.

[191] ibid.

establishment of social dialogue. [192] Social dialogue and stakeholder participation may defuse conflict and ensure fair and equitable sharing of the costs and benefits of forest management and utilization. [193]

106. Workers and employers in the forestry sector, as in other sectors, should have the right to establish and join organizations of their own choosing. [194] In many countries, different types of rural workers' organizations coexist, such as trade unions on the one hand and producer associations, cooperatives and other types of organizations on the other. [195]

107. At the global level, the Building and Wood Workers' International (BWI) brings together more than 140 wood and forestry trade unions across the world, supporting them in organizing and representing workers, collective bargaining and influencing policies to improve working and living conditions in the forestry sector. [196] Estimates of the unionization rates of forest workers are limited, but rates for the overall agriculture, forestry and fisheries sectors are in many countries lower than unionization rates for other sectors.

108. Forest contractors' associations have been established in Europe and elsewhere to function as a platform for improving the conditions of forest contractors and to influence forest policymaking at both the national and regional levels. [197]

109. The level of social dialogue in the forestry sector varies by country and region. In some countries, social dialogue is limited in rural areas, where the rural working population may not be involved in formal social dialogue processes and employers' and workers' organizations tend to be fragmented, with low levels of membership. [198] According to the ILO Guidelines for labour inspection in forestry, the right of workers to organize and elect representatives should be respected. Employers should be encouraged to engage in meaningful discussions with workers' organizations, where they exist, and workers should channel their inputs through these established mechanisms. [199]

110. Some countries, especially those with a long tradition of social dialogue and strong social partners' organizations at various levels, have forestry-specific collective bargaining agreements in place. In Germany, 13 per cent of employees in the agriculture, forestry and fishing sectors work in enterprises covered by collective bargaining, compared with 45 per cent in the overall economy. [200] In Finland, forest industry employer and employee

[192] ILO: *Working towards sustainable development*, op. cit.

[193] Poschen, *Social criteria and indicators for sustainable forest management*, op. cit.

[194] ILO: Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87).

[195] ILO: *Giving a voice to rural workers*: *General Survey concerning the right of association and rural workers' organizations instruments*, Report III (Part 1B), International Labour Conference, 104th Session, Geneva, 2015.

[196] BWI: "About" – Building and Wood Workers' International.

[197] Blombäck, Poschen and Lövgren, op. cit.

[198] ILO: *Social dialogue and tripartism*, Report VI, International Labour Conference, 107th Session, Geneva, 2018.

[199] ILO: Guidelines for labour inspection in forestry, op. cit.

[200] Destatis (Federal Statistical Office), Germany: "Collective bargaining coverage".

associations have agreed on a collective labour agreement for the 42,000 workers in forestry and paper industries, [201] while in Sweden a collective agreement has been established between the Swedish Association of Industrial Employers and the Swedish Union of Forestry, Wood and Graphical Workers, covering more than 50,000 workers in those three sectors. [202] In the Netherlands, there are provisions and clauses for forest workers, including self-employed workers, in collective bargaining agreements. Ensuring the participation of indigenous and tribal peoples in social dialogue is important. In this respect, Convention No. 169 calls for the establishment of conflict resolution procedures.

3. Occupational safety and health in forestry

111. Forestry is among the most hazardous sectors for workers. Its operations take place outdoors and in highly varying terrain and climatic conditions, subjecting workers to occupational risks that are different from those of industrial workers, for example. While the types of OSH hazard and risk have largely remained unchanged over the past decades, the effects of climate change, changes in work environments, work organization and work processes and the introduction of new technologies have all had an impact on OSH in the forestry sector.

3.1. Types of hazard and risk for workers in logging, tree planting and harvesting non-wood forest products

Physical safety hazards and workload

112. Common physical and ergonomic hazards in forestry work include falling trees and branches; slipping; machine-related hazards such as cuts and the noise and vibration of chainsaws; hazards related to transporting timber; challenging climatic conditions such as extreme heat or cold; and weather-related hazards such as floods, fires and storms. [203] Although it has the potential to reduce some physical safety hazards, increased mechanization in the sector has added new hazards, such as accidents involving the operation of large vehicles and the sedentary-related disease risk of spending long hours sitting while operating machinery. [204]

113. Exposure to physical hazards varies depending on the type of work and equipment used. Motor-manual workers are exposed to different climatic conditions, different levels of noise and dust and different types and intensities of vibration than machine operators. [205] The chainsaw remains a common type of work equipment in forestry across regions and while it is an efficient tool, it imposes a high risk of injury, in particular to the head, shoulders, arms,

[201] Finnish Forest Industries: "Labour market".

[202] Industri Arbetsgivarna: "What is a Collective Bargaining Agreement?" Swedish Association of Industrial Employers.

