CFA Newsletter

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Editor: Alan Pottinger

Contact: The Crib, Dinchope, Craven Arms, Shropshire SY7 9JJ, UK

Tel: + 44 (0) 1588 672868

Email: cfa@cfa-international.org

Web: www.cfa-international.org

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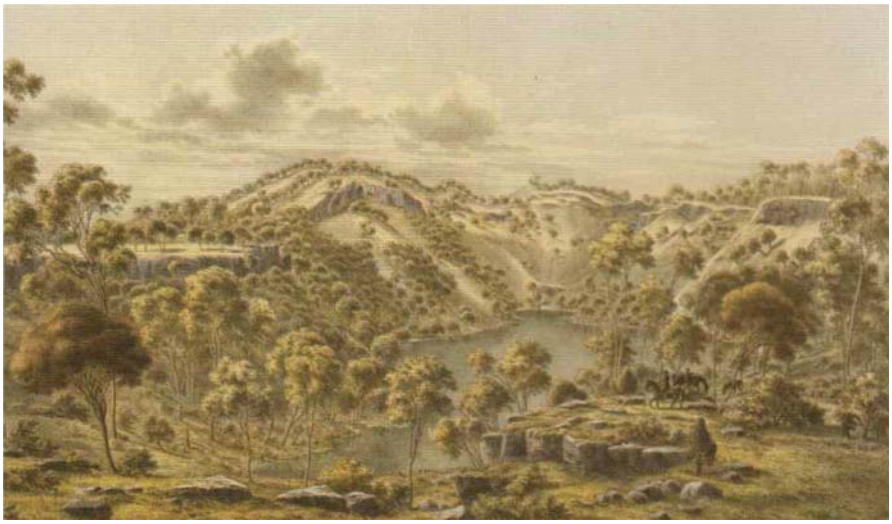
Indigenous forest management in Australia



Forest in Mt Eccles in western Victoria painted by Eugene von Guerard in 1858 showing Aboriginal forest management (from Gammage, 2011).

Introduction

Before I commence this article it is important for me to recognise the Djiringanj people of the Yuin nation the traditional owners of the land upon which we farm and I sit to write this article and pay my respects to their elders past, present and emerging.

If you had asked me 20 years ago whether I would open an article on Aboriginal land management by paying my respects to our traditional owners of our land I would have been bemused possibly even thinking it was tokenism. I think quite differently about my Aboriginal cousins now.

The turning point for me was a conversation with Rob Watson, a Kimberly man and colleague on the Australian Rural Leadership Program in 2003, when I asked him how do we fix the health, education and the myriad of social problems blighting Aboriginal communities. It was a deep and honest discussion between two Australian friends but in the end he said it is all about respect. I was initially expecting something about land rights, funding or social justice but I was wrong, while Rob was quietly spoken he carried a level of powerful inner confidence about his aboriginality and it was infectious. I now understand that it is all about respect for their land and their culture it is not about money!

The post 1788 migrants are slow learners about some things and understanding the Australian landscape is a strong example of our inability to accept Australia for what is and not what we can make of it!

We will never know what the Australian landscape exactly looked like in 1788 when the first fleet settled in Sydney Cove. But the more I research and study Aboriginal culture the more convinced I am that they had complex land management systems and I believe that for Aborigines to have existed in Australia for

The same forest area in Mt Eccles in western Victoria as portrayed on P1, taken in 2007 by Gammage.

some 60,000 years they must have developed strong systems to feed, clothe, protect and govern themselves, otherwise their communities would have collapsed.

The fact that they also lived happily as nations across our continent is testament to their ability to adapt and live harmoniously in a range of environments, from the coast to the mountains and from the plains to the deserts. Some of these environments, particularly our deserts, most white Australians would not survive in today.

The Australian government suggests that at the time of European settlement there were over 500 different clan groups or 'nations' around the continent, many with distinctive cultures, beliefs and languages[1]. Australia is unlike New Zealand, which has one Maori language (although there are dialects), in that it is not uncommon for some Aboriginal people not to be able to understand the language of other nations.

The story of Australia's most famous forest genus, Eucalyptus, is older than the Aborigines, having emerged approximately 50 million years ago before the Australian continent broke away from Gondwanaland. According to Hill *et al* (2016), Eucalypts have influenced the fire ecology of the Australian landscape more than any other plant group. They are the iconic plant taxon in the Australian vegetation today, but their origin, early evolution and migration remain poorly understood, mostly because of a remarkably sparse and underworked fossil record. However, they state it is likely that the origin was close to the Cretaceous–Paleogene boundary, possibly around 66 million years ago.

As Australia left Gondwanaland relatively early compared to the remaining continents, its vegetation developed in isolation which resulted in our uniqueness along with our wildlife. The dominance of Eucalyptus is consistent with a drying climate with a relatively high frequency of fire. Following the arrival of Aborigines, they had a profound impact on the Australian landscape due to their prodigious, frequent, and judicious use of fire.

Forest fire management

Professor Bill Gammage (2011) in his book *The Biggest Estate on Earth – how Aborigines made Australia*" comments in detail how fire was used by Aborigines for both hunting and cleaning the country. Gammage used the painting at the top of this article (among many) by well-known colonial landscape painter Eugene von Guerard to illustrate how Aborigines used fire to manage the vegetation to create hunting templates. The painting is of the extinct volcanic crater of Mt Eccles in western Victoria in 1858.

The photograph above, taken by Gammage in 2007, and the painting at the top of the article are of the same place, but note the vertical strips of trees in the painting which are not evident now. These strips are not natural, they are made by human intervention, most likely for hunting. As there were no cameras in 1858 landscape painters provide the clues to how the country was managed.

Gammage (2011) describes Aboriginal management as templates that were repeated across the continent and they were relatively simple and flexible but they all had the same purpose to "associate water, grass and forest providing habitats and making the clean, beautiful landscapes dear to Aboriginal feeling"

A common view of the Australian landscape at the time of European settlement was that it was very open. Gammage (2011) reported that in 1841 Anne Drysdale wrote:

[1] https://info.australia.gov.au/about-australia/our-country/our-people

'*This place is really beautiful. A short distance from the Barwon* (a major river through the town of Geelong in Victoria*), which is a noble river: all so green and fresh, with trees of the finest kinds…….scattered about, & in clumps like a Noblemans park.*'

It was a common comment, as Gammage (2011) again reported that in 1813 Evans described plains on the Fish river in NSW:

'*I came on a fine Plain of rich land, the handsomest Country I ever saw….. the track of clear land occupies about a mile on each side of the river……the Timber around is thinly scattered, I do not suppose there are more than 10 Gum Trees on an Acre* (25 trees per hectare)…..*there is game in abundance; if we want a fish it is caught immediately.*'

William Morton in 1859 described the Mackenzie northwest of Rockhampton in Queensland, '*All the open country, does not consist of plains but of thinly timbered well grassed long narrow strips, running parallel to the river. Behind are patches or belts of scrub.*'

East of Perth George Moore stated '*to the distant eye the country has the appearance of being well wooded, but I should not say it was thickly timbered. In some places there are open plains that resemble well ordered parks*'. His neighbour William Shaw estimated '*the trees [do] not exceed more than eight trees per acre (*20 trees per hectare*) and [are] laid out by nature in a most park-like scenery. Further south of Perth near Bunbury John Barrow thought the whole country wears the appearance of an English park.*'

There is no doubt the Australian landscape at the time of European settlement was 'man-made'. The problems began when the European settlers moved in and they drove the Aborigines off their land and their management was driven off with them.

Apart from the human tragedy of this, the other major impact was the cessation of regular skilful burning. This frequent use of fire was commented on by early explorers, and Captain Arthur Phillip (later to become Admiral) commented about Aboriginal burning by stating '*they are so frequently setting the country on fire*' when corresponding with Lord Sydney, Secretary of State for the Home Department (Carron 1985).

These new settlers were mostly from the northern hemisphere and not familiar with extensive fire in their home landscapes. Indeed, most Europeans were probably frightened of fire and Gammage (2011) noted that in 1847 Western Australia passed an ordinance to flog or imprison Aborigines for lighting them! The cessation of fire would upset the balance of nature that had been carefully managed by Aborigines for thousands of years.

Alfred W Howitt, a 19th Century polymath wrote a paper in 1890 to the Royal Society titled '*The Influence of settlement of the Eucalyptus forests of Gippsland*' which is relevant to understand the current condition of our forests. Importantly he commented on the lack of fire in the landscape following the removal of aborigines from their lands. He stated:

'These annual bush fires tended to keep the forests open, and to prevent the open country from being overgrown, for they not only consumed much of the standing or fallen timber, but in a great measure destroyed the seedlings which had sprung up since former conflagrations. The influence of these bush fires acted, however, in another direction namely, as a check upon insect life, destroying among others those insects which prey on the Eucalypts.'

In short, the European settlers, by removing regular fires from the landscape, unknowingly created the pre-condition for much larger and hotter bushfires. The lack of fire also allowed the bush to thicken up with more trees and shrubs per hectare which in turn allowed a build-up of native insect numbers which feed on the leaves of eucalypts which often result in massive tree diebacks.

The first attempts at forest management by the European settlers did not occur until the late 1800s and this was mostly around preventing clearing for agriculture or urban development. However, forestry and forest management by the European settlers did not come easily to Australia.

Controls on harvesting around the Hawkesbury river were implemented by Governor Hunter in 1879. However, with limited staff and large areas to cover there was little control. Any control that could be exercised was generally only related to the descriptions of the trees to be cut and licensees were often left to do as they wished (Carron 1985).

By 1870 there was concern about the poor controls around cutting trees on crown land. In late 1876 a small branch of the Lands Department was formed to administer forest regulations and by 1882 it was converted into a Forest Conservancy Branch – hesitant beginning of the NSW Forests Commission. In 1879 the Royal National Park was also dedicated just south of Sydney.

The last decade of the 19th century was difficult in Australia with economic depression, industrial problems, droughts and other pressures. It was also characterised by considerable anti-forestry sentiments by lands and agricultural departments who wanted to develop Australia under various settlement schemes and clear the forests for their vision of productive agriculture (Carron 1985).

The first Forest Acts did not appear until the early 1900s (1916 in New South Wales and 1920 in Tasmania) some 130 years after settlement and a massive amount of forest loss and disturbance. This new legislation brought grand titles like Forests Commissioner, but they were often short of trained staff and were merely policing royalties.

The anti-forestry sentiment by settlers and the policing activity by the forestry agencies on the sawmillers can be seen in forestry today. There is little active farm forestry and the public forest agencies dominate the supply of logs to industry which are administratively priced.

