CFA Newsletter

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Promoting scientific results from Australian funded forestry research in the Asia Pacific

Edwin Cedamon discussing agroforestry and community forestry research with a village leader at Methinkot in Nepal (Photo: Tony Bartlett).

The Australian Centre for International Agricultural Research (ACIAR) has funded more than 150 collaborative forestry research projects over the past 30 years. Currently the ACIAR forestry research program operates in 14 countries: Papua New Guinea, Solomon Islands, Vanuatu, Fiji, Tonga, Indonesia, Vietnam, Laos, Cambodia, Nepal, Ethiopia, Uganda, Rwanda and Zambia; and has an annual budget of approximately $10 million. The evolution of this program since 1984 and some of its impacts are described by Bartlett (2016), which is available as an open access article.

Each of these forestry research projects involves Australian or international scientists working with scientists and stakeholders in the partner country to address a research priority identified by that country. The economic impacts arising from such projects have been documented in various impact assessment studies commissioned by ACIAR. Other important impact categories include scientific, capacity building, social and environmental impacts. These impacts are harder to assess than economic impacts but they are equally important for research projects. One

component of scientific impact relates to the dissemination research results through academic journals.

Recently ACIAR supported the publication of an open access Special Issue of the journal Australian Forestry, to make some of the results from current and recent ACIAR projects more widely available. This Special Issue is available at: http://www.tandfonline.com/toc/tfor20/80/3?nav=tocList and includes an editorial and eight scientific articles. The articles demonstrates the geographic spread and technical breadth of some of ACIAR's forestry research. Half of the papers relate to research in Asia and the other half to research in the Pacific, with most papers including authors from the partner countries. The papers cover four broad themes of research – four papers cover aspects of the improvement, management and growth of important commercial species; one paper focusses on social aspects of agroforestry development; three papers cover aspects of enhancing value chains for timber and non-timber products; and two papers relate to forest policy. The eight articles are:

- Page *et al* report the promising early results from growth and form measurements in a second generation progeny trial for *Endospermum medullosum* (whitewood) in Vanuatu.
- Mendham *et al* report the response to application of phosphorus fertilizer in Indonesian *Acacia mangium* plantations grown for pulpwood production.
- Vigulu *et al* report the results from research into competition for nitrogen between *Tectona* (teak) and *Flueggia* (poumuli) trees grown in a mixed agroforestry system in Solomon Islands.
- Nuberg *et al* report encouraging results from trials of short-rotation coppice agroforestry systems aimed at the production of fuelwood or charcoal in Papua New Guinea.
- Cedamon *et al* report results of socio-economic research in the mid-hills of Nepal that can be used to better target appropriate agroforestry interventions for richer and poorer household groups.
- Cunningham *et al* describe the findings and lessons from research undertaken in Eastern Indonesia to support the development of viable small, medium and micro enterprises processing non-timber forest products and marketing them in domestic and export markets.
- Smith *et al* examine the interface between social factors and the effectiveness of plantation policies and regulations for smallholder teak plantations in northern Laos as a case study.
- Tacconi reports findings from policy-related research on the design and implementation of Reduced Emissions from Deforestation and Forest Degradation (REDD+) in Indonesia.

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REFERENCE

BARTLETT, A.G. 2016. The evolution and impacts of ACIAR's forestry research program over three decades. *Australian Forestry*, 79**,** 171–188.

Association news

Assessment of climate change impacts, its management in a developed country's environment (Canada) and its potential application in the developing countries

Summary of a report by the recipient of the CFA Young Scientist Research Award 2017

Climate change and its impact has become the global pressure as the world's temperature is rising beyond expected levels. This has become a threat to the whole world but its impact is noticed more in developing countries. Some developed countries are found to be great emitters of greenhouse gases while the lesser emitter (the developing countries) of GHGs are more vulnerable and susceptible to climate change and it impacts. Likewise, some preventional and mitigating activities are not to be followed or undertaken by developing countries. Some of the developing countries are often observed to adopt some strategies and international policies on the platter of good intentions, but with improper implementation and less adherence. Most of the activities and strategies of some international organizations like REDD+ and its subordinates on climate change and deforestation are not much observable, despite the time and money spent on their projects. For instance, some of the REDD+ five majorly enumerated works in developing countries are not efficiently observable. Some developing countries are found to be lower emitters of greenhouse gases, but are found to be most susceptible to climate change due to;

- high rate of deforestation and/or lack of good management,
- government policy and corruption, less preventional and mitigating procurements. For example;
  a) in some cases indigenous people strive to protect their forests without any support from the government, e.g. the government even sabotages their efforts due to corruption (in the case of Nicaragua) while at times the reverse is the case.

b) some developing countries like Somalia, North Korea, Afghanistan, Sudan and Iraq are ranked high on the list of corrupt countries in the world.

- improper implementation and less adherence to international policies and strategies. According to the Guardian report from IPCC on 27th September, 2013, low income countries will be on the top list of human-induced climate change in the next century. FAO also emphasised the importance for sustainable forest management practices especially in developing countries.

My research study was carried out in the Department of Forest Resources Management, UBC, Canada, under the supervision of Prof. Dr. Gary Q. Bull), which was supported by the CFA Young Scientist Research Award, and has much reflection and resolution on the developing countries. It envisaged the way in which developing countries can learn from developed countries in order to curb the general problem of climate and environmental changes which has resulted from deforestation, degradation, poor land use and improper forest management practise in most developing countries. It is well known that tropical forests which have very long regeneration periods, species diversities and store more carbon are found in most of the developing countries. Therefore, it might be difficult to recover the existing loss and any further loss of primary forest, but this will serve as a guide by providing some recommendations as precautionary measures to prevent any future loss of primary forest. Likewise, it shows how the already lost forest can be regenerated through secondary forest plantation and sustainably managed to meet the economic, social and environmental needs of society, without tampering with the remaining primary forest and in fulfilment of REDD+ aims, adopted in 2010 at COP 16 (16th section of UNFCC) in Cancun, Quintana Roo, Mexico.

In order to provide suggestions on some procedures that can be adopted by developing countries in order to mitigate and improve their ways of climate change management which has resulted from deforestation and degradation, this research tried to assess the ways climate change and its impacts are managed in a developed country (Canada) through effective practise of sustainable forest management were assessed. The 11-year deforestation rate which was mainly anthropogenically caused from 2005 to 2015 in 90 developing countries and the anthropogenic actions on Canadian forests from 2004 to 2014; in term of harvesting and regeneration were considered.

Hypothetically, the result shows that Canada's forest management practice in term of harvesting and regeneration is sustainable, efficient and recommendable. Therefore, if Canada's forest management practice strategies could be adopted/learnt from and applied by developing countries, this will enhance proper protection of the remaining primary forest and promote quick restoration of the lost forest in the short term. The needed forest products by citizens would also be met in the managed forest zone without tampering with the remaining available natural/primary forest zone in these regions. In addition, it will not only reduce or prevent deforestation and degradation in the tropics which has suppressed the aims of REDD+ but it will also facilitate REDD+ goals and aims.

Akinlemibola Oluwasina
CFA member

The Queen's Commonwealth Canopy adds new case studies

The **Queen's Commonwealth Canopy** is pleased to announce the addition of three new case studies to the website at *queenscommonwealthcanopy.org*. Dolphin Head Forest Reserve (Jamaica), N/a'an ku sê Forest Conservation Revegetation Project (Namibia) and Epping Forest (UK) are described in detail and join case studies from Canada, Singapore and Papua New Guinea.

As we look forward to more countries joining the QCC the following two pages highlight Fiji's dedicaitons.

THE QUEEN'S COMMONWEALTH CANOPY

Fiji

Colo-i-Suva Forest Park

Colo-i-Suva Forest Park is a legally protected preserved forest, containing native flora and fauna, sites of archaeological and historic interest, ecological systems, geological features and other natural phenomena of special scientific.

The Forest Park covers an area of approximately 92 hectares and contains many tree species that are vital to the survival of certain fauna such as the Vadra (Pandanus pyriformis) tree, which is critical to the survival of the Fiji Tree Frog.

Due to Fiji's relative isolation, fifty percent (50%) of its recorded native flora are endemic, many displaying limited ranges within Fiji's forests. Colo-i-Suva Forest Park has forty five (45%) of the endemic flora found within the Forest Park.

Among the wildlife are 14 different bird species, including scarlet robins, spotted fantails, Fiji goshawks, sulphur-breasted musk parrots, Fiji warblers, Golden doves and barking pigeons. Of the fifty seven (57) land birds in Fiji, there are about 30 bird species found in the Colo-i-Suva Forest Park.

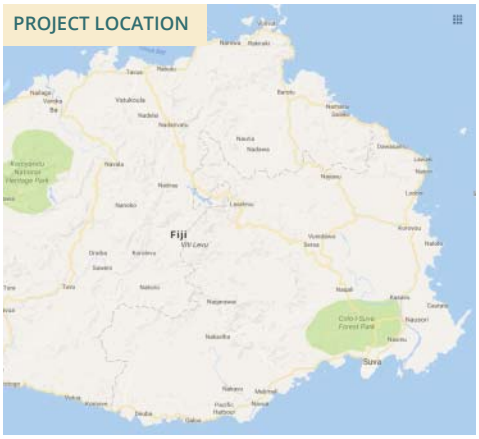
The Ministry of Forests is working closely with the local community to develop tourism to the Park, with tourists being able to witness traditional meke performances and buy traditional handicraft items. This collaboration has been well received by the local community, who look forward to increased tourism earnings contributing to the sustainability of their communities.

Main pool

Endemic tree frog

Waterfall

PROJECT LOCATION



Park pool

Partners

Forestry Department
Protecting our Forests; Sustaining Lives

THE QUEEN'S COMMONWEALTH CANOPY

Fiji

Emalu Forest

The Emalu forest is located South-West of Viti Levu, the largest island in Fiji. The forest has an area of almost 7400 hectares, is uninhabited and traditionally owned by the clan of Emalu. This is one of the largest pieces of land in Fiji owned by a single clan. More than 60% of the Emalu clan members are women and they have an equal stake and say on their land as the male clan members.