[203] M. Gifford: *Safety and health in the European forestry sector: The impact of more open markets and of increased regulation*, Working Paper 264 (Geneva, ILO, 2009); ILO: Guidelines for labour inspection in forestry, op. cit.

[204] M. Mylek and J. Schirmer: "Beyond physical health and safety: supporting the wellbeing of workers employed in the forest industry", in *Forestry: An International Journal of Forest Research*, Vol. 88 (2015), No. 4, pp. 391–406.

[205] B. Ponten: "Physical safety hazards", in *Encyclopaedia of Occupational Health and Safety*, op. cit.

hands, legs and feet. [206] During the harvesting of NWFPs, such activities as tree climbing, cutting, digging and the manual transportation of products impose physical safety risks. The risk of accidents is often higher in small-scale forestry operations, where work and safety equipment tends to be inadequate and workers less qualified. [207]

114. Physical workload in forestry work ranges from light to moderate (e.g. nursery work, planting) to heavy and very heavy (motor-manual and manual harvesting). [208] Increased mechanization has reduced work with a high physical load, but other health issues remain, such as one-sided strain, which may result in musculoskeletal disorders and repetitive strain injuries. [209]

Psychosocial factors

115. In the forest industry, psychosocial factors include: job satisfaction and security; the mental workload; susceptibility and response to stress; coping with perceived risks; work pressure, overtime and fatigue; the need to endure adverse environmental conditions; social isolation in work camps with separation from families; work organization; and teamwork skills. [210] Work in forestry can affect workers' mental and physical health in different ways, depending on the demands of a job and organizational matters such as clarity of roles and working environment. [211]

116. The forest industry is sometimes the subject of social conflict concerning its ecological, social and economic impacts and it may sometimes suffer from negative public perceptions by association with deforestation and other environmental risks. [212] These may have an impact on workers' well-being, which may in turn result in lower productivity, increased stress levels, higher levels of absenteeism and decreased job satisfaction. [213]

117. Some research indicates a relation between the method of payment and accident rate. Piece rate pay, together with payment according to time worked, is a common method of remuneration in forestry and may be related to risky behaviour by workers, increasing the

[206] European Agency for Safety and Health at Work: *Occupational safety and health in Europe's forestry industry*, E-fact 29, 2008.

[207] ILO: Guidelines for labour inspection in forestry, op. cit.; J. Klun and M. Medved: "Fatal accidents in forestry in some European countries", in *Croatian Journal of Forest Engineering*, Vol. 28 (2007), No. 1, pp. 55–62.

[208] B. Ponten: "Physical load", in *Encyclopaedia of Occupational Health and Safety*, op. cit.

[209] E. Kastenholz, J. Morat and U. Seeling: *Good practices in safety and health in forest enterprises*, Paper presented at FORMEC 2017 (Braşov, Romania).

[210] P. Poschen and M. Juntunen: "Psychosocial factors", in *Encyclopaedia of Occupational Health and Safety*, op. cit.

[211] ILO: Guidelines for labour inspection in forestry, op. cit.

[212] FAO: *Public perception of forestry industry and environment*, Item 8, Advisory Committee on Paper and Wood Products, Shanghai, 6 June 2007.

[213] Mylek and Schirmer, op. cit.

likelihood of accidents, injuries and death and hindering risk prevention. [214] According to the ILO Guidelines for labour inspection in forestry, "under no circumstances should the payment system encourage workers to take risks or to engage in unsafe work to meet production targets". [215]

Chemical and biological hazards

118. Forestry workers may be exposed to chemical substances, such as fuel and oils from portable machines, exhaust gases and pesticides and herbicides, as well as biological hazards such as poisonous plants, large mammals, animal-transmitted diseases, poisonous snakes, scorpions and spiders and ticks, bees and other insects, in addition to forest fires which are intensified by climate change. [216] When not correctly stored, mixed or applied, chemicals used in silviculture, timber protection and maintenance can cause both acute and long-term effects on workers. [217]

119. Vector-borne diseases carried by insects such as ticks, flies, mosquitos and fleas are a concern for forestry workers, especially due to the location and nature of their work. The global distribution of insects and the diseases they carry is shifting owing to changes in climate, global travel and trade and unplanned urbanization, [218] resulting in extension of transmission seasons or re-emergence, leading to a higher incidence of these diseases. In temperate regions, Lyme's disease is one of the best-known vector-diseases, [219] while in tropical areas malaria and dengue fever are risks in forests. [220]

3.2. Developments in occupational safety and health

Changes in organization, workforce and labour market

120. Most forestry accidents are caused by poor organization and supervision, inadequate equipment, poor planning and the lack of skills of workers, supervisors and managers. [221] While differences in size, scope, economic stability and culture of enterprises should not dilute the application of general OSH principles, [222] the prevalence of micro, small and medium-sized forest enterprises has an impact on OSH, including through higher risk of accidents. These enterprises may have limited professional management capacities and

[214] B. Johansson, K. Rask and M. Stenberg: "Piece rates and their effects on health and safety: A literature review", in *Applied Ergonomics*, Vol. 41 (2010), No. 4, pp. 607–614.

