# Second Assessment of the Impact of COVID-19 on Forests and Forest Sector in Western Europe and Other States

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The sixteenth session of the UN Forum on Forests (UNFF16) in April 2021 requested the Forum secretariat, in collaboration with members of the Forum, CPF member organizations and stakeholders, to conduct an assessment of the challenges faced by countries, and the strategies, recovery measures and best practices for reducing the impact of COVID-19 on forests and forest sector, and to present it to the Forum at its seventeenth session in May 2022. To conduct this second assessment, the UNFF Secretariat commissioned a series of assessments in different regions and subregions.

# UNITED NATIONS FORUM ON FORESTS

Assessment of the challenges faced by countries, and the strategies, recovery measures and best practices for reducing the impact of COVID-19 on forests and forest sector

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## Executive summary

The UNFF Secretariat has commissioned a series of reports for the major UN regions with the objective of providing information on the challenges faced by countries, including strategies, recovery measures and best practices for reducing the impact of COVID-19 on forests and the forest sector. The geographical scope of this report is the Western Europe and Others Group (WEOG) region, excluding the USA and Canada, which are dealt with in a separate assessment. The terms of reference laid out three topics to be covered in the assessment report. These are listed below together with a brief synopsis of the key findings.

**Challenges faced by countries in addressing the impacts of the COVID-19 pandemic on forests and the forest sector**

In most countries of the WEOG region, the forestry sector was classed as an essential one. Apart from some issues with travel restrictions for non-national specialists and constraints for the forest hospitality enterprises, the sector was subject to comparatively few restrictions. There does not appear to have been much impact on forest management operations. Demand for construction timber plummeted in some countries at the beginning of the COVID-19 pandemic but mostly recovered, not least due to economic stimulus packages. Nordic countries report on price increases for lumber and roundwood but caution that price developments may be volatile and in part influenced by developments external to the forest sector.

Increased demand for packaging materials is reported by several countries, largely driven by internet shopping, which experienced a substantial boost during the pandemic. Many countries report on a surge in the use of forests for recreational purposes during the pandemic with some issues related to local overuse. The increased use of forests for recreation is also reflected in the literature review, with many authors emphasizing the importance to human health of urban forests and other green spaces.

Overall, with a few localised exceptions, the forest sectors in the WEOG group of countries managed to deal with the effects of COVID-19 successfully, reacted quickly to changed needs and rapidly adapted existing systems to respond to the new challenges.

**Strategies and recovery measures being adopted by countries in combatting the impacts of the COVID-19 pandemic on forests and the forest sector**

A search of databases that monitor how 'green' countries' response policies and public expenditure revealed that policies addressing nature conservation and restoration of forest ecosystems appear to be the most common among policies pertaining specifically to forests. Some countries report that forests have risen on the political agenda during the pandemic due to an increased recognition of their benefits to human health and importance for rural economies. Several countries also mentioned efforts to strengthen local forest supply chains and cross-sectoral networks. That had already started pre-COVID-19 and proved useful to cope with the economic implications of the COVID-19 crisis.

**Best practices adopted by countries and other stakeholders for reducing the impact of COVID-19 on forests and the forest sector**

The main aspect highlighted by respondents is the increased use of IT and virtual communication, which has positive implications for participation, travel budgets and carbon emissions due to forgone travel. However, the issue of how to resolve online those complex issues where there are strongly divergent views remains somewhat unresolved.

## Acronyms and Abbreviations

| | |
|---|---|
| AUD | Australian dollar |
| COP | Conference of the Parties |
| EU | European Union |
| EU RRP | EU Recovery and resilience plan |
| EUR | Euro |
| GDP | Gross domestic product |
| HEDNO | Greek power supply company |
| IT | Information technology |
| NOK | Norwegian krone |
| R&D | Research and development |
| SGM | Sustainable forest management |
| SME | Small and medium enterprises |
| UK | United Kingdom of Great Britain and Northern Ireland |
| UN | United Nations |
| UNFF | UN Forum on Forests |
| USD | United States dollar |
| WEOG | Western Europe and Other States Group, UNFF Region |

# 1 Introduction

The COVID-19 pandemic, which started in autumn 2019 has claimed the lives of more than 5 million people globally and left many more in poor health. During the past two years, global society has struggled with multiple waves of infections and several mutations of the COVID-19 virus. Although vaccines are now available, their deployment remains highly unequal between high- and low-income countries (WHO 2021).

The initial response measures that were implemented to curtail the spread of the virus led to a global economic contraction. From a macro perspective, the global economy is now rebounding. However, the macro perspective masks the increasing cleavage between high-income countries that had the capacity to implement massive financial support and recovery packages and that have high vaccination rates and lower-income countries with little or no capacity for financial support, low vaccination rates and only moderate hospital capacities (OECD 2021b). At the time of writing (December 2021), supply bottlenecks for several internationally traded goods have resulted in price increases while at the same time energy prices are surging in Western Europe (ECB 2021).

In view of the persisting COVID-19 pandemic, and based on the UNFF16 discussions of April 2021, the Forum Secretariat was requested, in collaboration with members of the Forum, Collaborative Partnership on Forests, member organisations and stakeholders, to conduct an assessment of the challenges faced by countries, and the strategies, recovery measures and best practices for reducing the impact of COVID-19 on forests and the forest sector, and to present it to the Forum at its seventeenth session.

The UNFF Secretariat thus commissioned regional studies to identify and elaborate on, inter alia, (i) the challenges faced by countries in addressing the impacts of the COVID-19 pandemic on forests and the forest sector, (ii) the strategies and recovery measures being adopted by countries in combatting the impacts of the COVID-19 pandemic on forests and the forest sector and, (iii) best practices adopted by countries and other stakeholders for reducing the impact of COVID-19 on forests and the forest sector. These studies are an addition to an initial set of studies on the "Impact of COVID-19 on Sustainable Forest Management" that were presented at a virtual expert group meeting organized by the UNFF Secretariat in January 2021. The geographical scope of this report is the Western Europe and Others Group (WEOG) region, excluding the USA and Canada, which are dealt with in a separate assessment.

The key findings from the first assessment report for the WEOG countries were that despite the fact that all countries in the group had put some restrictions in place, most sustainable forest management activities had been carried out largely as planned. All governments provided a system of fiscal support that lessened immediate problems arising from the restrictions. However, women often had to deal with more of the negative effects, especially when having to cope simultaneously with impairment to their employment situation, lockdowns requiring them to work from home, and the need to provide additional childcare as well as home schooling when schools were closed. In many countries, people made increased use of the recreational opportunities offered by forests, not least to relax from the strains caused by the lockdowns and other restrictions.

