

CFA Newsletter



No.86

September 2019

ISSN 1750-6417

Contents:

Lead

- Backing up to go forwards

Forest Scenes

- Dryland resources of sub-Saharan Africa
- Improving sustainable forest management
- Jamaica's REDD+ journey gets financial boost
- Spotlight on Zambia's oil palm
- Strengthening the national process in Cameroon
- Tall an old or dense and young?
- Training compendiums on climate change in Africa

Publications

- Harmony
- Trees of PNG
- Special Issue of *Australian Forestry*

Around the World

CFA Newsletter

is the newsletter of the Commonwealth Forestry Association

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

The views expressed are not necessarily those of the CFA.

Backing up to go forward



Commemorative tree planting at the official opening of the new NZ forestry service, Te Uru Rakau – forestry Minister Shane Jones second from right and prime Minister Jacinda Ardern on his right.

A little over a year ago New Zealand voters elected a new Government, a result that fundamentally changed the engagement with the forest community and which had potentially significant implications for the operating environment for forestry practitioners and investors.

The new Government was a Labour led coalition including the NZ First party who have more of a protectionist agenda, and the Greens with strong environmental goals. It seemed likely this would be a Government with more of a social agenda, expected to be characterised as being more interventionist, less constrained with spending, and likely to set more challenging environmental targets. In practice much of this has followed with taxation reviews and wealth distribution goals embedded.

For foresters and forestry the big picture was that forestry suddenly had a profile and level of recognition that it has

not had for some time, and possibly as long as 30 years ago when an earlier Labour Government dis-established the New Zealand Forest Service and privatised its commercial activities. In between times and not unexpectedly the focus of forestry investment, research, policy, etc has been more heavily on profitability, security and efficiency being more relevant to private forest ownership. And some of the work previously undertaken on management of native species, non-timber values and social goals has of course been ascribed a lower priority. Government oversight of production forest policy and practice has resided in more recent times in a Ministry for Primary Industry (MPI), with a Department of Conservation administering protected and protection forests and a Ministry for the Environment addressing climate change and other environmental goals such as clean water.

Like many other countries New Zealand is a strong advocate for limiting climate change emissions although it has also struggled with the realisation that with an economy heavily weighted towards agricultural landuse (especially dairy farming and use of ruminant animals which “belch” methane) making reductions would not be easy. A saving grace has been the presence of rapidly growing forests planted through the 1990s and which are now sequestering carbon dioxide at rates often exceeding 30 tonnes per ha per annum. The advent of an emissions trading scheme (ETS) here meant that foresters could receive some additional benefit from the growth of their forest, trading with emitters via an established market. Ring fencing of the agricultural community, who are considered to have few technically feasible options for lessening emissions has handicapped the ETS a little, however over time the expectation is that agriculture will also be more heavily exposed to scheme and will also need to pay its way.

The new Government has not disappointed, its more challenging environmental targets have included a much clearer line of sight to its emission control targets, particularly those featuring greater afforestation. In particular it has announced;

- A new one billion tree planting target to be achieved within 10 years. This represents planting one million hectares at a rate of 100, 000 ha per year over the nominated period.
- Spreading the planting between fast growing exotic trees such as radiata pine and native trees with greater biodiversity outcomes but slower growth rates.
- Establishment of a Government entity, Forestry New Zealand or Te Uru Rakau (TUR).
- A review of the ETS to ensure that emissions policy and goals are well targeted, with the under fire farming community noting that “...planting more trees can offset emissions to meet Paris Agreement deadlines while we await science advances.

Farmers are very open to discussions about policies, including reducing red tape and current complexity that could increase the rate at which trees are planted”.

It is the new forest service, TUR which has generated most interest amongst foresters; it is 31 years since the last direct Government involvement in tree planting, setting policy and through its own agency participating in funding forest research

and other forestry development activity. TUR is once again involved in all of these areas so that in addition to undertaking tree planting in its own right it has also generated a schedule of planting grants and is building its staffing to undertake and advise on these programmes as appropriate.

However, the new regime also brings mixed messages and mixed fortunes depending on individual forest owner circumstances. Domestic investors with land available (including Maori-owned land) to plant are the primary forestry group that the government is looking to partner with, and provide support to, for tree planting. There is less direct benefit for those (often overseas owned) entities who already own forests. Nonetheless, the reinstatement of a ministerial position for forestry and a dedicated agency / Forest Service provides for a much closer level of engagement between industry and government on opportunities and threats.

The appointment of a Minister of Forestry inside Cabinet also restores forestry to a position it last held more than ten years ago and prior to the previous government creating an associate portfolio outside Cabinet. And in this case the position is strengthened further by Forestry Minister Shane Jones also having responsibility for infrastructure and regional development – with a \$1 billion per annum contestable Regional Development (Provincial Growth) Fund which is to be used to fund projects like investment in regional rail and also the tree planting. Furthermore, the Minister is assured of wider Cabinet support notably from the PM, particularly because environmental goals have been formally linked with forestry. Minister Jones is very keen to make progress with planting and accordingly has moved quickly to re-create the new forest service.

How much like the old Forest Service the new one will be is not yet obvious, but it already has the facilitation role in establishing the billion trees, has staff located in a number of regional areas, is working on developing a national forest strategy and has invested in tree planting in its own right.

Meanwhile issues around overseas ownership and reducing the export of raw logs (which is perceived as being to the disadvantage of the existing wood processing industry) are also being aired and considered for action by Ministers, the fact that Government once again is involved directly may help address at least some of these concerns.

Peter Berg



On the 1st of September this year it will be 100 years since the original NZ State Forest Service was established. Over the next 15 years 410,000 acres of new forest was planted, including Kaingaroa Forest shown here in the early 1950s. Kaingaroa was regarded as the biggest man-made forest in the world when planting finished in 1934.

Forest Scenes

Dryland forests of Sub-Saharan Africa: vital in enhancing livelihoods of rural communities and economies of countries and mitigating effects of climate change

By Ben Chikamai, Chidume Okoro and Sheila Mbiru

Background

Sub-Saharan Africa (SSA) covers approximately 23.6 million Km² of the continent with a population of about 926 million people (Fig. 1). Most of the area is classified as either sub-humid or dryland with aridity index values of less than 1 (<1) indicating an annual moisture deficit (Middleton and Thomas 1997). Forests are among the most important natural assets found in the region, which in the drylands cover about 350 million hectares (13%) of the land area, mostly in the form of wooded savannahs, bush-lands and shrub-lands (Lundgren, 2015).

The biggest challenge facing many countries in SSA is land degradation, which in the sub-humid and drylands is characterized by desertification (Blay et al, 2004). Desertification is said

to be occurring at varying levels with an annual rate ranging from 0.1% in the dry sub-humid lands to 10% in the arid lands. There are various underlying causes for this including population growth (average population growth rate for Africa is 2.4%), rural poverty, market and policy failures, poor policies, unsustainable agriculture and over-exploitation of natural resources, among others. Climate change is aggravating the problem of desertification. It is said that though Africa's contribution to Green House Gasses (GHGs) is only about 3.5% of the world's total, the region is most vulnerable to climate variability and change. The consequences of desertification and associated challenges aggravated by climate change are great and include: continued decline in land productivity and with it, declining agricultural and rangeland productivity affecting livelihoods of the rural farming and pastoral communities in these areas that



Figure 1: Map of Sub Saharan Africa ~ Johnson, Idowu. (2012)



Photo 1: Residents collect water in one of the many wells dug in the bed of a dried-up river in the Dierma region of Burkina Faso ~ Marc Bournof/IRD

are dependent on them thereby exacerbating poverty, food and social insecurity that put a barrier to sustainable development.

Nevertheless, forests of SSA hold hope for the drylands, if properly managed. They are the main source of domestic energy in the form of wood fuel (fuel wood and charcoal) where 82% of house hold energy is still derived from wood (FAO, 2014). They produce wood that is important in the construction (timber, poles and posts), artisanal and carving industries as well as for export and contribute to the GDP of several countries. Besides wood, the dryland forests in SSA are a source of a wide range of non-wood forest products (NWFPs) including gums and resins (that have been articles of commerce for millennia and remain to the present day), indigenous fruits (that directly contribute to food security and livelihoods of rural communities), medicinal plants (as herbals and for export) and bee products (Chikamai et al, 2009). Some of these commodities play a role in the livelihoods of the rural communities either in securing provision of food and essential subsistence goods and social security, health care needs or for social, cultural and spiritual functions. Most of them however, are articles of commerce contributing to the GDP of these countries.

Dryland forests also have an important role in supporting the agricultural sector and hence food security. Trees/bushes/shrubs restore soil fertility to agricultural fields by bringing up mineral nutrients from deeper soil layers and depositing them with decaying organic material on the soil surface and in the top-soil. There are several trees and shrubs, which are leguminous and able to fix nitrogen in the soils thereby improving soil fertility and hence agricultural productivity. There are many more that establish associations with several microbial organisms like mycorrhiza that enhance nutrient availability to crops. Then trees and shrubs act as windbreaks and shelter belts against desert encroachment and hence desertification. One initiative in Africa that has taken advantage of the full understanding of the importance of trees in supporting the agricultural productivity and environment is the Great Green Wall of Sahara and Sahel Initiative (GGWSSI) (Abdou, 2014). Additionally,



Photo 2a: Commiphora myrrha, Kenya ~NGARA



Photo 2b: Myrrh ~NGARA

trees/shrubs support the resilience of the agricultural systems in regulating water flow, enhancement of meso-climate (temperatures and winds), and supply of supplementary inputs in the form of fodder and grazing, among others. Finally, dryland forests harbor and protect a rich biodiversity, which in turn is the basis for a flourishing tourism industry, and a potential source of genetic resources for economic, social and environmental development as well as carbon sinks (Lundgren, 2015).

In recognition of the challenges facing dryland forests in SSA and the opportunities inherent in the resources for sustainable development, various initiatives have been developed. A major initiative is the Great Green Wall for the Sahara and the Sahel Initiative (GGWSSI), Africa's flagship initiative to build prosperity and resilience in more than 20 countries around the Sahara. It was initiated to combat the effects of climate change and desertification and to address food insecurity and poverty. The initiative aims to transform the lives of millions of people by creating a great mosaic of green, productive landscapes across North Africa, the Sahel and the Horn of Africa (Sacande & Parfondry, 2018). Several projects have been and are being developed to implement the initiative. One of these projects include the "Action Against Desertification in Support of the Great Green Wall for the Sahara and the Sahel and South-South Cooperation in ACP Countries (AAD)", implemented by FAO and partners, which promotes community-based restoration approaches along value chains – from the seed to the market. The project has presented value chains of five NWFPs from six countries in the African drylands and demonstrated that successful restoration can only take place if communities are able to derive economic benefits from restoration work (Sacande & Parfondry, 2018).

The Network for Natural Gums and Resins in Africa (NGARA) is another initiative established to address challenges to Sustainable Forest Management (SFM) in Africa (Fig. 2). NGARA is a Pan African organization assisting African producing countries and partners formulate a coordinated strategy for the sustainable development of their natural gums, resins and allied dryland resources, for improving rural livelihood and environmental conservation. The organization focuses more on enhancing value chains for improving rural livelihood and environmental conservation. The mission of NGARA is to position African producer countries and partners as major global players in the production, processing and marketing of gums, resins and allied tree based commodities from the drylands of SSA. This article provides highlights of some of the activities of NGARA and its future strategy.