[215] ILO: Guidelines for labour inspection in forestry, op. cit.

[216] J. Kangas: "Chemical hazards", in *Encyclopaedia of Occupational Health and Safety*, op. cit; J. Augusta: "Biological hazards among forestry workers", in ibid.

[217] ILO: Guidelines for labour inspection in forestry, op. cit.

[218] WHO: "Vector-borne diseases", fact sheet.

[219] Gifford, op. cit.

[220] ILO: Guidelines for labour inspection in forestry, op. cit.

[221] ibid.

[222] ILO: *Safety and health in forestry work*: an ILO code of practice, op. cit.

employ workers who are frequently not formally trained and have low education levels. In addition, many of these enterprises face economic pressures resulting from the low profit margins in their business, [223] leading to challenges in ensuring the quality of employment and appropriate OSH management. [224] In addition and in view of demographic transitions and the shortage of young people working in forests, challenges such as the capacity to cope with strain are a matter of concern for the older forestry workforce. [225]

121. The forestry sector is experiencing cross-border movement of workers, which is expected to continue and grow. This presents challenges from the perspective of the availability of workers' medical records across countries, as well for effective communication and ensuring understanding of safety and health information. [226]

Technological changes

122. Convention No. 184 states that workers shall have the right "to be informed and consulted on safety and health matters including risks from new technologies". Trends related to mechanization and improved safety provisions for higher-risk occupations within the industry have resulted in declining rates of physical injury in recent decades. [227]

123. Within Europe, the highly mechanized Nordic countries have been successful in reducing exposure to accident risks relative to motor-manual work, such as chainsaw-based methods. [228] In Sweden, the risk of accidents and health hazards was reduced by 73 per cent among mechanized logging-machine operators as compared to chainsaw-based methods. Improvements resulting from better ergonomics and safety organization were observed, with a reduced accident frequency rate among chainsaw operators by 48 per cent and among logging-machine operators by 70 per cent. [229] Drastic reductions in accident rates following mechanization have been observed in other countries, such as Brazil, Canada, New Zealand and the United States. Despite that positive trend, felling trees remains the most hazardous activity in forestry, with chainsaws playing a part in many accidents. [230]

[223] E. Kastenholz, J. Morat and U. Seeling: *Integrated prevention concept for safety and health in forest operations*, paper presented at FORMEC 2016 (Warsaw, Poland).

[224] ILO: *Globalization and sustainability*, op. cit.

[225] Kastenholz, Morat and Seeling, op. cit.

[226] Gifford, op. cit.

[227] Mylek and Schirmer, op. cit.

[228] Forest Europe, op. cit.

[229] S.-A. Axelsson: "The mechanization of logging operations in Sweden and its effect on occupational safety and health", in *International Journal of Forest Engineering*, Vol. 9 (1998) No. 2.

[230] J.J. Garland: *Accident reporting and analysis in forestry: Guidance on increasing the safety of forest work*, Forestry Working Paper 2 (Rome, FAO, 2018).

124. Furthermore, many occupations in forestry continue to expose workers to a high risk of physical injury or disease, based on how mechanization puts stress on the worker. For example, operating heavy machinery imposes a risk of injury together with sedentary-related disease risks associated with spending long hours sitting while operating machinery, as well as musculoskeletal disorders such as repetitive strain injuries. In some Central and Eastern European countries mountainous terrain and incomplete mechanization are factors in relatively high accident rates. [231]

Impact of climate change

125. Extreme weather events related to climate change have increased, as illustrated by the recent frequency and severity of forest fires across the globe, while salvage logging and clearing from forests that have faced fire or other natural disaster are among the most dangerous tasks in forestry work. Such events place extra demands on the forestry labour force and an effective response requires the ad hoc availability of an adequately trained workforce. [232]

126. The changing climate is one of the factors influencing the spread of vector-borne diseases carried by ticks, mosquitos, flies and fleas, resulting in longer transmission seasons and dispersion to geographic areas where the diseases were not previously known. [233] For forestry workers, this means a potentially higher exposure to such diseases. Furthermore, climate-driven heat stress and the related risks of dehydration may have an impact on forest workers, who often need to wear protective clothing that may reduce the body's capacity to manage heat. This may lead to heat-related illnesses, such as heat stroke, exhaustion or heat cramp, among others. [234]