Forest industries faced an initial drop in demand for construction timber, but this was partially balanced by much increased demand for DIY timber and other domestic uses. A number of countries suggested that economic stringencies could lead to pressure on overseas development assistance financing for forests. International institutional capacity proved robust and reasonably resilient, with the shift from personal to virtual meetings being the only major change. Overall, forest institutions and systems in the WEOG region were found to be generally robust and able to deal quickly and effectively with unexpected shocks.

## 2 Methods

For the WEOG region (excluding Canada and the USA), this assessment report sets out to identify and elaborate on:

- Challenges faced by countries in addressing the impacts of the COVID-19 pandemic on forests and the forest sector;
- Strategies and recovery measures being adopted by countries in combatting the impacts of the COVID-19 pandemic on forests and the forest sector; and
- Best practices adopted by countries and other stakeholders for reducing the impact of COVID-19 on forests and forest sector.

The assessment builds on both a literature review (reports, news items, policy briefs, and academic literature) and findings from a survey sent to the UNFF focal points of the WEOG countries (see Box 1 below for the questions). Given the difficulties experienced in reaching out to many of the focal points during the development of the initial report in 2020/21, substantial effort was put into updating and consolidating the list of addressees prior to sending out the survey.

The questions were sent to the updated list of focal points on October 14th and several reminders were sent until the end of the year. Responses were obtained from 12 countries – Andorra, Australia, Finland, France, Germany, Iceland, Ireland, Luxembourg, Norway, Switzerland, Turkey and the UK. It is likely that the 26th UN Climate Change Conference of the Parties (COP26) in Glasgow in early November fully absorbed the attention of many respondents. In addition, the anxiety around the COVID-19 Omicron strain may have required respondents to set their priorities differently.

For each of the three key topics, in the results section below, we present first the findings from the literature review and then summarize the findings from the survey responses.

*Box 1: Survey questions*

- **Q1** – Taking the five broad categories of Social, Technical, Environmental, Economic and Political matters, please indicate briefly where and how COVID-19 and its associated restrictions affected forests and the forest sector in your country.
- **Q2** – Using the same five categories, were the response measures taken to Covid–19 and associated restrictions temporary or have they resulted in long-lasting or permanent changes? Please highlight permanent changes relevant to forests and the forest sector. For example, more attention and/or finance to recreational use, long-term supply chain issues, fire protection measures, etc.
- **Q3** – In respect of long-term and/or permanent changes, please describe briefly any recovery measures or changes to policies, strategies or approved practices that have been made.
- **Q4** – The previous study revealed that in most cases, changes for forests and the forest sector were largely reactive, made in response to restrictions imposed and shortages experienced, although in most countries in the region, there were also notable effects from changes to disposable income in better-off households. However, the pandemic also made explicit structural vulnerabilities and potential weaknesses, such as complex supply chains reliant on "just-in-time" deliveries. To what extent has the experience gained from COVID-19 led to new best practices, such as actors being better prepared for future disruptions due to another pandemic or effects of similar magnitude and timing?

- **Q5** – Do you feel that the experience gained from tackling COVID-19 been helpful for raising awareness of other slower but more invidious challenges such as climate change? Has the appreciation and understanding of risks, and the need for methods to mitigate these, changed, leaving forests and the forest sector in a stronger position to deal with these as well as with a future pandemic?
- **Q6** – To complement the overall national perspective, could you please provide contact details for potential respondents with specific interests in, e.g., forest product markets and value chains, forest recreation and associated hospitality, forest management and protection, and social issues such as gender and intergenerational equity and social inclusion?

# 3 Results

## 3.1 General remarks

The countries comprising this region lie in the northern hemisphere with the exception of Australia and New Zealand, where the seasons are reversed in terms of the calendar. These two countries, being islands, adopted very stringent restrictions on travel as a response to COVID-19 as well as, in Australia, very intense lockdowns, and to date have been less affected than most other countries globally in terms of Covid-related deaths. Iceland limited travel from outside and has also had relatively few Covid-related deaths but otherwise had only mild restrictions and the effects of COVID-19 on their forest sector has been negligible.

Elsewhere, COVID-19 responses in 2020 were based around restrictions on travel by non-nationals/ residents, requirements for home working, closure of shops and hospitality venues, social distancing and meeting indoors. Most required the wearing of masks in public and there was rapid roll-out of mass vaccination schemes from late 2020. In most cases, restrictions applied nationally but in Australia there were different rules in different states, as there were in the devolved nations of the UK.

By mid-2021, vaccinations and restrictions on movement and gatherings appeared to have brought the pandemic under control but then new variants emerged. Firstly, Delta and more recently Omicron, which appears to be highly contagious but less infective than Delta. The information gathered for this report by and large predates Omicron and it remains to be seen what the ultimate impact of this variant will be. Figure 1 shows the development of the daily COVID-19 cases in the WEOG region.

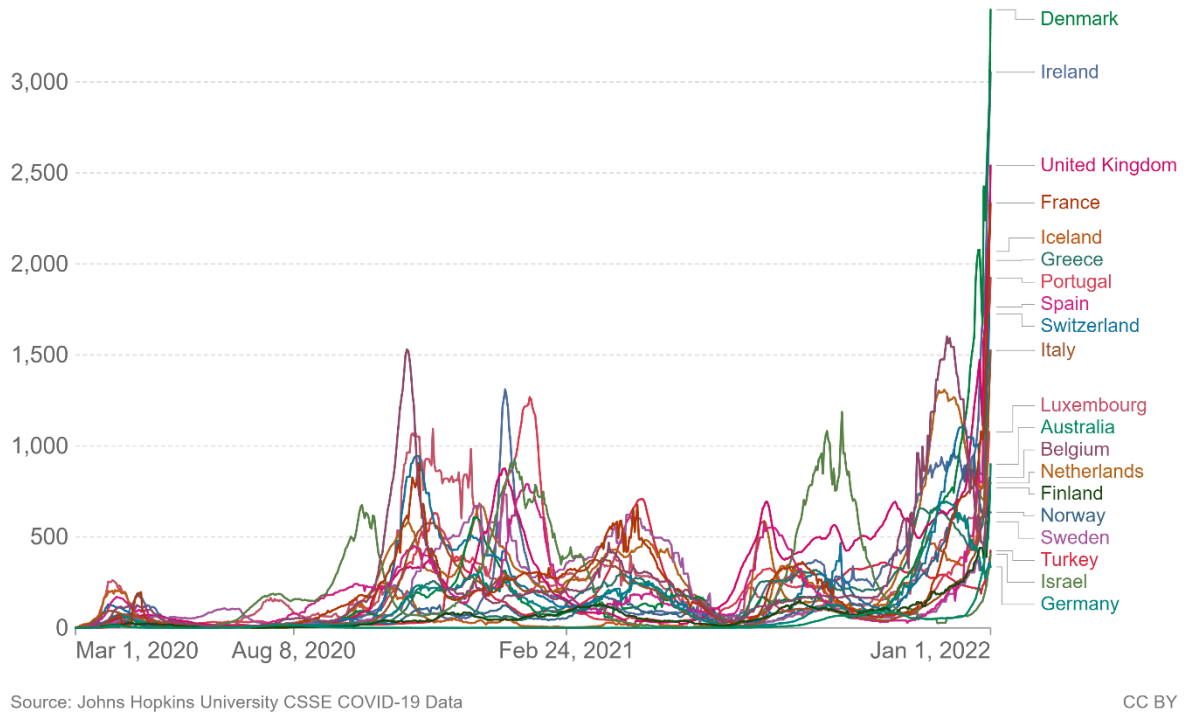


*Figure 1: Daily new confirmed COVID-19 cases per million people in the WEOG countries*