The Emalu forest is one of the hottest biodiversity spots in Fiji and is very unique even when compared to other hotspots in Fiji. This uniqueness includes a high occurrence of endemism not only in terms of diversity but also in population. This is a strong indication of the intactness of the forest. The Emalu forest is also a very important watershed when compared to other headwaters of Viti Levu because it is largely undisturbed. This ensures the provision of important ecosystem services to local communities downstream and to one the largest vegetable producing sites in Fiji, the Sigatoka valley. The Emalu forest also holds culturally significant information. Archaeological evidence in the area reveals ingenuity of our ancestors that enabled them to live in very rugged and challenging terrain. These features include old agriculture terraces; extensive channels/aqueducts for taro irrigation, habitation terraces, hill fortifications and habitation platforms.

Given the ecological significance of the site, the Emalu forest was selected as a REDD+ Pilot site for conservation in 2012. Since then there has been a strong focus on enhancing community livelihoods with strong community engagement in order to reduce the growing pressure to clear the Emalu forest for agriculture cultivation. Agriculture is the main source of livelihood for the villages living around the Emalu forest. A land use plan to promote sustainable agricultural activities was developed by the villagers, with support from various sectoral agencies. Activities are ongoing to ensure that the Emalu forest remains pristine.

PROJECT LOCATION

Partners

Forestry Department

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

german cooperation

Forest Scenes

Coppice Forest Management in Europe

When a single stemmed broadleaved tree is cut down this will, in many species, result in the sprouting of several shoots which will grow on into a multi-stemmed tree. These can then be harvested with the base, referred to as the stool, re-sprouting so the process can be repeated at intervals which will depend on the rate of growth rate and the intended product. This technique, known as coppice management (or coppicing), is widely acknowledged to be the oldest form of sustainable forest management and is still widely practiced with more than 20 million hectares still managed in this way across Europe.

Figure 1. Showing recently harvested coppice with the next years' crop in the background

In the past small diameter roundwood was important, particularly for fuel wood. However, from early in the 20th century the most prevalent form of management changed to favour high forest systems, driven by increased use of fossil fuels, demand for larger timber and advances in harvesting technology (including the widening availability of chain saws). As a result, many coppices were converted to high forest, over planted or simply abandoned. Interest in coppice has grown in recent decades as it is increasingly recognised as providing a wide range of products and services of value to society, in addition to the timber products.

COST Action FP 1301 *EuroCoppice: Innovative management and multifunctional utilization of traditional coppice forests – an answer to future ecological, economic and social challenges in the European forestry sector*[1] set out to consider how this traditional practice could be developed into a modern multifunctional system to increase the valuable contribution this type of management makes to society, economy and the environment. It involved representatives, who included forestry experts, researchers, practitioners and young forestry students, from 35 European and partner countries, to exchange knowledge about coppice management and to work together to consider the future for multifunctional coppice systems. Particular emphasis was given to technical and economic methods for promoting the wider (and not necessarily economic) services and products from coppice forests, while also considering the effects on rural development and job creation.

Figure 2. EuroCoppice delegates visiting a coppice in England

In addition to conferences, providing forums for information exchange and informal networking, there were training schools for students and a series of Working Groups which carried out in depth research on topics from harvesting techniques and products, to the factors influencing future development in the coppice sector. It identified that, while endorsing the characteristics of coppice outlined above, there are wide differences between countries in the factors affecting coppice. Perhaps the most significant is that there is simply a lack of robust data about coppice. This is because it is practiced at low intensity and does not always require permissions in the way that clear felling of high forest does. It may be harvested by the landowner for their own firewood or be processed into a range of products, such as charcoal or fencing, that is not sold in such large quantities as timber and so it is more difficult to isolate statistics than for bulk commodities.

The importance of woodland or forest managed as coppice was considered from the perspectives of the different countries and there was agreement about the common attributes. Dividing wooded areas into units, typical based on the rotation length with one harvested each year (i.e. if timber is harvested after fifteen years growth there will be fifteen compartments) is beneficial for **rural livelihoods**, ensuring regular income, sustainable employment and supply of the resource, such as firewood. In contrast high forest, with long growth periods, is typically harvested by contractors from outside the locality.

[1] For more information please visit the Action website at https://www.eurocoppice.uni-freiburg.de/

Figure 3. Visiting a fencing producer during the 'People and Forests' conference

Small diameter roundwood is a renewable, sustainable, environmentally friendly resource playing an increasing role in the **low-carbon bio-economy** producing biomaterials, such as textiles, as well as fuels. In some countries, particularly mountainous areas and those prone to landslides and avalanches coppice can provide an important **protective function** with the roots and multiple stems mitigating soil erosion, rockfall, landslides and avalanches. This can be particularly important to protect infrastructure, such as railways, and coppice is advantageous compared to tall single stemmed trees as it is resistant to windthrow. There is increasing interest in the **sharing economy** with commercially viable forests being used for multiple purposes, including community use for leisure and recreation as well non-timber forest products such as game, fungi and medicinal plants as well as p**roviding timber.** There are also widely acknowledged benefits for wildlife associated with maintaining a diversity in the age structure of wooded areas, and particularly in the rotational open space ensured by annual harvesting and the maintenance of extraction tracks.

In the UK, the importance of coppice for natural and cultural heritage, wildlife, landscape and production of wood products from fuel to fencing is acknowledged however in some countries, for example, in central and eastern Europe, the approach derived from the historical German school of forestry and legislation requiring 'close to nature' high forest persists. This has resulted in the conversion of former coppices across large area.

The final output of the EuroCoppice COST Action was a policy paper[2], entitled '*Coppice forests in Europe: A valuable and sustainable natural resource',* produced with the intension of raising awareness among policy and decision makers about the unique characteristics of coppice forests and that there are real potential benefits of bringing woodlands that had formerly been coppiced, back into management. While the most obvious driver for this is demand for biomass, coppice should be more widely recognised as providing a range of important ecosystem services. The current lack of information on the area actively coppiced and the value of the industry will only be addressed by positive interaction with both landowners and the workforce and both of these groups should provide input into policy and decision making for the coppice sector.

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[2] Available at https://www.eurocoppice.uni-freiburg.de/intern/pdf/deliverables/eurocoppice-policypaper-final-2017-05-23.pdf

Red rusts and crimson flowers: pathogens and exotics imperil forests of Oceania

The islands of Oceania (Polynesia, Melanesia and Micronesia) support unique floras that have largely evolved in isolation. Species-richness and high levels of endemism have led to the recognition of four biodiversity hotspots in the region: New Caledonia (3,270 plant species, 74.4% endemism), Aotearoa New Zealand (2,300 plant species, 81% endemism), Polynesia-Micronesia, a vast area that includes the Hawaiian archipelago and over 300 islands that comprise Fiji (5,330 plant species, 57.7% endemism), and the East Melanesian Islands (8,000 plant species, 37.5% endemism)[1]. In addition to unique plant species, the region bears one of the world's most endangered vegetation types – globally threatened Tropical Dry Forest. This in turn supports critically endangered fauna, including flying foxes that are essential pollinators and seed dispersers[2].

Habitats of Oceania are increasingly degraded, or entirely lost, due to land use change (industrial agriculture, logging, mining), and exacerbated by changing environmental conditions that cause aridification, increased severity and frequency of natural disaster (such as tropical storms), and increased severity of anthropogenic fires. Such degraded ecosystems consequently have little natural resilience to incursions of invasive species, including pathogens, that negatively impact indigenous flora and fauna and the food security of human populations already living in challenging conditions. Such environmental and economic challenges facing peoples of Oceania have recently

[1] Summaries from the Critical Ecosystem Partnership Fund http://www.cepf.net/resources/hotspots/Pages/default.aspx

[2] Luskin (2010). Flying foxes prefer to forage in farmland in a tropical dry forest mosaic landscape in Fiji. *Biotropica*. 42(2): 246–250.

Pōhutukawa (Metrosideros excelsa; Myrtaceae) *in Aotearoa New Zealand (Photo: Christabelle Rathe, Project Crimson).*

been highlighted internationally, as Fiji acceded Presidency of the 23rd Session of the Conference of the Parties (COP 23) of the UN Climate Change Conference (6–17th November 2017, Bonn Germany).

The Millennium Seed Bank Partnership – Pacific Regional Programme (Royal Botanic Gardens, Kew)

Developed over the past five years, the Pacific programme is among the Millennium Seed Bank's newest regional networks. Established partnerships and new collaborations are underway in Hawai'i (Laukahi- the Hawai'i Plant Conservation Network), Aotearoa New Zealand (the New Zealand Indigenous Flora Seed Bank, botanical gardens, and members of Te Tira Whakamātaki/ the Māori Biosecurity Network), Fiji (the Pacific Community) and New Caledonia (Institut Agronomique Néo-Calédonien/ Agricultural Institute of New Caledonia).

The Pacific programme is very much partner-driven, responding to conservation needs identified with our colleagues in the region. Current priorities include development of native tree seed supplies to support the forestry sector in Fiji, and a community-driven seed banking initiative in Aotearoa New Zealand as a response to fungal pathogens that afflict the Myrtle family (Myrtle Rust and Rapid 'Ōhi'a Death).

Myrtle Rust

Over the last ten years Myrtle Rust (*Austropuccinia psidii*[3]) has seen a rapid expansion in geographical and host species range, shifting from its natural host in South America to the endangered Hawaiian endemic *Eugenia koolauensis* (c. 2009) before reaching Australia in 2010, and New Caledonia in 2013[4]. In April 2017, Myrtle rust was detected on the Kermadec Islands, ca. 1,000 km north east of Aotearoa New Zealand, with confirmation on the North Island on May 3rd, 2017. As of 17th November, 132 confirmed sites had been recorded nationally.[5]

Working with Te Tira Whakamātaki (the Māori Biosecurity Network), the Pacific regional programme is providing technical advice and training on seed banking solutions, supporting community-driven responses to Myrtle Rust that threatens taonga (treasured) indigenous species, including the pollen source of Mānuka honey (*Leptospermum scoparium*).