Data on accidents, injuries, diseases and fatalities

127. Convention No. 155 and its Protocol of 2002 call for governments, in consultation with employers' and workers' organizations, to establish procedures for the recording and notification "of occupational accidents and occupational diseases and, as appropriate, dangerous occurrences, commuting accidents and suspected cases of occupational diseases", and for employers to record information on such accidents and diseases. In addition, governments are required to establish and apply procedures for the production of annual statistics on occupational accidents and diseases. Nonetheless, the availability of reliable and comparable OSH data on forestry at the national level continues to be a challenge, owing to a lack of consistency in interpretation and implementation of criteria for OSH in the forestry sector, among other things. In addition, accidents in the sector are generally considered to

[231] P. Albizu-Urionabarrenetxea, E. Tolosana-Esteban and E. Roman-Jordan: "Safety and health in forest harvesting operations: Diagnosis and preventive actions: A review", in *Forest Systems*, Vol. 22 (2013), No. 3, pp. 392–400.

[232] Gifford, op. cit.

[233] WHO: *Global vector control response 2017-2030* (Geneva, 2017).

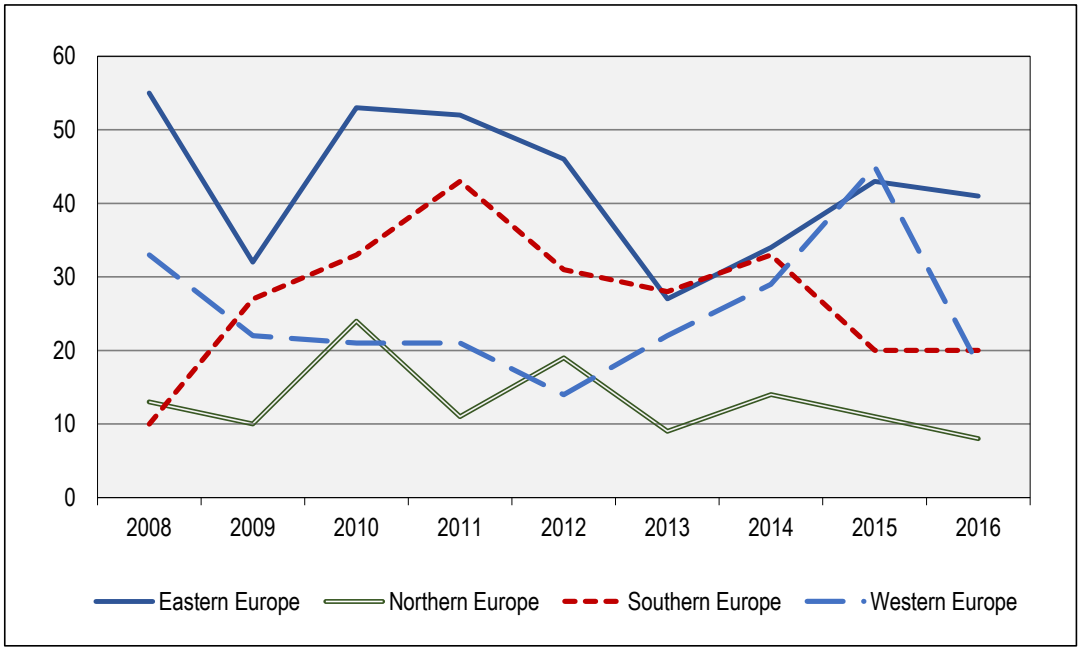
[234] D. Staal Wästerlund: *Managing heat in agricultural work: Increasing worker safety and productivity by controlling heat exposure*, Forestry Working Paper 1 (Rome, FAO, 2018).

be under-reported, especially in small-scale operations. [235] This is a common challenge for sectors such as forestry, in which informal employment is prevalent. [236]

128. Available data shows that forestry is a hazardous profession that has relatively high accident rates, with notable differences between and within regions. Some European countries report that one in eight forestry workers suffer an accident every year, while others report that less than one in 200 forestry workers suffer an accident every year. [237] Differences in the number of accidents, however, may arise from inconsistent methods of collecting and reporting data and of recording and notifying occupational accidents and diseases. [238] In addition, it is likely that accident rates would be higher if reported figures included non-professional and illegal operations. [239]

129. Figures 7 and 8 show a declining trend in the incidence of both fatal and non-fatal accidents from 2008 to 2016 in Europe. Indeed, largely thanks to the positive trend in southern Europe, forestry and logging was the sector with the highest overall decrease in the incidence of non-fatal accidents in Europe from 2010 to 2015. [240]

Figure 7. Number of fatal accidents in forestry and logging in Europe, 2008–16



Source: Eurostat. Information based on Eurostat data.

[235] Garland, op. cit.; ILO: Guidelines for labour inspection in forestry, op. cit.

[236] Gifford, op. cit.