There is both a blessing and curse of government involvement in forestry in Australia, the blessing being that governments have taken responsibility for controlling indiscriminate harvesting and clearing of natural forests and developing a sizable softwood plantation estate later in the 20th century. But the curse was that in the process the government forest agencies stifled development of private forestry both on farms and in the development of plantations and management of private natural forests, the latter being four times larger than the current area of public multiple use natural forests.

After World War II the silviculture of Australia's eucalypt forests was better understood and foresters were given the opportunity to plan for future wood production and protection from forest fires, particularly after major fires in Victoria in 1939 and in NSW in 1951/52.

Production shifted to increasing the development of softwood plantations in the 1960s as it was clear the natural

Illustration of how prescribed burning in Victoria in 2019 halted progress of a major forest fire in 2020 (Photo: Garry Squires).

forests would not supply the volumes required, and the use of prescribed burning to control bushfires was trialled and eventually implemented as a major management tool.

The prescribed burning used by the forest agencies was similar to Aboriginal burning in that the objective was to reduce dry fuel on the forest floor and control the flame height to limit crown scorch of the trees. Aboriginal burning was probably smaller in scale, more frequent and sensitive to different aspects of the landscape while the forest agencies burning was more regimented, about every 5 to 7 years, and larger in scale.

Australian foresters' main objective was fire protection for both the nearby communities and to protect the valuable wood products that were growing within them, while Aborigines were thinking more about landscape health and hunting.

Despite the different approaches under both managers it worked, as shown in the photograph above taken by well-known Victorian forester Garry Squires. The photo illustrates how a forest that had been prescribed burned in early 2019 held the spread of the Black Summer bushfires in January 2020. The crown fire on the right of the photo burnt into the forest that had been prescribed burned 12 months earlier and within 20 metres of the fire trail boundary the fire had gone out.

Since the 1980's there has been a significant increase in the area of National Parks and conservation reserves in Australia. As an indication, Carron (1985) reports the area of forests in National Parks in 1982 was 3.8 million hectares, and Australia's State of the Forests report in 2016 states that it is now 21 million hectares[2], and 46 million hectares in all forest reserve types. These two figures are not directly comparable as definitions of forest have changed over time but they are indicative.

Conclusions

With increased areas of environmental reservation and regulation there has been a decline in the quantity and quality of prescribed burning in Australia. There also appears to be a passive approach to forest management in reserves, with a 'let nature take its course' approach. This passive approach is an anathema to Aborigines as they do not see themselves separate from the land, as they are part of it and the land is part of them. Wilderness is a white Australian concept.

Of considerable concern to operational foresters is a trend by some researchers and community groups to question the value of prescribed burning. In my opinion as a result of this reservation much of our forest is not safe from fire which will impact our wildlife and our communities. Most operational foresters are in total agreement with Aboriginal cool burning experts like Victor Steffenson[3] that we need to drastically re-think our forest burning strategies if we want to improve the overall health of our forests and make them safe for all Australians.

In summary, our forests are overstocked and under burnt so they are declining in health and more fire prone. Personally, this is a massive concern. Without active management our forests will continue to suffer and create a major risk every summer. Bruce Pascoe the aboriginal author of '*Dark Emu – Black Seed Agriculture or Accident'* stated in the press recently that Australians need to '*treat Australia like Australia'*. In support, Gammage concluded in his book that '*If we are to survive, let alone feel at home, we must begin to understand our country. If*

[2] Crown land that is formally reserved for environmental, conservation and recreational purposes, including national parks, nature reserves, state and territory recreation and conservation areas, and formal reserves in state forests.

[3] Fire Country, How Indigenous Fire Management Could Help Save Australia by Victor Steffensen, Feb 2020.

we succeed one day we might become Australian'! Managing fire in our landscape is critical to our safety and the well-being of our forests and everything that lives in or near them.

Rob de Fégely AM
DIRECTOR, Margules Groome Consulting Pty Ltd, NSW, Australia
rob.defegely@margulesgroome.com
Member of the CFA Advisory Group

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Association News

OBITUARY

Robert Louis Newman OAM, B.Sc (For) Melb, Dip. For AFS, RPF, FIFA., FCFA

Bob Newman, forester, consultant, past Chairman & Vice President of CFA, died on 11th August 2020, aged 91.

Regarded as a leader in the development of private forestry in Australia, Bob Newman's 60-year career as a forester was characterised by work in many facets of forest management and by taking on significant roles in professional and industrial associations.

In 1955 he gained a Diploma from the Australian Forestry School Canberra, and a B.Sc.(For) from Melbourne University in 1958. He later obtained qualifications in Business Management. In his retirement he wrote a thesis on the ways government can encourage timber plantations by using long term incentives and in 2018 was awarded a Master of Science by Research from Southern Cross University.

Born in the UK at Barton on Sea in Hampshire on 20th July 1929, Bob travelled as a teenager to Australia in 1946. His first work in forestry in 1951 was as a student with for the Forests Commission of Victoria, followed by a period with the CSIRO Division of Forest Products. His first appointment as a forester at the end of 1955 was in Tasmania with Australian Newsprint Mills (ANM) at Maydena. This involved resource assessment and silvicultural research with Dr Max Gilbert. He then joined The State Electricity Commission of Victoria in 1959 as the Works Forestry officer for the Kiewa Hydro-electric scheme at Bogong in North-east Victoria.

During the 1960's Bob's career then took him to managing sawmills in Myrtleford and in the Otways, including timber treatment plants, a veneer mill, and new timber drying facilities. He became involved in timber distribution in the ACT and Southern NSW, followed in 1970 by the establishment of a successful timber supply business based in Canberra.

In 1976 he was one of the first foresters to start a consulting business, with work in Tasmania and he took on a founding role in the organisation formed for private (non Government) forest owners, the Australian Forest Development Institute (AFDI) which became Australian Forest Growers (AFG). He became a champion for private and farm forestry encouraging investment

in plantations and he successfully lobbied politicians for taxation deductions to remain in place.

In 1987 he based his office in Albury and was instrumental in organising the 1988 Bicentenary Forestry Conference and subsequently the National Foresters Grove, which is a reserve of trees planted in recognition of individuals who have made significant contributions to Forestry.

He moved his consulting practice to Yarralumla in Canberra in 1993 and in 2002, merged his practice with G.H.D. Consultants and continued in private practice until 2011. His clients included many major forest companies, Governments, and work overseas in Papua New Guinea, Malaysia, the Solomon Islands, South Africa, New Zealand, Canada, China and the U.K.

Bob's involvement in various Professional Associations was significant. Apart from AFG, he was a founding member of the Association of Consulting Foresters of Australia, involved with the Hoo Hoo club and with the Timber Preservers' Association. He held office and was a keen supporter of many gatherings and conferences.

As a Forester, he initially joined the Institute of Foresters of Australia (IFA) in 1951 as a student member becoming a full member in 1961. He was one of the founders of the Murray Catchment branch of the IFA. He became a Fellow in 2005, and was awarded the Institute's highest Award, the NW Jolly Medal in 2011. In his response, Bob acknowledged those foresters who had supported him through his career right from his early days. *"My tertiary education was helped by John Chinner of Melbourne University, Sibley Elliot of CSIRO Forest Products, Sir Edward Weary Dunlop of Japanese War Fame and a Wallaby, and Dr M.R. Jacobs the iconic Principal of the Australian Forestry School"*.

Bob was a great encourager and understood the value of recognition. He was instrumental in instituting various awards. In addition to the National Forester's Grove, he was responsible for the suggestion to establish the M.R. Jacobs Oration which is presented at IFA conferences. He organised awards for the ACT Forester of the year and raised funds for student prizes in silviculture.

He became a great supporter of the Commonwealth Forestry Association and joined the CFA in 1977. He attended many Commonwealth Forestry Conferences (Vancouver 1985, Rotorua 1989, Kuala Lumpur 1993, Perth 2001, and Colombo 2005) In 1988 he was elected Vice Chairman of the Governing Council and served as Chairman from 1990–1993, subsequently continuing on the Governing Council as a Vice President. In 1996 on the 75th Anniversary of CFA Bob had the honour of presenting H.M Queen Elizabeth II with an Australian parquetry piece depicting a Eucalypt. Bob was involved in the instigation of the Queen's Award for Forestry and arranged its first presentation to John Turnbull in 1998 in Melbourne. The CFA Regional Medal awarded for excellence in the S.E Asia and Pacific Region was proposed by Bob and has been implemented regularly since 1998.

Recognition of his service to forestry and the community culminated in his being awarded the Medal of the Order of Australia in the January 2006 Australia Day Honours.

Outside of forestry, rugby football was his sport. He excelled in this during his youth, was an ardent follower of rugby throughout his life and was a keen member of the Canberra male voice Rugby Choir. He also enjoyed blues music and folk songs. He is survived by his wife Janet, a son, a daughter, step-children and grandchildren.

Bob was a cheerful supportive colleague and an encourager and mentor to many. He was inclusive and gave employment to many forestry students and new graduates. He understood all facets of forestry, utilisation and marketing, and had an appreciation of the value of networks and influence. Movers and shakers like Bob are sometimes not without their critics, but he leaves many enduring legacies which pay tribute to his efforts and as a result, the profession and the forest industry is clearly the better for them.

Michael Bleby OAM
CFA Regional Co-ordinator SE Asia & Pacific

The **Commonwealth Forestry Conference** is an international forum for foresters, and all those with an interest in the forestry sector to exchange knowledge and experience. It is organized by the Standing Committee on Commonwealth Forestry and occurs every 4–5 years. The Conference relates to general aspects of forest management and governance and has a focus on the changing priorities of the forestry sector.

Please join us for the Twentieth Commonwealth Forestry Conference in August, 2021 and share your view on the joint future of forests and people. For full information please visit cfc2021.ubc.ca

CFA Advisory Group member receives recognition for services to the Australian forestry industry

The CFA is pleased to announce that Rob de Fegely, Chairman of Sustainable Timber Tasmania and member of the CFA Advisory Group, was recognised with a membership of the Order of Australia (AM) in the 2020 Queen's Birthday Honours.

This prestigious honour recognises Rob's great dedication, service and contribution to the Australian community, particularly the forestry industry.

Rob has always been community minded, having started as a forester in the NSW town of Bombala in 1980, developing pine plantations. He also worked as a project manager developing the local Bicentennial Gardens.

Now based in NSW, Rob's career has taken him to every state in Australia and overseas in Asia and North America, working for both government and the private sector. He has been the Chairman of Sustainable Timber Tasmania since June 2016, and was chair of the Australian government's Forest Industry Advisory Council for many years.