Highlights of Selected Activities of NGARA

Since its establishment in 2000, NGARA has collaborated with various partners in the development and implementation of a wide range of projects. One of the key partners is the Food and Agriculture Organization of the United Nations (FAO), which played a major role in the establishment of NGARA.

a) Collaboration with FAO

One of the projects implemented was the "Acacia Operation Project (AOP) – Support to Food Security, Poverty Alleviation and Soil Degradation Control in the Gums and Resins Producer Countries with funds from the government of Italy through FAO" implemented from January 2004 – May 2006 with a cost extension up to August 2008 and thereafter no cost extension until

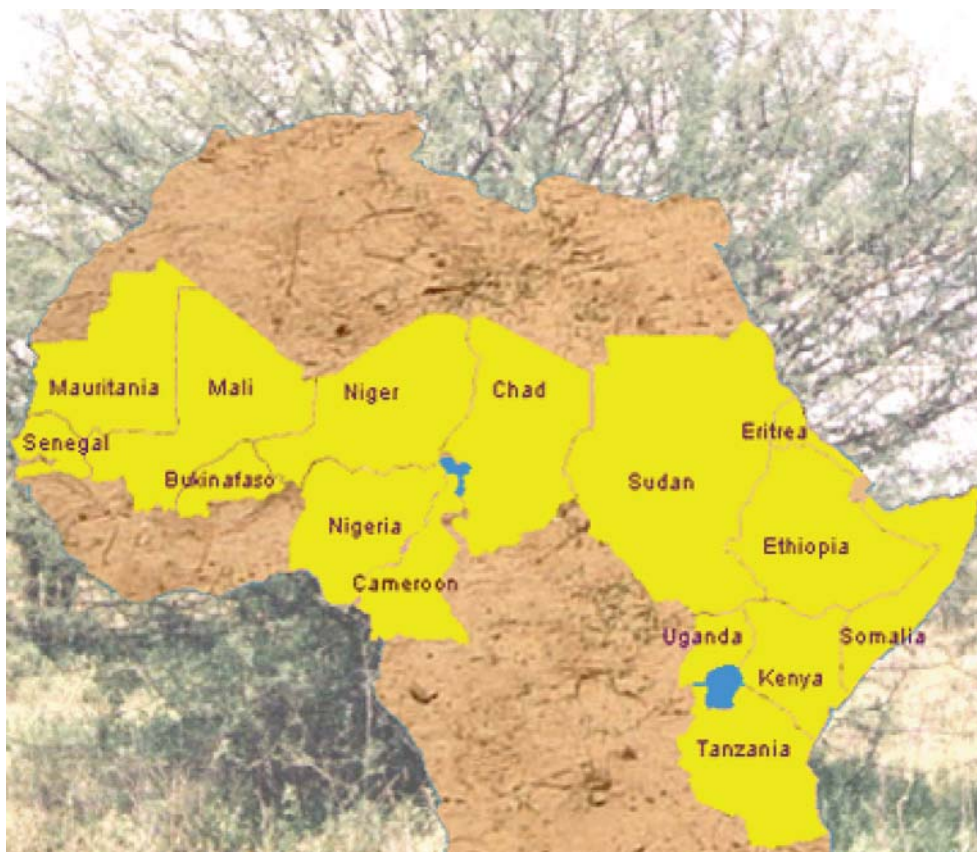


Figure 2: NGARA Member Countries

June 2010 (FAO, 2010). The AOP had three components; the major one focused on establishment of the Agro-silvo-pastoral system in arid and semi-arid lands using a mechanized water harvesting technology (Vallerani system).

At the end of the pilot phase in December 2006, a total of about 13 000 hectares of land had been worked in member countries of Burkina Faso, Chad, Kenya, Niger, Senegal and Sudan. These comprised 1,640 in Burkina Faso planted mainly with *Acacia senegal* inter-cropped with sorghum and grasses; 432 hectares in Chad also planted with *Acacia senegal* inter-cropped with sorghum; 286 hectares in Northern Kenya (Samburu and Marsabit counties) planted with *Acacia senegal* inter-cropped with cowpeas, green grams, pearl millet and sorghum and 53 hectares in South Eastern Kenya (Makueni) planted with *Jatropha curcas*, *Melia volkensii* and improved mangoes inter-cropped with hybrid maize; 2,175 hectares in Niger planted with *Acacia senegal*, *Acacia seyal*, *Acacia nilotica*, *Bauhinia rufescens*, *Ziziphus mauritiana* inter-cropped with herbaceous plants of *Cassia tora*, *Andropogon gayanus* and *Cymbopogon* species; 3,390 hectares of land in Senegal planted with *Acacia senegal* and *Acacia mellifera* inter-cropped with cotton, millet, peanut and watermelon; and 4,773 hectares in the Sudan

planted with *Acacia senegal*, *Acacia seyal* and other species of *A. mellifera*, *A. nilotica*, *Albizia spp* and *Azadirachta indica*. The project demonstrated that land degradation and desertification control is possible on large scale through mechanized rain water harvesting. A participatory approach is an important asset and agro-silvo-pastoral system key to successful rehabilitation as it provides both short and medium term benefits as it improves food security and reduces poverty to the rural communities, hence improved livelihoods.

After six years, trees under Vallerani system had a diameter and height of 14 cm and 7.4 m compared to 9.8 cm and 6.6 m respectively.

b) Development of Gum Arabic, Aloe & Allied dryland resources in Karamoja Region, Uganda

The project was an initiative by the President through the AGOA office to empower local people in Karamoja Region improve livelihood from natural resources and mitigate insecurity. The project was undertaken between July 2006 and March 2008. The major activities involved identification of commercially viable tree/plant resources in the region, mapping and assessment of the resources and market intelligence.



Photo 3a: Vallerani Delfino plough ~ NGARA



Photo 3b: Treno plough in Sudan ~ NGARA



Melia intercropped with green grams in Kibwezi sub County, Kenya in 2014

At the end of the study, it was established that Karamoja Region has potential for the production of gum arabic and aloe gum. The main sources for gum arabic are *Acacia senegal* var. *senegal* while aloe gum is from *Aloe tweediae*. Resource maps were produced for both sources. Results of the resource mapping (Fig. 4) and inventory showed that the estimated area of gum arabic resources in Karamoja Region is 648,147 ha with a production potential of 7,484 MT per year. Between the two species, *A. senegal* was more abundant and widespread. It was estimated to cover 373,542 ha with an estimated production potential of 4700 MT per year. *A. seyal* covered an estimated area of 274,605 ha with a potential production of 1784.06 MT per year.

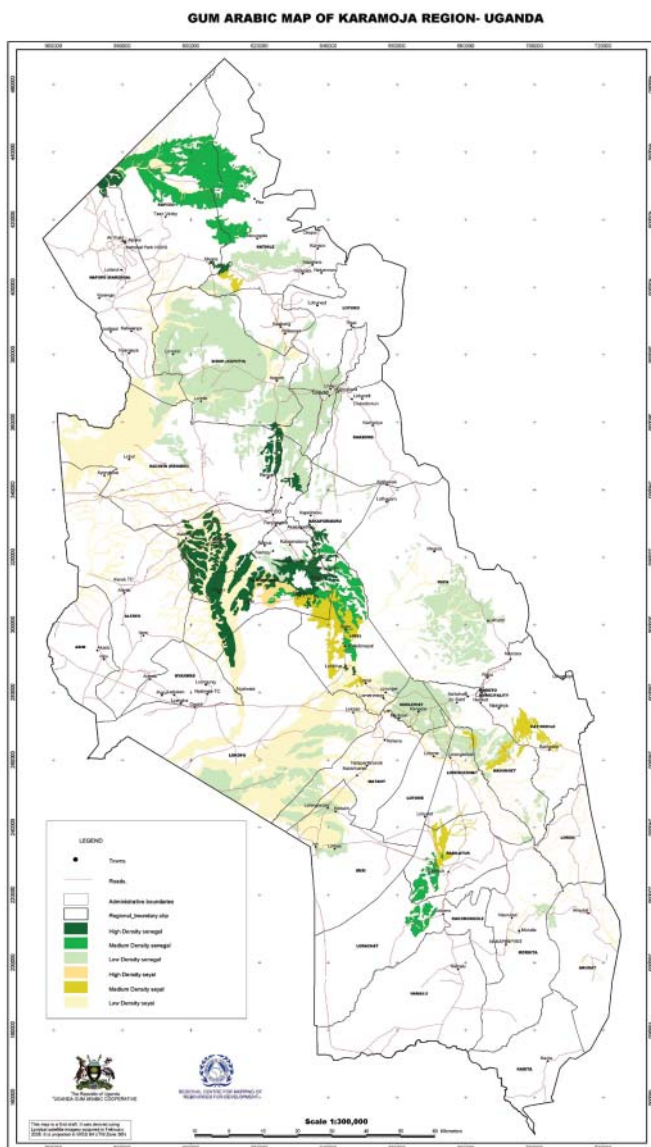


Figure 4: Gum Arabic map of Karamoja Region – Uganda

The area covered by aloe resources in Karamoja Region is shown in Figure 5. Aloe resources covered an estimated area of 379,136 ha with a production potential of 35,915 MT per year. Kotido District had the highest amount of the resource (190,826 ha) and production potential (10,862 MT) followed by Moroto District which had 185, 957 ha and production potential of 18,958 MT per year.

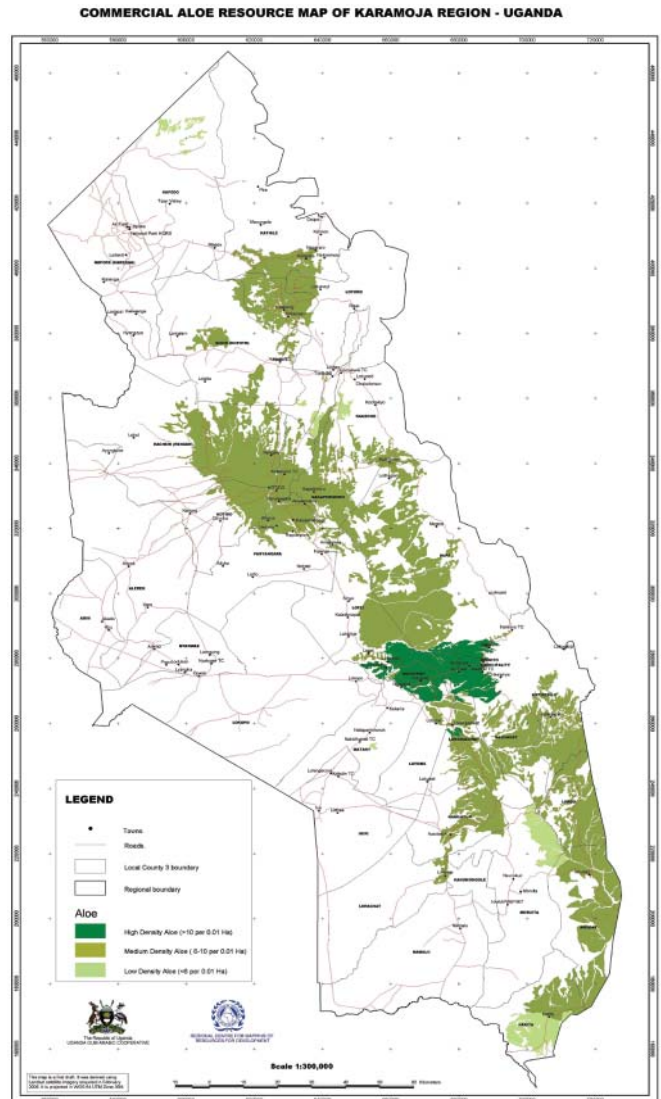


Figure 5: Commercial Aloe Resource Map of Karamoja Region – Uganda

Follow up activities involved linking the gum Arabic company to a major buyer in Europe as well as buyers of aloe gum in China and the Far East.

c) The gum acacia production, marketing and food security research in South Sudan

The project was undertaken as a joint initiative by NGARA and SNV Sudan. The objectives involved: carrying out resource assessment to establish the extent, distribution and potential yield of gum acacia resources by type in identified areas in Upper Nile State (UNS), North Barhl El Gazhal State (NBEGS) and Eastern Equatoria State (EES) and produce resource map(s); assessing current methods of harvesting, post-harvest handling, utilization and marketing of gum acacia in the three states and building the capacity of the relevant government agencies on resource assessment, data collection, analysis and report writing.

