New Generation Plantations | 2020 REVIEW

New Generation Plantations

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Thanks to all the contributing authors.

Cover photo: Lake Taupo Forests Trust at Hautu-Rangipo with sacred Mount Pihanga in the background. Tree Plantations in the Landscape field dialogue, New Zealand. ©The Forests Dialogue

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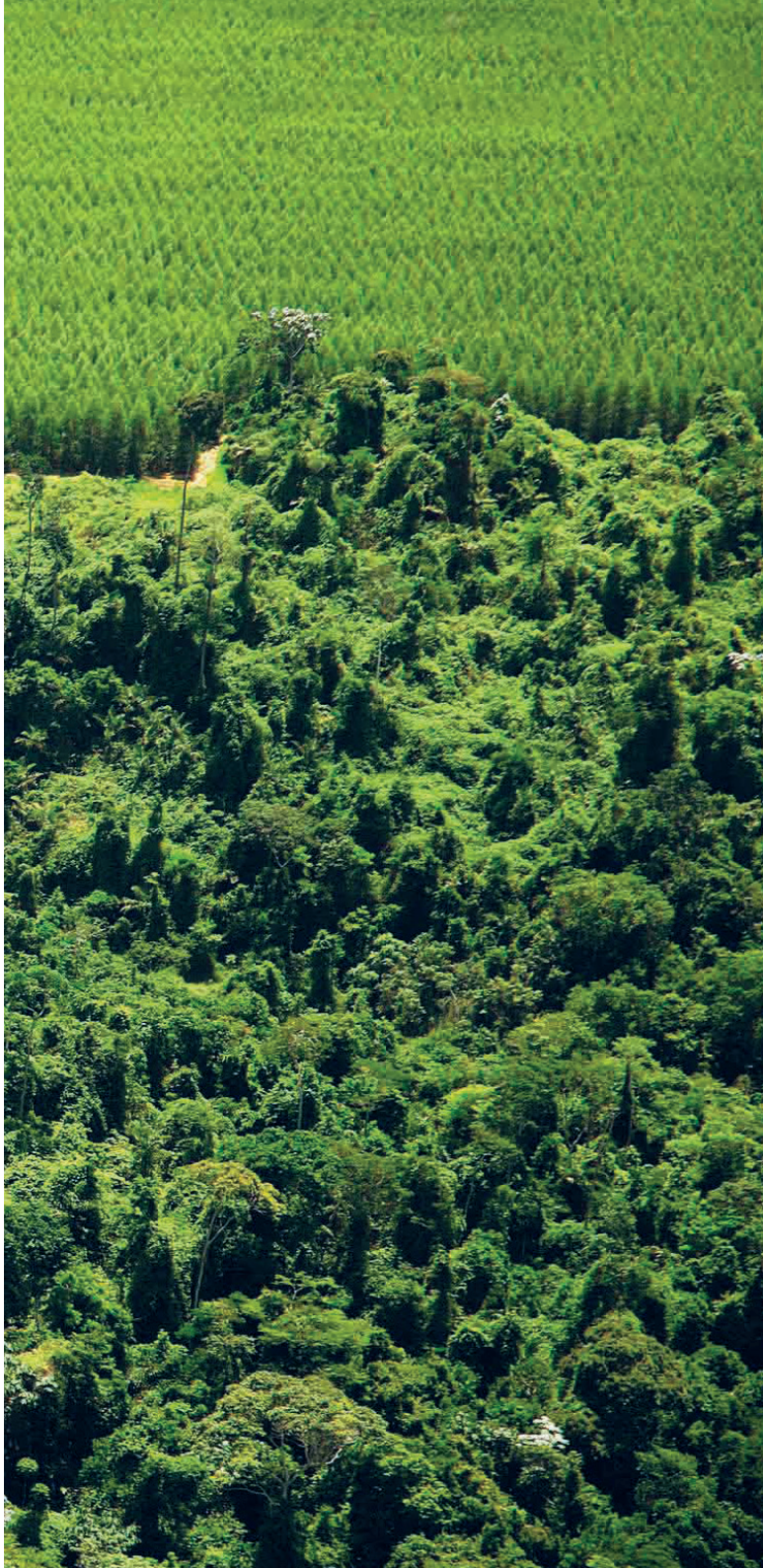

Foreword

We are living in extraordinary times. Of technological and economic change, political and social instability, population and consumption growth, climate and biodiversity crisis. The recent pandemic only highlights these trends.