Adapted from miragenews.com

IFSA | International Forestry Students' Association

Young African Foresters Initiative

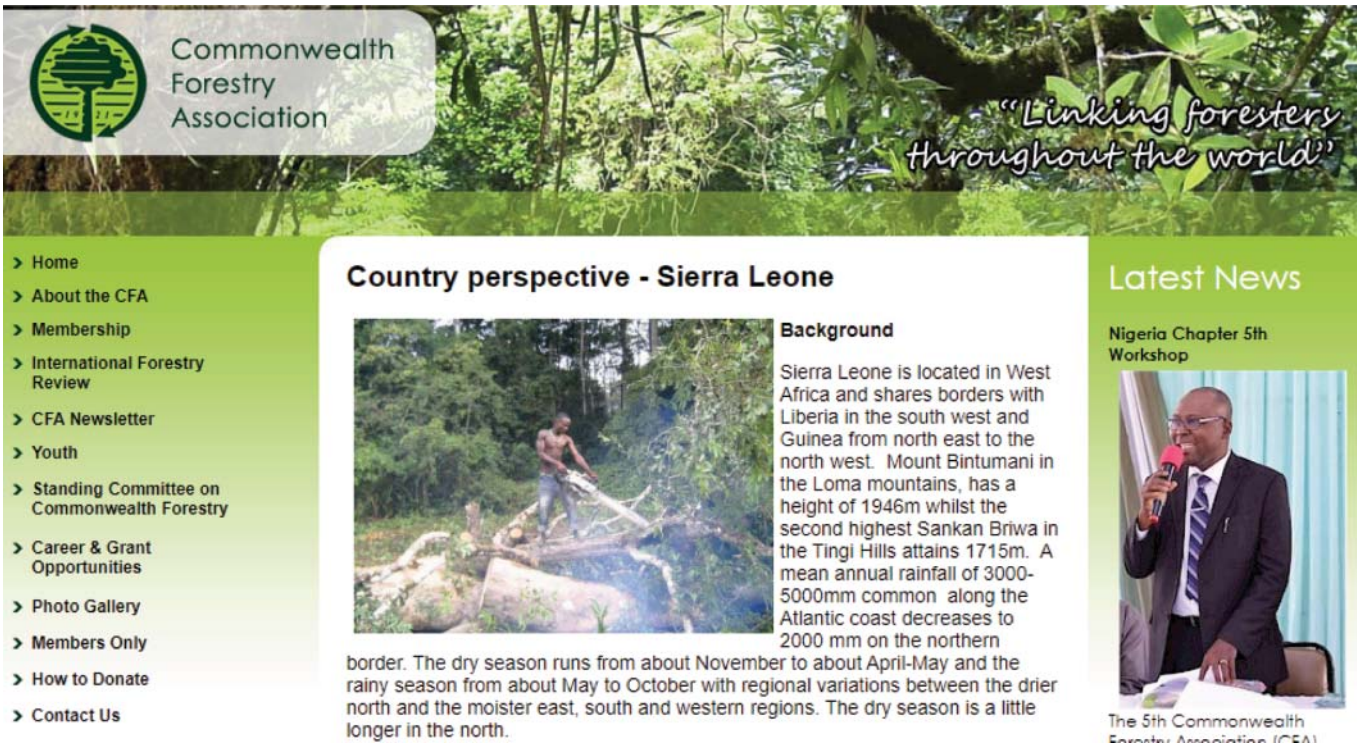
The International Union for Forest Research Organizations (IUFRO) together with the International Forestry Students Association (IFSA) is running a collaborative project through the joint IUFRO-IFSA Task Force on Education. The project dubbed "**Young African Forestry Professionals Publication (YAFP) Project**" was launched in April 2020 with the aim of motivating and inspiring young people to develop interest in forestry and related programmes and careers in Africa.

YAFP is collecting data through interviews of inspirational role models in forestry and related fields as well as developing a network of organizations that young foresters can join, both within and outside the continent. The results of the project will be compiled into a book that will be published, printed and distributed to tertiary institutions offering degree programmes in forestry and selected high schools on the African continent. It is expected that the project outputs will increase visibility for career options in forestry.

Against this backdrop, the project team has designed a survey to collect preliminary information on forestry students and young career professionals in Africa who would wish to share their stories. To access the survey, please visit the link: Inspire the Next Generation of Forestry Students and Professionals in Africa through your Career Success Stories

Should you require more information about this project, please visit the IFSA website at https://ifsa.net/ifsa-iufro-africa-book-project/

CFA country profiles



We would like to add new country profiles to those already on our website. If you feel that you would like to contribute information and photos for your country then please take a look at our existing profiles at www.cfa-international.org/country_report_1.php and get in touch at cfa@cfa-international.org

Forest Scenes

This app plants trees when people make lower-carbon choices

- Ant Forest is a mobile game that has become China's largest private sector tree-planting scheme.
- The game has funded the planting of more than 120 million trees, covering more than 100,000 hectares.
- The project has contributed to China becoming the world's leading tree-planting nation. Ant Forest was awarded the UN's Champions of the Earth award, its top environmental honour.

What if you could turn a good deed into a new tree?

An award-winning mobile app game from China does just that, and is responsible for more than 120 million trees being planted in some of the country's most arid regions.

Since its launch in 2016, over half a billion people have used Ant Forest to convert lower-carbon activities such as using public transport into real trees.

The game is helping China lead the way in re-greening the planet and is serving as a model for tree-planting schemes elsewhere.

It's the kind of innovation the World Economic Forum is seeking through UpLink, a platform for crowdsourcing sustainable development solutions to challenges including how to plant a trillion trees.

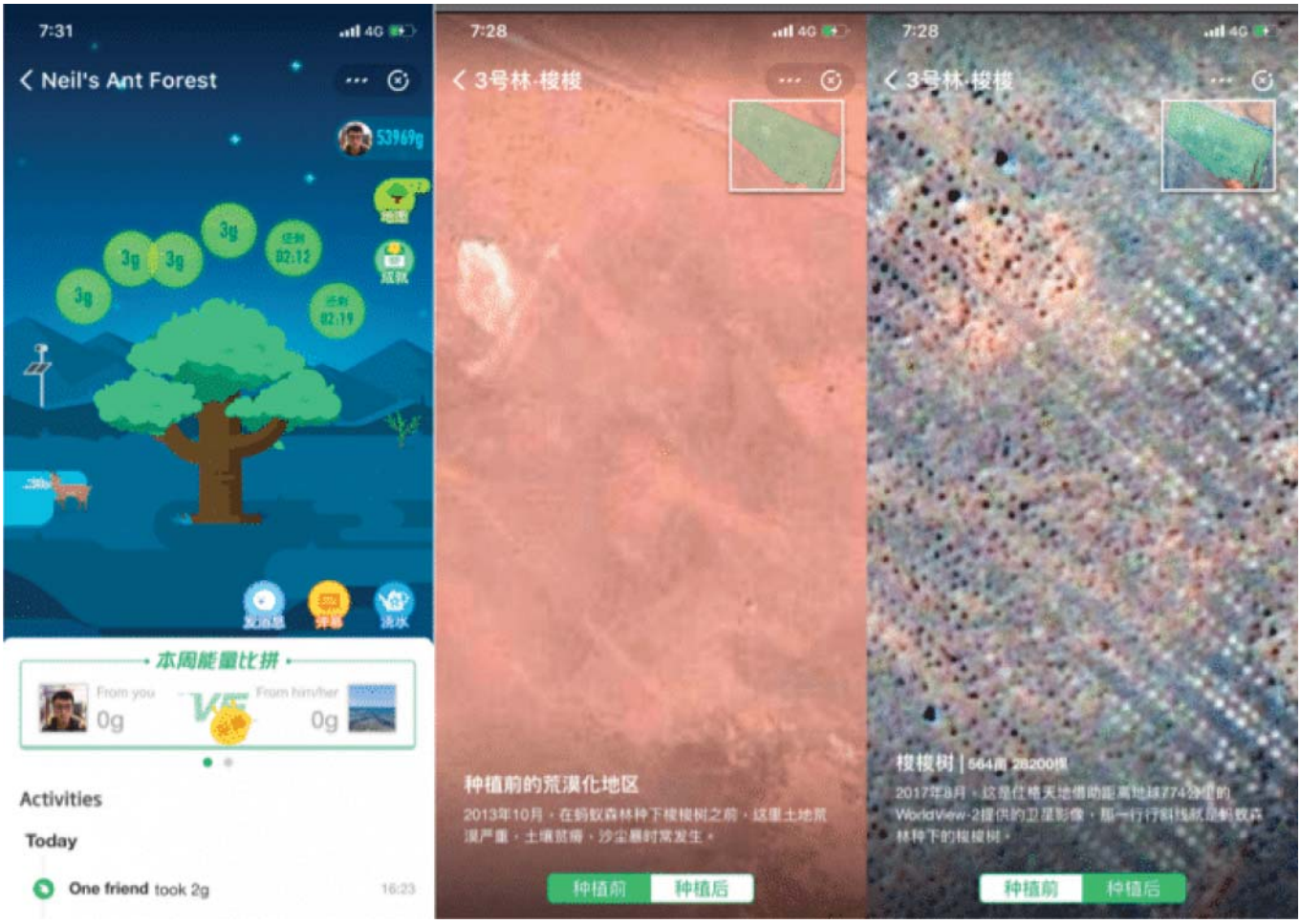
The Ant Forest model

"Ant Forest taps into the best of human ingenuity and innovation to create a better world," says Inger Andersen, Executive Director of the United Nations Environment Programme – which in 2019 gave the project the UN's top environmental award.

So how does it work?

To start with, Ant Forest has plenty of potential players, being part of China's Alipay mobile payments app, which is used by more than a billion people. Each time a user performs a lower-carbon activity, such as paying a utility bill online or cycling to work, they are rewarded with "green energy points".

Ant Forest user interface (Image from jasonlow.my)



Alipay Ant Forest users can see satellite images of their trees in real-time. The image in the centre shows a patch of land in Inner Mongolia before Ant Forest began planting trees, while the image to its right shows the same location in 2017 – the stripes are newly planted saxaul trees. (Image from jasonlow.my)

However, rather than immediately spending those points on a real tree, Ant Forest turns its users into game players. The green energy points "grow" into a virtual tree on the user's app. And users can share green energy with friends and see how their virtual forests compare with others.

For every virtual tree grown, Ant Forest donates – and plants – a real one. And this gamification has had real-world impacts.

A greening China

According to a study in Nature Sustainability, NASA satellites have revealed a 5% increase in global green leaf cover since the early 2000s – with China leading that growth.

While a third of Chinese greening is due to the expansion of agriculture, 42% comes from projects to plant forests. According to the UN, Ant Forest has become the country's largest private sector tree-planting scheme – so the game is a big part of China's greening.

And the locations for planting are ambitious: arid areas of Northern China like parts of Inner Mongolia, Gansu and Shanxi. Many of the 122 million Ant Forest trees have been planted in areas that have become deserts.