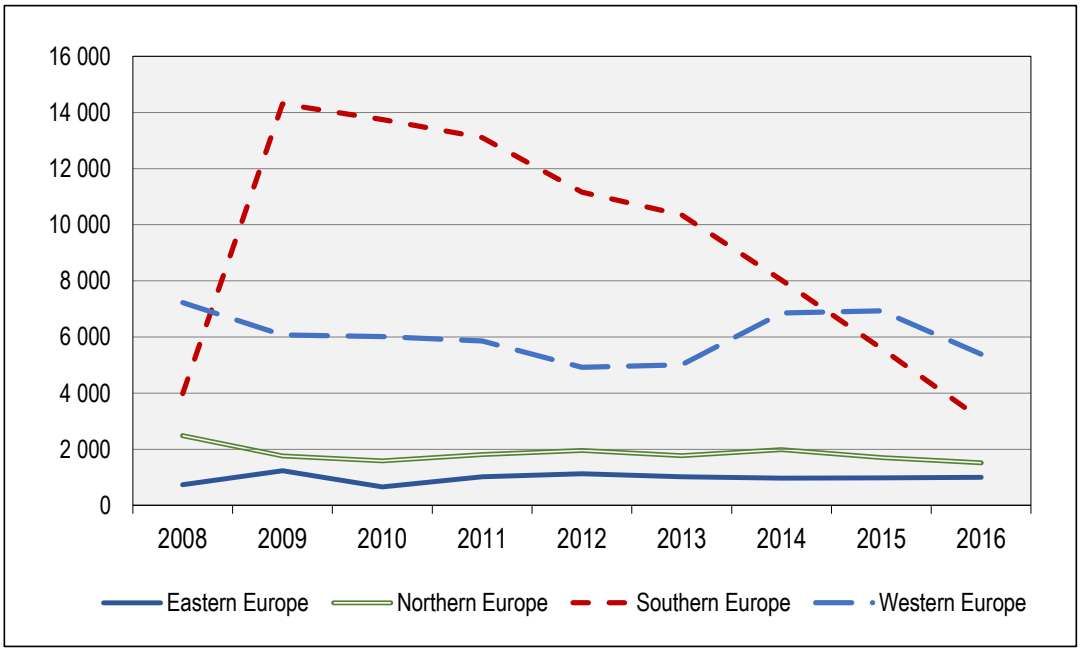
[237] Forest Europe, op. cit.

[238] ILO: *Recording and notification of occupational accidents and diseases*: an ILO code of practice (Geneva, 1996).

[239] Garland, op. cit.

[240] Eurostat: "Accident at work statistics".

Figure 8. Number of non-fatal accidents in forestry and logging in Europe, 2008–16



Source: Eurostat. ibid.

130. Apart from the physical health of workers, there is a general lack of robust data concerning the broader well-being of forest industry workers. [241] Reported data largely concerns workers in the wood-harvesting and wood-processing industries, excluding workers in NWFPs. Also, there is limited analysis on possible differences in accident rates between forest plantations and operations in natural forest areas.

3.3. Creating a safety and health culture: Measures to address OSH challenges

131. Creating a national preventive safety and health culture "in which the right to a safe and healthy working environment is respected at all levels, where government, employers and workers actively participate in securing a safe and healthy working environment through a system of defined rights, responsibilities and duties, and where the principle of prevention is accorded the highest priority" is essential for improving OSH at different levels. [242] As stated by the ILO code of practice *Safety and health in forestry work*, "satisfactory safety and health levels are achieved when a number of closely related principles have been applied at national, enterprise and worksite levels". [243] In addition, the code of practice calls for employers to ensure that all workers, including contractors and their workers and self-employed persons, are made aware of the relevant laws, regulations, requirements, codes of practice, instructions and advice relating to prevention of accidents and diseases. [244]

[241] Mylek and Schirmer, 2018, op. cit.

[242] ILO: Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187).

[243] ILO: *Safety and health in forestry work*: an ILO code of practice, op. cit.

[244] ibid.

132. Convention No. 187 calls for the formulation and implementation of a widely publicized national programme on OSH to promote, among other things, the development of a national preventive safety and health culture. OSH awareness can be raised through initiatives that include the training and certification of forest operators, supported by codes of practice and other materials, such as those of Australia, Brazil or South Africa. [245] The media has the ability to reach single forestry operators who may otherwise be difficult for inspection authorities to reach. [246]

Legal and policy framework

133. An effective and enabling legal and policy framework in promoting OSH is a starting point for an adequate safety and health culture. Developing safety regulations for forestry is challenging because legislation may often not be forestry-specific, while laws are difficult to apply and enforce in remote and frequently changing outdoor locations as they have been drafted with factory-type workplaces in mind. [247]

134. Since the 1990s, there has been a surge of new standards and regulations in the forestry sector with a view to reducing accident rates and contributing to the creation of healthier and safer working conditions. [248] A number of ILO instruments, tools and materials address OSH issues in general and forestry in particular. Convention No. 184 and its accompanying Recommendation No. 192 also cover forestry activities, with the exception of the industrial exploitation of forests. Other OSH standards, such as Convention No. 155, its accompanying Recommendation No. 164 and its Protocol of 2002, and Convention No. 187 and its accompanying Recommendation No. 197, play a key role in enforcement of OSH legislation and in promoting the development of national OSH policies and programmes, in consultation with the most representative organizations of employers and workers.