In recent weeks, three seed banking kits donated by the programme have been duplicated in-country for distribution to Māori community leaders. In early December I will be joined by colleagues from the MSB, Te Tira Whakamātaki and the Australian Seed Bank Partnership to deliver training in Auckland and Wellington. Our Seed Conservation Techniques courses are designed to assist a wide range of stakeholders with their plans to conserve native Myrtaceae seeds as a precaution against this virulent wind-born pathogen, and potentially enable propagation of individuals found to bear natural resilience.

[3] Formerly *Puccinia psidii, cf.* Beenken (2017). Biotaxa. 297 (1) http://dx.doi.org/10.11646/phytotaxa.297.1.5

[4] Carnegie, Kathuria, Pegg, *et al.* (2016) Impact of the invasive rust *Puccinia psidii* (myrtle rust) on native Myrtaceae in natural ecosystems in Australia. *Biological Invasions* 18: 127–144.

[5] MRNZ 2017 Stakeholder update (17/11/2017)

Rapid 'Ōhi'a Death

Since April 2015 Rapid 'Ōhi'a Death (ROD; *Ceratocystis fimbriata*[6]*)* has affected 75,000 acres of the dominant native tree 'Ōhi'a lehua *(Metrosideros polymorpha)* on Hawai'i Island.[7] Prevalence of this keystone species in the landscape[8] means that ROD also threatens unique ecosystems that *M. polymorpha* supports, and the fungus has the potential to devastate forest cover throughout the archipelago.

In response to this incursion, our colleagues at the Lyon Arboretum Seed Conservation Lab (part of Laukahi – the Hawai'i Plant Conservation Network) launched an urgent seed banking programme "#OhiaLove." Generous donations via a crowd-funding platform enabled collection of over 2 million seeds and led to the recent launch of the Rapid 'Ōhi'a Death Seed Banking Initiative that will deliver training to community members to expand collection effort.

Within the Polynesia-Micronesia Hotspot, the Hawaiian archipelago supports 1,400 indigenous plant species of which 90% are unique to the islands. Sometimes referred to as the Endangered Species Capital of the World, Hawai'i has a land mass of less than 1% of the United States but is home to almost 50% of the country's Federally Listed Threatened and Endangered plant species[9]. Through knowledge exchange we aim to support our colleagues at Laukahi with initiatives targeting seed conservation of widespread and keystone species like 'Ōhi'a, as well as development of seed storage and germination protocols for rarities.

The importance of a sustainable native tree seed supply

Use of exotic tree species that are not naturally adapted to local conditions (and may outcompete indigenous taxa) can compound the negative effects of environmental change. A lack of resilience in these taxa can magnify the effects of tropical storms and other natural disasters, causing wide scale forest loss, disrupting catchments, and potentially leading to outbreaks of water-borne diseases as water stagnates in log-jammed rivers. Once exposed, soil erodes rapidly with potential for catastrophic downstream effects, including sedimentation of natural fisheries and reefs that local communities depend on for food supply and income.

Albizia chinensis is one such exotic tree species that dominates vast expanses of forest in Samoa.[10] Introduced by Europeans as cattle fodder at the turn of the 20th Century[11,12], as recently as 1990 this species was still being used for agro-forestry experiments in Western Samoa[12] and the World AgroForestry Database lists its beneficial traits and uses.[13] In December 2012, Category 3 Cyclone Evan made land fall and devastated these shallow rooted invasive trees across Samoa's watersheds, causing flooding and destroying infrastructure including bridges, water supplies and homes[10] – exemplifying the ridge-to-reef impacts exotic tree species can have in island ecosystems.

Acacia, Eucalyptus and Pine remain the most widely used genera for forestry plantations in the tropics and Southern Hemisphere[14], yet they are also the focus of eradication programmes due to their invasiveness[15,16]. In plantations of Oceania, such fire-adapted species (evolved to survive natural fire regimes in their native ranges), can lead to invasive-plant fire regimes becoming established that favour the invading species, and increase risk of high intensity fires in plantations and any native vegetation that they invade (e.g. endangered Tropical Dry Forest, sclerophyll forests[17,18]).

Despite exotic forestry industries being long established in the region (e.g. pine introduced to Aotearoa New Zealand ca. 1830, and New Caledonia in 1959[19]), seeds and other live plant materials are imported to Oceania to supplement in-country production, supporting ambitious tree planting targets that are in some cases associated with environmental commitments (e.g. carbon sequestration, *cf.* COP23). This international trade risks unintentional introduction of invasive species to these unique, isolated ecosystems – such as the neotropical little fire ant, associated with introduction of *Pinus caribaea* to New Caledonia with negative impact on endemic reptile and invertebrate abundance[20].

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[6] Hauff (2016). Important Hawaiian tree species in need of genetic conservation. *Gene Conservation of Forest Trees*. Morton Arboretum, Chicago, USA.

[7] College of Tropical Agriculture and Humana Resources, University of Hawaii: https://cms.ctahr.hawaii.edu/rod/HOME.aspx

[8] Cf. RBG Kew's UK National Tree Seed Project,that incorporates the "prevalence in the landscape" of a species among their prioritisation criteria.

[9] State of Hawai'i Division of Forestry and Wildlife https://dlnr.hawaii.gov/ecosystems/rare-plants/

[10] SPREP (2016). Battling Invasive Species in the Pacific: Outcomes of the Regional GEF-PAS IAS Project. Prevention, control and management of invasive species in the Pacific islands 2011–2016. Apia, Samoa.

[11] Whistler (1984). Annotated list of Samoan plant names. *Economic Botany* 38(4): 464489.

[12] Anon. (1994). Evaluation of *Albizia chinensis* in comparison with *Calliandra calothyrsus* for alley cropping in Western Samoa. Proceedings of International Workshop on *Albizia* and *Paraserianthes* species 13–19 November 1994, Philippines.

[13] Orwa et al. (2009). *Albizia chinensis*. Agroforestree Database: a tree reference and selection guide version 4.0. (Available here: http://www.worldagroforestry.org/output/tree-functional-and-ecological-databases)

[14] Wingfield et al. (2001). Worldwide Movement of Exotic Forest Fungi, Especially in the Tropics and the Southern Hemisphere. *BioScience* 51(2): 134–140.

[15] Hughes (1994). Risks of species introductions in tropical forestry. *Commonwealth Forestry Review.* 73(4): 243–252.

[16] Fuller & Cronk (2001). *Plant Invaders: the Threat to Natural Ecosystems*. Earthscan Publ. Ltd.

[17] Pau et al (2009). Natural history, biogeography and endangerment of Hawaiian dry forests trees. *Biodiversity and Conservation*. 18: 3167–3182.

[18] Bouchet et al. (1995). Plant extinction in New Caledonia: protection of sclerophyll forests urgently needed. *Biodiversity and Conservation* 4: 415–428.

[19] Simberloff et al. (2010). Spread and impact of introduced conifers in South America. Lessons from other southern hemisphere regions. *Austral Ecology*. 35(5): 489–504.

[20] Jourdan et al. (2001). Little fire ant invasion (*Wasmannia auropunctata*) as a threat to New Caledonian lizards: evidences from a sclerophyll forest (Hymenoptera: *Formicidae)*. *Sociobiology*. 38: 283–301.

Improved technology and increasingly stringent biosecurity measures can reduce risks of this "plants for planting pathway"[21] but cannot eliminate them entirely. There is increasing evidence of pathogens spread via the seed trade (e.g. several important Eucalyptus diseases[22]). Such material is likely to be asymptomatic at the time of import. A lack of localized awareness may lead to inadequate screening of known pests and pathogens (e.g. the potential for continuing spread of Myrtle Rust in Oceania), and the latent impact of imported organisms may not be measurable (if their behaviour in a new environment has never been tested, or they not yet known to science).

Metrosideros collina *in Fiji (Photo: Ruth Bone)*

The annual cost of the impacts and control efforts of invasive species has been estimated to equal at least 5% of the global economy[10,23]. Given the magnitude of these issues there is increasing demand for native tree seeds to support native forest improvement and reforestation initiatives. In Fiji these include local Tropical Dry Forest restoration projects led by Fijian conservation NGOs and public-private partnerships, tree planting to mark Climate Change awareness campaigns, and participation in regional programmes including the Action Against Desertification Project led by FAO[24], and the REDD[25] programme, supported by the Pacific Community and GIZ[26] project "Coping with Climate Change in the Pacific Island Region".

The Pacific Island Tree Seed Centre (Fiji)

Located at the Pacific Community Land Resources Division near Fiji's capital city, Suva, the Pacific Island Tree Seed Centre (PITSC) was established in 2012 as a regional hub to facilitate controlled and efficient seed exchange for priority species in the Pacific region, and to provide research and training in seed technology in the Pacific. Its establishment was part funded by The Japan International Cooperation Agency (JICA), and priority species included dilo (*Calophyllum inophyllum*) for improved coastal protection.

The Pacific Community joined the Millennium Seed Bank (MSB) Partnership in 2014. In collaboration with foresters and seed lab managers from the Silviculture Research Division (Ministry of Fisheries and Forest), MSB and PITSC staff are working together to determine optimal seed collecting times, and seed collection, storage and germination methods. Our work (supported by the Global Tree Seed Bank Project[27]) will contribute to baseline knowledge required to develop a sustainable native tree seed supply and reduce reliance on exotic species in Fiji's forestry sector.

Alongside joint fieldwork and specialist training opportunities, we are drafting plans and fundraising for expansion of existing seed lab infrastructure at the PITSC, increasing the range of conditions available for seed storage and enabling long-term seed conservation in-country. As the programme develops we hope to develop new collaborative projects with other stakeholders in Fiji and the wider region, with botanical expertise at the South Pacific Regional Herbarium, and supporting conservation NGOs and their local communities.

Seed banks, and the expertise they foster, are essential to the development of sustainable native seed supplies that can be used for restoration and reforestation projects, and the development of indigenous forestry industries. As we are finding through our collaborative work in Aotearoa New Zealand, and our colleagues' work in Hawa'i, they also offer opportunities to save seeds and undertake research when faced with virulent plant pathogens that risk species of cultural, ecological and economic importance in Oceania.