There has been some criticism. In 2019, the journal, Nature, reported concerns that holding back deserts with trees could put pressure on water supplies. Scientists in China respond that local conditions are taken into account. Drought-resistant varieties, such as the "saxaul" shrub, are used by Ant Forest.

The project is certainly ambitious. In 2019, Alipay's parent company, Ant Financial Group, said the trees covered some 112,000 hectares. And there are sizeable spillover benefits too.

Environment and people

The young trees maintain and repair eroded soils, as well as reduce global CO2 levels.

Another major gain from the project has been employment. Ant Financial Group says 400,000 job opportunities have been created through Ant Forest, many for local farmers.

But if the trees are donated by Ant Financial, why not simply plant the trees and cut out the virtual ones? The reason, as the UN puts it, is "significant behavioural change"; gamification has encouraged millions of people to adopt lower-carbon lifestyles.

The success of the project has now led to a similar initiative in the Philippines, launched by the mobile payments provider, GCash.

The project is an encouraging step, according to the UN's Andersen. "Although the environmental challenges we face are daunting," she says, "we have the technology and the knowledge to overcome them and fundamentally redesign how we interact with the planet."

www.weforum.org

Improved stoves increase efficiency of woodfuel

Often, when we talk about clean energy access in Sub-Saharan Africa we immediately think of solar electricity. For many, energy is synonymous with electricity. This misconception has led to the focusing of efforts to address the challenge of clean energy access into solar home systems to power household lighting, televisions and other devices. However, over 95% of domestic energy needs are in thermal energy, rather than electrical.

Over 2.8 billion people around the world lack access to clean cooking technology. Many of these households cook on rudimentary, traditional cookstoves such as three stone fires whose main fuel source tends to be wood, charcoal or often kerosene. These cookstoves emit a lot of smoke, causing high levels of household air pollution (HAP) in the homes of their users, with negative consequences for their health. In fact, HAP contributes to the premature deaths of nearly 4 million people every year to illnesses such as heart disease, pulmonary disease and childhood pneumonia.

Now, in the midst of a global pandemic which has highlighted the correlation between poor air quality and susceptibility to diseases such as coronavirus, this issue of inadequate clean energy access has become more pressing than ever.

In rural Africa, approximately 80% of households rely on woodfuel as their primary energy source. This includes firewood and charcoal which requires a huge amount of wood to produce it. Most of this fuel tends to be harvested unsustainably from the surrounding environment, contributing to the rapid rates of deforestation found particularly in the regions of Sub-Saharan Africa and Southeast Asia.

The burden of collecting fuel for the household traditionally tends to fall on the women. As a result, women spend up to 18 hours a week collecting fuel and cooking. These are valuable hours which could be put into more productive tasks such as education. This also means that women tend to spend the most time around the domestic hearth, preparing food, and are thus the most susceptible to diseases relating to household air pollution.

Ruben Walker and his family witnessed this problem first-hand when living in Lesotho. They would see women walking hours back to their homes with huge piles of sticks thrown over the shoulder to use as fuel for their stoves. Meanwhile, the natural tree cover in the land was visibly rapidly depleting. Tall stacks of black smoke would billow out of the houses there, highlighting the need for a clean energy solution. So, Ruben and his father Stephen set up *African Clean Energy* which is headquartered in Amsterdam. From there, they came up with the ACE One.

The ACE One is an advanced solar-biomass hybrid cookstove. It burns any solid, dry biomass fuel, from sticks and twigs, to cow dung, to corn cobs, to crop residue. This mitigates the users' reliance on woodfuel from their surrounding environment. It also burns more efficiently than a traditional cookstove, reducing the amount of fuel required to cook and heat their homes as well as the amount of time women spend gathering this fuel. As a result, it emits considerably less CO2 than a traditional cookstove. Each ACE One used reduces CO2 emissions by approximately 2.5 tonnes every year. That's a considerable amount.

The efficient burn of the ACE One means it also cooks food far more quickly than a traditional cookstove, saving valuable hours spent around the stove. It has a built-in ventilator which raises the temperature of the gas in the device burning chamber to such a level that it combusts entirely, producing a smokeless flame. As such it helps protect the health of the user from harmful diseases which result from inhaling too much smoke.

What makes the ACE One affordable to its users, many of whom live on as little as $2 per day is the savings it makes on their energy expenses. Households in low-income countries spend a disproportionate amount of their income on energy expenses. Studies commissioned by UNDP evaluate energy costs make up as much as 20+% or even a third of their monthly expenditures. Crucial to the design of the ACE One is the device solar panel which users leave on the roofs of their homes to charge during the day. This in turn powers the fan as well as providing electricity to the two USB ports at the front of the ACE One. While thermal accounts for approximately 95% of all domestic energy needs, the majority of money spent on domestic energy is on electricity and lighting. Candles, kerosene and phone charging are all significant expenditures for these households. ACE One users can plug in their phones into the USB ports to charge, or the LED lamp attachment to light up their homes, saving them a lot of money on electrical costs.

The ACE One is made accessible to low-income households through its sale via an interest-free 9–12 month microloan which customers pay back through the savings they make on their energy expenses. Most customers tend to break even after 3–4 months, so they continue saving money with the ACE One long after they have repaid their loan. Many ACE customers are unbanked, so the credit rating they gain through their loan repayments can be very valuable to leverage in future financial dealings. As such, their ACE One purchase is an entry point into financial inclusion.

So, the ACE One is a solution to making clean energy accessible and affordable to households who are currently living without. It contributes to the health and financial resilience of the user as well as mitigating deforestation rates and CO2 emissions. At the moment, ACE is working to establish a clean and sustainable fuel supply chain in each of its markets, manufactured from leftover wood waste. For Ruben, wood pellets are the future of the clean cooking sector. Making wood pellets an affordable and viable alternative to unsustainably harvested biomass will be the next step in ACE's mission to make clean and affordable energy a reality for all.

ACE

The Cities4Forests Toolbox: connecting cities with tools to understand and manage forests

Mérida, a city in Mexico's lush Yucatán Peninsula, is home to 2.3 million trees, which cover over 20 percent of the metropolitan area. Merida's officials know that these trees provide benefits to the residents, but until recently they didn't know how much these benefits were worth or how they were distributed across the city. That made it difficult for the officials to know where to focus their limited budget and tough for them to advocate for more resources.

Thankfully, there's a tool for this. With help from USDA Forest Service, Mérida officials conducted an analysis using **i-Tree Eco**, a free tool that quantifies the climate, health, and water benefits that trees and forests provide to cities. The analysis found that Mérida's trees sequester over 16,000 tons of carbon each year. In other words, these 2.3 million trees offer a carbon value of US$648 million to the city. Mérida used this information to recommend three main steps to increase the value of its stock of urban trees:

1. Intensify the urban reforestation program in quantity, quality, tree species selection, and size of trees used.
2. Implement a program to improve the health of smaller trees.
3. Better regulate tree removal in new development projects.

Tools like **i-Tree Eco** provide a unique opportunity for city leaders to ground their policies, plans, and investment decisions in local scientific analysis. The **i-Tree Suite**, which includes **i-Tree Eco** and other forest analysis tools like **i-Tree Hydro**, has been used by over 320,000 users around the world. Yet, the United States is home to almost 90 percent of those users.

Cities in Latin America, Africa, and Asia often lack access to tools regularly used in Europe and North America. Tools can be expensive, or the data needed to run the tools may be unavailable for the area of interest. Sometimes the challenge is simply knowing which of the hundreds of tools now online best fit cities' needs.

Introducing the Cities4Forests Toolbox

Through extensive research, consultations with experts, and discussions with tool developers, Cities4Forests compiled 32 of the best tools to help cities include forests, trees, and green infrastructure in their decision-making, planning, and investments. The Cities4Forests Toolbox covers a range of topics, from valuing trees and forests, to maximizing key benefits (such as biodiversity, health, water, and carbon), to planning and

Skyline of the City of Mérida, México. (Photo: J. Magno)

managing forest-related projects inside and outside their boundaries. Most importantly, these tools are highly recommended, internationally available, low or no cost, and accessible to non-experts and experts alike.

Cites4Forests is also partnering with tool developers like the i-Tree team from USDA Forest Service and Davey Trees to help increase the use of these tools in Latin America, Africa, and Asia. The USDA Forest Service has already adapted i-Tree Eco for general use in Australia, Canada, Colombia, Europe, Mexico, and South Korea, and Cities4Forests is working to encourage adoption of the tool with member cities in Mexico and Brazil. In Mérida, where city officials were already familiar with i-Tree, Cities4Forests helped strengthen long-term capacity by training municipal staff to use the tool and confidently measure progress around their recommended action steps.

Similarly, Cities4Forests is working with cities in Indonesia, India, and Madagascar to start monitoring urban tree cover using a tool called Collect Earth where participants use satellite imagery to quantify vegetative cover.

We encourage cities to explore the best tools for them in the Cities4Forests Toolbox and to reach out to info@cities4forests.com or their Cities4Forests focal points to start using the tools to improve their decision-making.

Try out these five tools to get started!

- Want to understand the benefits that trees provide to your city? Explore i-Tree Eco @ https://cities4forests.com/toolbox/tools/i-tree-eco/
- Want to create your city's first tree cover map? Explore Collect Earth @ https://cities4forests.com/toolbox/tools/collect-earth/
- Want to design an urban forest management plan for your city? Explore the Urban Forest Management Toolkit @ https://cities4forests.com/toolbox/tools/urban-forest-management-plan-toolkit/
- Want to engage communities in your work? Explore Mapping Social Landscapes @ https://cities4forests.com/toolbox/tools/mapping-social-landscapes-guide/
- Want to procure sustainable wood products? Explore the Sustainable Procurement Guide @ https://cities4forests.com/toolbox/tools/sustainable-procurement-guide/

Sabin Ray and Abraham Berumen
Sabin.Ray@wri.org

Forest conservation in the Pacific Islands: a focus on the Nakauvadra Range in the Fiji Islands

Nakauvadra Range in Fiji Islands (Credit: Rosie Fitzgerald)

Fiji is one of the nations in the Pacific that holds the richest biodiversity. It is known to have around 900 vascular plants that are endemic, a number of endemic palms, amphibians, reptiles, bats and birds. Although biodiversity has been gaining in popularity as a conservation priority in Fiji almost half of the island's forests have been lost to agriculture, unregulated logging and intentional fires.

Forests in Fiji contribute to the quality of life especially for rural people who depend on it for timber, food, traditional medicine and environmental services such as water catchments and carbon sinks. This is particularly important in these island where approximately 80% of land, including forests, is owned by indigenous clans, called mataqalis, for whom these areas are a key source of income and livelihood.