NGP couldn't be indifferent to this changing world. We have to remain relevant to new realities. And as Winston Churchill supposedly said, "Never let a good crisis go to waste." We have taken it as an opportunity to reinvent ourselves.

NGP was created in 2007 by WWF, with the participation of a number of government forest departments and private companies that manage forest plantations. Over the years, it has evolved into a leading platform for sharing knowledge, best practices and collaborative learning about plantations.

Today, NGP is a concept that brings together an "ecosystem of collaboration" from civil society, the private and public sectors and academia to develop solutions that have an impact at a landscape scale.

NGP is now implemented under a new WWF umbrella programme, Forests Forward. This is where we work together to develop solutions, taking an integrated landscape approach, enabling good governance, creating shared value, and generating a pipeline of projects attractive for investors contributing to WWF's conservation goals.

We've also created a best-in-class technical assistance facility, which provides Forests Forward participants with technical support on implementing the NGP concept, and originating and incubating projects involving plantations.

Another piece in the puzzle is WWF's Bankable Nature Solutions initiative. By developing a pipeline of projects that generate a financial return for investors while having a positive impact on nature, people and climate, using innovative blended finance instruments, we can scale up our impact on the ground.

We are at the gateway of a new decade which brings some of the biggest challenges humanity has ever faced. The transition to sustainability is no longer optional. It is a matter of survival. We want NGP to be at the centre of this process, because we believe plantations to be part of the solution.

Looking forward to continuing to work with you in the decade ahead!

Luis Neves Silva
New Generation Plantations lead,
WWF Forests Forward programme

THE NGP ECOSYSTEM OF COLLABORATION

NGP was created in 2007 by WWF, with the participation of a number of government forest departments and private companies that manage forest plantations. Over the years, it's evolved into a leading platform for sharing knowledge, best practices and collaborative learning about plantations.

But it's vital that we turn the ideas and experiences we share into action. This year, we've made some changes in the way NGP is structured, which we believe will enable us to have a greater impact where it matters most. We see NGP as an "ecosystem of collaboration", bringing together a community of people and organizations from civil society, the private and public sectors and academia to develop solutions that can help transform the landscapes where we work.

WWF FORESTS FORWARD

FORESTS FORWARD is WWF's global engagement programme focused on delivering positive impacts in forest landscapes. Forests Forward participants each have their own agreed scope of work, focusing on improving forest and plantation management, responsible sourcing and supply chain sustainability, or other forest-based investments and interventions. A number of participants focus particularly on implementing the NGP concept.

New Generation Plantations

NGP SOLUTIONS builds on our history of learning and knowledge sharing. It's a Forests Forward thinking space dedicated to the development of the NGP concept, through study tours, encounters, dialogues and storytelling, and collaborations with companies, NGOs, governments, investors and researchers.

BANKABLE NATURE SOLUTIONS

WWF'S BANKABLE NATURE SOLUTIONS initiative links projects that can generate positive environmental and commercial returns with investors.

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TECHNICAL ASSISTANCE

NGP TECHNICAL ASSISTANCE provides Forests Forward participants with technical support on implementing the NGP concept, and works with companies, smallholders, communities, the public sector and others to originate and incubate projects.

- Maintain ecosystem integrity
- Protect and enhance high conservation values
- Effective stakeholder involvement processes
- Contribute to economic growth and employment

Landscape stewardship — Co-creating shared value — Restoration & conservation projects

THE ECONOMY OF THE FUTURE WILL GROW ON TREES

The climate is heating up at a rate unknown in human history. Biodiversity is in rapid decline. Humanity's ever-growing consumption is polluting and degrading our air, water and landscapes. It's never been clearer that business as usual, based on burning fossil fuels and extracting the Earth's resources at unsustainable rates, cannot continue.