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Royal Botanic Gardens, Kew

[21] Ramsfield et al. (2016). Forest health in a changing world: effects of globalization and climate change on forest insect and pathogen impacts. *Forestry*. 89(3): 245–252.

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UK – Soil Association Certification now verifying Woodland Carbon

Andy Grundy and Matt Taylor verify a WCC site in the Yorkshire Dales National Park.

Soil Association Certification's Forestry department is now accredited to verify new woodlands to Woodland Carbon Code (WCC) standards. This means that individuals and businesses wishing to offset their carbon emissions by contributing to new woodlands can be assured that sequestration schemes will deliver the carbon savings they claim.

As a certifier, Soil Association Certification Forestry (SACF) audits worldwide to the globally recognised FSC® and PEFC® forestry standards (FSC A000525, PEFC/16-44-917), safeguarding sustainable forest management for timber product sourcing. Soil Association Certification Forestry has been providing validation and verification services for Woodland Carbon Code applicants since 2016, and has now fully achieved its accreditation to ISO 14065. The WCC is a voluntary standard, encouraging a consistent approach to woodland carbon projects and offers clarity and transparency to customers. Compliance with the Woodland Carbon Code means that woodland carbon projects:

- are responsibly and sustainably managed to national standards
- can provide reliable estimates of the amount of carbon that will be sequestered or locked up as a result of tree planting
- must be publicly registered and independently verified
- meet transparent criteria and standards to ensure that real carbon benefits are delivered

The accreditation process to ISO 14065 requires witness assessments of completed work by the UK Accreditation Service before the final sign off. Soil Association Certification Forestry's experience, personal service and knowledge to validate and verify carbon sequestered by new UK forests means that carbon is traded with confidence.

What is the Woodland Carbon Code?

The Woodland Carbon Code is recognised as the UK's standard for forest carbon units, and is referenced in the UK Government's Environmental Reporting Guidelines as well as British Standards Institute's PAS 2060 carbon neutrality standard. At least half of all the potential carbon sequestration that has been certified has been sold upfront (bringing at least an estimated £6 million into UK woodland creation. The registered projects will create over 16,000 hectares of woodland and are predicted to sequester 5.9 million tonnes of carbon dioxide over their lifetime (up to 100 years).

Vicky West, Woodland Carbon Code scheme manager said: "*We are very pleased to see the accreditation of Soil Association Certification Ltd to validate and verify Woodland Carbon Code projects. This provides added assurance to carbon buyers of the robust nature of our scheme, which so far has grown to include over 240 projects across the UK likely to sequester six million tonnes of carbon dioxide over their lifetime.*"

Of the projects already validated, around half of the carbon has already sold to over 70 different businesses. Companies who have bought carbon units are mostly SMEs, including from the retail sector (food & drink, furniture), paper & lighting manufacturers, as well as the transport sector. They want to buy locally and they like woodlands because they are tangible investments that come with many other social and environmental benefits aside from carbon. BWOC, a fuel distribution company, state that one of the benefits of buying from a WCC project is that it has brought more business by helping them win public sector contracts. The Green Investment Bank really valued the opportunity to get their staff onsite to help with tree planting. See the Woodland Carbon Code's website for other case studies of other WCC buyers. http://www.forestry.gov.uk/carboncode

Carol Robertson and Andy Grundy examining a young ash tree for Chalara at a WCC site in Moray, NE Scotland.

Looking to the future

Across Europe, more countries are developing domestic carbon standards. Italy, Portugal, Spain and France have developed or are developing carbon standards including woodland creation or forest management, and other EU countries are assessing how they can use voluntary carbon markets to promote further action on climate change in sectors of the economy that are not part of the EU Emissions Trading Scheme (Ivleva et al., 2015).

Since 2011, a real forest carbon market has developed in the UK. Greater numbers of landowners and agents, as well as corporate buyers, are becoming involved. Recent policy developments following a new global climate change agreement in Paris, together with national commitments provide added incentives to develop such markets further. The aviation industry has recently agreed to offset the growth in international aviation emissions from 2020 and this will increase demand for carbon units. For landowners struggling to fully fund a woodland creation project, it's worth looking to woodland carbon as an extra source of income to help move a project from idea to reality.

To learn more about Soil Association Certification Forestry's FSC® and PEFC™ certification, Chain of Custody and Due Diligence System services, as well as upcoming training opportunities with the UK's leading forest management certification body, visit https://www.soilassociation.org/certification/forestry.

Andrew Grundy
Certification Manager, Soil Association
soilassociation.org

Marcus Wallenberg Prize awarded for new methods of gene discovery in trees

Many scientists believed that working on tree genes was too difficult. Professor Ronald R. Sederoff, North Carolina State University, USA, however saw the potential and became one of the first scientists in the field of molecular genetics of forest trees. From the early 1990s he was involved in almost all the early studies on genetic modification of conifer trees, quantitative genetic studies and later also tree genomics. He has also exploited new breeding technologies for improved properties.

For his discoveries Ronald R. Sederoff is awarded the 2017 Marcus Wallenberg Prize of SEK 2 million.

Innovations for the forest industry

Ronald R. Sederoff established in 1988 the Forest Biotechnology Group at North Carolina State University to concentrate on the genetic basis of quantitative traits in trees. Until then tree breeding had focused on understanding the inheritance of different qualities, without actually caring about the actual genes that determined these traits. He was one of the first scientists trying to link biological properties with genetic information in trees, so called genetic mapping, using the newest markers available to identify important characteristics like rust resistance, growth and quality. "The area of genetics was greatly hindered by the long generation times and large size of the experimental material. The advent of genome sequencing increased the potential of identifying and characterizing large groups of genes and their products. The new technology has become even more powerful through the introduction of gene editing, which is a more direct method of altering genes." Ronald R. Sederoff explains.

In his group the scientists have been actively working on sequencing pine and American chestnut genomes. They have also specialized on the molecular basis of the structure of wood to investigate the biochemical and genetic basis of cell wall formation. Their focus is on the pathway for lignin biosynthesis and cell wall structural proteins.

Ronald R. Sederoff has also provided the forestry sector with new methods and applications for tree breeding as well as valuable information to be used in the restoration of for example the American chestnut, which is today on the verge of extinction due to a devastating fungal disease. Several of the inventions in his group have been granted as patents in the US.

A rapidly developing field

The Marcus Wallenberg Prize is awarded once a year to a path breaking scientific achievement with importance to forestry and forest industries. Ronald R Sederoff considers the prize as an important stimulation to investigators around the world to use trees as their experimental material. "One benefit of the prize is that it gives young scientists more confidence to try new things and realize that problems that appear difficult at first are often easier than expected. It is important to think beyond what is obvious. It is in the more challenging work that new discoveries are made".

Ronald R. Sederoff has always tried to encourage his students to take the less travelled road and look for something new. "The future of the field of tree genomics depends on attracting brilliant students who will accept the intellectual challenge of difficult systems. The new genomic technology makes the work possible." he says.

The Laureate

Ronald R. Sederoff, born in 1939, received a Bachelor of Arts in Zoology in 1961 at the University of California, UCLA, USA, where he also received a Master of Arts in Zoology in 1963 and a Doctor of Philosophy in Zoology in 1966 – both in Genetics.

He was 1967–1969 a Post-doctoral Fellow at the University of Geneva, Switzerland, and 1975–1978 held Associate and Assistant Professor positions at Columbia University, the University of Oregon and the Department of Genetics at North Carolina State University – all in the USA. For the next two years he held a Senior Scientist and Plant Molecular Geneticist position at the USDA Forest Service. In1987 he became a Professor in the Department of Forestry and Environmental Resources at NC State University, where he also held associated faculty status in Genetics and in Molecular and Structural Biochemistry. He is currently Emeritus Distinguished University Professor and Edwin F. Conger Professor of Forestry and Environmental Resources at NC State University.

Professor Sederoff was in 1995 elected to the National Academy of Sciences, USA, appointed Adjunct Professor Nanjing Forestry University in 1997, appointed as an Honorary Research Professor, Chinese Academy of Forestry in 1998, elected as a Fellow of the International Academy of Wood Science in 2000, became a Fellow of the American Association for the Advancement of Science in 2003 and was awarded an Honorary Doctorate from the Swedish University of Agricultural Sciences in 2004.

Prize ceremony and symposium

The purpose of the Marcus Wallenberg Prize is to recognize, encourage and stimulate path breaking scientific achievements, which contribute significantly to broadening knowledge and to technical development within the fields of importance to forestry and forest industries. The prize was awarded at a ceremony on October 26, 2017, in Stockholm, Sweden.

mynewsdesk.com

Youth

Forestry students meet to discuss COP23 and the role of forests in climate change policy

IFSA-UBC Organizing Committee for 'Prepping for COP23' (Photo: Emma Roberts)

In preparation for the 23rd Conference of Parties (COP23) in Germany, the University of British Columbia (UBC) chapter of the International Forestry Students' Association (IFSA) organized an event to discuss the importance of forests in climate change policy. The event was hosted at UBC but was streamed on social media so that IFSA members around the world were able to watch and participate by submitting their questions online.

The United Nations Framework Convention on Climate Change COP23 is being attended by approximately 25 000 participants and provides a space for the nations of the world to advance the Paris Agreement and intergovernmental climate policy in general. IFSA has sent a delegation of forestry students from around the world to be observers at the event as well as to participate in side events during the conference. IFSA values highly its partnerships with international organizations and the opportunities they provide for students and youth to become more involved in global issues.

The main goal of our "Prepping for COP23" event was to have a meaningful conversation with our panelists about international climate change policy and the role of forestry and forest science in terms of mitigation and adaptation. Our panelists included Cecil Konijnendijk, a UBC professor of Urban Forestry; Brianne Riehl, a Technical and Policy Analyst at the Pembina Institute; Yemi Adeyeye, a PhD student in the UBC Faculty of Forestry and active IFSA member; and Gabby Doebeli, the Communications Coordinator for a student-run climate activism group.

One of the topics we discussed at the event was the importance of green spaces in creating livable, resilient cities. Dr. Konijnendijk explained how, although urbanization has put a lot of stress on the environment, green spaces and sustainable cities play a key role in mitigating and adapting to climate change as well as achieving the UN sustainable development goals. He used Vancouver and Singapore as examples of cities that have focused resources on providing green spaces and urban trees for the benefit of their residents and the environment.