The Fijian Government, local communities and NGO's have pledged the protection Fiji's natural forest heritage by establishing protected areas and also through the Fiji's National Biodiversity Strategy and Action Plan. However, although there is a growing number of community conserved areas there is very little focus on Fiji's remaining forests.

Nakauvadra Range

The Nakauvadra range is present on the north coast of Viti Levu and extents for about 23 kilometres, with elevation ranging from 300 to 850 meters. Nakauvadra is located in one of the drier sections of the island and receives approximately 2000mm of rainfall annually, with monthly rainfall ranging from 50mm in dry to 400mm. Temperature varies between 20.2°C and 30°C. Mixed vegetation is present on the lower regions of Nakauvadra, such as grasslands, agro-plantations, and secondary forests near villages, and cloud and native forests are present on higher elevations. There are 75 landowning units (Mataqali) in Nakauvadra in three districts: Naiyalayala, Naroko and Tokaimalo.

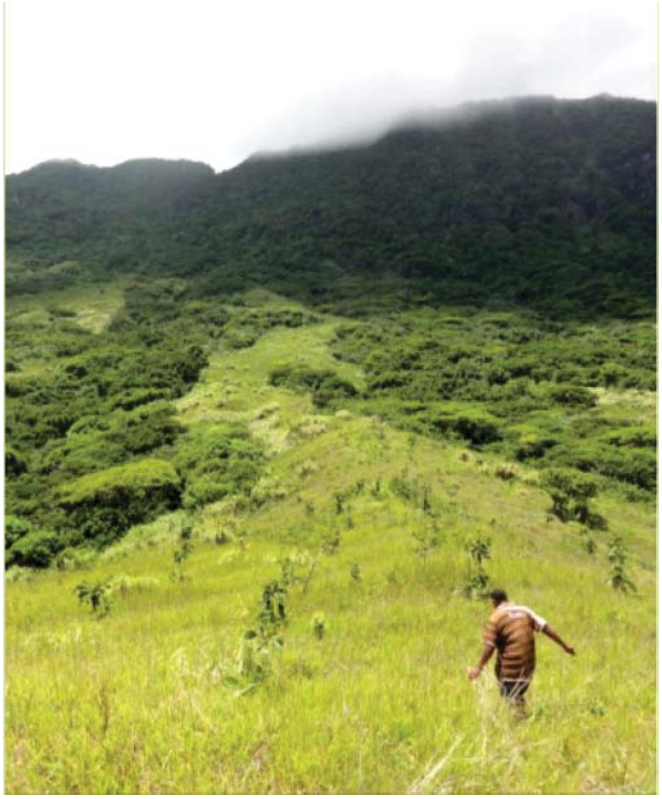
Biodiversity of the Nakauvadra Range

Flora

There are approximately 480 different plant species present in the range of which 338 are native. Two species which grow in Nakauvadra, *Neoalsomitra integrifoliola* and *Neoalsomitra integrifoliola,* are of particular interest as they are rare in Fiji.

Fauna

A total of 11 terrestrial herpetofauna has been recorded in the Nakauvadra Range, representing 33% of the total found on Fiji Islands, with endemic species *Platymantis vitianus, P. vitiensis, Emoia concolor and E. parkeri*. The recent discovery of *Platymantis vitianus* (Fijian Ground Frog) was particularly exciting as this species was thought to be extinct on Viti Levu. However, the highlights in the range are the two stick insect species, *Nisyrus spinulosus* and *Phasmotaenia inermis,* both of which are extremely rare in Viti Levu.



Nakauvadra Range in Fiji Islands (Credit: Conservation International)

Threats to biodiversity

The forest of the Nakauvadra range is one of the last remaining intact forests in the drier side of Viti Levu but the threat of fires is significant, particulalry in areas close to villages and farming communities. In some cases fires have resulted in the transformation of native forests to talasiga grassland which has provided a pathway for alien species to move into the ecosystem – including rats, goats, mongoose and pigs all of which disrupt the ecosystem.

Recommendations for community engagement in forest conservation in Fiji

The role of local communities living within or surrounding forest areas in conservation is widely recognized, and indigenous participation is considered to be the best approach to conservation for rights-based, moral and practical reasons. Consequently, one of the ways in which government and organizations can achieve protection of these remaining forests is through payment for ecosystem services (PES) which provides income for locals thus increasing food security and overall income for the clan people.

Traditional ecosystem knowledge held by indigenous people plays a key role in sustainable management of natural resources as these traditional practices and knowledge have proved that they allow ecosystems to become resilience for generations. Further research needs to be carried out on documenting the traditional knowledge possessed by clans present in the Nakauvadra range so that this knowledge can be integrated into proposed management plans for the Nakauvadra forest block. This should be coupled with increasing awareness amongst people of all ages in the local communities regarding the importance of forest conservation, and declaring the Nakauvadra range as an official protected area. Combining traditional knowledge with modern methods of forest management is likely to maximize the outcome of conservation efforts.

Danian Singh
School of Science and Technology, University of Fiji, Fiji Islands.
daniansingh@gmail.com

The Green Mobilization Initiative in Nigeria

Nature remains the most precious gift to humanity. However, its mismanagement has resulted in various environmental challenges faced by human race. Such challenges include flooding, resource conflict, air pollution, deforestation, heat waves, desertification, migration etc.

The Green Mobilisation Initiative (GMI), with its Head Office located in Abuja, was established to achieve an environmentally sustainable environment in schools and communities through raising awareness of the values of the Nigeria ecosystem and promoting the involvement of all sectors of society and government in its management,.

GMI has embarked on series of tree planting projects geared towards environmental wholesomeness including **Planting for Peace** which took place at **Maichibi Secondary, Sabotasha, Kaduna to commemorate the World Environment,** was aimed at fostering peace in a community prone to religious crises.

In 2017, GMI partnered with the Ogun State Ministry of Forestry, Abeokuta in a campaign of *Ten Thousand Trees for Schools* in the State tagged *Run for Trees*. In this project, trees were planted in 8 schools in Abeokuta namely; Federal University of Agriculture International Secondary School (FUNIS), Alabata; Federal College of Education (FCE) Model School, Osiele; Nawarudeen Grammar School, Obantoko; Asero High School, Asero; Egba High School, Asero; Lisabi Grammer School, Idi Aba; and Methodist High School, Ogbe. The Ministry officials, Head-Teachers, Teachers, and Students, of the different schools were actively involved along with GMI in all the activities.

In 2018, GMI planted trees at the Federal Government Boys College, Apo, Abuja. Following the success, GMI also in 2019, planted trees in 3 schools namely; Government Day Secondary School, Dutsen Alhaji; Government Secondary School, Bwari and Government Secondary, Kuje all in the Federal Capital Territory.

In stimulating community sustainability, GMI reinforced the Community Ownership strategy which gives the community a sense of ownership. Host schools were trained on Tree Management Strategy which appears to have been a success as over 80% of the trees planted survived when GMI conducted monitoring and evaluation of their activities.

This novel action is in tandem with the Goal 13 of the Sustainable Development of the United Nations which focuses

Federal College of Education (FCE) Model School

Federal University of Agriculture International Secondary School (FUNIS)

Government Secondary School, Bwari

Federal Government Boys College, Apo, Abuja

on Climate Action. So far the Green Mobilisation Initiative has planted over 5000 trees and intends to do more for the sake of mankind. The projects mentioned above were realized through careful planning and collaborative efforts with government agencies such as Ogun State Ministry of Forestry, Abeokuta; Federal Ministry of Education, Abuja; Parks and Recreation Department of the Federal Capital Territory (FCT) and the FCT Secondary Education Board.

A lot more could be achieved in this planting initiative **#GreenNigeriaschoolsproject** and we encourage more schools to become enlisted into the programme.

Gabriel O. Aborele
Founder/Executive Director, Green Mobilisation Initiative
greenmobilisationinitiative@yahoo.com
Twitter: Gabriel Aborele

On trawlers and workboats – a personal account of a Forest Officer in Papua New Guinea

Chris Borough communicating with base at Ioma

Over the period 1966 to 1968 workboats, trawlers and speedboats were an integral part of my involvement with projects undertaken by the Territory of Papua and New Guinea's Department of Forests. The workboats and trawlers were owned by the Territory Administration and were available to all Government Departments on request. Rabaul was the largest town and centre of Administration for the islands of New Britain, New Ireland, Manus and Bougainville.

Within a month of arriving in Rabaul as a newly appointed Forest Officer I was told I was to form part of the Forest Resource Assessment of New Britain. The Department of Forests was undertaking a massive program to identify and quantify the forest resources of the entire country. The focus was the timber resource in the predominantly Lowland Rainforest.

The assessment of the resource needed many skills – the key being the preparation of maps and air photo interpretation to stratify the resource. It has to be remembered that the only land maps available were those prepared by the Australian Army during WW2.

Ken Granger, draftsman for this survey says "*We simply worked with the old 1:63 360 scale and "four mile" map series. The drawing office produced base maps for each survey based on that material. After the survey the air photos available (for New Britain typically photos taken in 1949 by the USAAF) were used to provide the boundaries of forest types established by the photo interpreter (i.e. me) and they were transferred to the base maps so that area calculations could be made.*" Ken was also responsible for air-photo mapping of geographical feature such as rivers, villages, volcanoes, sink holes etc. as well as forest types. Once in the field he was also tasked with locating survey lines and suitable landing pads.

Ken adds "*We certainly cut pads when there were not natural sites or garden areas available to give an adequate sample coverage. That involved a team of four walking in from a natural pad on a compass bearing to find a selected ridge top where they then used chainsaws and axes to open the canopy.*"

Resource assessment teams typically comprised one Forest Officer or Technical Officer together with a Technical Assistant, a species identifier and a labourers. The typical identifier was an indigenous technical assistant with phenomenal skills in identification – with PNG Pidgin as the only a means of communication. The identifiers were only taught species by their botanical name – it is hard to imagine how species such as Ziziphus or Dracontomelum might sound when verbalised by a non-English speaker.

Prior to my time the Department sent one Forest Officer or Technical Officer into the field to undertake a Resource Assessment – often for many months at a time. The process was inefficient and very stressful due to isolation and the extended period away from their families. The whole process was reviewed and the new approach was to use a large team well supplied with a helicopter (Bell 47G-3B) for support.

A typical team at base camp would comprise an OIC, Draftsman, Forest Officers and Technical Officers for field work, indigenous species identifiers, helicopter pilot and helicopter engineer. Equipment used included a very important Crammond transceiver was fitted with crystals to allow regular contact with the outside world as well as field crews. Surveys were planned to run for three months although later two helicopters were used and the time staff spent away from their home base was reduced to six weeks.

The West New Britain Resource Survey was to be my first exposure to forest inventory as practiced in New Guinea and also a form of transport that would become a common part of my life as a young Forester in this part of the Territory that had few roads and relied upon aircraft and coastal shipping for all forms of transport.