Results of the resource mapping and inventory showed that the estimated area under gum acacia resources in the three states was 4,596,342.5 ha with an annual gum production potential of 25,722 MT, with *A. seyal* being more abundant and widespread. It was estimated to cover 2,709,118 ha (59 %) with

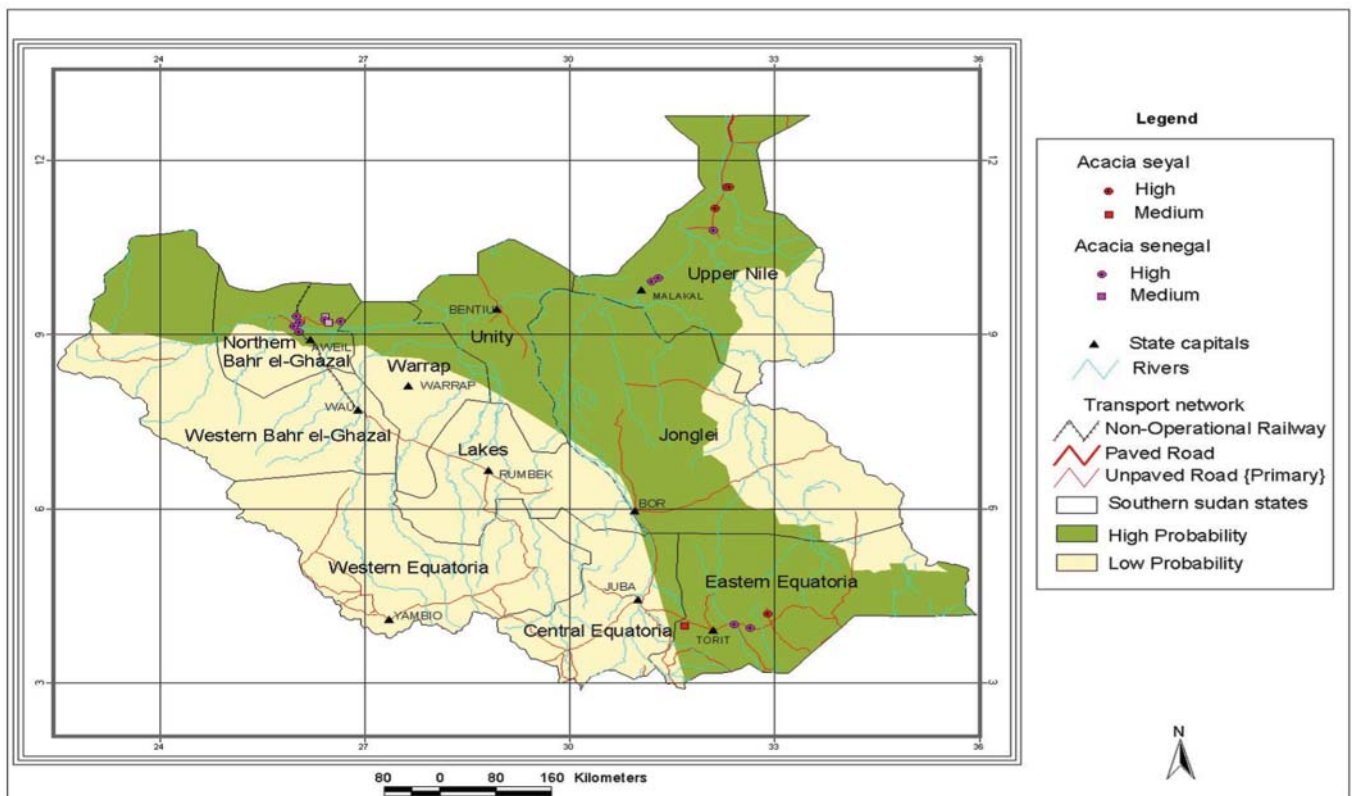


Figure 6: Probability map showing gum resources in South Sudan SNV, (2009)

an estimated production potential of 20,498.2 MT (80%). *A. senegal* covers an estimated area of 1,887,224.8 ha (41.1 %) mainly in UNS and EES with a potential production of 5223.7 MT (20.3 %) per year. With adequate support and proper tapping, the potential yield of *A. senegal* can go up to 74% (Figure 6).

It was also observed that commercial exploitation of Gum Acacia was at different stages in the target states. The exploitation of the resources was explicit and well defined in the northern part of UNS for gum derived from *A. senegal* (gum hashab) and in eastern part of NBGS for gum from *A. seyal* (gum talha) with the players in the value chain operating at three supply chain levels: local, national and international. However, the situation in EES was unclear and still in infancy stages of growth with undefined value chain.

Operations in the value chain include tapping, harvesting, cleaning, grading, packaging, transportation and marketing. Opportunities for making costs manageable exist in form of collective actions and shared collection arrangements. However, there was low involvement of local communities and value adding in the Gum Acacia value chain reducing levels of benefits realized. It was observed that spatial transfer of the product from production sites to the export auction market greatly enhances its value.

It was observed that producers who are able to market their collection up to the international supply network reap maximum benefits from their efforts. However, most Gum Acacia collectors/producers and local traders are constrained with inadequate capacities in the form of skills, finance, market information and intelligence, and poor transport arrangements. The sub-sector is still evolving from the era of monopoly system

with most players having limited capacity to participate in a free economy system and reap benefits.

Framework of NGARA Priorities and Strategy

In an effort to contribute to Sustainable Forest Management (SFM) in the region, United Nations Strategic Plan on Forests (UNSPF) 2030 and the Sustainable Development Goals (SDGs) while putting in place strong institutional mechanisms for better coordination of the sector, NGARA has developed a Framework of Priorities 2030 (Figure 7). Through the support of the African Union Commission (AUC), FAO and Africa Forest Forum (AFF) NGARA organized two regional workshops in Nairobi (August 2015) and Dakar (March 2016) that resulted in the development of the NGARA Strategy: Overview and Framework of Priorities 2017–2030. The NGARA strategy has identified seven key result areas as follows;

- Result Area 1: The sustainable production and restoration of gum, resin and allied resources promoted
- Result Area 2: Marketing and investment of gum, resin and allied products enhanced
- Result Area 3: Enabling policies and legal frameworks developed
- Result Area 4: Capacities at national and regional levels strengthened
- Result Area 5: Research and development supported
- Result Area 6: Coordination of national and regional activities strengthened
- Result Area 7: Communication, advocacy and visibility enhanced

Each of the result areas has strategic objectives, strategies and performance indicators.

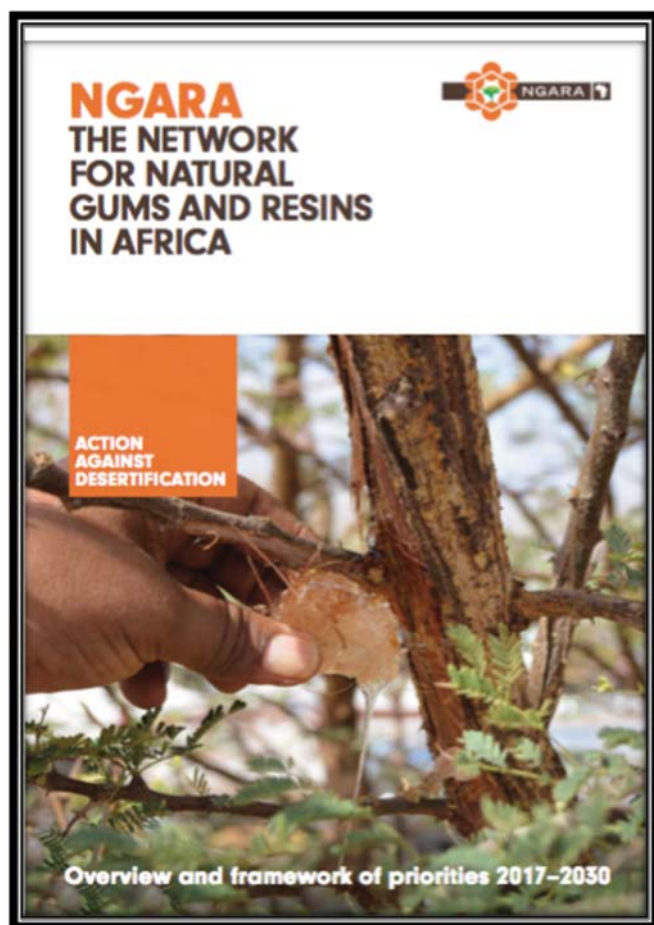


Figure 7: NGARA Overview and Framework of Priorities 2017–2030

NGARA is now collaborating with different partners to mobilize resources for implementing the strategy. One project has been initiated with the African Forest Forum through financial support from the Swiss Agency for Development and Cooperation (SDC) and will cover five NGARA member countries focusing on “Strengthening Capacity among Stakeholders for Production and Trade in Gums and Resins in Africa”. A second initiative is with the FAO Regional Office for Africa focusing on “Strengthening Value Chains of Gum Arabic for sustainable livelihoods and landscapes in Dryland Africa”. The initiative will cover six other NGARA member countries thereby increasing the scope of coverage in the region and among Anglophone and Francophone speaking member countries. More initiatives are in the pipeline.

Literature cited

- ABDOU, M. 2014. The Great Green Wall of Sahara and Sahel initiative: Climate Change and Gender Issues. AFF Working Paper Series, Vol. 2(2), 34 pp.
- BLAY, D., BOUNKOUNGOU, E., CHAMSHAMA, S. A. O., and CHIKAMAI, B. 2004. Rehabilitation of Degraded Lands in Africa: Lessons Learned from Selected Case Studies. WWW.iufro.org/spdc/synthesis_paper_rehabilitation.htm
- CHIKAMAI B., TCHATAT M., TIEGUHONG J. C. and NDOYE O. 2009. Forest Management for Non-Wood Forest Products and Services in Sub-Saharan Africa. Discov. Innov. Journ. 21 (SFM Special Edition No. 1), 50–59.
- FAO. 2014. Contribution of the forestry sector to national economies, 1990–2011, by A. Lebedys and Y. Li. Forest Finance Working Paper FSFM/ACC/09. 166 pp. FAO, Rome.
- FAO. 2010. GTFS/RAF/387/ITA Terminal Report. FAO, Rome.
- JOHNSON, I. 2012. CITIZEN REVOLUTION IN TUNISIA AND REGIONAL CONTAGION: LESSONS FOR SUB-SAHARAN AFRICA. Journal of Sustainable Development in Africa. 14.
- LUNDGREN B. 2015. Forests and Trees: Their roles and opportunities in Africa's Economic Development, Food Security and Environmental Health. A Publication of the African Forest Forum. Ecomedia Limited.
- MIDDLETON N. J. and THOMAS D. 1997. World Atlas of Desertification. UNEP, Anorld, London-UK.
- SACANDE M. and PARFONDRY M., 2018. Non-Timber Forest Products: From Restoration to Income Generation. Rome, FAO. 40 pp.

Improving social sustainability in forest management through Corporate Social Responsibility in Kenya

The assumption that all can be winners in implementing forest management policies towards Sustainable Development (SD) has been central to the emergence of broad-based forest management actions which involve new partnerships between local communities, businesses, and government agencies. Corporate Social Responsibility (CSR) is fast emerging as one of the approaches by forestry businesses seeking to promote social sustainability. Even though there is no universally accepted definition of CSR, the sustainability of forest sector is linked to its ability to respond to certain fundamental social and environmental issues that affect or are affected by business operations. Other studies have argued that with the increasing democratization and globalization, the choice of a CSR modality is affected by various social, political, economic, and cultural considerations. In some cases legislation appears to be shaping society's expectations whereas in other cases society's expectations appear to be shaped by legislation.