Brianne Riehl from the Pembina Institute illustrated the important role of forestry in terms of carbon storage, growing sustainable resource sector jobs, biofuels, sustainable buildings, and long-term wood products. This gave the audience plenty of examples of the ways in which forestry can address climate change. She also mentioned some of the impacts of climate change that the sector is already experiencing in British Columbia, such as pest outbreaks and worsening wildfire seasons.

Our discussion brought up an interesting point about the role of youth in events such as COP23. Yemi Adeyeye explained that although youth are not active participants at high-level intergovernmental decision-making such as COP23, it is up to youth to implement the decisions that are made and follow up on the goals that are set. This idea was echoed by Gabby Doebeli, who stressed the importance of local, grassroots action involving youth in addressing the systemic issues behind climate change.

This event provided students with the opportunity to learn more about the role of forests in climate change policy, as well as hopefully inspired them to ask difficult questions and seek out new knowledge. It is imperative that the next generation of foresters, forest scientists, and natural resource professionals consider issues related to climate change in their studies and future careers. Young people are concerned and perhaps overwhelmed about the implications of a warming climate and yet many are hopeful about innovative technologies, changing attitudes, and other opportunities for improvement, accountability, and progress.

Emma Roberts
CFA IFSA-Liaison Officer

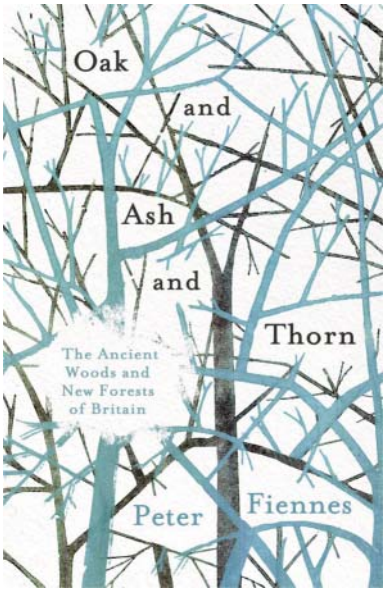
Publications

Oak and Ash and Thorn

The Ancient Woods and New Forests of Britain

Peter Fiennes

Oneworld



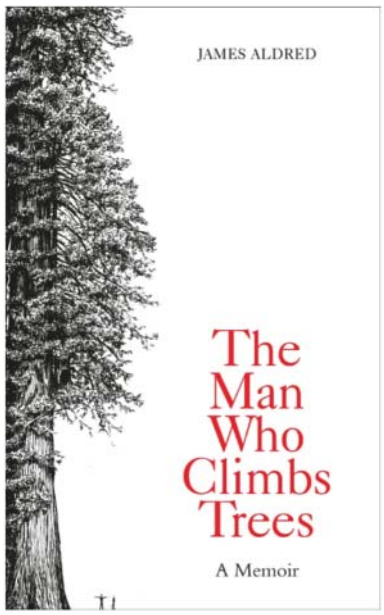
The magic and mystery of the woods and trees are embedded in our culture, from ancient folklore to modern literature. They offer us refuge, a place to play and a place to think. They are the generous providers of fuel, timber, energy and life. They let us dream of other ways of living. Yet we now face a future where taking a walk in the woods is consigned to the tales we tell our children. Threatened by development, neglect, climate chaos and ignorance, they are emptier – of flora and fauna, but also of people – than they have ever been.

Immersing himself in the beauty of Britain's woodlands and the art and writing they have inspired, Peter Fiennes explores our long relationship with the woods and the sad and violent story of how so many have been lost. Just as we need them, our woods need us too. But who, if anyone, is looking out for them?

The Man Who Climbs Trees

By James Aldred

WH Allen



This is the story of a professional British tree climber, cameraman and adventurer, who has made a career out of travelling the world, filming wildlife for the BBC and climbing trees.

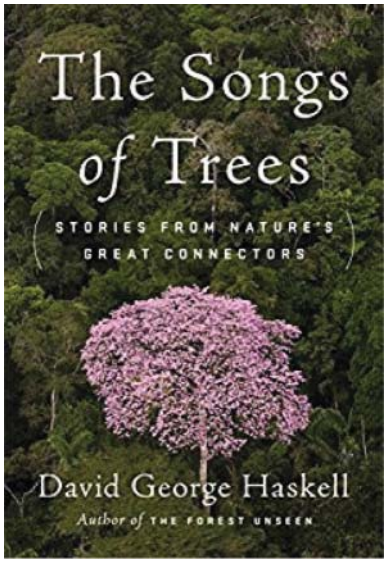
James's climbs take him around the globe, scaling the most incredible and majestic trees in existence: the strangler fig tree of Borneo, the monolithic Congolese moabi tree, the fern-covered howler tree of Costa Rica and the colossal mountain ash of Australia. On the way he meets native tribes and jungle cats, he gets stung by African bees and chased by gorillas, and he spends his nights in a hammock pitched hundreds of feet up in the air, with only the stars above him.

This book blends incredible stories of his adventures in the branches and a fascination with the majesty of trees to show us the joy of rising – literally – above the daily grind, up into the canopy of the forest.

'The wide horizontal branches stretched away from me to curl up like the giant fingers of an enormous cupped hand. I slid back into the centre of its protective palm and waited for my heart to slow. After a while the small herd of fallow deer I had been following emerged from the trees, carefully picking their way through the churned-up leaf litter to pass beneath me in the wake of the ponies. They had been there all along and I was immediately struck that not one of them appeared to have seen or smelt me as I crouched in the arms of the oak directly above.'

The Songs of Trees: Stories from Nature's Great Connectors

David George Haskell. Viking, $28 (304p)
ISBN 978-0-525-42752-0



In this inspiring but uneven account, Haskell (*The Forest Unseen*), professor of biology at Sewanee, investigates the myriad connections between trees and their natural surroundings. Trees do not exist in isolation, he notes, and though their "trunks seemingly stand as detached individuals, their lives subvert this atomistic view." He devotes each of his 10 chapters (plus two interludes) to a particular tree, visiting Ecuador, Japan, and various points in North America. In Amazonian Ecuador, for example, Haskell calls attention to the ceibo tree, describing local hummingbirds, frogs, and monkeys before touching on oil-drilling camps now found in the rainforest. The heavy machinery cannot be ignored; "half of Ecuador's export revenues and one third of the government's budget come from oil." Juxtaposing contrasting images of nature in urban landscapes, Haskell describes the worlds revolving around a cottonwood tree in Denver and a callery pear in Manhattan in lively chapters full of engaging digressions and meditations. But the chapters on a balsam fir in Ontario and maples in Tennessee and Illinois are harder to read, sometimes dazing readers with tangential and obscure references. Despite a few weak spots, Haskell's study of interconnectedness reveals as much about humans as it does trees.

publishersweekly.com

Around the World

Vietnam: Illegal loggers challenge PM order to close natural forests

Many deforestation cases still occur in front of local authorities. The serious deforestation has once again become a hot topic for NA Deputy discussions. "PM ordered forest closure, but the forests have not been closed," said Nguyen Sy Cuong, a NA Deputy from Ninh Thuan province.

"The large-scale deforestation cases in some localities recently showed that the PM's order has been ignored," he said. The director of a forest planting company, who Cuong met in a business trip, said that illegal loggers had been lent a hand by local authorities. "If local authorities and forest rangers did not support them, illegal loggers will never be able to carry out such large-scale deforestation cases," he said.

Cuong said the director had said that illegal loggers just need 16 minutes to fell a 100-year old tree and must pay VND400,000 to every forest ranger station to bring wood out of forests. "If local leaders only turn up at sites after the forest is destroyed and they don't have to take responsibility for deforestation, I wonder when the PM's order on forest closure will be enforced," he said.

The increasingly serious forest devastation is also a concern of Duong Xuan Hoa, a NA deputy from Lang Son province. He cited a report of the NA's Legal Committee as saying that the deforestation in many localities have had serious impacts on the environment and affirmed this is a major reason behind the serious floods recently.

Hoa commented that in many cases, illegal loggers had felled trees for several consecutive months, but local authorities only discovered the deforestation when the forests became bare. Ksor Phuoc Ha, a deputy from Gia Lai province, confirmed that the forests in Central Highlands have been seriously devastated.

"Regarding the Central Highlands, one would think of large green forests, vast prairies, mysterious mist and mineral resources. However, the large green forests are being destroyed," she said.

"In 2016, the Prime Minister ordered forest closure. In 2017, the lost forests in the Central Highlands increased by 50 percent compared with 2016. Is this a paradox or a challenging message?" she asked.

The Ministry of Agriculture & Rural Development (MARD), at an online conference on strengthening measures to develop forests several days ago, reported that the forest area in the Central Highlands had decreased by 3,170 hectares in comparison with 2015 to 2,558,646 hectares.

In the latest news, the Binh Dinh provincial authorities have discovered that 15,745 hectares of forests in Canh commune of Van Canh district have been eliminated.

vietnamnet.vn

Canada: Gender balance shifting in B.C. forestry as more women enter industry

The gender balance has recently started to tip in British Columbia's forestry industry as more women occupy leadership positions and complete post-secondary studies in one of the province's key sectors. Sally Aitken, associate dean of forestry at the University of British Columbia, has noticed the shift in the classroom.

Forty-seven per cent of undergraduate students and more than half of graduate students in the forest program are now women, and a third of the faculty are female, she told CBC *Early Edition* host Rick Cluff. "We see a big change in the numbers of women receiving professional degrees that relate to forestry," Aitken said. "We're now at about gender balance in terms of our educational programs." Forestry is a cornerstone to the province's economy, according to a recent report by the B.C. Council of Forest Industries and generates one out of every 17 jobs in the province. And women across the province are filling those positions.

"We've got women who have worked their way up through the ranks, whether that's in industry or in government or in academia," Aitken said.

She highlighted Diane Nicholls, who became chief forester for the provincial government in 2016, as just one example of women in top forestry leadership positions in B.C.