## 3.2 Challenges for forests and the forest sector

### 3.2.1 Literature review

Around the world, people resorted to forests during the COVID-19 pandemic, albeit for very different reasons. In many developing countries, COVID-19 lockdowns and associated measures stalled economic activities in urban centres with major impacts for people working in the informal sector. Given the lack of income opportunities in urban centres, there was substantial return migration from densely populated urban areas to rural regions. In some geographies, return migrants are reported to have increased forest degradation and forest clearing to cultivate cash crops and to have overharvested forest biodiversity (Saxena et al. 2021; Brancalion et al. 2020; Rahman et al. 2021).

Conversely, in the WEOG region, people resorted to forests near urban centres to recreate, enjoy leisure time and to cope with stress while abiding by social distancing regulations during the lock downs. For example, increases in forest visits during the pandemic have been reported for Belgium (Da Schio et al. 2021), Germany (Weinbrenner et al. 2021; Derks et al. 2020; Beckmann-Wübbelt et al. 2021), and Finland (Korpilo et al. 2021). In Sweden which pursued a strategy of 'soft touch' restrictions rather than hard lock-downs, recreation in areas with forests supported self-perceived changes in wellbeing (Samuelsson et al. 2021).

Weinbrenner et al. (2021) argue that two different processes were relevant for forest visits during the pandemic – coping and compensation. People who used the forest to compensate for closed public spaces used the forests' services as a substitute – or functional equivalent – on many levels, e.g. as a playgrounds for children, as a gym, or as a place for meditation. Compensation, in this sense, is a process where people actively create an enjoyable situation while giving less weight to the natural features of the forest. By contrast, people who used the forest for coping with psychological strain, did not actively create an environment but appreciated the forests' natural contributions to coping. The main challenge mentioned in the literature was pressure on urban forests due to the increase of visitors (Da Schio et al. 2021).

The pandemic emphasised the importance of urban forests and other green spaces to human health. Building on this understanding, a challenge for future urban planning will be how to best create equitable access to safe green spaces for all inhabitants of a city regardless of their socio-economic backgrounds. This is in line with calls for future park planning at a global scale (Geng et al. 2020).

### 3.2.2 Summary of survey findings

In accordance with the findings of the literature review, the survey responses also mentioned changes in the recreational use of forests. However, the survey responses offered a more comprehensive overview of challenges, especially related to labour and travel restrictions, forest management, demand for wood products and challenges for forest industries, as well as interacting challenges from fires, pests and other forest influences.

#### 3.2.2.1 Labour and travel restrictions

The forestry sector was generally classed as an essential one although not initially in some countries. This classification as essential extended to work in the forest and in forest industry to keep supplies of wood and wood-based products fed into national economies. This easement did not cover the forest hospitality sector, which had to suspend its activities during lockdowns. Although rules varied in detail across countries, there

was support to employees who were laid off and to self-employed people. The latter was valuable for the forestry sector as much field activity, such as planting and harvesting, is undertaken by the self-employed.

Because forestry field work in the region is generally highly skilled and tasks such as harvesting require people with certified competence to meet health and safety requirements, in a number of countries specialised non-nationals may carry out a significant proportion of certain operations; COVID-19 travel restrictions prevented these people crossing borders. This was not reported as a problem in Germany or Finland, but Norway has found it to be a serious issue in forestry, as well as in other sectors such as agriculture. There is an ongoing review by the government and professional bodies to determine whether action is required and, if so, what it should be. In Australia, different restrictions in adjacent states caused problems with movement of material across state borders, although states did communicate and try to minimise the problems.

The forestry sector in New Zealand also relies quite heavily on skilled labour coming from Australia but travel restrictions prevented this. The shortfall was made up by drawing in people from other sectors, similar to the response in Iceland.

In the UK, Brexit has also had some effect both on trade patterns, discussed below, and on employment since it ended from January 2021 the free movement of people allowed during EU membership. This has proven unfortunate as, for reasons that are currently unclear, COVID-19 restrictions and the support scheme appear to have triggered a substantial increase in retirement, which is increasingly serious. Skilled workers and professionals are now hard to find and this is causing difficulties sector wide.

Forest work patterns differ from much other work situations in being fairly easily adapted to meet COVID-19 measures such as social distancing, while those in office situations were usually required to work from home whenever possible. New protocols were developed rapidly in most countries to enable forest work to continue efficiently.

#### 3.2.2.2 Effects on forest management

There does not appear to have been much impact on forest management operations although Australia, where post-fire work is still dominating, reported that it was not yet possible to determine this. Germany, Finland, Ireland and Switzerland confirmed that there was little or no effect on forest operations while Norway, as noted, experienced delays to planting due to difficulties of travel for foreign workers.

While home or remote working in administrative and support functions generally continued in all countries, the UK reported reduction in activities such as management planning although planting levels remain buoyant and are increasing while Ireland observed that the nature of forestry work meant that the pandemic has not had a lasting impact on the technical aspects of forestry.

Turkey noted that COVID-19 restrictions, including the need for people to isolate, had resulted in difficulties completing planned field operations such as planting, thinning and felling and that forward planning of these activities had become more complex as a result.

Andorra responded that there had been no interruption to planned activities in their largely publicly-owned forest area while in Iceland, there was increased tree planting as people who had lost their employment in the tourism sector were engaged in tree planting and other environmental tasks. No information has been received from Mediterranean countries on whether fire protection measures were delayed in 2021 but Turkey reported that while fire-fighting crews had some absences due to COVID-19, there had been no effect on implementation of earlier fire protection measures.

#### 3.2.2.3 Demand for wood products and forest industries

It is hard to summarise briefly the demand for wood across the region as countries vary widely in terms of the balance of domestic demand and consumption, imports and exports. In general terms, house construction dropped severely when COVID-19 first appeared in early 2020. Australia responded with its Home Builder grant scheme to try and support the sector. This scheme saw high levels of interest and demand for some wood products has increased. Demand has exceeded supply for key construction products, with impacts on projected timelines and costs for projects going forward. The Australian government has also provided $15 million AUD to salvage and transport bushfire damaged logs to address timber shortages in the building industry.