However, historically, CSR in business began in Britain in the 1800s. This has since been enhanced through policy provisions such as the Equal Pay Act of 1970, the Health and Safety at Work Act of 1974, the Sex Discrimination Act of 1975 and the Race Relations Act of 1976. In-fact, to demonstrate commitment to CSR, under Blair's Government (1997–2007), the world's first Minister for CSR, Kim Howells, was appointed in March 2000. In the forest sector, CSR approaches such as Eco-labeling and forest certification seeks to ensure that timber is sourced from sustainably managed forests are common in developed countries and are also fast emerging in mid-income countries. Forest certification refers to a market-based voluntary arrangement where an independent third party called a certifier assesses forest management and production against some set criteria predetermined by public and private organizations. Whereas eco-labeling refers to a voluntary method of environmental performance certification which identifies products proven to



CFA members sticking out at Sagana 2A compartment

improved community livelihoods in the country. However, studies also indicate that there should be clearly laid out minimum standards, explicit legal backing, and consideration for conditions laid out in SRA selection process.



Young Pinus spp. plantation established by community involvement in Kenya

be environmentally friendly. The intention of both certification and eco-labeling is to inform consumers about the sustainability of the forests from which their wood was produced. CSR disclosures involving forest logging companies are also common in fast emerging economies. For instance, in China, the accepted standards for forestry companies are contained in CASS 3.0 and CNFPIA 2.0 released by the Chinese Association of Social Sciences and the Chinese National Forestry Products Industry Association. Up-to seven thematic areas are identified in the framework of CSR disclosure which includes: (i) government (e.g taxes payment and other three disclosures), (ii) environmental protection (12 disclosures), (iii) community (e.g donations and amounts among other 5 areas), (iv) supplier, (v) employees, (vi) customer (5 disclosures), and (vii) shareholders (4 disclosures including profitability).

On the African continent, CSR is increasingly gaining recognition in the forest sector with a trend towards implementation mechanisms containing absolute provisions on benefit-sharing with forest adjacent communities. In Ghana, the Timber Resources Management Act, 1997 obligates timber firms to sign and implement “Social Responsibility Agreements (SRAs)” with forest adjacent communities. Under these social agreements, vetted logging companies submit community development proposals to the Timber Utilization Committee (TUCs) for evaluation. Upon ratification, logging companies are only awarded Timber Utilization Licenses (TUL) after they commit to spend 5% of their annual royalties on community development projects. Recent studies have confirmed that SRAs as forms of CSR have



Members of a Community Forest Association Participating in Tree Nursery Management Activities

Kenya is also keen on realizing social sustainability through forest management. This has been demonstrated by the deliberate sophistication of forest policy with the introduction of participatory forest management in the Forest Conservation and Management Act, 2016. Besides granting forest tenure to forest adjacent communities, article 53 of the new forest law provides that investors in forest management activities shall share the benefits of their investments with forest adjacent communities by applying various options. The letter and spirit of these social equity provisions is well intentioned and there is no doubt that if the proper implantation mechanisms are put in place, this could transform the livelihoods of many forest dependent communities. However, in-view of the current developments in the country where legislation seems to be the driver of societal behavior, evaluation of the current CSR practices in the forest sector points to a rather disjointed and vaguely conceived CSR approach. Practices are individual entity-based, scattered, and do not clearly identify the issues to be addressed or the level

of CSR disclosures. Moreover, besides the limitation of forest related CSR studies, this mis-conceptualization is mainly due to the non-absolute nature of article 53 of the new forest law which fails to indicate the minimum benefit-sharing ratios with local communities like in the case of Ghana. This policy gap exposes the Act to the risks of subjective political mis-conception and may translate to non-implementation due to weak enforcement,

monitoring and evaluation. Thus, in-view of the existing participatory forest management framework, this paper calls for more forest related CSR studies that will inform the review of article 53 of the current forest law to provide the proper forest CSR provisions in Kenya.

Chisika Sylvester Ngome

Jamaica's REDD+ journey gets financial boost



Jamaica's journey to REDD+ readiness has been made easier through the receipt of funds under the Green Climate Fund's (GCF) REDD+ Readiness Support and Preparatory Grant valued at USD 613,000 over the next 28 months.

Reducing Emissions from Deforestation and Forest Degradation Programme (REDD+) is a mechanism introduced by the United Nations Framework Convention on Climate Change (UNFCCC) to create a financial value for the carbon stored in forests, offering positive incentives for developing countries to reduce emissions from forested lands and invest in low carbon paths to sustainable development.

As the lead Agency for its implementation in Jamaica, the Forestry Department through initiatives detailed in the National Forest Management and Conservation Plan (NFMCP) 2016–2026, will be spearheading this national collaborative initiative, aiming to have the island being REDD+ ready in the next three to four years.

Mr. Brahim Diop, focal person for the Programme within the Agency, says the funding will serve to assist with capacity building as well as establish the planning mechanism to guide the country to becoming REDD+ ready. This, he says, will better enable the Government to access Results Based Payments associated with international Climate Financing Schemes.

The activities supported under this Green Climate Fund's (GCF) REDD+ Readiness Support and Preparatory Grant fall under four (4) components. The first will engage various stakeholders in a consultative process to ensure efficacy, accountability and transparency of the national readiness management process and institutional arrangements. As such, the Agency will be hosting a series of public consultations across the island.

The second step in the process will be the preparation of Jamaica's National REDD+ Strategy. This is expected to precipitate and or catalyse actions at all levels to ensure the conservation and protection of the country's forests. One of the variables that will be assessed under this component is land use and land use change drivers. We will be identifying and characterizing the key drivers of deforestation and forest degradation and redesigning conservation and sustainable forest management activities to reduce emissions. The National REDD+ Strategy will also focus on identifying how current land use and forest law, policy & governance structures impact on the drivers of deforestation and forest degradation as well as proposing alternatives for mitigating the identified drivers and reducing the adverse impacts.

The grant will also go towards the development of a National Forest Monitoring System which will allow Jamaica to assess a broad range of forest information. While the Forestry Department has the technical capacity to gather and interpret data, financial constraints prevents the Agency from acquiring current spatial data to generate information on an annual basis.

The objectives of components three and four are aimed at ensuring that the REDD+ strategy is gender responsive by assessing the differential roles, responsibilities, knowledge and skills of men and women in forest degradation, deforestation, sustainable forest management and climate vulnerability as well as developing at least two project concepts for submission to GCF based on a selected strategy priority option defined in the National REDD+ Strategy.

Meanwhile, the REDD+ mechanism is a timely response to the issue of climate change by encouraging the proper management of forests. While forests have been identified as one of the cheapest and most effective tools to fight against climate change, the forestry sector has been identified as one of the largest emitters of carbon dioxide, one of the greenhouse gases that cause climate change globally. This is largely attributed to deforestation and forest degradation.

The benefits of implementing REDD+ activities to the country's growth and development extends beyond building a climate resilient nation. The benefits for the forestry sector will significantly contribute to its sustainability. This may include cross-sectoral policies/plans/measures impacting national REDD+ efforts, payments per tonne of carbon emissions reduced or removed; international recognition for mitigation results; biodiversity conservation; poverty alleviation; and contribution as one of the catalysts for developing a green economy integrating forestry, agriculture, energy and finance.

forestry.gov.jm



Spotlights on Zambia's oil Palm

The 6th Africa Oil Palm and Rubber Summit took place in Abidjan, Cote D'Ivoire from 8th to 9th of May 2019. The event saw participants drawn from palm oil & rubber producers, company executives, plantation advisors, agronomists, scientific officers, R&D departmental heads, millers, traders, importers and exporters and consultants alike gather to share ideas and knowledge portfolios around the dynamics of palm oil plantation, harvesting, processing, marketing and trade.

Palm oil is an edible vegetable oil derived from the fruit of the oil palms and it has been estimated that palm oil production has a recorded history of 5000 years (MPOC 2006). The oil palm (*Elaeis guineensis*) is one of the largest of the palm species and produces more oil per hectare than any other oil crop (4–6 tonnes oil/ha/ year) (Arulraj and Suresh 2009, Fairhurst and Hardter 2003).

Scholars have empirically confirmed that African oil palm originated along the coastal strip (200–300 km wide) between Liberia and Angola, from whence it spread north, south and east to Senegal, the Indian Ocean, Zanzibar (Tanzania) and Madagascar (New CROP 1996 cited in Douglas et al. 2009). In Africa, the expansion of industrial plantations has changed its focus from edible palm oil to the production of agro fuels, mostly led by a broad array of foreign corporations eager to invest in the region (Carrere 2010). This has led to prioritisation of early and high yielding hybrid palms to meet industrial demands.

The FAO has pioneered the development of cold-tolerant oil palm in poor rural communities of central Africa with Agricultural Services and Development (ASD de Costa Rica). FAO Tenera technology transfer promotion began in Ethiopia and continued in Cameroon (the Village Women's Organization, Bamenda), Malawi (Kaporo) and Zambia (Luapula) before being extended to west Kenya (Griffie et al. 2003). Tenera oil palm being promoted resulted from the controlled crossing of Pisifera and Dura (AAR 2010). Dura, a local variety has a thick husk, thin mesocarp and small kernel with less oil yield as compared to Tenera. Pisifera is noted for its importance for cross breeding palms although it is of little commercial value owing to its high ratio of abortion. In the fertile fruits, it has small pea like kernels (Corley and Tinker 2003, Verheye 2011). Tenera according to Verheye (2010) has the following characteristics: "shell 0.5–3mm thick; comprising 1–32% of weight of fruit; medium to high mesocarp content of 60–95%, but occasionally as low as 55%". It has a 26% oil to bunch ratio as compared to 16% in Dura (Mohan and Priyadarshan, 2009). "One tree yields 24 fruit bunches/year weighing 30Kg each under good management. Each bunch has a potential of 10 litres of oil. Ten trees can give 2400 litres of oil per year and yields can be 4–5ton oil /ha/year", (Rachier, 2008). According to the DoA (2011) farmer register, Luapula, Zambia has about 4500 oil palm farmers out

of which about 1000 farmers (350 females and 650males) are in Mwense. The oil palm tree population in Mwense by the end of 2011 was about 16 700 out which about 11 800 were Tenera hybrids (Hamweete 2012).

The focus of this article is on Zambia and related efforts the country has been making in promoting the economic value of the palm Oil and its products. Participation in the industry has seen a proliferation of various actors from traditional practitioners through small scale to industrial production. Chief amongst these actors is the Zampalm Oil Palm¹ tree plantation in Senior Chief Kopa's area in Kanchibiya district, Muchinga Province. The Government of the Republic of Zambia acquired the company from Zambeef Products Plc at a cash consideration of US\$16 million.

It has been reported that the estate has the potential to produce up to 100 tonnes of crude palm oil in a month from its primary processing plant. Once at full capacity, it could feed refineries with a steady flow of raw material for processing into ready-for-use edible oil and other products all year round. It is said that the multi-million dollar venture could also help stem the importation of edible oils into Zambia and earn the country a significant level of foreign exchange through exports. Currently, there are 3 300 hectares of high-yielding hybrid varieties of palm trees imported from Malaysia and Indonesia.

The Estate Manager, Mr Subakanya says Zampalm started planting the trees in 2011 on 168 hectares while harvesting began in 2016 when the first crop matured. The bunches of oil palm fruits weighing between one and five kilogrammes have a dark brown colour when immature and turn orange to yellow when ripe. They are handpicked by hordes of workers who pile them in heaps on the edges of palm tree rows, where they are collected by tractors with trailers and transported to the mill to be processed into crude. Mill manager Simon Chileshe says the plant is currently producing 1.6 tonnes of crude a day, but the output is expected to increase as the harvesting peaks. The plantations sits on uninhabited grassland on the edge of the Bangweulu Wetlands. The Zampalm story resonates with Section 7 of the Seventh National Development Plan (SNDP) where the government envisages to achieve economic diversification and job creation through agriculture, mining and tourism. The strategy targets increased employment opportunities in rural areas by promoting rural infrastructure development, agro

¹ This was established by a private company, Zambeef, which is one of the largest integrated agribusiness establishment in Zambia with operations in some West African countries and annual gross revenues of approximately \$255 million USD (2014 International Food and Agribusiness Management Association (IFAMA)).

value chain development and labour-intensive industries operating in rural areas.