While the climate crisis may be the most pressing argument, there are other compelling reasons for shifting to a low-carbon economy built on renewable and bio-based resources. Globally, extraction of materials jumped from 27 billion tonnes in 1970 to 92 billion tonnes in 2017, and could reach 190 billion tonnes by 2060 if today's trends continue.[1] The extraction, production and disposal of the materials we use bring a host of environmental and social impacts – from the effects of sand mining on riverbeds and coastal areas, to cement and steel manufacturing processes (each responsible for around 8% of global greenhouse-gas emissions), to the devastating extent of plastic pollution in the ocean.

Substituting wood for fossil fuels or energy-intensive materials such as cement, steel, aluminium, plastics or cotton can bring considerable benefits. For every tonne of carbon in wood products used in place of other materials, overall carbon emissions are reduced by 1.2 tonnes on average.[2] As well as having lower emissions during the production process, wood products can be recycled several times before eventually being burnt to generate energy at the end of their useful life. Timber products also store carbon throughout their lifetime – which in some cases may be decades or even centuries.[3]

Some of the most striking benefits are already being seen in the construction sector. Most building components – from structural elements and exteriors to floors and insulation – can be made from wood, and technological advances are opening up new opportunities. Engineered wood products like cross-laminated timber panels (multiple layers of wood glued together at right-angles to form super-strong panels) allow for larger and taller wooden buildings. Timber towerblocks are already becoming a reality. Vancouver currently boasts the world's tallest wooden residence at 53m and 18 floors, but sights are being set even higher: Japanese company Sumitomo Forestry is planning a 350m tall 70-storey skyscraper in Tokyo, which would contain around 180,000 cubic metres of wood.[4]

The benefits of using wood vary according to the material it is replacing. A study by the European Forest Institute suggests that every tonne of wood used in place of a tonne of concrete reduces CO_2 emissions by 2.1 tonnes over the product's life cycle.[5]

Given that 4.6 billion tonnes of cement is poured into concrete structures every year,[6] there is huge climate mitigation potential in replacing concrete with timber where possible. It's been estimated that replacing conventional construction materials with wood could remove 0.5-1 gigatonnes of CO_2 from the atmosphere, and save up to 31% of global CO_2 emissions.[7]

Wood also plays an important role in meeting global energy needs. Today, bioenergy provides around 13% of total global energy consumption, and is by far the largest source of renewable energy. By comparison, hydropower contributes 3% to the global energy mix, and all other renewables combined just 2%. The vast majority of this – about 80% of all global bioenergy – is in the form of burning wood for cooking and heating, primarily in Asia and Africa.[8]

The European Forest Institute suggests that every tonne of wood used in place of a tonne of concrete reduces CO_2 emissions by 2.1 tonnes over the product's life cycle.

THE ECONOMY OF THE FUTURE WILL GROW ON TREES

Planting more trees and using more wood in our daily lives can help us mitigate the effects of climate change, reverse biodiversity loss and reduce pollution – as long as we do it right

By NEW GENERATION PLANTATIONS

This story is extracted from a longer paper co-authored by the working group NGP/IUFRO Task Force 'Resilient Planted Forests Serving Society & Bioeconomy'.

Read the full article on our Exposure storytelling site

In fact, according to FAO statistics, around half of the nearly 4 billion cubic metres of annual global wood production is burnt for energy.[9] Inefficient use of wood can contribute to overharvesting, forest degradation, loss of ecosystem services, and indoor and outdoor air pollution. However, there is huge scope to lessen the environmental and social impacts of traditional biomass use – including more efficient stoves, using offcuts and recycled wood products rather than virgin timber, and substituting other renewable energies for cooking and heating where suitable.

Modern bioenergy will be a vital part of a future low-carbon, fully renewable energy mix, particularly for functions not so easily filled by other renewable energy sources like wind and solar power – including heat, baseload electricity and transport fuel. While wood will continue to be burnt in home stoves and power stations, new thermo- and bio-chemical processes are opening up possibilities for producing liquid fuels from wood products. Some companies are already producing biodiesel from tall oil and black liquor, residues from the pulp-making process. And the range of products that can be derived from cellulose and lignin – the main components of wood – is increasing all the time.