Australia also reported anecdotally that members of the building industry are communicating extended timelines to clients, and taking action to order supplies that may be limited more in advance; however, a shift away from "just-in-time" may rely on storage capacity at the delivery point. It is difficult to comment on this, or to project how long this behavioural change in forecasting timelines may last, or its applicability to future challenges.

Elsewhere, the industry responded by reducing production of construction grade timber and increasing material for DIY home and garden use and for packaging papers and card to meet the rapid increase in internet shopping, which required delivery.

In Switzerland, preparatory measures to secure the supply of wood energy (energy wood, pellets) were examined and found that the measures taken in the context of the economic national supply together with measures taken during the pandemic (confirmation of supply relevance) were sufficient. For timber construction, on the other hand, building site closures posed a business problem. No changes were implemented during the acute phase of the pandemic. In the case of a future pandemic, it would have an impact on the supply chain and on the business outcomes for the timber construction industry.

The supply bottlenecks for the timber industry and timber construction in Switzerland (glues, glued wood products, etc.) have led to price increases. It cannot be completely ruled out that this could strengthen regional supply chains in the future and thus reduce dependence on international suppliers. The Swiss federal government has not adopted any economic stimulus measures for the timber industry (timber industry, timber construction) although the Swiss parliament has allocated 100 million Swiss francs for the forestry sector for forest maintenance over the next four years.

For SMEs in Ireland, funding is available via a new COVID-19 Restrictions Support Scheme (CRSS) aimed at businesses impacted by COVID-19 restrictions. In addition, enhanced “restart” grants are available to businesses that have been affected by COVID-19 and meet the requirements. The Irish government has continued to highlight the important role in which the forest sector can play in maintaining employment in the rural economy and on the role which forest parks can play as a valuable recreation resource for people in the current circumstances.

Remote working in Ireland allowed administrative aspects of forest sector management to continue throughout the pandemic and forest industry was not affected significantly by COVID-19 restrictions. Lockdowns did have a severe impact on the construction sector early on in the pandemic and the demand for Irish timber in both domestic and UK markets was affected. Notwithstanding this, the Irish forest industry had an essential role to play in supply chains and in maintaining the rural economy and this continues to be the case. Overall, COVID-19 restrictions have not overtly impacted on the sector. Despite Ireland

experiencing a relatively strict and prolonged lockdown compared to other countries in Europe, the decline in economic activity in Ireland, as measured by headline GDP, was relatively benign.

The Australian government is concerned about domestic wood-fibre security, as well as the impacts of changes in trade relationships in the forestry sector that were partially influenced by Covid. Through Australia's ongoing Regional Forestry Hubs (RFHs), industry, state and local governments, and other key stakeholders are working together to undertake strategic planning, technical assessments and analyses to support growth in the forest industries in their region. It is anticipated that this work may now include exploring issues highlighted by COVID-19, such as domestic processing capacity, domestic market supply, and other supply chain issues.

It is posited that the pandemic has, in Australia, reinforced the importance of addressing the issues of fibre security and supply that were already focused on, including through the National Forest Industries Plan. The COVID-19 pandemic, taken together with the2019/20 bushfires, has perhaps focused attention more on dealing with the impact of immediate, unforeseen shocks to the industry, rather than on methodological long-term planning.

Despite current uncertainties, Australia is committed to growing 1 billion additional plantation trees by 2030 in response to the projected increased demand for timber products in the future, potentially decreasing the need to rely on imports. However, the extreme bushfire season of summer 2019-20 affected 130,000+ hectares of plantations as well as substantial areas of native forest used for timber production. Together with the effects of COVID-19, this has created a perfect storm of supply disruption for industries and individuals. In terms of future planning. Australia's response to this challenge, however, is most heavily vested in understanding how it might manage the impact of bushfires for the forest sector, rather than future planning around pandemics.

In Finland, the forest sector experienced an upturn while Norway experienced increased prices for lumber and roundwood but the current uncertainty over future demand and prices has made it harder for the forest industry there to plan future investment.

**Summary from Finnish Forest Sector Outlook 2021 - 2022**

In 2021, the sawn timber export volume increased by 12% while the price increased by 40%. It is expected that in 2022, the price increase will drop to 20% while volume growth will slow to only 2%. For plywood, the export volume increased by 17% but the price by only 5%, both these values are expected to fall slightly in 2022.

While profitability has been good in sawmilling and board production, it has been less so in the pulp and paper sector. Carton board was the top Finnish forest industry project with strong demand in Europe but falling demand in China, reflecting the growth in internet shopping in Europe. The market for Kraft liner paper was also strong but both demand and price for these products is expected to fall in 2022 as demand weakens and costs will be pushed up by the expected inflation.

Finland has historically imported substantial quantities of roundwood from Russia but the new export tax from 2022 is projected to lead to reduced imports and increased removals from national sources. The return on investment for private forest owners was less than 3% in 2020. This rose to 10% in 2021 but is expected to fall again to around 3% in 2022.

Overall employment in the forest and forest industry sector is expected to be stable following a slight decrease in 2020 and then an increase from new industry investment in 2021 and 2022 and despite an expected fall in the paper sector. New legislation and emissions taxes on the burning of coal and peat is expected to lead to an increase of 6 to 7% nationally in demand for wood pellets to replace these fuels plus increased demand from exports.

The report notes a number of risks and uncertainties. The first of these is the Omicron variant of Covid. Although so far this has proved less serious than earlier variants, its infectivity is leading to restrictions on movement and people isolating, which will affect employment patterns. Wider issues identified include the global supply chain issues, which have still not recovered since early 2020, debt bubbles and monetary crises, which are at least partially Covid-related, and rising global political tensions such as that between China and the United States.

The UK experienced increased demand as well as supply constraints, in part a direct consequence of COVID-19 restrictions, and this led to steep rises in timber prices. At the same time, the increased demand for home improvement materials continued, driven by home-working and, at least for some people, increased disposable income levels from money saved on commuting and holidays. Restrictions on retail outlets caused much increased demand for packaging materials as people switched to online shopping. This trend had started pre-Covid but the restrictions have given it a very substantial boost. While it is expected that this trend may decline once COVID-19 is past, retail outlet shopping is unlikely to return to pre-Covid levels.

Forest industry in the UK benefitted considerably from the increased demand. The level of automation in most modern wood processing plants is such that these able to continue working, as social distancing and other measures were readily accommodated. The sector also benefitted from increased investment that funded expansion. The experience of interrupted supply chains encouraged further integration to reduce the risk of future interruptions and improve supply-chain resilience.

The increased demand for domestically sourced timber has benefitted the sector and encouraged investment in processing capacity. COVID-19 restrictions, and Brexit, have created shortages of spare parts for machinery and equipment. In the UK, however, the effects of COVID-19 on supply chains are almost impossible to disentangle from those due to the UK leaving the EU as part of Brexit, which legally commenced on 31 January 2020 although the process also included a transition period, which is still in process.