Other actors include Elim Enterprises Ltd in collation with Isubilo farmers Cooperative in Mwense. The Citizens Economic Empowerment Commission (CEEC) has given Elim Enterprises K1.2 million to enable the company set up a palm oil processing plant in Mwense. The company's Chairman, Mr Chibiliti, estimates that his equipment has the capacity to produce one tonne of palm oil per hour. The palm trees are predominantly grown along the Luapula River corridor. He said the company, which already has market for the palm oil, intends to add value to the product so that it can be sold to big supermarkets such as

Shoprite and Pick n Pay. He concludes by saying that the by-products will be used to make feed for livestock. Palm oil is very good for those that are healthy conscious as it is cholesterol-free and can even cure some diseases, he noted. The company received a loan facility from the Citizens Economic Empowerment Commission (CEEC). The CEEC is a government initiative aimed at empowering citizens.

It is planned that such a loan facility is expected to go a long way in boosting the business in terms of financial capacity.

Victor Kawanga
CFA Zambia

Strengthening the national process for controlling illegal logging and associated trade in Cameroon*



*Mix of Cameroon and Central African Republic logs at the Douala seaport ready to be containerized and exported
(Photo: © Denis Mahonghol-TRAFFIC)*

Cameroon has a rich and diverse biodiversity and forests are a key resource for its people. In spite of significant efforts in the forest sector, there are still incidences of illegality throughout the timber trade supply chain, partly due to the lack of staffing capacity and training, coordination with other enforcement agencies such as Customs, and a lack of information on where the main areas of illegality are happening in the supply chain.

TRAFFIC, with funding support from the International Tropical Timber Organization (ITTO) implemented a project, ending in 2016, to strengthen the national processes for controlling illegal logging and associated trade in Cameroon.

The outcomes of the project were published in a series of French and English study reports:

Monitoring of forest law enforcement in Cameroon¹ which finds that the forestry sector contributes 456.9 billion FCFA (780.4 million USD) or 30% to the national economy and accounts for 4% of the GDP, with an annual production of about 2.3 million m³.

* Summary of an ITTO project TFL-PD 003/09 Rev.2(M)

¹ http://www.itto.int/files/itto_project_db_input/2947/Technical/TFL-PD-003-09-R2-M-Technical-Report-2.pdf
http://www.itto.int/files/itto_project_db_input/2947/Technical/TFL-PD-003-09-R2-M-Technical-Report-7.pdf



Handling of timber at the Douala seaport for the shipment (Photo: © Denis Mahonghol-TRAFFIC)

A study of timber trade routes and flows² found that between 2000 to 2012 industrial timber production in Cameroon reported increasing volumes felled through selective and extensive logging, with Ayous *Triplochiton scleroxylon* and Tali *Erythrophleum ivorense* being the top species harvested. These two-species account for more than half of the total volume of the top ten most used species in both the domestic market and for international trade in Cameroon.

Industrial timber processing is principally in sawn wood and timber exports are mainly directed to Europe but increasingly to Asia, the largest importer of Cameroon logs during the period 2004 to 2012 being China (including Hong Kong and Taiwan), which accounted for 55% of the average exports.

Timber processing and export in Cameroon still faces a number of challenges including: onerous and protracted procedures to register as a timber processor, legal and legislative weaknesses and procedural flaws that facilitate illegal exportation, and the lack of information sharing between relevant agencies, in particular the Department of Trade and the Ministry of Forestry and Wildlife (MINFOF).

Forest taxation is inefficiently captured as the laws are weakly enforced and do not cover the entire sector.

It is worth noting that illegal logging activities occur in all forest types in the country. The study found that some of the routes used for timber from community forests and agroforestry areas were new and not in the current timber route monitoring network of MINFOF.

A study on implementation of the timber tracing system³ reported Cameroon signed a Voluntary Partnership Agreement (VPA) with the EU as part of the EU Forest Law Enforcement, Governance and Trade (FLEGT), a mechanism to promote good governance and sustainable forest management. The VPA process provided funds to support the technical implementation of the systems in the country.

A computerized database (SIGIF) to facilitate timber monitoring and traceability was established in 1999 and integrated to the VPA / FLEGT process. MINFOF is now working on the development of an updated system, SIGIF II.

At the time of the study, progress is reported in terms of MINFOF staff training and the signing of certain laws. However, the process that will result in the implementation of this system is protracted and faces a number of challenges including inadequate resources and persistent corruption.

Conceptualization and development of a roadmap for a multi-stakeholders' national co-ordination committee⁴ finds a key leverage of forest governance and sustainable management of forest resources is co-ordination of action among all forest law enforcement services.

There is a fairly strong relationship between MINFOF and the actors of the forestry profession (wood industry unions and operators) on the one hand and independent observers on the other.

With other sectoral ministries such as the Ministry of Defence (MINDEF), Ministry of Finances (MINFD), Ministry of Justice (MINJUSTICE), Ministry of Transport (MINTRANSPORT), Ministry of Environment, Nature Protection and Sustainable Development (MINEPDED) among others, there is an encouraging level of collaboration. However, its effectiveness could be further improved given the overlapping missions of each ministry.

This study proposed a draft text for establishing a multi-stakeholder national co-ordination committee with the aim of strengthening the national process for controlling illegal logging and associated trade, to be placed at the level of the Prime Ministry offices for co-ordination.

Transparency of the timber legality system⁵ finds that despite efforts by MINFOF aimed at timber trade transparency in the fight against illegal logging, there is an absence of a true functional timber traceability system, relevant resources and

² http://www.itto.int/files/itto_project_db_input/2947/Technical/TFL-PD-003-09-R2-M-Technical-Report-4.pdf

³ http://www.itto.int/files/itto_project_db_input/2947/Technical/TFL-PD-003-09-R2-M-Technical-Report-1.pdf

⁴ http://www.itto.int/files/itto_project_db_input/2947/Technical/TFL-PD-003-09-R2-M-Technical-Report-3.pdf

⁵ http://www.itto.int/files/itto_project_db_input/2947/Technical/TFL-PD-003-09-R2-M-Technical-Report-8.pdf

references materials, results of forest litigation, relevant statistics on illegal logging and regular updates of published information.

The study, which was part of improving the transparency of the timber legality system in Cameroon, notes the shortcomings of the current system in combatting illegal logging. The study highlights the need to develop an integrated technology IT tool for information amongst law enforcement agencies in order to lend credibility to Cameroon's forest sector at national and international levels.

Strengthening the capacity of Forest Law Enforcement services training⁶ work led to a training manual on "Forest Legislation and Control: Towards a concerted fight against illegal logging", developed to help improve the governance and transparency of logging and timber trade in Cameroon.

⁶ http://www.itto.int/files/itto_project_db_input/2947/Technical/TFL-PD-003-09-R2-M-Technical-Report-5.pdf
http://www.itto.int/files/itto_project_db_input/2947/Technical/TFL-PD-003-09-R2-M-Technical-Report-6.pdf

The training manual is a tool for trainers, Justice departments, Police and Gendarmerie, helping to understand better the missions and roles and responsibilities of all actors in the chain of control. It is intended to be dynamic and usable by all other stakeholders as well as in forestry and administrative schools and Customs institutes.

For the integrity of forest agents in their daily work, the study also proposed a code of conduct and professional ethics for personnel of the Ministry of Forestry and Wildlife on control mission.

TRAFFIC looks forward to working with MINFOF and other key agencies in Cameroon to implement the recommendations of the studies and training materials.

Denis Mahonghol

Senior Programme Officer

TRAFFIC Office Programme Central Africa

Yaounde, Cameroon

Tall and old or dense and young: Which kind of forest is better for the climate?

Scientists say reforestation can provide 18 per cent of climate change mitigation through 2030, but studies appear to be divided about whether it's better to prioritise the conservation of old forests or the replanting of young ones.

In 2007, Richard Branson, the British business magnate, offered a \$25 million prize to anyone who can invent a device capable of removing significant volumes of carbon dioxide from the atmosphere.

Andy Kerr, a noted Oregon environmentalist, drew a picture of a tree and sent it in. After all, a tree performs the job of sucking carbon out of the air far better than any technology yet devised by humans. But Kerr didn't win, foiled by contest rules specifying the winner must be the inventor of such a device, and it's certain neither Kerr nor anyone else invented the tree. An artificial tree might win if it could perform the implausible feat of inhaling CO₂.

Kerr's idea, however, was rooted more in the climate benefits provided by an entire forest rather than just a single tree. These benefits can be enormous, according to "Natural Climate Solutions," a paper published in 2017 in the Proceedings of the National Academy of Sciences.

The paper asserts better management of forests, wetlands and farmland can provide 37 per cent of the cost-effective climate mitigation needed through 2030. Forests alone can provide 18 per cent of the mitigation, according to a statement published last year by the Climate and Land Alliance and signed by an international group of 40 scientists.

"The 'natural technology' of forests is currently the only proven means of removing and storing atmospheric CO₂ at a scale that can meaningfully contribute to achieving carbon balance," the 40 scientists said. "The world's forests contain more carbon than exploitable oil, gas, and coal deposits, hence

avoiding forest carbon emissions is just as urgent as halting fossil fuel use."

Last year, the United Nations' Intergovernmental Panel on Climate Change (IPCC) warned we have only until 2030 to act if we hope to limit global warming to moderate levels.

Forests cool the atmosphere by inhaling CO₂ through the process of photosynthesis and storing or sequestering it in roots, trunks, branches, needles and leaves. Half a tree's weight is carbon. Although every backyard vegetable garden absorbs some amount of carbon, a rainforest takes in exponentially more. For this reason, rainforests and other large terrestrial ecosystems made up of dense vegetation are known as "carbon sinks."

Kerr lives at the edge of a temperate rainforest straddling the west coast of North America from the redwoods of Northern California into Alaska, the largest contiguous temperate rainforest in the world. Few ecosystems anywhere match its capacity to absorb and store carbon. Trees in the temperate rainforest, among the tallest in the world, live for 800 years or more.

The expansive Amazon tropical rainforest of South America is one of the world's largest carbon sinks. But on a per-acre basis, the Amazon is not nearly as efficient at absorbing carbon as the coastal temperate rainforest. The Douglas fir forests of Oregon and the hemlock and cedar forests of Alaska store about twice as much carbon per acre as the Amazon. The giant redwoods of Northern California, which store seven times as much, are regarded as the most carbon dense forests in the world.

The temperate rainforest is a "carbon storage powerhouse," says John Talberth of the Portland, Ore.-based advocacy group Center for a Sustainable Economy (CSE). "If allowed to mature, Pacific Northwest forests can capture and store more carbon than almost any terrestrial ecosystem on Earth."

The problem is most mature trees in the rainforest have been cut down and young ones are not allowed to mature.

Outside conservation areas like national parks and wilderness, ancient groves are converted to industrial tree farms by the timber industry.

After cutting down every old growth tree it can get its hands on, the industry typically plants a young sapling in its place. The saplings grow for about 40 years on average until the next harvest. Then the cycle repeats again and again.

This business model might be good for timber industry profits, but what does it do to the climate?

Sara Duncan, a spokeswoman for the Oregon Forest Industry Council, a lobbying group, claims this business model is good for both profits and the climate. She says old growth trees store a lot of carbon, but like everything else, old growth trees eventually die. If they aren't harvested and converted into wood products, they will fall down in a windstorm, burn up in a wildfire or meet their fate some other way. Eventually they will release all their stored carbon content back to the atmosphere.

