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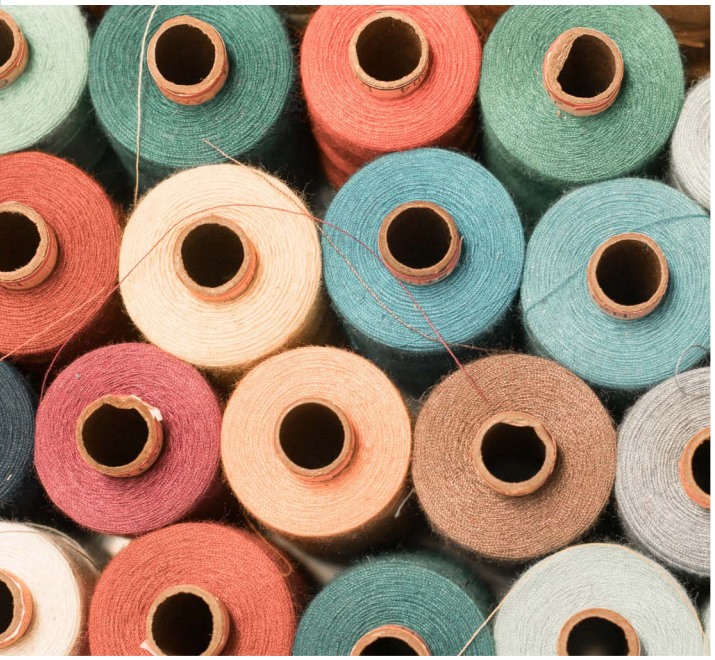
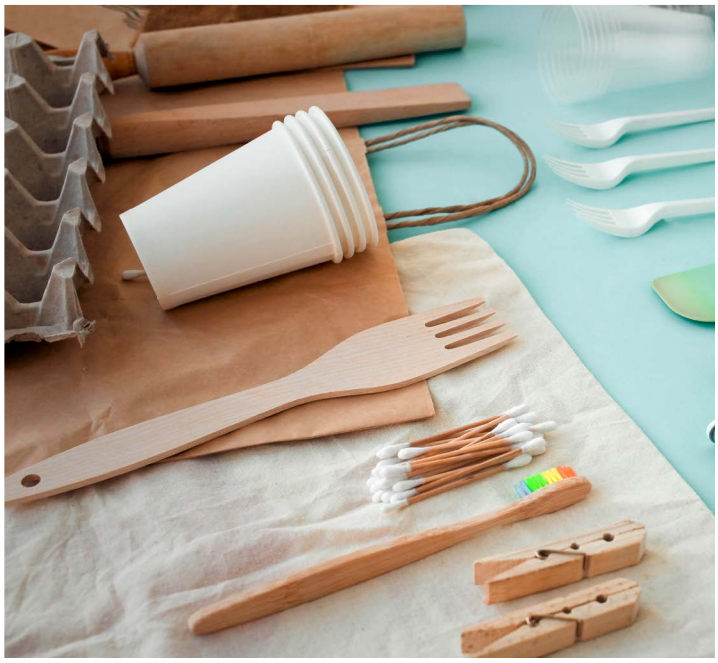
Circularity concepts in forest-based industries





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ABSTRACT

The world's prevalent economic model, based on a 'take-make-use-dispose' approach, cannot maintain and raise human standards of living without causing environmental degradation and incurring economic risks. Decoupling economic activity from the increasing demand for natural resources could be done through circular, bio-based economy approaches leading to a regenerative growth model, allowing humankind to reduce its environmental footprint on the planet.

The forest sector, situated in both the biological and technical cycles of a circular economy, is well suited to embrace a circular, bio-based economic model. However, challenges in the overall circularity of forest-based value chains persist as a result of the sector's traditional means of operation.

To ensure the sustainability of the forest-based value chains, continuous consideration and coordination of circularity at all stages of the value chains are needed. A viable starting point for this is with the principles of sustainable forest management (SFM), following by the optimized cascading use of wood at every production stage and concluding with the recovery of post-consumer wood at the end of value chains.

This study analyses the existing and possible limitations to circular approaches in forest-based industries, namely the woodworking industry (focusing on sawn wood processing, bioenergy production and wood in construction), the furniture industry, the paper and pulp industry as well as industry using cellulose-based fibres and cellulose-based plastics.