**New Zealand**

By virtue of its geographic location as an isolated island nation, New Zealand effectively excluded COVID-19 by instituting very strict border controls. Whilst its population was largely unaffected, disruptions and changes in international trade patterns had a severe economic effect. The country's large plantation resource is export-oriented, with China being the predominant buyer of logs and timber; in 2019/20, it took 51% of forestry exports but as of June 2020, there was a drop of 20%. The forestry sector was not adjudged to be an essential one and most firms applied for the employment support offered by the government.

The forest product export sector has, as a consequence, been severely affected by the disruptions to both its direct export markets and to wider international trade patterns caused by COVID-19. Businesses with high debt levels have been particularly badly affected. Global forest supply chains are intensely complex

and interconnected. China provides an interesting example of this as it is a major importer of both logs and processed timber, with the main suppliers being Russia, US/Canada and New Zealand.

North American supplies have been badly disrupted by drought, fire and insect attacks and Russia has just imposed export taxes. New Zealand timber, which could fill the gap, is currently being undercut on price by insect damaged logs and timber from central Europe, although the shortage of containers and shipping space has also acted as a significant constraint to this trade from Europe.

Despite the temporary problems, the long-term view of the forest sector in New Zealand remains positive. There is a buoyant supply of roundwood through to at least 2030. Private growers account for a substantial proportion of the planted forest resource base but both plantations and forest industry have in recent years attracted a high level of interest and investment from overseas. COVID-19 and its associated effects have resulted in an ongoing reconsideration of the wisdom of allowing this structure of heavy reliance on investment from outside to develop.

Linked to this is an ongoing detailed review of the potential for increasing the area of planted forests using lower quality pasture land, improving productivity of plantations and adding value in the processing sector. These ideas are very congruent with the wider policy aims of transitioning to a low-carbon economy.

#### 3.2.2.4 Recreational use and forest tourism

Most countries have reported a surge in the recreational use of forest areas even though hospitality facilities were usually unavailable due to COVID-19 restrictions. Although there was an increase in access to forests and their use for recreation, much of the hospitality industry around forest recreation, such as those providing accommodation and food, has suffered greatly from COVID-19 restrictions despite government financial support schemes in most countries. The latest surge in infections due to the Omicron variant of COVID-19 has been very unhelpful for this sector and it remains to be seen what the ultimate effect will be.

Norway and Finland both experienced substantial increase in recreational use in National Parks and forests close to urban areas, estimated at 25% in Finland and this increased use is expected to continue albeit not at the maximum levels experienced during the most stringent COVID-19 restrictions. Germany noted a similar increase in the use of forests close to settlements but did not perceive any indication of longer-term changes to usage patterns.

In certain areas of Switzerland, the number of visitors in the forests increased markedly during the lockdowns but the importance of forests for recreation was generally already a topic on the rise and is being given more emphasis in forest education. As a consequence, the existing forest jobs of forestry personnel increasingly include dealing with people and offering services to people, which in turn requires more communication skills than in the past. This trend may have been underscored by the pandemic but is not a consequence of the pandemic as such. A limited number of new jobs related to recreation in the forest might be created but major changes are not expected.

The monitoring and analysis of information on visitors to urban and peri-urban forests in Switzerland noted in our previous report has continued and indicates that the effects of OVID-19 restrictions on these green areas have become normalised to some extent. Visitor numbers in autumn 2022, before the Omicron surge started, were not as high as visitor numbers during earlier periods of restrictions but nor have they returned

to the lower visitor number levels recorded before the pandemic. This information is still being processed by the Federal Institute for Forest Snow and Landscape Research (WSL) with publication planned in 2022.

There have not been any detailed studies reported from Australia but indications are that multiple use forests may have seen increased popularity for recreational use due to limited other travel opportunities. Other, less accessible areas, may have seen reduced use, due to lower tourism numbers, or as for example, during a nine-week lockdown the Australian Capital Territory, when national parks were closed to the public in an effort to reduce the risk of transmission and encourage compliance with stay-at-home orders.

In Turkey, forests were heavily used as safe spaces where socially distanced activities could be undertaken by people who had limited alternatives. Increased use was particularly recorded close to urban areas but no downsides from the increased use were reported.

The Irish government strongly encouraged people to take advantage of forest areas for recreational purposes and for socialising outdoors during the pandemic and has given guidance on doing so safely. Luxembourg also experienced heavy use of urban forests; this was such that restrictions were required to prevent overuse. In the UK, as in other countries, there was greatly increased use of forest areas for recreation. Travel restrictions had precluded or severely limited overseas vacations and the great increase in numbers, particularly at more popular and accessible locations, resulted in much increased litter and waste problems as well as higher traffic levels, which often caused parking areas to overflow.

While the UK reported that forests themselves were seldom directly damaged, uses such as off-road cycling on unmarked tracks has led to some damage in sensitive areas, such as those under regeneration. The high level of recreational use experienced in the UK during COVID-19 restrictions is expected to drop somewhat but to stabilise at a higher level than pre-pandemic as many people have enjoyed their experience of forest-based recreation. Attention to littering and waste and to anti-social behaviour will be required to deal with these issues.

#### 3.2.2.5 Fires, pests and other forest influences

During the northern summer of 2021, Europe experienced a combination of record high temperatures following drought that caused very serious forest fires in the Mediterranean region countries of Portugal, Spain, France, Italy, Greece and Turkey. The European Forest Fire Information System in August reported that the number of fires larger than 30 ha was 2.5 times the average number experienced between 2008 to 2020. It is not clear to what extent this climate driven situation was worsened by the effect of COVID-19 restrictions limiting fire protection work. At the same time, northern European countries, northern Italy and parts of Turkey, suffered from extreme rainfall events and severe flooding.

In Central and northern Europe, the spruce bark beetle (*Ips typographus*) outbreak that started in 2016 continued to cause damage and countries are reporting forest insect and disease outbreaks driven at least in part by warming temperatures. These influences are well known and recognised although when they will occur cannot necessarily be predicted. Northern European forests also periodically experience storms that lead to windblow and are major events. For example, the winter storm damage in Norway in November 2021 that caused significant windblow damage equivalent to 10% of the Annual Allowable Cut.

Against this background, the effects of COVID-19 have been relatively minor; there have been much more significant effects on trade patterns and economies than on the forest resources themselves. However,

Luxembourg noted that reduced hunting due to COVID-19 response measures has increased damage from browsing by deer. As this damage tends to be concentrated on broadleaved species, it is having a severe effect on efforts to diversify forest structure by increasing the proportion of broadleaved trees. Work is continuing to find a solution to this problem. No other country reported this point but it may well be more widespread and is an issue that could benefit from additional attention.