135. In addition to that provided by legal instruments, practical guidance on promoting and improving OSH in the forestry sector is provided by non-legally-binding tools such as the code of practice *Safety and health in forestry work* and the Guidelines for labour inspection in forestry (2005), while general direction on planning and organizing for safety and health is provided by the Guidelines on occupational safety and health management systems (2001). [249]

136. The code of practice *Safety and health in forestry work* covers all types of forestry workers and emphasizes that safety starts at the top, whether at the national level, in the enterprise or at the worksite. It outlines a safety management system for enterprises that integrates safety into overall enterprise management and offers detailed technical guidance on logging and other high-risk operations such as tree climbing, harvesting of windfalls and forest

[245] WorkCover New South Wales, Australia: *Safety in Forest Harvesting Operations*: *Code of Practice 2002*, Government Gazette No. 178, 2002; ILO: *Cartilha sobre o trabalho florestal* (Brasilia, Brazil, 2009); Department of Labour, South Africa: *Health and safety in forestry*, pamphlet, 2013.

[246] Gifford, op. cit.

[247] O. Wettmann: "Rules, legislation, regulations and codes of forest practices", in *Encyclopaedia of Occupational Health and Safety*, op. cit.

[248] Ackerknecht, op. cit.

[249] ILO: *Guidelines on occupational safety and health management systems: ILO–OSH 2001*, second edition, 2001.

firefighting. [250] While applicable internationally, the code is especially useful for countries that lack relevant regulations and guidelines; it has been translated into several languages, including Bahasa Indonesia, Chinese, Polish, Portuguese and Russian, and is used in a number of countries as a basis for OSH policies in the forestry sector.

137. Employment issues at the national level, including on OSH, are often regulated as part of general legislation on labour, OSH and forest laws and not by forest-specific OSH legislation. [251] The ILO maintains a global database on OSH legislation that maps national OSH legislation, regulatory frameworks and various legal criteria. [252] To complement legislation, countries have developed national codes of practice for OSH in the forestry sector, which may be either voluntary or binding, depending on the country. [253] Voluntary forest management certification schemes may include OSH provisions and requirements.

Labour inspection

138. The existence of an effective and adequately resourced labour inspection system based on well-formulated and transparent labour legislation has a positive impact on OSH. It provides protection of rights, encourages safe and healthy work practices and improved productivity, and contributes to the creation of a workplace health and safety culture. [254] A public labour inspection system is an essential element for improving the safety and health of workers in the forestry sector. [255]

139. The nature of forestry, which often operates at remote worksites and locations, as well as the limited financial and human resources of labour inspectorates, are major challenges faced by the labour inspectorate in monitoring and ensuring compliance. [256] Therefore, in some cases other organizations such as employers' and worker's organizations may support public labour inspection in OSH management, including through supporting contractors in complying with national regulations and labour standards. [257]

140. The ILO Guidelines for labour inspection in forestry include a specific section on addressing OSH issues in labour inspection. Labour inspectors in forest operations should focus on issues such as risk and safety management, evidence of accident records, the use and quality of personal protective equipment (PPE), the state of machinery, levels of noise, vibration and other parameters, the status of contractors and contract workers, insurance and social

[250] ILO: *Safety and health in forestry work*: an ILO code of practice, op. cit.

[251] Forest Europe, op. cit.

[252]ILO: Global Database on Occupational Safety and Health Legislation (LEGOSH), ILO website.

[253] J. Cedergren: *Occupational Health and Safety in Forestry: Issues of Relevance in Tropical Concessions*, FAO, 2016.

[254] ILO: Resolution concerning promotion of rural employment for poverty reduction, op. cit.

[255] ILO: Guidelines for labour inspection in forestry, op. cit.

[256] ILO: *Safety and health in forestry work*: an ILO code of practice, op. cit.