The industry's solution to the climate crisis is to log the trees, truck them to the mill, and store the carbon in 2-by-4s, plywood boards and toilet paper. Eventually, however, the carbon in these products will still return to the atmosphere one day.

But is there a more climate-friendly way to manage our forests? Can we get more climate mitigation from a forest if we don't cut it down every 40 years? The science suggests we can.

In 2014, a study published in *Nature* by a team of international researchers led Nathan Stephenson, a forest ecologist with the United States Geographical Survey, found that a typical tree's growth continues to accelerate throughout its lifetime, which in the coastal temperate rainforest can be 800 years or more.

Stephenson and his team compiled growth measurements of 673,046 trees belonging to 403 tree species from tropical, subtropical and temperate regions across six continents. They found that the growth rate for most species "increased continuously" as they aged.

"This finding contradicts the usual assumption that tree growth eventually declines as trees get older and bigger," Stephenson says. "It also means that big, old trees are better at absorbing carbon from the atmosphere than has been commonly assumed."

But the science, as usual, is muddy. As Mongabay reported in February, a study published in the *Proceedings of the National Academy of Sciences* in 2019 by Thomas Pugh of the Birmingham Institute of Forest Research in the UK found young forests sequester more carbon per year than old-growth forests.

"These findings upend conventional wisdom that old-growth tropical rainforests are the planet's biggest carbon sinks," Pugh's study said. It defined old-growth forests as any stand over 140 years of age.

It would appear the two studies contradict each other. But both scientists say they are consistent.

"The difference is that Stephenson et al. looked at biomass of individual trees, whereas our study looks at biomass of whole stands of trees," Pugh said in an email. "Whilst a single tree might continue to pile on more and more biomass, there will be less of such trees in a stand, simply because of their size and as tree stands age, gaps tend to appear due to tree mortality."

"So, our conclusion is actually that young forests are responsible for more of the terrestrial carbon sink than old growth forests," Pugh said.

"Both things are true," Stephenson said in an email. "Individual tree mass growth rate increases with tree size, but old forests usually absorb carbon more slowly than young forests."

However, the relative growth rates of young and old trees do not tell the entire story.

"Older forests store a lot more carbon than young forests and much of it is returned to the atmosphere quickly when harvested and planted with young trees," says Beverly Law, a professor of global change biology at Oregon State University.

By the time it becomes a desk, table or 2-by-4, a log will lose about 70 per cent of its carbon, according to Dominick DellaSala, director of the GEOS Institute, an environmental think tank based in Oregon.

About 45 per cent of the carbon is left on the forest floor, said DellaSala, a member of the Oregon Global Warming Commission Task Force on Forest Carbon. "This includes decomposition of root wads, branches, and tops remaining on site and a little soil carbon. Logging takes nearly half the carbon and puts it into the atmosphere within years."

Another 25 per cent is lost during manufacturing, he said. And as the finished wood products decay over time, he said, they emit even more.

And that doesn't include carbon emitted by chainsaws, logging trucks and lathes. In 2018, Law led a team of researchers who quantified these and all other carbon emissions as logs move from forest to sawmill. Their paper, published in the *Proceedings of the National Academy of Sciences*, said logging operations in Oregon contribute an average of 33 million tons of CO₂ to the air. This equates to almost as much as the world's dirtiest coal plant, Taichung Coal Plant in Taiwan, which emits about 36 million tons per year.

Moreover, the climate impacts of logging are even greater if you factor in a harvested log's lost future growth opportunities, Law says. Although her paper makes no attempt to quantify a logged tree's foregone climate mitigation potential, she acknowledges it could be significant.

Law called on the industry to help buffer climate change by doubling harvest rotations to 80 years and urged government agencies managing forests to impose their own harvest restrictions. These and other actions could increase the amount of carbon absorbed by Oregon forests by 56 per cent by the year 2100, as well as improve water quality and biodiversity, her paper said. She is conducting a similar analysis for forests in California and Washington.

Even after the wood is converted into a wood product, the carbon will likely return to the atmosphere sooner than people might think, Law said.

"Old growth trees in the coastal temperate rainforest can sequester carbon for hundreds of years," she said, "which is much longer than is expected for buildings that are generally assumed to outlive their usefulness or be replaced within several decades."

Training compendiums on climate change in African forestry launched at AFF 10th anniversary celebrations

On May 22, 2019, the African Forest Forum (AFF) celebrated its tenth anniversary with the launch of eight forestry related training compendiums on basic science of climate change, carbon markets and trade, climate modelling and scenario development, and international dialogues and processes in climate change; as well as a book titled, *“The State of Forestry in Africa: Opportunities and Challenges”*.



L-R: Prof. Godwin Kowero, Executive Secretary-CEO AFF; Mr. Gideon Gathaara, Conservation Secretary, Ministry of Environment and Forestry; Mr. Macarthy Oyebo, Chair AFF Governing Council; Prof. Demel Teketay, Chair AFF Members Forum during the launch of the AFF book titled, *“The State of Forestry in Africa: Opportunities and Challenges”*

Established in 2007 as a non-political, non-governmental, and not for profit international organisation, the African Forest Forum (AFF) is an association of individuals with a commitment to the sustainable management, wise use and conservation of Africa’s forest and tree resources for the socio-economic well-being of its peoples and for the stability and improvement of its environment. AFF undertakes its work in an objective and independent manner.

For more than a decade, AFF along with its partners, has worked on the science-policy-development interface that is crucial for enhancing sustainable forest management (SFM) practices on the African continent, as well as proffering solutions to the many challenges afflicting the sector. In this regard, eight training compendiums were developed in a pedagogical manner to support capacity building and skills development on the continent to facilitate better handling of climate change issues in forestry. The compendiums were developed by several expert teams and validated by forestry stakeholders at a workshop organized jointly with the University of Ouagadougou from 12–16 March 2018 in Burkina Faso. Thereafter, they were peer-reviewed by a number of experts before being edited for production. They were officially launched by AFF on May 22nd.

- Basic science of climate change: a compendium for professional training in African forestry

- Basic science of climate change: a compendium for technical training in African forestry
- Basic science of climate change: a compendium for short courses in African forestry
- Carbon markets and trade: a compendium for professional training in African forestry
- Carbon markets and trade: a compendium for technical training in African forestry
- Carbon markets and trade: a compendium for short courses in African forestry
- Climate modelling and scenario development: a compendium for professional training in African forestry
- International dialogues, processes and mechanisms on climate change: compendium for professional and technical training in African forestry

The compendiums are tailored for different audiences, including those at professional and technical levels, as well as for guiding delivery of short courses. The latter also target extension agents and civil society organisations that interact with local communities; and this is the approach AFF has taken to get its information reach local communities.

The training compendiums are the first of their kind in Africa, and most likely in the world, and are based on demands by African forestry and related training institutions expressed through a need’s assessment conducted by AFF. These compendiums will be complemented by six others under preparation on climate change adaptation and climate change mitigation in African Forestry. They are expected to provide educational and training information, organized in a pedagogical manner, that is crucial to a standard or uniform approach in building the capacity and skills on climate change issues related to forestry among African forestry stakeholders in the various African sub-regions. They will also provide guidance on addressing national and regional issues on climate change and forestry by other interested stakeholders.

In an effort to complement FAO’s regular reports on the global state of forestry resources and on related aspects, AFF also launched the book on *“The State of Forestry in Africa: Opportunities and Challenges”* on May 22nd. The issue provides a broad overview of some of the most pressing concerns in the African forestry sector, with the intention that subsequent issues of this publication will dwell on other equally important concerns that could not be accommodated in this issue. AFF plans to produce such issues, with potential partners, once every 2–4 years, resources permitting.

Celebrating 10 years of commitment to Africa’s forests and tree resources

The occasion, jointly organized by AFF, the Kenya Forest Service (KFS) and the Kenya Forestry Research Institute (KEFRI), was held at the Amani Gardens, Karura Forest grounds in Nairobi, Kenya. It was attended by over 200 participants from across Africa and outside the continent, representing governments and public agencies, international organizations, the private sector, academic and research institutions, non-governmental organizations (NGOs), and community-based organizations (CBOs).



L-R: Dr. Doris Mutta, Senior Programme Officer (SPO)-AFF; Prof. Godwin Kowero, Executive Secretary-CEO AFF; Mr. Gideon Gathaara, Conservation Secretary, Ministry of Environment and Forestry; Mr. Macarthy Oyebo, Chair AFF Governing Council; Prof. Demel Teketay, Chair AFF Members Forum.



Kenya Forest Service (KFS) choir entertaining guests



Guests at the 10th anniversary celebrations held at the Amani Gardens, Karura Forest grounds in Nairobi Kenya



Tree planting by Ms. Ulla Andrén, the Regional Head of Development Cooperation in Sub-Saharan Africa at the Embassy of Sweden in Addis Ababa, Ethiopia, Prof. Godwin Kowero, Executive Secretary-CEO AFF and presided over by Ms. Monica Kalenda, Senior Deputy, Chief Conservator of Forests, KFS

“We started this journey on December 06, 2007 when AFF was registered as a not-for-profit NGO in Nairobi Kenya, and with a grant from the Swedish International Development Cooperation Agency (Sida) in 2008, which helped us, among other things, to set up AFF as a platform that could support African forestry stakeholders to discuss and mobilise resources for improved management and use of their forest and tree resources. A second grant from the Swiss Development Cooperation Agency (SDC), has strengthened AFF as an institution that is gradually being recognized and respected as another key actor on the African forestry scene” said Prof Godwin Kowero, Executive Secretary-CEO at AFF.

In his opening remarks, Prof Godwin Kowero, emphasized the need for a new narrative for Africa, that captures the urgency of the environmental challenges facing the continent and the world at large, and the role of forests and trees outside forests at the centre of human, animal and plant survival on the continent. He also highlighted AFF’s efforts on issues related to: management of trees and forests in different landscapes and in the context of climate change; forest certification; quality supply and management of tree germplasm; and forest and tree pests and diseases. He emphasized the role of AFF as a knowledge brokerage institution in generating and sharing information and knowledge. He underlined the work AFF has done in supporting African delegates with capacity to develop common positions, negotiation strategies, and effectively articulating their issues in international forestry related dialogues. In view of this, it was noted that the wealth of information generated through

these activities provided a sound basis to develop and expand the forestry sector in Africa.

Speaking on behalf of the FAO Regional Office for Africa, and the representative for the FAO Southern Africa office, Mr. Edward Kilawe, commended AFF as a key partner in promoting and developing forestry in Africa. He reiterated FAO’s gratitude for the collaborative approach it has had with AFF that has enabled the institution to support Africa’s regional and country strategies and policies on sustainable forest management and the 2030 Agenda for Sustainable Development.

Mr. Almami Dampha, a Senior Policy Officer with the Rural Economy and Agriculture Department of the African Union Commission (AUC), recognized the vision and foresight of the AFF founding members towards establishment of the institution. He also appreciated the Government and people of Kenya for providing a conducive environment to host the regional entity. Other partners equally acknowledged by him in supporting AFF included ICRAF, UNFF, UN agencies, FAO, RECs, and development partners/the donor community. He reaffirmed the commitment of AUC in working with all partners towards Agenda 2063- a socioeconomic transformation framework for the next 50 years

Ms. Ulla Andrén, the Regional Head of Development Cooperation in Sub-Saharan Africa at the Embassy of Sweden in Addis Ababa, Ethiopia, commended AFF for creating a collective voice for forestry on the continent and beyond. She encouraged further inclusion of women’s leadership in the forestry sector for increased productivity and economic benefits. In the same

token, Mr. Patrick Sieber, Programme Manager, Swedish Agency for Development and Cooperation (SDC), indicated a sense of pride in AFF's growth as an institution and re-affirmed commitment towards its long standing and rewarding partnership.