Forestry across the whole region has a generally successful track record of responding to direct negative influences, such as fires, pests and diseases and by and large it has also coped well with the impact of COVID-19 restrictions. Temperate forests are generally robust and much easier to manage than complex tropical forests. Operations such as thinning can be brought forward or postponed by several years without causing significant problems and this is indeed often done to optimise revenue when prices change. Most industries, and especially those that need secure regular supplies of raw material have a well-established practice of buying forward supplies and these provide a resilient buffer.

The general consensus is that, with a few localised exceptions, the forest sectors in the WEOG countries managed to deal successfully with the effects of COVID-19, reacted quickly to changed needs and speedily adapted existing systems to respond to the new challenges.

## 3.3 Strategies and recovery measures

### 3.3.1 Literature review

In view of the economic slow-down following the COVID-19 restrictions, many governments announced economic stimulus packages. According to data provided by the International Monetary Fund, as of September 2021 governments of the WEOG region announced a total of USD 2.471 billion in national fiscal measures in response to the COVID-19 pandemic since January 2020 (IMF 2021)[1] of which 15% was for the health sector and 85% for non-health sectors. Many governments pledged to "build back better", i.e. to direct the funds available in the recovery plans to foster a transition towards more sustainable economies (OECD 2021a). As Sen (2020) has argued, if the ambition to shift to a more sustainable, green and inclusive global economy is taken seriously, forests should become a major pillar of stimulus packages.

Several databases[2] have been set up that monitor "green" countries' COVID-19 response policies and public expenditures. To obtain an overview of strategies and recovery measures being adopted by countries in combatting the impacts of the COVID-19 pandemic on forests and the forest sector, we searched two of these databases for policies implemented in the WEOG countries that contain the term "forest".

In **Error! Reference source not found.** (below), we present data retrieved from the Global Recovery Observatory (O'Callaghan et al. 2020) on policies proposed by countries in the WEOG region that contain the term "forest" in their description. Table 2 presents data from the OECD Green Recovery Database on policies in financial packages for the forest sector in WEOG countries. It is unclear whether the two databases report

[1] The dataset does not report data for Andorra, Liechtenstein, Monaco and San Marino.

[2] https://www.greenrecoverytracker.org/; https://recovery.smithschool.ox.ac.uk/tracking/; https://www.imf.org/en/Topics/imf-and-Covid-19/Fiscal-Policies-Database-in-Response-to-Covid-19; https://www.vivideconomics.com/casestudy/greenness-for-stimulus-index/; https://www.oecd.org/coronavirus/en/themes/green-recovery

on identical or different policies for individual countries, so we refrain from summing the monetary values to avoid double counting.

Overall, Tables 1 and 2 reveal that policies addressing nature conservation and restoration of forest ecosystems appear to be most common. However, there are also other policies undertaken in some countries. Germany and Italy promote digitisation in the forest sector while Ireland, Norway and Sweden offer payments, subsidies and financial compensation to forest owners and the forest industry. Sweden also maintains a skills training policy to promote green jobs.

*Table 1: Forest policies announced as part of WEOG countries' stimulus packages. Source: Global Recovery Observatory (O'Callaghan et al. 2020), retrieved November 2021*

| **Country and Policy name** | **Description** | **Value, US$m** |
|---|---|---|
| **France** | | |
| Afforestation measures | Support resilience of forest ecosystems, and facilitate green investments in forestry production | 240 |
| **Germany** | | |
| Forestry digitisation program | For digitisation in forestry as well as investment in modern operating machines and devices. Promotion of wood as a building material. | 790 |
| **Ireland** | | |
| Support for the sustainability of the agriculture, marine, and forestry sectors in rural areas | Our Rural Future represents the Irish government's blueprint for a post-COVID-19 recovery and development of rural Ireland over the next five years. It provides the framework to achieve the vision of transforming the quality of life and opportunity for people living in rural areas. Of this, policies 121-134 as outlined in the document will be allocated towards supporting the sustainability of the agriculture, marine and forestry sectors. Policies 128 and 129 relate specifically to forests. | 0 |
| Payments to forest owners | EUR 29.5 million paid out to a total of 8,300 landowners. The grants are annual tax-free premiums and cover the cost of establishing the forest plantation and also provide for the payment of annual forestry premium of up to €680 per hectare for 15 years. | 40 |
| **Norway** | | |
| Further subsidies for the forestry industry | Total of NOK 50 million allocated in subsidies to the forestry industry to help the continued operation of expensive equipment during the economic downturn. Eligibility applies. | 10 |
| Extraordinary package for forestry | This package of measures is designed to keep forest contractors employed by turning felling into thinning, where most pulp is extracted. | 0 |
| **Sweden** | | |
| Compensation to forest owners | Compensation to forest owners with subalpine forests. | 50 |

*Table 2: Green recovery policies in the forest sector in WEOG countries retrieved from the OECD Green Recovery Database (OECD 2021a), November 2021*

| Country and Type of measure | Summary description | Value, US$m |
|---|---|---|
| **Austria** | | |
| R&D subsidies | Forest fund aimed at funding research projects that help enhance climate adaptation of forests; this includes measures to protect and enhance biodiversity, increase the natural forest protected areas, etc… | 386 |
| **Belgium** | | |
| Tax reduction / Other subsidy | Increase by 20% the fraction of salary that can be deducted for donations: from 45% to 60%. This measure applies to all registered charities including charities that purchase and restore nature. | 25 |
| | Biodiversity and adaptation to climate change of the Walloon Region – Forests and Re-meandering of water courses | 37 |
| | Biodiversity and adaptation to climate change of the Walloon Region – Protected areas & National parks | 55 |
| **Finland** | | |
| Grant/Loan (including interest-free loans) | EUR 10 million is proposed for "Metsähallitus" (the Finnish Forest Administration) for the rehabilitation of nature sites and the development of their infrastructure. A sum of EUR 13 million is proposed for projects involving green areas, water services and forest conservation. Funding is also proposed for the development of nature and wildlife tourism (EUR 3.1 million); for the renovation of wetland (EUR 1.8 million); to promote flood protection, water renovation and migratory fish (EUR 6 million). | 37 |
| **France** | | |
| Other or not specified | Forest | 221 |
| **Greece** | | |
| Tax reduction / other subsidy | HEDNO network upgrades aiming at enhancing resilience and protecting the environment | 66 |
| | HEDNO overhead network upgrading in forest areas | 44 |
| | National Reforestation Plan and Parnitha flagship investment | 247 |
| | Forest firefighting, prevention and response equipment | 127 |
| **Italy** | | |
| Grant/Loan (including interest-free loans) | Digitization of national parks | 110 |
| | Renaturation of the Po area: The project consists of the redevelopment of the river Po with the aim of balancing the active morphological processes, to ensure the renaturation of the river | 397 |

| | | |
|---|---|---|
| | Reclamation of orphan sites: The aim of this intervention is to give the land a second use, favouring its reintegration into the real estate market, reducing the environmental impact and promoting the circular economy. | 551 |