Plastic waste, Jakarta, Indonesia ©Yunaidi Joepoet/WWF

As fossil fuels are phased out, we will see oil refineries replaced by biofineries which use wood and other biomass to make everything we currently derive from petroleum – not just fuels, but paints and adhesives, asphalt and detergents, and various types of plastic. With plastic pollution increasingly capturing the headlines, biodegradable bioplastics offer obvious environmental benefits. Viscose and other fibres derived from cellulose can substitute for cotton, the cultivation of which uses huge quantities of arable land, water and agrochemicals. Other products derived from wood that are under development or already on the market range from food additives and hygiene products to pharmaceuticals and LCD screens.[10]

The shift to a bioeconomy offers particular opportunities for developing countries with limited fossil resources but plenty of land. It can support a truly sustainable model of rural development, increasing the value generated by forestry and agriculture while also – if done right – helping restore land, enhance ecosystem services and reduce carbon emissions. For the forestry sector, a bioeconomy represents a switch from present high-volume, low-value commodities to an enormous range of high-value, low-volume products. This presents opportunities for small producers and SMEs in particular to innovate and capture value.

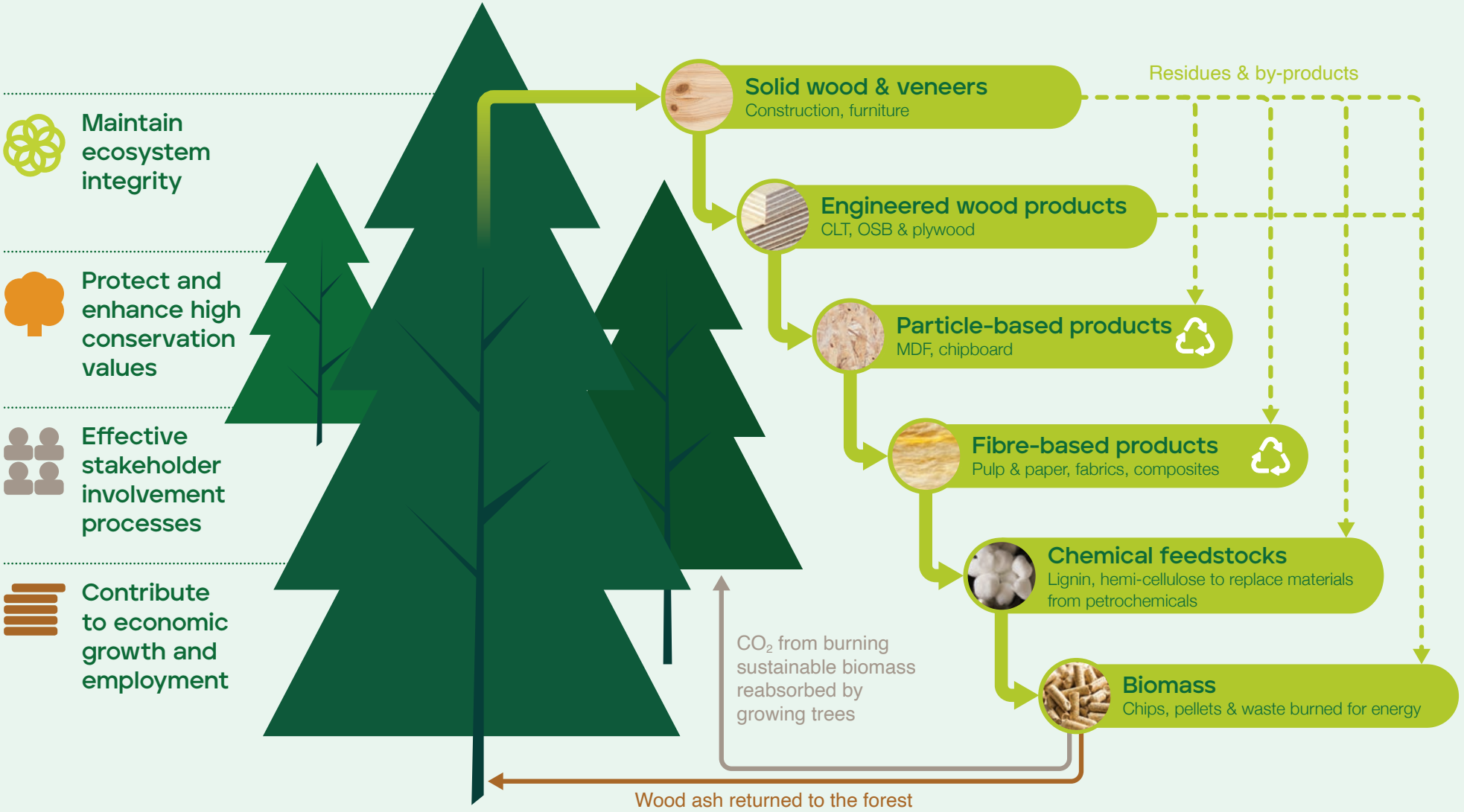
Replacing concrete with timber has huge climate mitigation potential ©Stora Enso