Mr. Macarthy Oyebo, Chair of the AFF Governing Council, provided an overview into AFF's journey over the past decade to become the leading platform of stakeholders in African forestry. In the process, he extended gratitude to all African governments, partners and stakeholders who enabled the institution to achieve its targets and also provided a conducive environment for its work. He also appreciated the kind financial support from the Swedish International Development Cooperation Agency (Sida) and the Swiss Agency for Development and Cooperation (SDC) to undertake a number of project activities in Africa. He further informed delegates that AFF had redefined its approach to conceiving and managing its work through a programmatic approach that is guided by its own strategy and the priority areas of action identified by the African forestry fraternity.

Mr. Gideon Gathaara, Conservation Secretary, Ministry of Environment and Forestry lauded the efforts of the African Forest Forum (AFF) for a decade of service to African forestry, and the achievements attained within the short period. He stated that deforestation and forest degradation remained challenges that hindered the ability of African countries to address poverty. For this reason, he took note of the considerable work AFF had

done in providing useful information from its continent-wide studies. The development of such information, he further noted, could support evidence-based decision making to improve management and wise use of forest and tree resources.

The celebrations were also marked by a number of events that included: a regional workshop on 'sharing of information, knowledge and experiences in African Forestry'; and two regional training workshops on (1)

'sustainable forest management and leadership for policy makers in Africa' and (2) 'forest governance for Eastern and Southern Africa.' With an impressive list of speakers from many partners, the workshops showcased results obtained from the work of by AFF and its partners during the last five years.

For further information please contact:

Executive Secretary
African Forest Forum (AFF)
United Nations Avenue, Gigiri,
P.O. Box 30677 – 00100, Nairobi, Kenya.
Tel.: +254 20 722 4203
Fax: + 254 20 722 4001/ 4181
Email: exec.sec@afforum.org; g.kowero@cgiar.org,
Website: www.afforum.org

Follow us on Twitter @africanff
Like us on Facebook / African Forest Forum
Find us on LinkedIn / African Forest Forum (AFF)

Publications

Harmony – A New Way of Looking at Our World

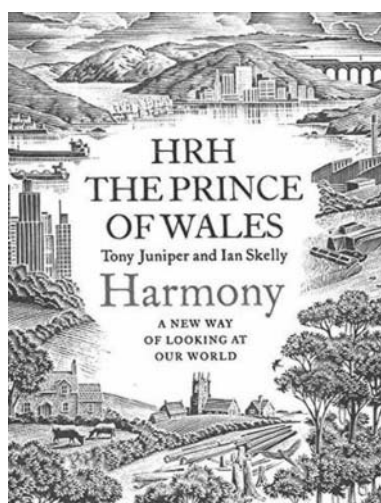
HRH The Prince of Wales, Tony Juniper and Ian Skelly

Harper Collins

Although this book was published in 2010, now is a good time to remind readers of it, since the principal author, HRH the Prince of Wales, became our patron this year. It is a beautiful publication in all respects, as one would expect from the title "Harmony", and we are very fortunate to have the benefit of the authors' insights here.

The subtitle states that it is "a new way of looking at our world", but in fact it is also a call to regain older "wholistic" ways of viewing the universe and life on earth as an integration of physical and spiritual dimensions, where everything is interconnected. We have to embrace the spiritual better.

If that sounds rather airy fairy to hard-nosed lumberjacks (and lumberjills), it is not at all. The Prince's arguments for



better stewardship of our resources, supported by the expertise of the co-authors, are very down to earth. And he starts off by giving a very arresting summary of the current state of our planet and the need for a "call to revolution".

It can be argued that a revolution is already beginning to happen in our appreciation of the world, but the Prince wants more than that. We need to look back and reengage with ancient philosophies and thinkers that help us to redefine what is beautiful, good and true, as well as embracing what is beneficial in our current reductionist scientific ways of understanding reality. Throughout this book you can see what has motivated Prince Charles in his studies,

interests, observations and activities. It is an excellent summary.

Had he written this book a few years later, after 2015, no doubt the Prince would have enlisted the help of Pope Francis by referring to his encyclical *Laudato Si'* (reviewed in the CFA Newsletter Sept. 2015). Both writings urge us to change the way

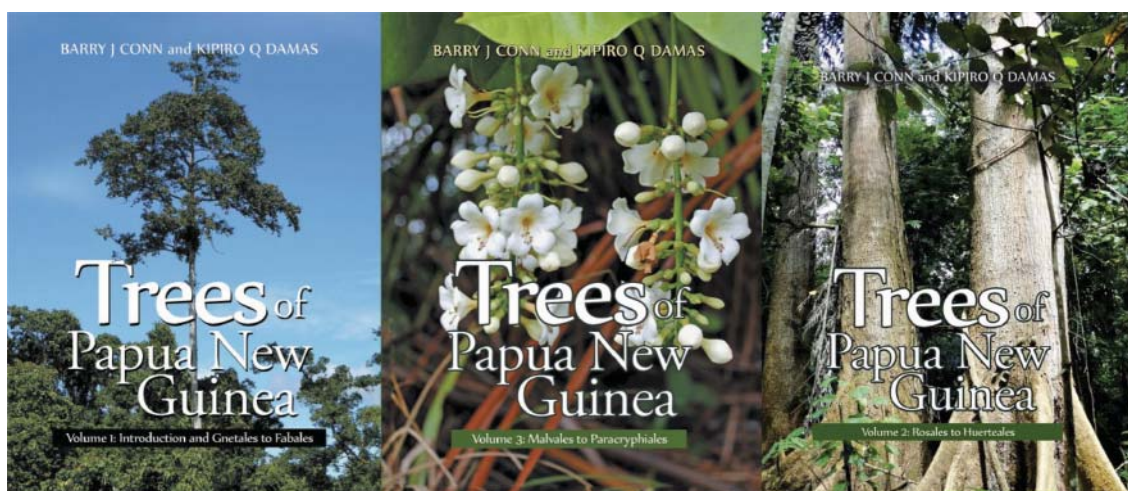
we think about and act in our world, where we should be stewards and not exploiters.

I think there is much in this book that will already resonate with foresters and environmentalists, but which we urgently need reminding of. Some readers may find the Prince's inclusivity of ideas goes too far for their liking. But both Pope and Prince urge us to be open and to hold what seem like polar opposites in tension, so as to find lasting answers to the problems that face us.

If this paints are rather esoteric picture for some, it is not. This is a book that should be read by all of us to reset the way we look at the world. That was the aim of the authors in writing it. The solutions to our planet's ills lie not in an "either/or" approach but a "both/and" one that looks forwards and backwards to address the needs of now. Only in this way can we achieve the balance and harmony needed in our efforts to become better stewards of planet Earth.

Marcus Robbins
CFA Finance Manager

Trees of Papua New Guinea Volumes 1 - 3



Barry J Conn and Kipiro Q Damas

Xlibris

The island of New Guinea has a high diversity of species and a high level of endemism, containing more than 5 percent of earth's biodiversity in just over one half of a percent of the land on the earth. New Guinea supports the largest area of mature tropical moist forest in the Asia/Pacific region. Papua New Guinea consists of the eastern part of the island of New Guinea, plus the islands of the Bismarck Archipelago, Buka, and Bougainville. There are between fifteen thousand and twenty thousand species of vascular plants in Papua New Guinea, with at least two thousand species of trees. The most important challenge for Papua New Guinea is the protection of biological diversity against the pressures resulting from global climate change, inappropriate destructive conversion of natural communities, unsustainable

exploitation of forests, national economic development and societal demands, including a fair sharing of the nation's wealth, and law and order issues.

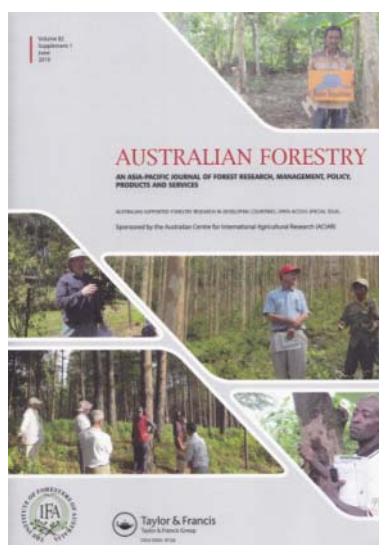
There are very few resources available to natural resource managers, environmental scientists, nongovernment agencies, and various extractive industries, most importantly, the timber industry that will assist in the identification of major tree species within Papua New Guinea. It is hoped that the publication of these three volumes will enable those who are responsible for natural resource management to improve their knowledge of the trees in these forests so that they can fully appreciate the richness of these biologically diverse forests. The forests of Papua New Guinea need to be managed sensitively and sustainably based on advanced evidence-based knowledge.

The *Trees of Papua New Guinea* publication provides a comprehensive treatment of 668 species of trees (Volume 1: 257 species; Vol. 2: 246 species; Vol. 3: 165 species) that will assist in the identification of the trees of Papua New Guinea.

Australian Forestry – Special Issue: Australian supported forestry research in developing countries

A recent open access special issue of the *Australian Forestry* journal presents ten articles and an editorial related to international forestry research that has been funded by the Australian Centre for International Agricultural Research (ACIAR). ACIAR currently spends about AUD \$115 million annually on agricultural Research for Development (R4D) projects in partner countries, including about AUD \$10 million on bilateral forestry research. ACIAR's forestry program currently supports about 30 projects across 14 countries from Zambia to Tonga and these projects cover many different themes of research and are implemented in many different situations. The editorial "striving for success in international forestry research" discusses how success of forestry research projects vary within and between countries and the utility of a new methodology for systematically evaluating the relative success of different projects.

Disseminating scientific findings is an important part of achieving impact, and therefore ultimately in achieving success, from R4D projects. This special issue contains a range of articles that highlight some of the more recent findings and benefits from some of ACIAR's current and recently concluded forestry projects. Two articles highlight findings and lessons from recent research on agroforestry and community forestry in Nepal, including modelling the effects of different actions in the



integrated farm-forest system and improved management approaches for realising improved financial returns from Nepal's community forests, with two other articles examining water use by trees in landscapes in China and Uganda. Another important article reviews recent advances in the knowledge of the nutrient, water and organic matter dynamics of acacia plantations on mineral soils in Southeast Asia, highlighting that water availability and appropriate management of nutritional requirements are key factors influencing productivity on different sites. The special issue also includes analysis of the application of the Australian Master TreeGrower training program in Indonesia, and from research to create future business opportunities for Indigenous communities

in northern Australia based on growing the local sandalwood species. Two articles present findings on the management of balsa wood value chains in Papua New Guinea, and on the most appropriate silvicultural practices for growing teak plantations in northern Laos. The other article reports on research related to managing significant tree diseases in Acacia plantations in Indonesia.

The Special Issue of Australian Forestry is available at: <https://www.tandfonline.com/toc/tfor20/82/sup1?nav=toCList>

Dr Tony Bartlett
Canberra, Australia

Around the World

Ethiopia 'breaks' tree-planting record to tackle climate change

Ethiopia has planted more than 350 million trees in a day, officials say, in what they believe is a world record. Prime Minister Abiy Ahmed is leading the project, which aims to counter the effects of deforestation and climate change in the drought-prone country. Some public offices have been shut down to allow civil servants to take part.

The UN says Ethiopia's forest coverage declined from 35% of total land in the early 20th Century to a little above 4% in the 2000s.

Mr Abiy launched the tree-planting exercise as part of his Green Legacy Initiative, which is taking place in 1,000 sites across the country. Officials were assigned to count the seedlings being planted by volunteers, reports BBC's Kalkidan Yibeltal in the capital, Addis Ababa. Ethiopia's Minister of Innovation and Technology Getahun Mekuria tweeted that more than 350 million

trees were planted in 12 hours. The aim is to plant a total of four billion indigenous trees.