| Country and Type of measure | Summary description | Value, US$m |
|---|---|---|
| **New Zealand** | | |
| Other or not specified | National Wilding Conifer Control Programme to Boost Regional Economies and Employment. This initiative supports regional communities by providing employment opportunities and stimulating economic activity across a wide range of goods and services providers by controlling wilding conifers. This funding will enable the removal of extensive infestations, reduce the spread of wilding conifers, and minimise lifetime control costs. Controlling wilding conifers will also help to protect farmland, water and biodiversity. | 67 |
| **Portugal** | | |
| Regulatory change | Regulatory framework as the basis for the investments of the landscape transformation programme | 0 |
| | Regulatory framework to re-organise the prevention and combat of increased forest fires in response to climate change | 0 |
| Grant/Loan (including interest-free loans) | Investments in vulnerable landscapes to increase the ecological resilience of those territories | 298 |
| | RE-C08-i02 Rural Property Registry and Land Use Monitoring System | 95 |
| | RE-C08-i04 Means of preventing and fighting rural fires | 98 |
| | RE-C08-i05 MAIS Forest Programme | 55 |
| **Spain** | | |
| Tax reduction / Other subsidy | Component 4 Conservation and restoration of ecosystems and their biodiversity (all investments) | 1,812 |
| | Component 5 Preservation of coastal space and water resources | 2,306 |
| **Sweden** | | |
| Skills training | Relaunching an initiative for green jobs for people who are far from the labour market (part of the government's proposed Spring Amending Budget for 2020) | 16 |
| Other or not specified | Investments to protect natural areas | 401 |
| | EU RRP (proposed): Biodiversity protection | 259 |
| Grant/Loan (including interest-free loans) | Compensation to forest owners with subalpine forests | 41 |

### 3.3.2 Summary of survey findings

Respondents were asked to report on any recovery measures or changes to policies, strategies or approved practices that have been made. The subparagraphs below summarise responses received that concern changes to political perceptions of forests and responses received that have more to do with disaster preparedness, such as with regard to risks from climate change.

#### 3.3.2.1 Political perceptions of forests

In Ireland, the COVID-19 pandemic has not had an environmental impact but other policy instruments such as the European Green Deal, EU Forest Strategy and EU Biodiversity Strategy will have significant effects on the long-term relationship between forestry and environment. There is increased capacity for remote working to prevent any administrative delays. The Irish government has continued to highlight the important role that the forest sector can play in maintaining employment in the rural economy and on the role that forest parks can play as a valuable recreation resource for people in the current circumstances.

The value of the national roundwood supply in the UK, despite the country being a major importer of wood, was recognised politically in part due to the effect of COVID-19 on supply chains. Together with the recreational opportunities provided by forests, this has resulted in a raised political profile for the sector as a whole. COP 26 further emphasised this although the aspirational statements have yet to be translated into hard commitments and financing.

#### 3.3.2.2 Disaster preparedness and policy changes

The COVID-19 pandemic did not require any fundamental change to forest policy in Ireland where a new National Forest Strategy will be published in 2022. COVID-19 restrictions have had little effect on the lifestyle and livelihood patterns of people dependent on forests in Ireland although issues, other than COVID-19, such as delays in felling licensing, have had an effect. More generally, the Irish government has published a new National Climate Change Strategy and is also committed to European Union policies: the EU Green Deal; EU Biodiversity 2030; and the EU Forest Strategy.

As Australia is still very much dealing with the full implications of the COVID-19 pandemic, the government is yet to take stock of any permanent changes or outcomes in respect of policies, strategies or approved practices. The COVID-19 pandemic has highlighted strengths and weaknesses in the systems supporting responses to sudden impacts. This has tested interactions between jurisdictions (noting the Australia's federal structure), and highlighted the importance of clarity of scope, communication strategies, and transparency. Improved understanding of these dynamics going forward may be helpful in cross-jurisdictional work and responses to large scale issues in future.

Iceland was warning of negative climate change effects before COVID-19 and will continue to do so. Emergency (contingency) planning for natural disasters was also widespread before COVID-19 and that has not changed. In Switzerland the perception of the COVID-19 pandemic is that it is a short-term problem, while climate change is viewed as a medium- to long-term problem.

Luxembourg has adopted the approach promoted by Seidl (2014) for the assessment of risk and uncertainty around forests and the forest sector and this has as proven very valuable. In 2016, it created a Wood Cluster to encourage wood use, enhance supply chain efficiency and diversify the wood processing sector. The

cluster brings together public and private sector entities as well as research organisations and seeks to encourage wider use of wood in construction and to stimulate innovation through partnerships and easier access to market and product information. While this predates COVID-19, it is proving valuable in the response to it, as well as to wider policy issues such as climate change. In the UK, Wales has promoted a similar initiative aimed at improving local supply chains and promoting increased use of wood products in buildings, which is also a valuable climate change response.

In France, the forestry component of the French recovery and resilience plan was launched in December 2020; it will be allocated €200 million for the next two years. In order to ensure success, several support systems have been created. The general ambition is to adapt forests to climate change and initiate their renewal in order to protect biodiversity and meet society's needs for wood products. All the planned actions are centred around four main objectives: (i) To support the forest towards more resilience and adaptation to the challenge of climate change; (ii) To promote wood as a renewable and ecological resource, in particular for carbon storage in construction; (iii) To reconcile and create an unbreakable link between the upstream and downstream sectors in the service of sovereign, competitive and sustainable wood production; and (iv) To recognise and enhance the multifunctionality of forests in all their dimensions (economic, ecological and social).

The French recovery plan devotes €150 million to forest renewal in the context of climate change, by encouraging forest owners to invest in adapting their forests or improving their contribution to climate change mitigation. The expectation is that more than 45,000 hectares of forest should be adapted, regenerated or reconstituted, i.e. approximately 50 million trees. Aimed at public and private forest owners, this financial package should make it possible to renew forest stands damaged by the effects of climate change, particularly forests in the north-eastern quarter of France hard hit by the bark beetle crisis. It should also stands showing signs of vulnerability to adapt to climate change and enhance the mitigating effect of the forest carbon sink by improving forest stands to enable both timber production and carbon storage in wood materials.

COVID-19 has been generally a good test of forest and forest sector resilience. While this has relevance for responding to climate change, it is largely a result of long experience of dealing with influences such as fire, insect attacks, drought and storms rather than being due to responding to the pandemic.

## 3.4 Best practices adopted by countries and other stakeholders

### 3.4.1 Literature review

COVID-19 put a spotlight on the intimate link between human health and ecosystem intactness. Although not a new insight *per se*, the relevance of nature conservation and ecosystem restoration to decrease the propensity for future zoonosis was brought to the fore by the pandemic (Wunder et al. 2021) and creates an opportunity to push for more ambitious and bolder shifts toward sustainability (Saxena et al. 2021).