Others include people like Susan Yurkovich, head of the B.C. Council of Forest Industries, and Shannon Janzen who is chief forester for one of the the province's largest coastal woodland operators, Western Forest Products.

Aitken said although there is a growing recognition of the need for more balance and diversity at all levels in the industry, there is still much room for improvement.

"It really benefits the organizations themselves. It broadens the workforce and it diversifies the perspectives," she said. "In order to realize that, workplaces need to be more welcoming places than perhaps they historically were."

cbc.ca

Poland faces €100,000-a-day fines over illegal logging in Białowieża forest

Poland has been given two weeks to stop illegal deforestation in the Unesco-protected Białowieża forest or face fines of at least €100,000 a day. In a precedent-setting ruling that will echo across the EU, the European court of justice ordered Poland to show it was acting lawfully in the ancient woodland, or face a €36.5m (&32m) annual penalty.

Agata Szafraniuk, a lawyer for the green law firm ClientEarth, said that the court was acting after Poland's environment minister, Jan Szyszko, showed "complete contempt" for an earlier emergency ban on logging in the ancient woodland. "Financial penalties are, unfortunately, an essential tool to ensure that the best-preserved primeval forest in Europe is protected from further harm," she said. "Trees are still being cut down every day, so the court prescribed this measure to guarantee the full protection of this unique forest, and to avoid irreparable damage."

The court move will ratchet up pressure on Poland, which is already facing a suspension of its EU Council voting rights over a clampdown on the country's independent press and judiciary. Women's groups have also been targeted for police raids, and rights to protest have been curtailed, adding to concerns about the rule of law in the east European country.

Donald Tusk, the EU Council president, condemned Poland's nationalist-right Law and Justice party government on Sunday, suggesting it was following the "Kremlin's plan".

The Polish government maintains that it always behaves lawfully and that logging in Białowieża is necessary to staunch a spruce bark beetle outbreak. "In the western media, everything is based on disinformation," a Polish government spokesman told the Guardian. "We are doing everything right by law. We are using EU law. We are using Polish law, and we are doing nothing against decisions made by the European court of justice."

Greenpeace says that it has logged photographic evidence of violations to the court's "public safety" condition for logging in 16 out of 30 areas of Białowieża surveyed. Szyszko though, has previously accused the EU of "spreading lies" by using photos of extensive logging in Białowieża that he claimed were "manipulated" in a cyber-attack.

While the EU's case on illegal logging was "without any arguments, ours are based on facts and documents," the Polish official said. "Białowieża is not the last primeval forest, because it was made by local people, and we have facts and books that show that people were there from the beginning."

theguardian.com

Indonesia: Scientists find new orangutan and it is already the most endangered great ape in the world

Scientists say they have found a new species of orangutan – and it is already in danger of extinction. There are just 800 of the species left, making it the most endangered great ape species now known, the researchers said. And, they added, its habitat is being destroyed at such a rate that it might soon be entirely extinct.

Found in upland forests in north Sumatra, in Indonesia, the Tapanuli orangutan (pongo tapanuliensis) was originally considered to be part of the Sumatran orangutan population, but the discovery of a separate species means it is considered the most endangered of all great ape species.

"If steps are not taken quickly to reduce current and future threats to conserving every last remaining bit of forest, we may see the discovery and extinction of a great ape species within our lifetime," they said.

It's the first great-ape species to be proposed by scientists in nearly 90 years. Previously, science has recognised six great-ape species: Sumatran and Bornean orangutans, eastern and western gorillas, chimpanzees and bonobos.

The research is based on analysis of the skeleton of an adult male killed in a conflict with villagers, a genetic study indicating the population's evolutionary split from other orangutans occurred about 3.4 million years ago and analysis since 2006 of behavioural and habitat differences.

The primates are confined to a range of about 1,100 square kilometers (425 square miles) in the Batang Toru forest in the Tapanuli districts of northern Sumatra. Historically, the population has probably been isolated from Sumatran orangutans further north for 10,000 to 20,000 years, based on the most recently detectable influx of male genes from outside, according to the genetic study.

Aside from genetic evidence and the physical differences that are most apparent in comparison with Bornean orangutans, other unique characteristics include diet, restriction of habitat to upland areas and the male's long call.

Primatologist Russell Mittermeier, head of the primate specialist group at the International Union for the Conservation of Nature, called the finding a "remarkable discovery" that puts the onus on the Indonesian government to ensure the species survives.

independent.co.uk

USA: Putting a price on rainforests

In early October, shortly after Hurricane Maria made landfall in Puerto Rico, Tesla CEO Elon Musk said on Twitter that his company could, given the opportunity, rebuild the island's electrical grid using solar power. Coming in the midst of so much human suffering, it was a bold claim. But from a technological perspective, the timing was perfect. By late October, solar panels and high-capacity batteries had been installed at San Juan's Hospital del Niño, and additional projects are in the works.

This type of response to a natural disaster — replacing a fossil-fuel-reliant power grid with renewable energy — should be applauded. But no matter how clean and efficient renewable energy sources may be, they will never fully mitigate the climatic effects that are bringing more hurricanes like Maria ashore. There is another way to do that, and it is far cheaper than what Musk has proposed.

Puerto Rico is home to one of the most efficient and inexpensive tools available in the fight against climate change: rainforests. On the island's eastern tip, the nearly 29,000-acre El Yunque National Forest is one of the Caribbean's most important systems for capturing and storing carbon.

Maria destroyed the forest, too. But tech CEOs have not tweeted about restoring that resource, because, at the moment, they see no viable business model for saving trees. But what if such a model did exist? What if there were ways to make tropical forests worth more alive than dead?

Global leaders have been pondering this question for years. And, at UN climate talks, they have come up with a novel solution: an initiative called Reducing Emissions from Deforestation and Forest Degradation (REDD+). The idea is simple: with the right incentives, people, governments and industries will preserve and restore tropical forests, rather than plough them under. In return, the world gets more carbon sinks to soak up greenhouse gasses.

REDD+, which has been around in various forms for nearly a decade, provides a payment structure for preservation and restoration efforts. By putting an economic value on forests for the role they play in large-scale carbon capture and storage, REDD+ allows standing trees to compete with lucrative land uses — such as logging or agriculture — that result in deforestation.

The first large-scale REDD+ programme, an agreement between Norway and Brazil, was initiated in 2008. Norway agreed to provide $1 billion in "performance-based payments" to Brazil for successfully protecting its rainforests. The money from Norway was released in instalments, as Brazil conserved its forests. The results were impressive: Brazil reduced the average rate of Amazon deforestation by over 60 per cent over the last decade, absorbing about 3.6 billion tonnes of carbon dioxide, more than any other country. And Norway was able to help mitigate global carbon dioxide emissions.

But, despite the success of the pilot partnership, the REDD+ programme today is in dire need of capital. In many ways, the solution is similar to Musk's solar proposal in Puerto Rico. Only this time, the innovation is not technical, but financial.

Creating a market for REDD+ credits would create investment opportunities in tropical forest preservation for heavily polluting companies and industries. With an adequate policy framework, REDD+ credits could be offered through existing compliance markets — such as the carbon credit markets in California or South Korea — unlocking billions in additional capital for reforestation efforts. Developing such a framework would also enable REDD+ to become part of future compliance systems, like the one being developed by the global airline industry to cap emissions, or the carbon-permit market that China plans to launch later this year. Integration into these markets could also tap new funding streams for forest conservation and reforestation, as it would allow financial intermediaries, like the REDD+ Acceleration Fund, to connect REDD+ projects directly with the private sector.

At the moment, most of this is aspirational. REDD+ is merely a set of guidelines, and a forest credit market will require rules and standards to govern how protection and reforestation allowances are allocated to buyers and integrated into current markets.

Global leaders gathering this week for the UN climate change conference in Bonn, Germany, can aid these efforts by continuing to support the development of effective and transparent accounting mechanisms for REDD+ projects. There is danger in delay. In the two years since the Paris Climate Agreement was adopted, deforestation increased sharply in Indonesia and parts of the Amazon, where much of the world's largest and most vital tropical forests stand.

According to the Union of Concerned Scientists, tropical deforestation is responsible for three billion tons of additional atmospheric CO2 annually — more than the world's entire transportation sector.

No technology is as effective at storing carbon as tropical forests, and saving and restoring them offers one of the cheapest large-scale forms of emissions abatement or capture, while providing a host of other environmental and social benefits.

To take advantage of this crucial hedge against a warming planet, more trees must remain standing.

For those of us who believe that a forest credit market could provide critical means of protecting our planet our Musk moment is here. We must be similarly bold.

jordantimes.com

Czech Republic: alarm called over endangered Moravian Amazon

The Moravian Amazon, an area along the lower parts of Morava and Dyje rivers in the southern part of the Czech Republic, is considered to be one of the richest habitats in Central Europe. But scientists are ringing alarm bells, warning that the number of old trees in the UNESCO Biosphere area which provide a home to rare species of beetles, are being crowded out and their numbers are rapidly declining.

The open woodlands along the lower Morava and Dyje rivers in the southern tip of the country has been extremely rich in old oaks, elms and other trees providing a valuable refuge of biodiversity. But according to a recent study by a team of Czech biologists published in a prestigious magazine Diversity and Distributions, the magnitude of the open woodland loss equals that of the most endangered tropical habitats.

To map the extent of open woodland loss, scientists compared two sets of aerial photos of the region, from 1938 and 2009. In 1938 about half of the area was covered by an open forest, which looked a bit like savannah. Now, it is only about five percent and the rest is covered mainly by dark, closed-canopy forest.

Lukáš Čížek is one of the members on the research team: *"We discovered that the large trees and the endangered beetles associated with them are found today mainly in the places that are still open. But we also found out that within the closed forest, these old trees and the rare beetles are found in places that used to be open back in the 1930s. The incidence of rare trees and beetles is much lower in the closed-canopy forest."*

Scientists also discovered that the mortality of trees is much higher in the closed canopy forest than in the open conditions. The old trees growing up in open forest usually climb to 20 or 25 metres. In the closed-canopy forests, they are usually overgrown and eventually killed by younger, taller and more vigorous species.