As the health of our planet continues to worsen, incremental change is no longer enough: bold new approaches are needed. A bioeconomy, supplied by a new generation of plantations that benefit people and the environment, needs to be at the heart of the solution.

Just imagine what that could look like. A world where wildernesses are left to nature, while responsibly managed and restored forests and a new generation of highly productive tree farms supply the products that a 21st century society needs. A world where raw materials are grown, not mined, in a way that helps to restore ecosystems, reduce emissions and improve local livelihoods. A world where those materials are reused, recycled or used to generate energy at the end of their life-cycle. What a wonderful world that would be. ■

PLANTATIONS SUPPORT A CIRCULAR BIOECONOMY:

Plantations that follow the NGP concept can provide a source of renewable materials for a circular bioeconomy. The cascading uses on the right show how wood can be recycled several times before being burnt for energy. The carbon dioxide this releases is reabsorbed by new plantations, and the ash provides nutrients for the soil.



LIFE IN THE "GREEN DESERTS"

Often criticized as sterile monocultures, can plantations contribute to conserving and restoring biodiversity?

| Jaguar © naturepl.com / Edwin Giesbers / WWF

The capercaillie *(Tetrao urogallus)*, the world's largest species of grouse, is one of the UK's most endangered birds. Famous for its ostentatious mating display, this forest-dwelling bird suffered a severe population decline from the 1970s onwards. Today, fewer than 500 male capercaillies are thought to exist in the country, and the species is now largely restricted to pine forests in the Strathspey area of Scotland.

Back in 2002, the governmental agency Forestry and Land Scotland (then known as Forestry Commission Scotland) launched a capercaillie conservation project. At the time, only six displaying males were known to inhabit the plantations it manages in Strathspey. Forestry operations were restricted during the breeding season, and tree cover was thinned and clear felling avoided to enhance the adult birds' summer diet of ground vegetation and the chicks' diet of insects. By last year, the number had risen to 45.

Many of those involved with NGP have first-hand experience of observing the wildlife within plantations – from watching elephants browsing on eucalyptus in South Africa to spotting rare birds

Capercaillie populations have increased substantially thanks to conservation work in Scottish plantations ©Krasula/Shutterstock

In a world where wildlife is in stark decline, the capercaillie's comeback is a welcome conservation success story. And it demonstrates that planted forests managed for timber production have a part to play in halting and reversing biodiversity loss.

This is not a premise everyone agrees with. Some still see commercial plantations as enemies of biodiversity. Monoculture plantations, especially of fast-growing exotic species, have been described as 'green deserts' and 'ecological dead zones'. It's undeniable that intensively managed plantations don't harbour the same richness as an old-growth forest. And biodiversity will suffer if plantations are established in place of existing forests or other natural ecosystems like grasslands.

But a growing body of research suggests plantations that follow NGP principles can have positive impacts on biodiversity.

Elephants graze in a firebreak in Mondi's plantations in South Africa

This is partly by taking pressure off natural forests at a time when timber demand continues to grow rapidly: there's evidence to show that forest degradation, one of the leading drivers of biodiversity loss, is reduced as tree plantations expand.[11] This, though, is only part of the picture: with sensitive design and management, plantations can go further in enhancing and conserving biodiversity.

At the landscape level, plantations can contribute to conservation in areas that have lost natural forest cover by helping maintain connectivity and heterogeneity (diversity).[12] They can also act as a buffer around native forest remnants and conservation areas. This can reduce edge effects – abrupt changes in habitat that can be detrimental to many species – and encroachment by people.