The Government Trawler *MV Motuana* was already loaded with food and equipment; we departed Rabaul in the late afternoon and headed towards Kokopo. The *MV Motuana* had seen better days but it was a great form of transport. Heading out to sea we encountered a heavy swell and I began to suffer from seasickness from a combination of diesel smoke and a good swell. Fortunately, the *Motuana* was fitted with bunks and I was able to get relief – well at least until the cockroaches started

feasting on my feet. The cockroaches won so it was a long night feeling rotten and starved of sleep.

The next morning we stopped at Pomio on the New Britain south coast. Walking up the wharf was challenging – for some reason this solid looking wharf was moving. It took a few hours before I found my land legs.

We had the opportunity to visit a logging operation in the rainforest adjacent to Pomio. The destruction of the forest with bulldozers virtually disappeared below the land surface as they dragged logs to the sawmill. To my eyes this was very poor forest management. I was later told that Pomio had an annual rainfall of more than 4000 mm/a. Interestingly Kauri Pine was growing just behind the fringing mangroves.

Back to the *Motuana* to continue our voyage to Melenglo Island where the first base camp for the West New Britain Survey was to be based. The Resource Assessment comprised a strip line (2 miles (3.2 km) long) along which 32 fixed area sample plots were to be assessed. The plots were located at intervals of 5 chains (330 ft or 100.1 m). Measurement along the strip line was undertaken using a topo chain and abney level. Over each chain length (66ft) the average slope was ascertained and an extra length added using appropriate marks on the topo chain. This meant that the location of each plot could be accurately located on an air photo or map. Each plot established was 1 chain or 66ft long (20.1 m) and 20 ft (6.1 m) wide. All trees greater than the minimum diameter above buttress size (dab) of 20 inches were identified, diameter recorded and log length estimated. In later inventories variable plot widths based on diameter were adopted to better sample the larger trees.

The location of each strip line was plotted on an air photo with a starting point and compass bearing provided by the draftsman. Typically the draftsman would choose a chopper pad such as a gravel bank on a river's edge; a bush camp would be established nearby. The team of four comprised a team leader, a technical officer, species identifier and a labourer. In most cases it was determined that either 2 or 3 strip lines would be established from the one bush camp. Communication between field teams and base camp was by portable HF radio.

In March 1966, having finished the initial assessment work out of Melenglo, the whole camp was moved to Amalut Plantation on the mainland adjacent to the Arawe group of Islands. The area had been the scene of a major offensive against the Japanese in WW2.

Unlike the rivers further east, the lower parts of rivers such as the Pulie River were often surrounded by sac sac swamp. My team of four were landed at a location identified by the chopper pilot as the nominated drop-off point but in practice was surrounded by sac sac swamp. We tried pushing through the deep swamps hoping that crocodiles were not hungry that day and finally, after almost drowning my shorter companions, I opted out and we were able to be picked up the next day. Turns out we were landed on the wrong shingle bank.

Back at base camp I started feeling ill and my wife was contacted via the daily radio sched that serviced all remote settlements in New Britain. My wife, Robyn (and Janet about 8 months old) flew down from Rabaul to Kandrian on the "Milk Run". The Milk Run, a DC3 skyliner operated by TAA, ran a return daily service between Rabaul, Tol, Kandrian, Talasea, Cape Gloucester, Finschhafen and Lae. Robyn and Janet were picked up at Kandrian airport and then taken by chopper to the base camp at Amalut Plantation.

Engineer Ron Turner servicing the helicopter

My condition was not improving and, after a few days, Robyn, Janet and I were found accommodation with Bill Jamieson, his wife and two children at the Anglican Mission on the nearby island of Kumbun. Bill was a lay missionary who was diabetic but had insufficient money to purchase insulin for his condition. It was astounding to me that the Anglican Church expected Bill to undertake missionary work without meeting the funds necessary for his survival. I know the funds from the Accommodation Warrant for Robyn and me would have been very welcome.

Despite the care from my wife and the good food from the Jamiesons, I was very weak and unable to walk down to the water's edge and back (about 10 steps). After about a week, it was arranged for the three of us to be taken back to Kandrian on the workboat *MV Toa* where I was placed in the hands of Hungarian doctor – Dr. Gostarlis. He diagnosed scrub typhus and put me on a diet of weak beef soup.

After recovery in Rabaul I was sent back on the milk run DC3 to join the Resource Assessment team at Cape Gloucester where I was picked up by the *MV Motuana* en route to Linga Linga Plantation. By this time I had about enough of Resource Assessment Survey and just did my job but without much enthusiasm. The most miserable day of my life was on a beautiful beach out of Linga Linga. It was only after we established camp that we realised that the sandflies were king at this idyllic spot. After dinner, I tried unsuccessfully to sleep inside my mosquito net – the survey "bois" just made sure the fire was smoky and stayed up all night. By next morning we had all gone on strike

and requested the chopper to come and collect us. Unfortunately it was the pilot's rest day so we had to wait another full day and night being driven mad by sandflies. Never were four people happier to hear the noise of salvation – the Helicopter Utilities chopper.

Over the next few years the time that Resource Assessment teams were expected to be absent from their home base was reduced by increasing the number of staff involved and introduction on some surveys of a Bell Jet Ranger 206 helicopter that carried all four members and was able to navigate into smaller pads.

Chris Borough

Acknowledgement – Input from draftsman Ken Granger on map preparation and air photo interpretation greatly appreciated

Around the World

Guatemala: Money-laundering drug cartels are driving deforestation

Drug traffickers in Central America have been known to practise "narco-ranching", in which they launder cash by buying land and cattle, then selling the meat in Mexico for money that can't be traced to drug activity. A new analysis suggests this method may be responsible for up to 87 per cent of deforestation in a nature reserve in Guatemala – and the situation may be similar in protected forests along the drug transport corridor countries of Central and South America.

"This is the first attempt to quantify the role narco-cattle ranching plays in the deforestation happening in the Maya Biosphere Reserve," says Jennifer Devine at Texas State University. Carved out of the rainforest, these ranches also help traffickers hide airfields and control territory along smuggling routes.

She and her colleagues analysed 4500 aerial images of deforested areas in the 2.1 million hectare Maya Biosphere Reserve in Petén, Guatemala, which covers one-fifth of the country's total land area, to determine what had caused the loss. They found evidence of large-scale cattle ranching in 87 per cent of the images in a key part of the reserve, Laguna del Tigre National Park.

Liza Grandia at the University of California, Davis, who has worked in Petén for 27 years, says "cattle culture" has been in the region since the 1960s, when massive ranches were encouraged by the national government.

"It wasn't really until 2002 or 2003 that narco-ranchers entered the area as the new villain," she says. "It was the normality of cattle ranching that really allowed the narcos to move in so swiftly and cloak themselves as an average agribusiness."

From 2000 to 2015, about 30 per cent of the forest of Laguna del Tigre, Guatemala's largest national park, was turned into agricultural land.

Devine and her team conducted more than 100 interviews with people living in and around the reserve to understand how to identify areas deforested by narco-ranching. These feature large clearings of dozens of hectares of land, set out with straight lines, square and rectangle shaped plots, and even tractor marks.

She says they can't definitively say the deforestation was funded by drug traffickers, but other small farmers, or *campesinos,* tend to grow food crops, not just pasture, and have smaller overall plots.

"Jennifer's work is unique in identifying what land use is changed to after the forest is lost," says Beth Tellman at Columbia University in New York. "Understanding specifically where forest loss leads to cattle ranching is essential to understand how narco capital transforms landscapes: it helps us 'follow the money'."

David Wrathall at Oregon State University says narco-ranching happens wherever there is a lot of illegal money passing through forested frontiers. He says while *campesinos* have long been scapegoats for deforestation, local people have been shown to be the solution to stopping the destruction of nature reserves.

"If people have collective, local decision-making authority about land and resources, and they have strong expectations that they will maintain this authority in perpetuity, then we see better development outcomes and forest conservation outcomes," says Wrathall.

For example, the Association of Forest Communities of Petén (ACOFOP) manages the concessions granted to indigenous people and peasant farmers in 1990 to sustainably harvest timber and other forest products. Erick Cuellar, ACOFOP's deputy director, says the land that is part of these concessions has virtually no deforestation compared with the national parks.

Marcia Macedo at Woods Hole Research Center in Massachusetts, who studies the Amazon, says although narco-ranching doesn't appear to be a major driver of deforestation across the whole of the Amazon, studies like this can be a powerful tool to curb such activity.

"They can provide objective evidence of what is happening on the ground, prevent false narratives from taking hold and keep voting citizens and the international community informed," she says.

newscientist.com

Brazil: Amazon soya and beef exports 'linked to deforestation'

Up to one-fifth of Brazil's soya exports to the European Union may be "contaminated" by illegal deforestation, a study has found. Researchers used freely available maps and data to identify the specific farms and ranches clearing forests to produce soya and beef destined for Europe.

They found 2% of properties were responsible for 62% of illegal deforestation. These "bad apples" have global environmental consequences, they said.

Prof Raoni Rajão, of the Universidade Federal de Minas Gerais in Brazil, said it was up to the country's political and economic leaders to root out "the bad apples in the soy and beef sectors. Brazil has the information it needs to take swift and decisive action against these rule-breakers to ensure that its exports are deforestation-free," he said.

What does the study show?

Reports from non-governmental organisations and journalistic investigations have previously revealed cases of soya and beef being produced in areas of deforestation and exported. But this is the first study to link property-level illegal deforestation with export data.

The research, published in the journal *Science*, found that 2% of properties in the Amazon rainforest and the Cerrado grasslands are responsible for 62% of all potentially illegal deforestation.

Roughly 20% of soya exports and at least 17% of beef exports to the EU may be "contaminated with illegal deforestation", the researchers said. According to their analysis, two million tons of soya grown on properties with illegal deforestation may have reached EU markets annually during the period of analysis, 500,000 of which came from the Amazon. As the soya is fed mainly to livestock, customers can't be sure whether the meat they buy is "deforestation-free".

Duncan Brack, of the Chatham House think tank, said the study strengthened the argument for government measures to end UK consumers' contribution to deforestation, such as a due-diligence or duty-of-care obligation on companies importing products such as beef or soya.

What is the scale of the problem?

A recent report found the majority of all soya (65%) comes from countries with high deforestation rates. The land required overseas to meet the UK's annual demand for soya between 2016 and 2018 equated to an area approaching the size of Wales, according to environmental groups WWF and the RSPB.

"Without knowing it, we're eating meat and dairy products from animals fed on soy grown on deforested land in Brazil," said Mike Barrett, executive director of science and conservation at WWF-UK. "We need to stop importing habitat destruction."