[257] ILO: Guidelines for labour inspection in forestry, op. cit.; FAO: *Guide to good practice in contract labour in forestry*, Report of the UNECE/FAO Team of Specialists on Best Practices in Forest Contracting (Rome, 2011).

security registration, and the status of specific groups of workers such as young, women and migrant workers. [258]

Skills development on OSH

141. Unlike in many other industries, where in order to reduce OSH hazards, OSH considerations are included in the design of equipment, workplaces and work methods, in the forestry industry exposure to risks is largely determined by the technical knowledge, skills and experience of the individual worker and supervisor, as well as their commitment to working together to plan and execute their work. Training is therefore crucial in determining the standard of OSH in forestry work. [259] Many countries have training systems for workers with forestry engineering and other high-level technical skills, but often have fewer training systems for forestry operators (such as timber and woodworkers) to develop the skills needed to be able to work safely and productively. The limited availability of quality training programmes remains a challenge faced by forest enterprises in increasing the productivity and safety of their operations. [260]

142. The cross-border movement of workers creates additional challenges for skills development, including the approval of foreign training qualifications. Some countries may not accept such qualifications from other countries, partially owing to differences in OSH coverage, and foreign workers may need to pass a formal assessment to demonstrate their competencies. In the European Union, for example, the harmonization of OSH legislation has improved the situation. [261] When planning training programmes for migrant workers, language barriers need to be considered, in addition to social and cultural contexts such as literacy, language and the cultural appropriateness of materials and training procedures. [262] Examples of accessible OSH materials include those of Sweden and Switzerland, where detailed content on OSH measures at the workplace have been published in images and in English, making them more accessible for migrant workers.

143. Other emerging practices on OSH training are found in countries where compulsory training programmes for forest workers have been established. In Germany, for example, operators are required by law to undergo a three-year course under the guidance of a forestry supervisor before they are allowed to independently operate forestry equipment. An additional advanced course is required for those desiring to become supervisors. [263]

144. Various causes of psychosocial issues, for example, may be addressed through training programmes. Workplace stress may be addressed by the implementation of workplace stress management initiatives. National skill development policies and strategies may address

[258] ILO: Guidelines for labour inspection in forestry, op. cit.

[259] Poschen, "Skills and training", loc. cit.

[260] Ackerknecht, op. cit.

[261] Gifford, op. cit.

[262] T. O'Connor et al: "Occupational safety and health education and training for underserved populations", in *New Solutions*, Vol. 24 (2014), No. 1, pp. 83–106.

[263] Ackerknecht, op. cit.

stress resulting from social conflict and assist workers in coping with negative reactions to the forest industry on the part of external stakeholders. [264]

Developing effective OSH management systems

145. Effective OSH management system at the enterprise level ensures that the employer approaches OSH systematically, is committed to OSH and takes into account its various aspects, including compliance with national regulations. In principle, the OSH management system contains the elements of policy, organizing, planning and implementation, evaluation and action for improvement. [265] It may often be impractical for forest enterprises to have separate management systems in place for different issues and the management of labour standards is often combined as one overall management system. [266] The ILO code of practice *Safety and health in forestry work* has a dedicated chapter on OSH management that outlines responsibilities at different levels of management system. [267]

146. Occupational accident and injury insurers play an important role in implementing OSH management systems as well as in labour inspection, while protecting both workers and employers from economic consequences caused by accident or occupational disease. [268] In some cases, enterprises have not included OSH assessments in their management systems and the implementation of OSH organization has been seen as a way to fulfil legal requirements rather than as a beneficial supporting function. [269]

Cooperation on OSH at the workplace and other partnerships

147. Workplace cooperation between management, workers and their representatives is an essential principle of OSH and a way to preserve labour protection. Social dialogue on OSH matters at the workplace may decrease work-related injuries and accidents, leading to improved productivity and competitiveness. [270] Possible measures for promoting cooperation at the workplace or enterprise level include the establishment of OSH committees with employer and worker representation, the appointment of workers' safety and health representatives, the appointment of persons to promote and advise on OSH matters and training on OSH. [271]

148. In outsourced operations, collaboration between employers and contractors is important in order to ensure sufficient consideration of OSH issues, including the application of safe systems of work, sharing information on hazards and coordinating to protect against them

[264] Mylek and Schirmer, op. cit.

[265] ILO: Guidelines for labour inspection in forestry, op. cit.

[266] ibid.

[267] ILO: *Safety and health in forestry work*: an ILO code of practice, op. cit.

[268] FAO: *Guide to good practice in contract labour in forestry*, op. cit.

[269] Kastenholz, Morat and Seeling, op. cit.

[270] ILO: *Social Dialogue: Recurrent discussion under the ILO Declaration on Social Justice for a Fair Globalization*, Report VI, International Labour Conference, 102nd Session, Geneva, 2013.

[271] ILO: Guidelines for labour inspection in forestry, op. cit.; see also ILO Convention No. 184.

through clear supervision arrangements. [272] For similar reasons, worker-to-worker cooperation at workplace on OSH is important.