At the stand level, too, plantations can provide biodiversity benefits compared to other land uses. Studies have shown that plantations have a richer range of amphibians and reptiles than the pasture lands they tend to replace, as well as richer birdlife and more mammals than pasture lands that don't have any remaining natural vegetation.[13] They can also support diverse insect communities.[14] Many of those involved with NGP have first-hand experience of observing the wildlife within plantations – from watching elephants browsing on eucalyptus in South Africa to spotting rare birds.

Collectively, the companies and governments implementing the NGP concept manage more than 11 million hectares of land. Timber plantations – often established on degraded agricultural land – make up less than half of this total. Much of the remainder consists of native forests, grasslands and wetlands that are being maintained or restored with the explicit aim of conserving biodiversity – including officially designated nature reserves, ecological corridors, areas of high conservation value and even natural World Heritage sites.

Most Forests Forward participants applying the NGP concept publicly identify biodiversity conservation as one of their organizational objectives. They carry out a wide range of research and monitoring projects ranging from small-scale pilots to landscape-level and multiregional programmes, including:

Monitoring and conservation of key species, including Darwin's fox (Chile), Patagonian huemal (Chile), jaguar (Brazil, Argentina), capercaillie (UK) and various other birds and plants.

Ecosystem-based projects, from freshwater monitoring to removing invasive plants and increasing the amount of deadwood in plantations.

Landscape mosaic models, connectivity and ecological networks – for example, looking at the richness of native species and animal movements within wildlife corridors.

Managing and monitoring conservation areas.

Some encouraging results have already been seen. In South Africa, the areas of natural vegetation in and around Mondi's plantations had a similar richness and abundance of dragonflies and butterflies as protected areas, and were frequented by a wide range of large mammals including elephants, white rhinos, buffalo, giraffe and zebra.[15] More than 700 bird species have been recorded on land managed by Suzano in Brazil, with the numbers increasing every year. UPM has recorded over 1,200 plant species on its land in Uruguay, including several rare and endemic species and some that had never before been recorded in the country. In Portugal, The Navigator Company's annual biodiversity surveys have recorded 236 animal species, 97 of which are protected by European law.

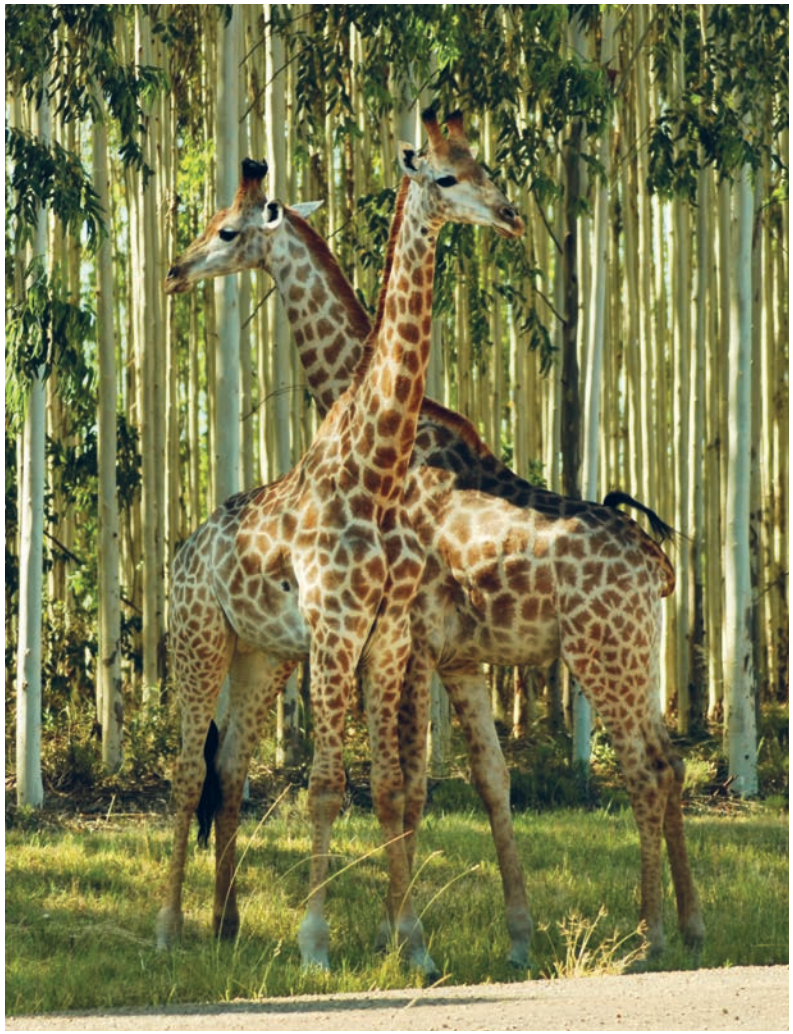
Plantation managers continue to build on these efforts. More research and better data can help us improve our understanding of the impacts of plantation design and management regimes on biodiversity, and lead to more effective conservation interventions and landscape planning.