According to Lukáš Čížek, changing the situation would require a partial cutting of the forest to make space around the old tress as well as changes in the forest management. *"The Moravian Amazon is biologically richest forest in the Czech Republic and probably in all of Central Europe. It is a UNESCO Biosphere Reserve and it is protected by the NATURA 2000 programme, but the problem is that none of these recognitions have any real effect. The forests are managed by state forest enterprise. They are being extremely rapidly logged out and their age is decreasing. Currently only about two percent of the area is covered by nature reserves. So it is necessary to declare much more of the area as a protected space that really allows decisions concerning nature conservation to be taken on the spot."*

Another step to prevent the overgrowing of open woodlands is the introduction of large herbivores, such as cattle and bison, which used to graze there in the past.

radio.cz

Peru: Amazon Gold Rush Continues to Decimate Peru's Rain Forest

For decades gold miners have pillaged the lush Peruvian Amazon forest of Madre de Dios in search of the precious metal. Now a study reports that illicit mining is sharply on the rise despite local government efforts to curb it—and this is taking a heavy toll on the ecosystem.

In 2012 the Peruvian government announced a slew of legal decrees to defend Madre de Dios—considered the country's biodiversity capital—against miners. Authorities conducted raids, dismantled clandestine camps, and regulated fuel and supply traffic. Despite the crackdown, the total mining area had increased by about 40 percent (to around 170,000 acres) just four years later. According to the most comprehensive analysis to date, the practice—possibly enabled by poor control of the region and greater highway access—extended into at least one of the forest's two national reserves, protected areas where mining is prohibited.

The study, which analyzed satellite images taken between 1999 and 2016 and was published in August in Environmental Research Letters, found an initial decline in deforestation after the government's action in 2012. By 2013, however, forest loss rates had ballooned. New mines started to appear in the following years. They invaded protected areas such as the Tambopata National Reserve—home to the indigenous Ese Ejja, Quechua and Aymara peoples, as well as brightly colored macaws, giant river otters and jaguars. By 2016 mining operations had felled at least 1,287 acres of forest within the reserve.

William Llactayo, a geographical engineer at Peru's Ministry of Environment, who did not take part in the work, says the study comes at a critical time. If the mining trend continues, Llactayo says, "a lot of these areas will be [irreversibly] degraded in the years to come."

scientificamerican.com

UK: Gender pay gap in agriculture and forestry falls by 9 per cent

The gender pay gap in the agriculture, forestry and fishing industries has fallen by 9% in the last decade. That's according to a new report published by Informi, a website offering free practical advice and support for small businesses.

The report shows that women who earned just 77p for every £1 a man earned in agriculture, forestry and fishing back in 2008 now earn 86p, meaning the remaining gender pay gap in the industry stands at 14%.

Since 2008, female hourly pay has increased by 22%, while male hourly pay over the same period has increased by 9% – meaning that the overall gender pay gap has narrowed by 37%.

Across all small business-dominated industries, which includes agriculture, forestry and fishing, the gender pay gap is falling at twice the rate as that of all companies across the UK.

The research found that while the national gender pay gap was at 21% ten years ago (and at 22% in SME-dominated industries), current wage inequalities in those sectors with a greater number of SME employees has fallen to 13%, compared to a national average of 17%.

With a 9% overall fall in the gender pay gap across these SME-dominated industries over the last ten years, the sectors are set to eradicate the remaining 13% average wage inequalities by 2034, should it continue to fall at current rates.

Darren Nicholls, product manager for Informi, said: "Small businesses are the lifeblood of the UK economy, and this report demonstrates that they are blazing a pathway towards wage equality and helping to eradicate the gender pay gap.

"Small businesses are not shackled by tradition, legacy or bureaucracy in the same manner as many large companies can be. That said, clearly a double digit gap is still far too high. There's a great deal more to be done, with some industries lagging behind others in implementing the necessary changes to ensure that females get just as many opportunities to thrive in their profession of choice.

"The fact that mandatory reporting has been brought in by the Government for larger companies should act as an encouragement for small businesses to consider female progression within their own firms, auditing their own internal data and acting upon their results."

Chloe Chambraud, gender equality director for Business in the Community, added: "Closing the gender pay gap is not just about equal pay, but about a much bigger organisational culture shift."

fginsight.com

Rwanda: Forestry ministry, Police sign MoU on environmental conservation

Rwanda National Police (RNP) signed a Memorandum of Understanding with the Ministry of Lands and Forestry, yesterday, to formalise their joint partnership to protect, conserve and develop lands and forestry.

The signing of the agreement between the commissioner for Community Policing in RNP, Assistant Commissioner of Police (ACP) Damas Gatare and the Director General for Rwanda Water and Forestry Authority Prime Ngabonziza, on behalf of their respective institutions was held on the sideline of the Police Council in Kigali.

The signing event was overseen by the Minister for Justice and Attorney General, Johnston Busingye, Minister Francine Tumushime of Lands and Forestry, and the Inspector General of Police (IGP) Emmanuel K. Gasana.

The formal agreement outlines partnership in areas of afforestation, forest management and protection, agroforestry (on farm) tree planting, land management and protection, public awareness and community mobilisation; law enforcement; and soil protection related activities.

The partnership binds the two institutions to plant at least 27, 000 hectares of trees in the next five years – 5, 000 hectares of hilly areas and 22, 000 hectares agroforestry places.

Minister Tumushime said: "This is a step forward to sustainably protect forests and increased production of the forestry sector."

According to the Minister, deforestation activities are haunting the country direly, with the business community spending billions of money to import forestry products.

She said the partnership will greatly supplement the afforestation efforts in the country.

Under Vision 2020, agroforestry is expected to increase to 85 percent of the cultivated space.

Minister Busingye observed that Rwanda is endowed with natural resources that need to be protected, adding that the agreement should be actionable response to the problem.

RNP through its environmental protection programmes has planted about 500 hectares of trees in different parts of the country.

The RNP Environmental Protection Unit operating under CID has also been instrumental in enforcing environmental protection laws through awareness and operations against deforestation.

newtimes.co.rw

NZ: High-quality forestry investment welcomed

Forestry Minister Shane Jones says overseas investment in forestry that brings genuine benefits to New Zealand's economy and its environment will be welcomed by the Government.

Mr Jones says he is pleased with the inclusion of a Forestry Directive in the new Ministerial Directive Letter issued to the Overseas Investment Office, which sets out the Government's policy approach to overseas investment in sensitive New Zealand assets.

"The inclusion of a specific directive for forestry recognises the importance of forestry to the New Zealand economy and regional communities," Mr Jones says.

"As part of the coalition agreement, this Government has committed to an ambitious tree planting programme that will require a partnership between the Crown and the sector itself. High-quality overseas investment can certainly help us achieve this goal.

"Forestry, and the processing of forest products, are significant sources of employment in our regions and we want to build on that to get more people into a sustainable workforce.

"I've heard first-hand from the industry the value of good overseas investment and the Forestry Directive recognises there is a role for overseas investors to play. However, we want to encourage value-added wood processing to generate jobs and other benefits for our regions.

"The new directive for forestry directs the Overseas Investment Office to place high importance on increased processing of primary products and the advancement of the Government's policies when assessing applications for consent.

"It also emphasises that Ministers expect the Overseas Investment Office to impose conditions on consent where appropriate – for example, a requirement for the overseas investor to enter into a supply arrangement with a local processor," Mr Jones says.

The letter recognises that conditions imposed on forest land may need to be for longer periods given the often long-term nature of these investments.

"Forestry has an important role to play in many of the Government's priority areas – enhancing regional development, improving water quality, reducing carbon emissions and creating jobs – and I'm looking forward to seeing the sector prosper in the coming years," Mr Jones says.

scoop.co.nz

Belarus: World Bank to allocate $14m on forestry development in Belarus

The World Bank will allocate an additional loan of $14 million on the development of the Belarusian forestry sector. The matter was discussed at a meeting between a group of the World Bank specialists and representatives of the Forestry Ministry, BelTA learned from the press service of the Forestry Ministry.

Experts discussed the implementation of the Forestry Sector Development Project in Belarus and the possibility of providing additional funding for the project. World Bank Country Manager for Belarus Alex Kremer praised the activity of Belarusian specialists and took note of the important function that forests perform. Speaking about the possibility of allocating an additional loan of $14 million, Alex Kremer said that a positive decision was made on the matter. Experts, however, still have a lot of work to do, i.e. to prepare the documents and determine together with the Forestry Ministry the deadline for repaying the loan.

"As our credit resources are currently limited, we had to take a very balanced approach to this decision. One of the factors in favor of allocating the additional loan was the successful implementation of the current project. The second factor in favor of a positive decision was the desire all the organizations of the World Bank Group to assist Belarus in its efforts to combat climate change," the head of the office noted at the meeting.

In turn, Belarus' Deputy Forestry Minister Leonid Demyanik stressed that Belarus attaches significant importance to reforestation, environmental protection and the improvement of the ecology in general. "I think that these funds will serve a good cause, give a good result. You know that Belarus is viewed to be the lungs of Europe. We will fulfill all the obligations we have undertaken on time and in full," Leonid Demyanik stressed.

The Belarusian Forestry Ministry has earlier received a loan from the World Bank to the total tune of $40.7 million. The funds were used to purchase machinery and set up hi-tech nurseries. Three such centers are being built in Belarus: in Brest Oblast, Vitebsk Oblast and Minsk Oblast. With the support of the World Bank, modern nurseries will be set up in other areas within the next three years.

eng.belta.by

PNG: Forestry sector tax part of PNG govt efforts to raise revenue

Papua New Guinea's government is to start taxing the forestry industry in a bid to grow revenue. It's one of the announcements in the $US4.5 billion national budget for 2018 delivered by Treasurer Charles Abel yesterday.

The latest budget has the Peter O'Neill-led government re-organising the structure of its mounting debt. This included a deal with the International Monetary Fund to stabilise debt and rehabilitate coffers from the last two years of collapsed revenues.

Government wanted tax and customs bodies to collect more from various sectors, such as the forestry industry which is finally to be subject to a progressive tax.

Mr O'Neill and Mr Abel expressed optimism about the fiscal outlook.