For example, the EU Biodiversity Strategy for 2030 makes the need to learn lessons explicit: “Restoring biodiversity will also be a critical element for Europe’s economic recovery following the COVID-19 crisis. When restarting the economy, it will be crucial to avoid falling back into damaging old habits” (European Commission 2021, p. 6). The bulk of policies on forest conservation and restoration reported in **Error! Reference source not found.** and Table 2 (above) reflect this ambition.

A second lesson emerging from the pandemic relates to health benefits especially from urban forests. From a global perspective, Saxena et al. (2021) argue that green recovery must at its heart allow rural and forest dwelling communities to benefit from forested landscapes. The reports on increased use of urban forests for coping and compensation in the WEOG region point to the importance of forests for recreation, as well as physical and psychological health.

An opportunity emerging from the experiences with the COVID-19 restrictions is to give greater weight to health aspects in the management of urban forests. The 2030 EU Biodiversity Strategy is moving in this direction by foreseeing a dual role for urban green spaces and urban forests in supporting human wellbeing and biodiversity restoration (European Commission 2021). However, no reference was made explicitly to urban forests in the policies reported in Tables 1 and 2.

### 3.4.2 Summary of survey findings

Respondents were asked to explain to what extent the experience gained from COVID-19 led to new best practices, such as actors being better prepared for future disruptions due to another pandemic or effects of similar magnitude and timing. Many responses referred to the use of IT and virtual communication as well as skills building, health and safety but many also observed that their forestry sector was already well-framed to respond to natural and anthropogenic responses prior to COVID-19.

#### 3.4.2.1 Use of IT and virtual communications

IT systems were in regular use for planning and communications in all countries in the WEOG region before COVID-19 but the restrictions on working practices and physical meetings that ensued galvanised their rapid further uptake and use, particularly for virtual meetings.

In Australia, the increase in frequency of forestry industry meetings via remote or virtual formats was seen as an unexpected benefit of COVID-19 in reducing the time needed and the expenditure for travel and accommodation, while also allowing for greater participation to support information sharing. It also led to increased utilisation of emerging communication and web technologies. There has been a benefit to both domestic applications, in improving collaboration across jurisdictions (sharing data, reports, etc. digitally), and also to improve international ones, with enhanced participation from less-developed states through more cost-effective virtual participation solutions.

Both of these have the ability to support improved delivery of SFM, including more frequent engagement with international SFM-related processes that bring about an evolution of SFM, knowledge and capacity. It is, however, noted that some key trading partners have struggled to maintain regular bilateral engagement as a result of the pandemic, particularly where organisation and access has been challenging during working from home restrictions. Although there is no hard data yet available, it is considered anecdotally in Australia that it is likely there will be long term economic implications for the management, monitoring and reporting activities of governments and industry.

Norway also reported major use being made of virtual meetings and expects this to continue as does Iceland. The Irish Department for Agriculture, Food and the Marine continues to meet in various international fora in a virtual format. This has in some cases led to increased attendance in the virtual fora due because it does not require travel nor entail as much overlap of meetings, which is a positive. There have been some delays

regarding the decision-making process, due to the informal nature of some meetings. However, this has improved as requirements and processes became more familiar to all participants.

In the UK, COVID-19 restrictions galvanised wider uptake of IT systems and virtual communications that were already in use and this change is likely to continue and increase. There is also now active development of less formal virtual spaces where people can meet for social contact and/or exchange ideas and information by optimising the use of IT systems and capitalising on the roll out of 5G telephony as well as cabling. While there are clearly benefits from this wider access and from new communications opportunities, the question of how to resolve complex and difficult issues, particularly where there are strongly divergent views, without face-to-face contact remains to be resolved. There is also the issue of ensuring security for such communications as they encompass increasingly more information.

Like Norway, the UK noted that increased use of IT reduces travel, including commuting, also noting that this is a generally helpful contribution to emissions reduction for addressing climate change. Hybrid working patterns were developing pre-pandemic the restrictions imposed as a result of COVID-19 appear to have advanced the speed at which these are now evolving and becoming mainstreamed.

#### 3.4.2.2 Skills building, health and safety

In forestry education in Switzerland, there have been and still are organisational matters that need to be taken care of in order to comply with protection rules for lectures and courses but with regards to the content of the curricula, no change is expected.

In the UK, forest work is essentially socially distanced although people seldom work in isolation for safety reasons, so new regulations were easily accommodated for outdoor work. There have been reports of those in office-based support functions working from home suffering from mental health issues due to the lack of social contact that was previously the norm.

**Institute of Chartered Foresters (UK) Webinars**

Learning and information exchange through webinars, regional and national meetings and virtual study tours continued, building on experience gained in 2020 as a result on the initial COVID-19 restrictions. This has provided personal professional development opportunities as well as more general information exchange. Of particular note is the two-hour virtual international study tour that encompassed forestry activities in England, New Zealand and Tasmania and was very well-attended.

While not COVID-19 related, it is interesting to note that New Zealand has been working actively on remote controlled harvesting machinery to improve worker safety and reduce accidents.

# 4 Synthesis

The effects of COVID-19 on the forests and forest sectors in the countries in the WEOG region have been more limited than in other regions of the world where large numbers of people depend on forests for their livelihood and may use them as a buffer in times of need. All of the WEOG countries are developed economies and have been able to fund responses such as financial support to those directly affected. The two predominant points of impact are changes to the demand for wood products, driven by disturbed international trade patterns and alterations to domestic demand, and, in most countries, much increased use of forest areas for recreation.

At the same time, other regular forest influences have resulted in impacts that make it hard to tease out specific effects from COVID-19. As well as regular storm damage in northern Europe, which may be becoming more frequent and occurring beyond the normal winter season, there has been an ongoing bark beetle outbreak affecting Norway spruce (*Picea abies*) a hugely important species for wood industries in Central and northern Europe. In southern Europe, fires have been increasingly serious in recent years, while Australia is still recovering from the huge fires in both natural forests and plantations that started in September 2019 and destroyed 8.3m ha of natural forests and 140,000 ha of plantations.

The survey responses and literature review highlight the intimate links between the economic resilience of the forest sector, the benefits forests provide to human health and the importance of ecosystem intactness, not least to avoid future zoonoses. In terms of policy recommendations, these links underscore the value and importance of pursuing sustainable forest management with a view to achieving an equilibrium between economic, social and environmental goals. Whether consumers' experience of interrupted supplies and the importance and value of wood and wood products will also lead to altered perception of wood as a climate change friendly material remains to be seen.

Perhaps the most striking insight we have gained in this research is on the importance of the role that urban forests across the WEOG region played for maintaining physical and psychological health during the lockdowns and other restrictions. Building on this experience, one policy recommendation is to strengthen efforts to manage urban forests in a way that creates equitable access to safe green spaces for all residents of a urban areas regardless of their socio-economic status.

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