This will be crucial over the coming decades as tree planting across the world reaches unprecedented levels. Supplying the growing demand for timber while also drawing down carbon and restoring biodiversity is a huge challenge: Forests Forward participants applying the NGO concept are showing how it can be done. ■

This story draws on research being developed by the working group NGP/IUFRO Task Force

'Resilient Planted Forests Serving Society & Bioeconomy'.

Areas of natural vegetation in Mondi's plantations in South Africa support an abundance of dragonflies as well as large mammals like giraffes; ospreys had become extinct in England, but now nest in non-native conifer plantations.



Orange dragonfly in South Africa
©Eleanor Esterhuizen/Shutterstock

Osprey with fish
©Mark Medcalf/Shutterstock

NGP activities: *What we've been up to since the last NGP Review in 2018...*

TREE PLANTATIONS IN THE LANDSCAPE DIALOGUE

Rotorua, New Zealand | November 2018

In partnership with The Forests Dialogue and SCION, we co-hosted a field dialogue looking at the plantation forest industry in New Zealand. Around 60 international participants took part in two days of field visits followed by two days of structured dialogue around the social, environmental and economic issues raised. Key topics included the indigenous Maori people's approach to forestry, climate change mitigation and sustainable intensification.

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NEW APPROACHES TO SMALLHOLDERS FIELDSHOP

Vietnam | March 2019

Hosted by WWF-Vietnam and organized in collaboration with the Forest Stewardship Council (FSC) New Approaches initiative, this three-day "fieldshop" looked at the experiences of smallholder cooperatives in the forestry sector in Vietnam. Participants from around the world came together to learn from success stories, discuss challenges and generate new ideas to strengthen and scale up sustainable forestry and livelihood projects for smallholders.

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TRANS-SIBERIAN STUDY TOUR

China/Russia | August 2019

Organized in partnership with the Boreal Forest Platform, this study tour took us from Beijing to the shores of Lake Baikal in Siberia. Observing forestry practices in both China and Russia, participants discussed ways to sustainably increase timber production in the boreal forest while also securing vital ecosystem services. Discussions took place in forests and pulp mills, conference rooms and a carriage on the historic Circum-Baikal steam train that formed part of the original Trans-Siberian Railway.

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NGP ENCOUNTER

Maputo, Mozambique | November 2019

One hundred people from 20 countries came to Maputo, Mozambique, for NGP's annual encounter. Representatives from companies, communities, NGOs, governments, finance institutions and academia spent two intensive days discussing the future of plantation forestry in Africa – the huge opportunities for social prosperity and landscape resilience, the formidable challenges, and the possible ways forward.

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BAHIA VIRTUAL STUDY TOUR

Bahia, Brazil | July 2020

The coronavirus pandemic meant our study tour to the Atlantic rainforest in southern Bahia couldn't go ahead as planned. Undeterred, we worked with our partners from Fórum Florestal da Bahia's (Bahia Forests Dialogue) to host a virtual study tour. More than 150 delegates around the world watched presentations, short films from local communities and discussions livestreamed on YouTube, and interacted in virtual meeting rooms.