In 2019, an area of primary forest the size of a football pitch was lost every six seconds across the world, according to a study by the University of Maryland, US.

Brazil accounted for a third of it, its worst loss in 13 years apart from huge spikes in 2016 and 2017 from fires.

bbc.co.uk

Global: World's biggest trade deal in trouble over EU anger at Brazil deforestation

- *The trade agreement between the European Union and Mercosur (Brazil, Argentina, Paraguay and Uruguay), is the biggest trade treaty ever negotiated. Signed a year ago, the US$19 trillion deal's ratification could fail due to Brazil's refusal to respond.*
- *At the end of June, French President Emmanuel Macron declared that his nation will not make "any trade agreement with countries that do not respect the Paris [Climate] Agreement," a direct reference to the administration of Brazilian President Jair Bolsonaro who has pursued an aggressive policy to develop the Amazon.*
- *The Dutch parliament, Austria, Belgium, Ireland and Luxembourg, plus some EU parliamentarians, and NGOs are opposed to the deal, saying it brings unfair competition to EU farmers and accelerates Amazon deforestation. French and Brazilian business interests and diplomats meet this week to try and settle differences.*
- *Brazil's Bolsonaro has so far been unmoved by all these objections. While the government plans to launch a PR campaign to convince the EU to ratify the trade agreement, it continues pressing forward with plans to allow industrial mining and agribusiness intrusion into Amazon indigenous reserves and conserved areas.*

https://news.mongabay.com/2020/07/worlds-biggest-trade-deal-in-trouble-over-eu-anger-at-brazil-deforestation/

Europe: Scientists unlock Alpine trees' molecular defence

Researchers have found a way to tackle a disease that threatens thousands of hectares of Alpine forests each year. Needle bladder rust causes Norway spruce needles to yellow and fall out, causing a significant reduction in growth.

Scientists in Austria have unlocked a natural defence mechanism that the species can use to fend off the potentially fatal pathogen. The findings have been published in the BMC Genomics journal.

Disease is one of the major threats facing trees around the globe, especially in a warming world where many organisms are finding themselves living in an environment in which they are under increasing levels of stress. It is widely predicted that invasive pathogens, and the insects that can spread them, are expected to thrive in a world experiencing climate change.

In evolutionary terms, harmful pathogens developed alongside plants' attempts to protect themselves, creating a multi-millennia cold war between biological kingdoms. It is a natural defence mechanism that a team of scientists utilised to create a system to protect the Norway spruce from needle bladder rust.

"Our research seeks to curb this disease unravelling the molecular defence mechanism of Norway spruce against needle bladder rust infection," explained co-author Carlos Trujillo Moya, a researcher from the Austrian Research Centre for Forests. Dr Trujillo Moya and colleagues have continued to monitor Norway spruce trees in the mountains of Austria, allowing the team to select trees that seem to display a resistance to the disease. From these trees, the team were able to generate clones and then study the genes, as well as studying the production of defence chemical compounds.

Dr Trujillo Moya told BBC News that trees that displayed a resistance to the needle bladder rust defended themselves via a "hypersensitive response". "This defence mechanism consists in the production of a complex artillery of proteins and chemical compounds that isolate the fungus in the attacked leaves," he explained.

"The infected part of the leaf dies in a controlled way and thus prevents the fungus from spreading throughout the rest of the tree. The team said the findings represented "enormous progress" in the way Norway spruce trees are selected for their resistance to the needle baller rust pathogen (*Chrysomyxa rhododendron*).

"Our finding allows to better identify resistant clones and promote the establishment of replanting programmes by using selected trees, based on most effective hypersensitive defence reponse," Dr Trujillo Moya observed.

He concluded by saying this research helps tackle one of the main issues facing the ecological and economic sustainability of Alpine ecosystems.

bbc.co.uk

Poland: The Senate voted against burning wood from native forests in power plants

Polish Senate rejected the draft amendment to the act on renewable energy sources (RES). – The change in the definition of energy wood contained in it was to allow the burning of wood from Polish forests in power plant furnaces – says Greenpeace. The government defends the amendment.

The amendment to the law would allow for mass felling, removal and burning in power plant furnaces, the most valuable forests from the point of view of nature protection – dead and dying trees. – This is what happened after the introduction of similar regulations in Slovakia. Meanwhile, trees in such a state are habitats for many legally protected species, such as woodpeckers and owls. They also enrich the soil with minerals and humus, and provide many other 'ecosystem services' that are of great importance for the functioning of forests. All this is irretrievably lost when the trees are taken out of the forest and burned – says the environmental organization.

During Thursday's Senate debate on the amendment to the act on renewable energy sources (RES), Małgorzata Golińska, deputy head of the Ministry of Environment, was asked, inter alia, on the financial condition of the State Forests in connection with the coronavirus. Golińska informed that the data obtained from the State Forests show that the revenues of Lasów fell by over PLN 600 million in the first half of the year compared to the planned ones. She explained that this was due to less timber harvesting and sales. – Compared to the plan, we already have over PLN 600 million less and we are talking only about the middle of the year – she said.

The amendment to the RES Act provides for the introduction of a new, temporary definition of energy wood. It says, among other things, that energy wood is, for example, wood that is not sawmill and cut wood, which are logs, sawmill and cut logs, by-products resulting from the processing of wood raw material, etc.

The amendment is to apply from October 1 this year until December 31, 2021. According to the government, the new law is to allow for the management of wood lying in forests, which, due to the coronavirus, has not been picked up by the timber industry. According to the calculations of the Ministry of Environment, it is about 2 million cubic meters of wood. Now the draft amendment to the act rejected by the Senate will be returned to the Sejm.

biznesalert.com

India plans to fell ancient forest to create 40 new coalfields

Under a new "self-reliant India" plan by the prime minister, Narendra Modi, to boost the economy post-Covid-19 and reduce costly imports, 40 new coalfields in some of India's most ecologically sensitive forests are to be opened up for commercial mining.

Among them are four huge blocks of Hasdeo Arand's 420,000 acres of forest in the central Indian state of Chhattisgarh, which sit above an estimated 5bn tonnes of coal.

It marks a significant shift. The coal industry in India is state-owned, but this auction of 40 new coal blocks will see the creation of a privatised, commercial coal sector in India. Among those bidding for it are India's rich and powerful industrial giants, including the $14bn (£11bn) Adani group run by the Indian billionaire Gautam Adani, who operates India's largest coal power plants and has close ties to Modi.

The coal auction has already proved controversial at both the local and political level. At least seven of the coal blocks up for auction were previously deemed "no go" areas for mining due to their environmentally valuable status and about 80% of the blocks are home to indigenous communities and thick forest cover. Four state governments – West Bengal, Maharashtra, Jharkhand and Chhattisgarh – have written to Modi in opposition or raised legal objections to the auction, and one coal block, which overlapped with the Tadoba tiger reserve in Maharashtra, has already been removed.

While across the world governments have geared towards a "green recovery" post Covid-19 – the United Nations secretary general, António Guterres, said recently there was "no good reason for any country to include coal" in recovery plans – India is putting fossil fuel at the forefront of its strategy to turn the pandemic into economic opportunity.

"Why cannot India be the world's largest exporter of coal?" asked Modi as he announced the coal auction project.

Yet with its 45% ash content, making it some of the most polluting coal in the world, there is unlikely to be an international market for Indian coal. In addition, many major factories in India cannot run on "dirty" domestic coal, meaning they will still need to import it from abroad.

India's joint secretary for coal, Maddirala Nagaraju, said that all the country's projections showed that demand for coal would increase and insisted that increased domestic coalmining was the "cheapest way of meeting the energy needs of the people".

"We are the country with the fourth largest coal reserves in the world and we need to provide energy security for over a billion people: coal is the only way," said Nagaraju. He conceded that there would be "costly trade-offs" in opening up protected forest areas for mining, but said this had the support of local communities who "want the land to be acquired because they get high compensation packages".

Among the prominent opponents to the project is the former environment minister, Jairan Ramesh, who also wrote a letter to Modi condemning coal auctions. It was during his time in office that a survey was carried out in 2010 on India's biggest coalfields and determined that 30% were "no-go areas" due to their biodiversity or resident tiger or elephant populations. Yet since Modi came to power in 2014, that 30% has been reduced to about 5%.

theguardian.com

Indonesia: Conditional cash transfers to alleviate poverty also reduced deforestation

Solutions to poverty and ecosystem degradation are often framed as conflicting. We ask whether Indonesia's national anti-poverty program, which transfers cash to hundreds of thousands of poor households, reduced deforestation as a side benefit. Although the program has no direct link to conservation, we estimate that it reduced tree cover loss in villages by 30% (95% confidence interval, 10 to 50%). About half of the avoided losses were in primary forests, and reductions were larger when participation density was higher. The economic value of the avoided carbon emissions alone compares favorably to program implementation costs. The program's environmental impact appears to be mediated through channels widely available in developing nations: consumption smoothing, whereby cash substitutes for deforestation as a form of insurance, and consumption substitution, whereby market-purchased goods substitute for deforestation-sourced goods. The results imply that anti-poverty programs targeted at the very poor can help achieve global environmental goals under certain conditions.

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Japan eyes 'energy forests' for biomass power generation

As part of efforts to shift from fossil fuels to renewable energy, the Japanese government is considering securing "energy forests" for the specific purpose of growing sources for woody biomass power generation, officials have said.

Greater dependence on woody biomass is believed to help mitigate climate change as the growing of forests absorbs carbon dioxide through photosynthesis and the use of renewable wood raw materials, as a replacement for fossil fuel products, reduces the volume of new CO2 that would otherwise be released into the atmosphere.

At present, Japan uses biomass fuel derived from the thinning of forests and from branches removed in preparing lumber for building materials. Exclusively using a forest to grow woody biomass fuel is expected to cut labor and other costs by one-third as the work of thinning forests will become unnecessary, the officials said.

Forest biomass power generation would also boost resource-poor Japan's energy self-sufficiency and help ensure a stable electricity supply in times of natural disasters and other emergencies, they said.

Moreover, it was stated that fast-growing trees can be grown and shipped in a relatively short period of time and could produce 2.5 times the yield of Japanese cedar, which is generally used as a building material.

In July, the Agency for Natural Resources and Energy and the Forestry Agency jointly set up an expert group to explore the feasibility of the woody biomass power generation project. It will study the issue in light of the need for forest conservation, the officials said.

Ensuring sustainable forest management through reforestation remains a challenge. The two government agencies say the project could be a new source of income for forest businesses and enable forestry and power industries "to co-exist in a sustainable manner."

Japan currently depends on renewable energy sources such as solar and wind power to generate 17 percent of its electricity. The government has set a target of lifting the ratio of renewable energy to around 22 to 24 percent of its electricity by March 2031.