The analysis provides evidence that not all circular approaches are sustainable under all circumstances. In some cases, the focus on circularity may cause environmental externalities, in other cases, it may not guarantee economic viability. While the transition to a circular, bio-based economy can be facilitated by a legislator, the process will need to develop organically, based on the location of industries, proximity to available (waste) resources and consumer preferences.

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FOREWORD

The year 2020 gave birth to a new reality that most of the world had not previously imagined and that most societies were ill-prepared for. Covid-19 held a magnifying glass to the globe's economic, social and environmental fabric and revealed its fragility, caused at least in part by harmful economic practices impacting human health, biodiversity loss and driving climate change. These damaging patterns of economic activity, such as the unsustainable use of natural resources, were sobering indicators of human society's unsatisfactory progress towards achieving global sustainability.

While economic and social recovery from the COVID-19 crisis is possible, for such a recovery to be durable and resilient, returning to 'business as usual' is not a viable option. Continuing to see human health and activity in isolation from nature, ecosystems and animal health is fraught with danger. Enduring environmental crises are causing, and will continue to cause, social and economic damage more profound than that incurred by COVID-19. To avoid this, planning for the world's economic recovery needs to be done using a sustainable model that allows us to "build back better".

The COVID-19 crisis, while traumatizing and tragic for so many, is also an opportunity that we should not miss. The recovery policies being realized should aim to trigger investment and behavioural changes that will reduce the likelihood and severity of future health, economic and environmental shocks while increasing society's resilience to them when they do occur. Central to this approach is a focus on human well-being and reconnection with the broad interplay of natural processes at work around the globe.

More specifically and in the context of this study, forest-derived biomass has for centuries been an important raw material for the global economy. Being both widely available and renewable serves to heighten its importance, however, both of these positives will remain only if forests are sustainably managed. Woodworking industries have made progress in this regard by being genuinely committed to sustainable forest management, and not only because their industry depends on this natural resource. Today, forest sector activities rely on large volume flows of wood as a commodity, with the sector's innovation efforts focusing on raw material productivity and optimization of production processes. From both the economic and environmental points of view, these strategies have been successful and align well with the principles of a circular bioeconomy.

Nevertheless, in the context of the "green recovery", the forest sector stands on the cusp of a new opportunity – one that would allow an enhanced role for wood manufacturing and create new jobs in many economies. Being a strategic provider of a key resource to many forest-based industries, the forest sector can play a central role in the successful implementation of many post-COVID recovery policies focusing on a circular bioeconomy.

With this publication we want to contribute to a better understanding of what circularity means for forest-based industries, what its limitations are and what is needed to make circularity sustainable and economically viable in these industries in the long term.

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ABBREVIATIONS

Btu	British Thermal Unit
CEPI	Confederation of European Paper Industries
CEI-BOIS	European Confederation of Woodworking Industries
CO2	Carbon dioxide
CSCM	Circular Supply Chain Management
DFD	Design for Dismantling
ECE	United Nations Economic Commission for Europe
EEA	European Environment Agency
EPA	United States Environmental Protection Agency
EU	European Union
Eurostat	Statistical office of the EU within the European Commission
FAO	Food and Agriculture Organization of the United Nations
FSC	Forest Stewardship Council
GHG	Greenhouse gases
IEA	International Energy Agency
ISIC	International Standard Industrial Classification of All Economic Activities
ITC	International Trade Centre
ITTO	International Tropical Timber Organization
kJ	Kilojoule
MDF	Medium-density fibreboard
mm	Millimetres
Mt	Million tonnes
NACE	Statistical Classification of Economic Activities in the European Community
NWFP	Non-wood Forest Products
OECD	Organisation for Economic Co-operation and Development
OSB	Oriented Strand Board
PACE	Platform for Accelerating the Circular Economy
PEFC	Programme for the Endorsement of Forest Certification
SCM	Supply Chain Management
SDG	Sustainable Development Goals
SFM	Sustainable Forest Management
SME	Small and medium-sized enterprise
TCO	Total Cost of Ownership
UEA	European Federation of Furniture Manufacturers
VCA	Value Chain Analysis
WWF	World Wildlife Fund

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