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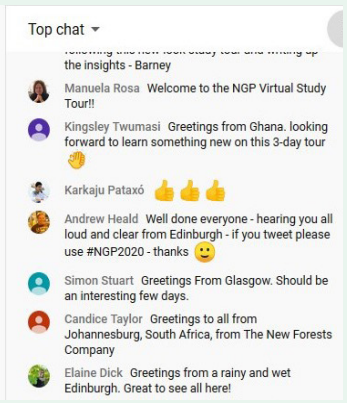

Discover how we organized the event, and follow the links to the recordings

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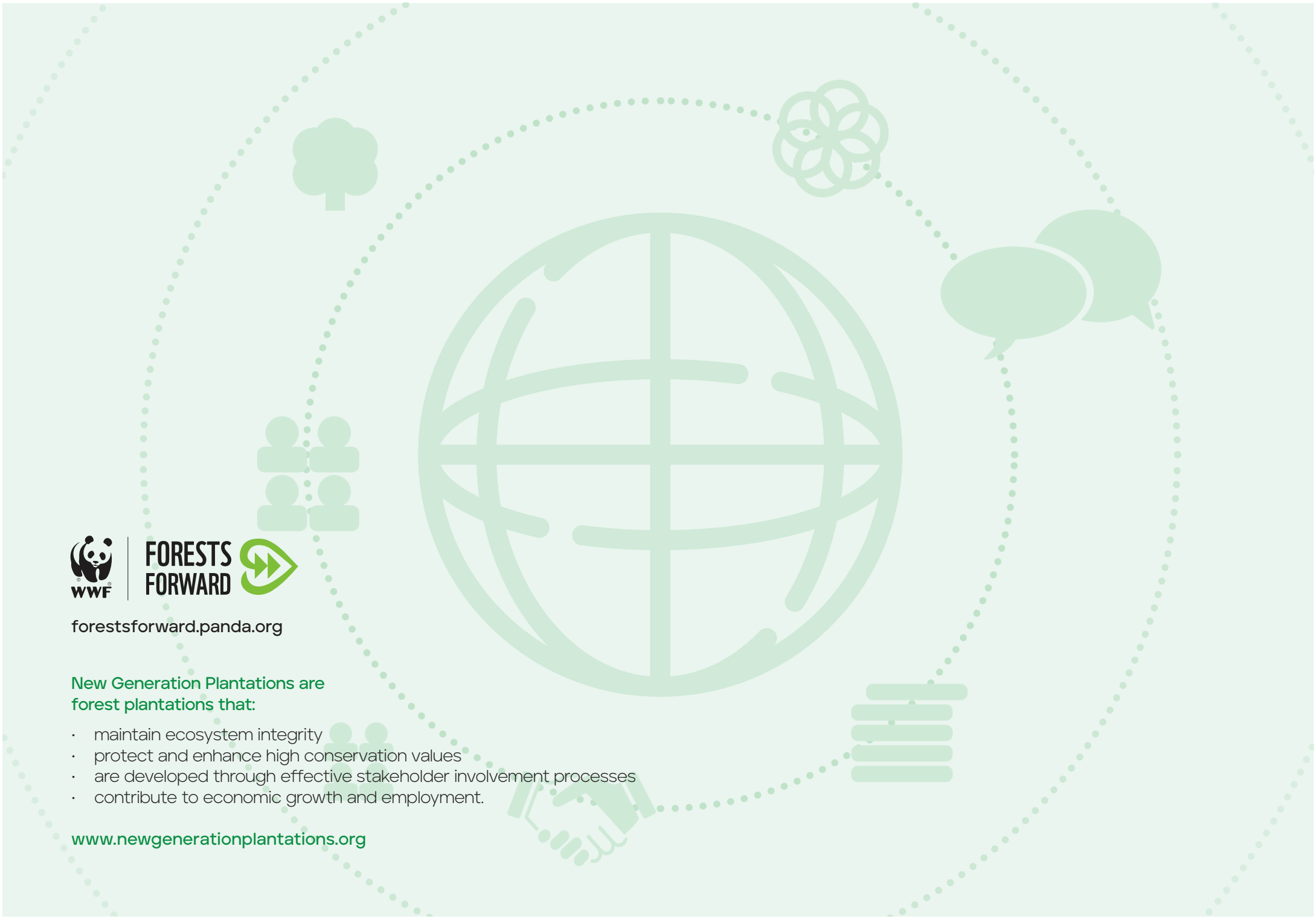

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- maintain ecosystem integrity
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