149. The outsourcing of forest operations has emphasized the importance of communication on safety and health matters among forest owners, managers, contractors and operators, who should together ensure that OSH is properly managed and that clear procedures are in place, understood and duly followed. [273]

150. Manufacturers and suppliers of forestry machinery and equipment are important stakeholders in the sector and have an interest in engaging with the users of their products, as well as the legislative and enforcing authorities, to ensure that new machinery does not create unexpected risks during usage. The development of work equipment with user safety in mind can have a positive impact on workers' safety. [274]

Personal protective equipment

151. Forestry work is one of those occupations for which PPE is needed wherever the safety of workers cannot be ensured by other means, such as eliminating the hazard, controlling the risk at source or minimizing risk. [275] While mechanization has decreased the number of workers using hand-held chainsaws, there are many remaining tasks that big machines cannot reach and thus where manual labour is required. [276] The correct selection, use and maintenance of PPE is important when dealing with various work activities and handling of dangerous chemical substances. [277]

152. The development and use of PPE has been affected by increased requirements for accident reporting because it is an effective way of reducing accidents. [278] The ILO code of practice *Safety and health in forestry work* outlines the generally accepted practices and requirements for PPE, including protection measures for head, eyes and face, ears and hearing, feet, legs and hands, and their recommended use by type of operation. [279] In addition, it is important that suitable PPE be made available for women workers. [280] PPE should be provided and maintained by the employer, without cost to the workers. As for many other OSH considerations, the application of correct PPE use is challenging in informal and illegal operations, making workers in those operations more vulnerable to emerging risks.

[272] ILO: *Safety and health in forestry work*: an ILO code of practice, op. cit.

[273] Gifford, op. cit.

[274] ibid.

[275] ILO: *Safety and health in opencast mines*: an ILO code of practice, second edition, 2018.

[276] E. Korhonen, "Personal protective equipment", in *Encyclopaedia of Occupational Health and Safety*, op. cit.

[277] ILO: Guidelines for labour inspection in forestry, op. cit.

[278] Garland, op. cit.

[279] ILO: *Safety and health in forestry work*: an ILO code of practice, op. cit.

[280] ILO: *10 Keys for gender sensitive OSH practice – Guidelines for gender mainstreaming in occupational safety and health*, Working Paper (Geneva, 2013).

Appendix

International labour standards that have an impact on forestry operations and practices

- Forced Labour Convention, 1930 (No. 29)
- Labour Inspection Convention, 1947 (No. 81)
- Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87)
- Migration for Employment Convention (Revised), 1949 (No. 97)
- Right to Organise and Collective Bargaining Convention, 1949 (No. 98)
- Equal Remuneration Convention, 1951 (No. 100)
- Social Security (Minimum Standards) Convention, 1952 (No. 102)
- Abolition of Forced Labour Convention, 1957 (No. 105)
- Plantations Convention, 1958 (No. 110)
- Discrimination (Employment and Occupation) Convention, 1958 (No. 111)
- Employment Injury Benefits Convention, 1964 [Schedule I amended in 1980] (No. 121)
- Invalidity, Old-Age and Survivors' Benefits Convention, 1967 (No. 128)
- Medical Care and Sickness Benefits Convention, 1969 (No. 130)
- Minimum Age Convention, 1973 (No. 138)
- Minimum Age Recommendation, 1973 (No. 146)
- Worst Forms of Child Labour Convention, 1999 (No. 182)
- Labour Inspection (Agriculture) Convention, 1969 (No. 129)
- Minimum Wage Fixing Convention, 1970 (No. 131)
- Rural Workers' Organisations Convention, 1975 (No. 141)
- Human Resources Development Convention, 1975 (No. 142)
- Migrant Workers (Supplementary Provisions) Convention, 1975 (No. 143)
- Occupational Safety and Health Convention, 1981 (No. 155)
- Occupational Health Services Convention, 1985 (No. 161)
- Occupational Safety and Health Recommendation, 1981 (No. 164)
- Employment Promotion and Protection against Unemployment Convention, 1988 (No. 168)
- Indigenous and Tribal Peoples Convention, 1989 (No. 169)
- Occupational Health Services Recommendation, 1985 (No. 171)
- Safety and Health in Agriculture Convention, 2001 (No. 184)
- Worst Forms of Child Labour Recommendation, 1999 (No. 190)
- Safety and Health in Agriculture Recommendation, 2001 (No. 192)
- Promotion of Cooperatives Recommendation, 2002 (No. 193)
- Promotional Framework for Occupational Safety and Health Recommendation, 2006 (No. 197)
- Social Protection Floors Recommendation, 2012 (No. 202)
- Forced Labour (Supplementary Measures) Recommendation, 2014 (No. 203)
- Transition from the Informal to the Formal Economy Recommendation, 2015 (No. 204)