A signatory to the 2015 Paris climate accord, Japan is targeting a 26 percent reduction in greenhouse gas emissions by fiscal 2030 from fiscal 2013 levels, but is facing calls to set a more ambitious goal.

japantimes.co.jp

Mauritius: Oil from Japanese ship that ran aground off Mauritius could kill mangrove forests

- More than 1,000 tonnes of oil leaked from the bulk carrier MV Wakashio into the pristine Indian Ocean waters off the tourist island of Mauritius
- Japan dispatched a disaster relief team to the country, which found that coral reefs were damaged but oil could suffocate and kill mangroves

A Japanese disaster relief team said the oil spilled from a grounded Japanese freighter off Mauritius in the Indian Ocean could kill mangroves if it is not cleaned up soon. The team composed of seven members, including five environment experts, has been conducting an on-site probe of the damage to the environment, especially the mangrove forests and coral reefs, since Friday, while providing on-site environment assistance to the Mauritius government.

"In the heavily polluted areas, oil adhesion to pneumatophores (or aerial roots) can suffocate mangroves to death. Also, if the oil stays for long, its toxic substances can kill mangroves," Noriaki Sakaguchi, vice team leader and an ecosystem conservation expert at Japan International Cooperation Agency, said in an online briefing. While no dead or dying mangroves have been found so far, the team said oil coating on the pneumatophores of mangroves has been confirmed in all seven surveyed locations, with a wide area of damage found in two sites.

Clearing oil from mangrove forests in a muddy environment, instead of a rocky one, is particularly difficult as the removal work may allow deeper penetration of the oil beneath the forests, according to the team. The group will start assessing the impact of oil spill on the Ramsar wetlands near the accident site on Thursday.

The bulk carrier Wakashio transporting a total of some 3,800 tonnes of fuel oil and 200 tonnes of diesel, operated by Mitsui O.S.K. Lines Ltd., ran aground near Pointe d'Esny on July 25, and more than 1,000 tonnes of oil began leaking from the vessel on August 6.

Following the incident, JICA dispatched last week the second batch of members of the Japan Disaster Relief team to Mauritius. Environment Minister Shinjiro Koizumi told a press conference on Tuesday that the ministry is considering sending additional environment experts to the island nation.

The second team has inspected 12 locations near the shipwreck, finding no apparent coral deaths caused by the oil spill and no evidence of oil on the seabed. However, ropes containing the spill and the wreck of the ship have destroyed corals, according to a team official, and the water near the accident site is murky as a result.

The front section of the ship was towed to open water and sunk as instructed by local authorities after the wreckage was broken into two.

"If turbidity continues for a long period of time, it will put stress on corals and could kill them," Sakaguchi said, adding the team will continue to monitor the situation and take measures to deal with it.

scmp.com

Global: Infrastructure projects in the tropics threaten forests and community rights, study finds

Large-scale infrastructure investments in Latin American countries threaten efforts to protect tropical forests and mitigate climate change, according to a new analysis published in the journal *Proceedings of the National Academy of Sciences*. The analysis warns that so-called "mega-infrastructure" projects – such as dams and highway systems – can compromise the community rights of Indigenous, Afro-descendent, and traditional populations who play an important role in ecosystem conservation.

The findings contradict the priorities of many major banks and national governments, which say large-scale infrastructure investments are critical for achieving economic growth and stability in undeveloped regions – arguments that have gained even more support as countries aim to recover from the economic damage caused by Covid-19. According to the G-20, investment in infrastructure could reach $78.8 trillion by 2040. In Latin America alone, plans exist for a wide array of new infrastructure projects, including highways, railways, ports, dams, power stations, and other infrastructure.

But the research found that these projects typically accelerate climate change and frequently exacerbate forest and biodiversity loss, threaten freshwater and river ecosystems, and fuel conflicts and social displacement, among other harmful consequences. Dams built in the Amazon, for example, have caused increased methane emissions and mercury pollution, disrupted aquatic life, and contributed to the spread of malaria, the study says. The research was led by scientists and policy experts at Clark University in Massachusetts.

To address these challenges, the researchers propose a three-pronged approach to increase resilience through better infrastructure governance. First, they suggest rethinking the current relationship between infrastructure and development by determining the value of infrastructure based on its contribution to human and environmental well-being. Second, the planning and decision-making process for new infrastructure projects must prioritize the communities most affected by those projects, particularly Indigenous communities. Finally, infrastructure agendas should better integrate science with policymaking to increase engagement and fully address the equity impacts of new projects.

e360.yale.edu

New Zealand: Greater Wellington proposes operation to save old growth forests

An operation to save approximately 11,400 hectares of pristine old growth forest, including 3000 hectares of plantation forestry, from damage caused by predators in the Akatarawa Forest is being proposed by Greater Wellington.

"Possum numbers in the forest have risen way above acceptable levels. We need to act now to limit the threat they pose to some of the most treasured forests in the region.

"If we leave them unchecked we will see significant degradation of the forest environment and the habitats it provides for a wide range of regionally and nationally significant native plants, birds and animals," says Greater Wellington General Manager, Catchment, Wayne O'Donnell.

The operation will have the additional benefit of simultaneously controlling populations of rats and stoats, which also predate on native plants, birds and animals.

Greater Wellington's proposal is for an aerial possum control operation in the Akatarawa Forest from early November, using the biodegradable pesticide sodium fluoroacetate (1080). It would follow previous aerial 1080 possum control operations, which were carried out in the area in 2007 and 2013. Regular control operations are required for optimum predator control.

"The operation will be subject to strict safety, quality-assurance and monitoring requirements, and full information will be given to neighbouring properties and user groups," says Wayne O'Donnell.

Helicopters will be equipped with GPS navigational technology to ensure the bait is accurately placed within agreed operational areas and identified 'exclusion zones' are avoided. This would only take place occur during suitable weather, timed for early November.

The use of 1080 requires consent from the Medical Officer of Health. It also must comply with both the Hazardous Substances and New Organisms Act, and the Resource Management Act.

Under the proposed approach non-toxic pre-feed cereal pellets would be sown by helicopter across the forest, attracting and familiarising possums to the bait and encouraging them to later consume toxic pellets which will be sown in a follow-up operation. They will be applied at a rate of 2kg per hectare, less than the equivalent of one small box of laundry powder per rugby-field-sized area. 1080 breaks down when mixed with water into a harmless substance. In June 2011 the Parliamentary Commissioner for the Environment strongly endorsed its continued use in New Zealand.

To make the pellets less attractive to birds they are 20mm in diameter, coloured green and incorporate cinnamon.

If the proposed operation proceeds, the forest will be closed to all recreational users for three to four days so main tracks can be cleared of 1080 pellets. Following this, motorised recreation, mountain biking and walking will be permitted if precautions on the poison warning signs are followed.

Greater Wellington works in partnership with six mana whenua entities of the region to achieve mutually beneficial outcomes for restoring and protecting the flora and fauna of parks, and recognises their interests in a healthy and sustainable environment in the Akatarawa Forest.

Greater Wellington will consult separately with iwi in relation to mana whenua values inherent in the forest and the nature of the operation.

Full details of the operation will be provided to farmers and neighbouring properties, along with horse riders and known hunters. Local emergency services, medical centres, veterinary practises and schools will also be notified.

Information will be posted on Greater Wellington's website. Warning signs and information boards will be put up before the operation starts, and will remain in position until poison residues are no longer present. This will ensure the general public and dog walkers are informed before they enter the forest. Dog walkers will be advised to stay clear of the area until all baits have become nontoxic and possum carcases have decomposed, which will take three to four months following the application of 1080.

Statements and updates will also be made to the media and detailed information will be available through Greater Wellington's website at www.govt.nz.

"We're rightly proud of our magnificent old growth forests. We've heard the call from a broad range of conservation and environmental protection groups to help save them from threats posed by predators. The legacy of this operation will be a thriving forest with sustainable habitats for our native plants, birds and animals, and a wonderful place for our communities to visit," says Wayne O'Donnell.

scoop.co.nz

UK sets out law to curb illegal deforestation and protect rainforests

Critics say government's proposals for prohibitions and fines are seriously flawed

The government has announced plans to introduce a new law to clamp down on illegal deforestation and protect rainforests by cleaning up the UK's supply chains. The proposals suggest the introduction of legislation to prohibit larger businesses operating in the UK from using products grown on land that was deforested illegally.

The businesses would also face fines if they fail to carry out due diligence on their supply chains by publishing information to show where key commodities – including rubber, soil and palm oil – come from and that they are produced in line with local laws protecting forests. The government said the size of the fines would be set later.

Deforestation accounts for about 11% of global greenhouse gas emissions. The proposed legislation says illegally produced commodities have no place in the UK market, but Greenpeace has called the government's plans "seriously flawed".

A consultation on the proposed legislation will run for six weeks and seek views from UK and international stakeholders. It will consider potential impacts on businesses and other interests, the Department for Environment, Food and Rural Affairs said.

The announcement follows the establishment of an independent taskforce, the Global Resource Initiative, which the government set up last year to consider how the UK could "green" international supply chains.

The UN's COP26 climate change conference was supposed to have been held in Glasgow in November, but has been postponed until next year.

The international environment minister, Zac Goldsmith, said: "The UK has a duty to lead the way in combating the biodiversity and nature crisis. We have all seen the devastating pictures of the world's most precious forests being cleared, often illegally, and we can't afford not to act as a country.

"There is a hugely important connection between the products we buy and their wider environmental footprint, which is why the government is consulting today on new measures that would make it illegal for businesses in the UK to use commodities that are not grown in accordance with local laws."

Elena Polisano, a forests campaigner at Greenpeace UK, said: "Defra's proposal to make it 'illegal for larger businesses to use products unless they comply with local laws to protect natural areas' is seriously flawed. We've all seen the way president [Jair] Bolsonaro has championed the expansion of agriculture in Brazil at the expense of the Amazon rainforest.

"There is also nothing to address the fact that some commodity producers may have one 'sustainable' line but continue to destroy forests elsewhere, which just shifts the problem into someone else's backyard.

"We will never solve this problem without tackling demand. Companies like Tesco, who sell more meat and dairy and so use more soya for animal feed than any other UK retailer, know what they need to do to reduce the impact they are having on deforestation in the Amazon and other crucial forests

"They must reduce the amount of meat and dairy they sell and drop forest destroyers from their supply chain immediately."

Mike Barrett, executive director of science and conservation at WWF-UK said: "It's clear businesses and consumers don't want imports that wreck the planet, drive deforestation in areas like the Amazon and lead to devastating fires. The government must now fast-track strong, effective laws that clean up our supply chains and show the UK can take the lead in tackling the global nature and climate crisis."

theguardian.com