But critics said the projected revenue of $US3.9 billion was unrealistic, and would lead to more of the cash-flow problems that have dogged the government in recent years.

radionz.co.nz

Asia-Pacific: Forestry ministers highlight measures for illegal logging, job creation at APEC forum

Ministers from across the Asia-Pacific region have gathered in Seoul this week to discuss the varying social, economic and environmental issues related to forestry management, during the Asia-Pacific Economic Cooperation's fourth annual Meeting of Ministers Responsible for Forestry, held from Monday to Wednesday.

One of the main focuses of this year's forum is stressing the need for regional cooperation in tackling illegal logging and related product trade restrictions. The ministers meeting highlighted its member countries' varying illegal timber trade restriction systems; trade promotion policies on legal forest products; and efforts and cooperation methods utilized by other international organizations in order to prevent illegal logging.

According to a statement from the Korea Forest Service, the government is anticipating topic discussions relayed at this year's meeting of forestry officials will help speed up the introduction of new systems to add further restrictions against illegal logging and related trading.

"The international community sees illegal logging as a major cause of deforestation and damage to fair trade practices, which is why the international community adopted the 'Forest Action Plan' in 1998 at the G-8 Summit in Birmingham, England, in an effort to combat the issue," the statement said.

APEC, with its 21 member countries, is a regional economic forum established in 1989 to leverage the growing interdependence of the Asia-Pacific by promoting balanced, inclusive, sustainable, innovative and secure growth and by accelerating regional economic integration.

At the APEC level, the Expert Group on Illegal Logging and Associated Trade was established in 2011 to deal with illegal harvesting of forest products in relation to the implementation of appropriate measures to prohibit the trade of forest products. According to the Korea Forest Service, the United States, European Union, Australia, Indonesia and Japan have all adopted and implemented relevant systems, creating a positive effect on the sustainability of the global environmental protection and resources.

"It is necessary to recognize and encourage fair and transparent policies and mechanisms for the trade of forest products by mutual sharing of restrictions on imports and exports between countries for illegal logging," the Korea Forest Service said.

Korean Prime Minister Lee Nak-yon on Monday also called for multilateral cooperation in the Asia-Pacific region to work on preventing illegal logging and promote forestation as a method to tackle global environmental issues such as climate change.

Lee cited Korea's efforts toward reforestation following the Korean War, stating the peninsula was able to successful recover and expand its forested areas over the span of two decades thanks to assistance and cooperation from the international community.

Job creation through forestry was another hot topic focused on at this year's meeting.

According to the Korea Forest Service, APEC members account for more than 54 percent of the world's forests. However, they also account for 60 percent of the world's industrial waste and 44.6 percent of forest products trade, leaving the door open to create increased economic benefits and job creation through forestation.

The forum discussed effective ways for government to engage in employment and profit-making activities in rural areas by exchanging members' government-level support systems in rural communities, as well as policy plans on the creation of forest jobs based on sustainable forest management.

"Forests are developing as a cross-cutting issue that combines environmental issues related to climate change and poverty, as well as being tied to various contemporary societal issues," said the Korea Forest Service.

"In 2015, the UN proposed sustainable development targets as well as several goals related to terrestrial ecosystems, such as terrestrial ecosystems, climate change and urban environments such as forests, swamps, dry land and mountains. We want to explore what ways we can proactively respond to global issues and develop new ways to create new value."

koreaherald.com

Ireland: Red squirrel forces halt to forestry road plans

The humble red squirrel has managed to stop plans for a road through a scenic wood close to the Co Donegal border with Derry.

Campaigners have been told the Republic's forestry agency, Coillte has suspended plans to build an access road through the picturesque Lis na Gra woods to protect the habitat of the red squirrels.

Situated above the border village of Muff, Lis na Gra woods is one of the last areas in the north west where the native red squirrels have been breeding successfully.

Lis na Gra has a large colony of red squirrels, as well as other wildlife. However, environmentalists feared that plans to build a road through the woods, to access a pin forest, would destroy the creatures' natural habitat.

Coillte said it was also necessary to remove some trees on the grounds of safety as they had become prone to windfall. Wildlife enthusiasts set up an online petition to oppose the move.

The campaign attracted a huge interest and it now appears that the red squirrel has won.Coillte told campaigners earlier this week that it intends looking at alternative access means to the pine forest.

Campaigner, Bren Whelan paid tribute to the forestry agency over its decision to suspend its plans which he said would protect the integrity of the woodland for future generations.

irishnews.com

Malaysia: Forestry-related Acts To Be Amended To Curb Illegal Logging

Several logging and forestry-related laws will be amended to curb illegal logging activities in the country.

Natural Resources and Environment Deputy Minister Datuk Dr Ir Hamim Samuri told the Dewan Rakyat that the laws needed to be refined to detail the provisions on enforcement action which fell under the jurisdiction of the state government and in the joint-list between the federal and state governments under the Ninth Schedule of the Federal Constitution.

He said the laws had to be amended to meet current changes.

"Although we have the relevant acts, but the power (enforcement) is still at state level, except the Environmental Quality Act 1974, it is under the joint list where we can impose rules or laws to ensure environmental sustainability."

"Even then it still need to be amended," he said when winding up the 2018 Supply Bill for the Natural Resources and Environment Ministry at the Dewan Rakyat here today.

Earlier, several members of Parliament from Barisan Nasional (BN) and the opposition proposed to the government to find ways to curb illegal logging activities that were seen to be widespread.

bernama.com

Fiji tells COP23 forests need more funding

Fiji's Minister for Economy and Climate Change says all countries need to prioritise forest protection and rehabilitation as well as financing of forest ecosystems. Aiyaz Sayed-Khaiyum was speaking at the COP23 Climate Conference in Bonn, Germany.

Mr Sayed-Khaiyum said while progress had been made in protecting ecosystems to enhance resilience to climate change, real incentives were needed to attract more investment in delivering nature based solutions.

Some countries and corporations are taking action to cut emissions from forest use and establish sustainable forestry management. Initiatives from Ecuador and Gabon, as well as corporates like Walmart and Mars Incorporated were welcomed by delegates at the Forests Global Climate Action day in Bonn

Mr Sayed-Khaiyum said forestry ecosystems were high on the agenda for Small Island Developing States because they were among the nations most vulnerable to climate change impacts.

A spokesman from the World Wildlife Fund said forests played a huge role in efforts to tackle climate change and protecting them would ensure they continued to absorb emissions from the atmosphere, protect biodiversity, and provide livelihoods.

The conference heard destructive, often illegal, logging and deforestation continued, with last year, forests equal to the size of New Zealand disappearing from the planet.

radionz.co.nz

Việt Nam records progress in forestry development

Việt Nam recorded average forestry production value growth of 6 per cent per year, nearly doubling the target of the national forestry development strategy following 10 years of implementation.

Under the strategy for the 2006–20 period, the figure is expected to reach 3.5–4 per cent by 2020, the Ministry of Agriculture and Rural Development reported.

Forestry export value also rapidly increased, almost tripling after 10 years, from US$2.18 billion in 2006 to $7.3 billion in 2016. It is expected to reach $8–8.5 billion by 2020, higher than the target of $7 billion by that year.

Forest plantation was also actively implemented during the 10-year period, with some 225,000ha of forest planted each year.

Forest protection and fire prevention tasks also recorded positive progress with the area of damaged forest dropping from over 5.500ha per year during the 2006–10 period to nearly 3,000ha per year during the 2011–16 period.

The quantity of wood exploited from planted forests increased five times, from 3.2 million cu.m of wood per year in 2006 to 17 million cu.m in 2016.

The payment for forest environmental services has become an important source of finance to help improve the efficiency of forest protection, management and development, and contribute to reducing the burden for the State budget. The country collected some VNĐ1.3 trillion ($57.7 million) worth of forest environmental services each year during the period.

However, shortcomings remain, such as illegal deforestation, illegal exploitation of forest for valuable timber and the wrong use of forest land, according to the ministry. Although the rate of forest coverage increased, the quality and biodiversity of natural forests continued to decline.

The scale of forestry production was still small, while technology and administration of small-and medium-enterprises were underdeveloped, leading to low productivity.

vietnamnews.vn

UK: Scotland dominates the UK commercial forestry marketplace

More than £111 million of forestry was sold in the UK in the past year, 40 per cent more than in 2016, according to the latest annual UK Forest Market report by Tilhill Forestry and John Clegg & Co.

The report contains many key highlights based on information obtained from the sales of commercial forest properties between October 1 2016 and September 30 2017. It reports that the market returned to its normal growth after a quieter year in 2016 with 87 forest properties sold – compared to 67 the previous year – for a total of £111.04m, up £31.8m from 2016 and against a five-year average of £104m a year.

Other highlights reveal that a total of 17,272 hectares were traded, 78 per cent of which were in Scotland, underlining the country's dominant position in the commercial forestry marketplace. Forestry in England amounted to 18 per cent of the market while the Welsh share was 4 per cent.

The report highlights the demand for farmland with potential for new planting schemes and underlines the fact that the future fortunes of farming "in the changing world of Brexit and generational succession will have a significant impacts on forestry".

Fenning Welstead, Partner in John Clegg & Co's Edinburgh office said: "There is a move towards exciting new afforestation programmes with positive support from grants and political will. Potentially, significant opportunity for afforestation may result from existing farmland owners planting parts of their land or from changed ownership to forestry investors."

The report reveals that the industry is in good shape with annualised returns of 10.7 per cent and continues to outperform most other asset classes – despite a fall from the 10-year annualised rate of 17.4 per cent.

Peter Whitfield, Tillhill Forestry's business development director, states in the report: "We have been encouraged to see a steady flow of new investors into the market attracted by the good returns, the potential for tax planning and/or long-term capital growth, and frequently just a genuine enthusiasm for getting involved in forestry."

Fenning Welstead added: "Large scale commercial plantations have been in strong demand, but the supply of such properties is decreasing. With some notable exceptions, none have been established for almost 30 years. Many of the larger private plantations are now in the ownership of collective funds and portfolios. Whether they will come to the open market again is debatable and these funds continue to seek further acquisitions. There have been some very strong sales this year as a result."