Promotional videos have run on state media urging the public to plant and care for trees, our reporter says. Staff from the United Nations, African Union and foreign embassies in Ethiopia have also been taking part in the exercise.

The current World Record for planting trees in a single day is held by India, which used 800,000 volunteers to plant more than 50 million trees in 2016.

Critics of Mr Abiy say he is using the campaign to distract the public from the challenges his government is facing, including ethnic conflicts which have forced some 2.5 million people from their homes.

BBC.co.uk

USA: What are moon trees?

Have you ever gone to the moon and back? Moon trees made the journey – or rather, their seeds did.

The story of moon trees starts in 1971, when Apollo 14 launched a mission to the moon. The mission pilot was Stuart Roosa, a former U.S. Forest Service smoke jumper. When he was selected for the job, a few of his Forest Service colleagues asked him to take hundreds of tree seeds into space with him. He agreed.

Seeds were collected from five types of trees: Loblolly pine, sycamore, sweetgum, redwood, and Douglas fir. The seeds were sorted – there were 400–500 total – and another set of seeds remained on Earth as a control sample.

On Jan. 31, 1971, Roosa, along with astronauts Alan Shepard and Edgar Mitchell, took off on the third mission to the moon. The seeds stayed with Roosa as he orbited the moon and flew back to Earth. But during decontamination, the kit containing the seeds burst open, and the crew thought the seeds were no longer viable. However, the Forest Service sent the seeds to two of their stations to be germinated anyway. Nearly all of the seeds

began to grow, and after a few years, the Forest Service had more than 420 seedlings.

In 1975 and 1976, most of the seedlings were given away to state forestry groups to be planted for the country's bicentennial celebration. Not all states received trees because the five species were from western and southern states and wouldn't have thrived in other climates.

Other saplings found prominent homes in the U.S. such as at the White House, the Kennedy Space Station (pictured above) in Florida, Goddard Space Flight Center in Maryland, Washington Square in Philadelphia, Valley Forge in Pennsylvania, and various universities. Some trees were given away as gifts to other countries, including Brazil, Switzerland, and Japan.

The number of moon trees has increased over the years, as cuttings were taken of moon trees and replanted. These second-generation moon trees are called half-moon trees.

NASA has a list of some of the Moon Trees at https://nssdc.gsfc.nasa.gov/planetary/lunar/moon_tree.html

www.treehugger.com

Norway to supply highly detailed satellite images of world's rainforests

Norway intends to spend up to USD 50 million USD to purchase high-resolution images of tropical forests. The images will be made freely available for governments, researchers and NGOs all over the world. They will enable the monitoring of deforestation, even on smaller areas. Insights into changes in the rainforests is crucial for reducing tropical deforestation, says Minister of Climate and Environment Ola Elvestuen.

For over a decade, Norway's International Climate and Forest Initiative – NICFI – has supported developing countries' efforts to reduce deforestation. Tropical deforestation leads to large emissions of greenhouse gases and is a grave threat to the global diversity of plants and animals. Estimates show that preserving forests and improving land management can contribute to one third of all the emission reductions before 2030 that the world needs to be on track to reach the goals set in the Paris Agreement.

Part of NICFI's forest funding has, for a number of years, given free access to satellite images and analysis that track and measure forest changes and loss. Norway supports Global Forest Watch – GFW – tracks annual changes in global tree cover and publish freely accessible maps around the globe. GFW also release early alerts on deforestation hotspots. Analysis methods developed at University of Maryland has also enabled GFW to separate deforestation of primary forests, extremely important to greenhouse gas emissions and biodiversity.

The satellite images used by these service show changes in the forest canopy over relatively large areas. However, they cannot detect illegal logging, or other activity, hidden by the rainforest canopy. Alongside better monitoring to detect forest crimes, NICFI is stepping up the fight against illegal deforestation through Interpol and the UN.

-The continued high deforestation rates is a global crisis of existential proportions, says Elvestuen. The latest data from Global Forest Watch showed that 2018 was the third worst year for primary tropical forest on record. The world lost an area the size of Belgium, 36.000 square kilometers of primary tropical forest.

- Our aim is to give everyone deeper insights into what is really going on in the forests, and strengthen the hand of those who try to save them, says Minister of Climate and Environment Ola Elvestuen.

Norway rewards several tropical forest countries, amongst others Indonesia and Brazil, with payments for reduced greenhouse gas emissions from deforestation.

-With better satellite images it is easier to uncover the reasons behind deforestation, it becomes easier to stop, and it becomes easier to set up good systems to reward countries that manage to curb deforestation, says Elvestuen.

NICFI is planning to purchase the high-resolution satellite imagery of all tropical countries for two years, with the possibility for extension for a further two years.

Norway aims to purchase the rights to the imagery, to make them freely available, used and shared multiple times by anyone who has a use of them. To ensure a widespread use of the images, they will be available through existing projects that Norway supports, such as Global Forest Watch and SEPAL. This will considerably strengthen these services.

NICFI's international tender seeks offers from the whole world. The plan is to complete this process during the fall of 2019. If NICFI finds a supplier that can deliver a satisfactory product, the images could be available already by the end of the current year.

regjeringen.no

Cameroon: U.S. guitar firm tunes business to protect ebony

Companies that use wood grown in Cameroon – from makers of guitars to electricity poles – are helping revitalise endangered tree species to better sustain their businesses and bolster the fight against climate change. The firms have teamed up with the government and villagers in public-private partnerships to restore forests because it makes sense for both their profits and the planet, they said.

Barbara Wight, chief financial officer for Yaounde-based Crelicam, an internationally owned supplier of Cameroonian ebony for musical instruments, said forests were crucial for the future of all who depend on their wood and other natural assets. “Working with the government and the local communities to protect these resources is important,” she said in an interview in Yaounde.

Two decades ago, Cameroon’s East and South regions were covered in verdant hardwood trees such as ebony, sapele and African cherry, but that is no longer the case, said Martin Tchamba, head of the forestry department at Cameroon’s University of Dschang.

High demand for wooden electricity poles, medicinal trees, furniture, specialist guitars and other equipment has depleted most of these hardwoods to the point that they have become endangered, he said. “There is an urgent need to depart from the unsustainable practice of felling trees without replacing them,” said Tchamba. “Tree restoration could help drive sustainable forest management.”

Involving companies in such efforts could herald a transformation in the economic model of exploiting natural resources without taking care of the environment, he added.

Crelicam, which is co-owned by two foreign companies – U.S.-based Taylor Guitars and Spain-based Madinter, which supplies wood for instruments – is one of the firms blazing a trail in safeguarding the ebony tree. The ebony project, which began in 2016, is part of Cameroon’s sustainable forestry initiative, one of the biggest such projects in the forest-rich Congo Basin, home to the world’s second-largest tropical rainforest.

Other companies replanting hardwood trees in Cameroon include Plantecam, a pharmaceutical company that uses African cherry to make medicines for prostate cancer.

The National Forestry Development Agency (ANAFOR), a government-owned organisation that processes timber for use in Cameroon and for export, is also working with local councils and private sector as part of the country’s sustainable forestry initiative, which began in 2012.

Taylor Guitars funds and works with the state and the Congo Basin Institute on the ebony restoration project which is also part of a U.N-backed programme to reduce planet-warming emissions from deforestation in Cameroon’s south. Wight said all ebony used by the guitar company to manufacture acoustic instruments comes from Cameroon’s forests.

“Protecting this endangered species means protecting the music world... and (means) that the music coming from Cameroon’s forest will continue,” she said. The longer-term aim is to secure a supply of the wood for the next 1,000 years or even longer, she added. So far in 2019, the company has planted 3,000 ebony trees in four villages buffering the Dja Rainforest Reserve southeast of Yaounde.

The project, estimated to cost more than \$1 million, aims to plant about 20,000 ebony trees by 2021. It also includes research on how to grow the hardwood, as well as cultivating it in nurseries, cloning and grafting.

Another company working on tree species restoration is SITEP-CAM, an industrial firm based in Cameroon’s Northwest Region which processes and markets electricity poles from eucalyptus trees.

SITEP-CAM CEO Clement Wara said it had provided a steady market for farmers growing eucalyptus since 2012 and given them nursery-grown seedlings to plant. “We ensure that every eucalyptus tree cut and used for electricity poles is replaced,” he said. One eucalyptus electricity pole sells for 50,000 to 70,000 CFA francs (\$87–\$122) depending on the size, he noted.

In partnership with local councils in Oku, Ndu and Jakiri, more than 5,000 eucalyptus trees were replanted in each of the communities in 2016.

In 2018, about 1,500 eucalyptus trees were also planted with Bali and Kumbo councils. But due to concern over the amount of water the thirsty trees soak up, some local authorities have been reluctant to join the programme, Wara noted. Tchamba said any effort to restore trees in a deforested landscape, “no matter how small”, would help capture rain, conserve the soil, preserve biodiversity and reduce the effects of climate change by storing more carbon.

Some companies are also combining the planting of hardwood trees with local fruit and cocoa trees to encourage forest communities to participate, he noted.

Local people who have embraced the programmes told the Thomson Reuters Foundation they were upbeat about the results. “We need to bring back our trees,” said Engono Manguel Paul, a farmer in Djoum. “This is our life; this is the future of our children.”

The cocoa and fruit tree seedlings, alongside fertilisers and pesticides received free from the companies, have allowed them to increase their yields and incomes, he added. But Crelicam officials said getting the ebony restoration project off the ground had not been easy. The company first had to learn how to grow ebony, which cannot be planted in rows using normal plantation methods but is more complex.

“Going through the authorisation process from the government, as well as convincing the local communities to be part of the process was also a big challenge,” said Wight.

As ebony takes 60 to 70 years to mature, the villagers had little interest in a project that did not yield immediate financial benefits, she added. “We had to introduce the cultivation of cocoa and fruit trees, inter-cropped with ebony, to permit them to generate income in a shorter period,” she said.

Cameroon’s environment minister, Pierre Hele, said the government would make it a policy to involve companies and forest communities in hardwood replanting programmes.

Researcher Tchamba urged more companies to team up with governments to protect at-risk tree species. “We need more businesses to embrace this type of restoration initiative that enforces the principle of sustainability,” he said.

Africa: Elephants help forests store more carbon by destroying smaller plants

Elephants do a lot of damage to plants as they stomp around the jungle, but, counterintuitively, this activity increases the biomass of the forest, letting it store more carbon.

If elephants were to go extinct, the amount of carbon stored in central African rainforests could ultimately fall by 7 per cent, according to a new analysis.

There are thought to have been around a million elephants in these forests in the early 19th century, but there are now only about 100,000. These animals graze and trample on trees smaller than 30 centimetres in diameter – plants that are subject to a lot of competition for light, water and space.

Fabio Berzaghi at the Laboratory of Climate and Environmental Sciences in Gif-sur-Yvette, France, and his colleagues wondered if elephants' destructive habits might allow surviving trees to grow larger by eliminating their competition. They built a mathematical model of plant diversity and simulated the impact of elephants by increasing the mortality of smaller plants.

The model showed that elephants reduce the density of stems in the forest, but increase the average tree diameter and the total biomass. Overall, they favour slow-growing trees that live longer and store more carbon in their trunks. "If elephants promote these kinds of trees, in the long run you will store more atmospheric carbon in trees," says Berzaghi.

The model results fit with data from sites in the Congo basin where elephants live and comparable areas that are undisturbed by elephants.

These effects may also account for the differences between African and Amazonian rainforest. In the Amazon, where there are no large herbivores, the number of trees per hectare is higher, but they tend to be smaller and hold less biomass in total. "We think that large herbivores have contributed to these differences," says Berzaghi.

Because these large trees are so long-lived, the sharp decline of the elephant population over the past two centuries will take a long time to remodel the forest. However, the study estimates that, in due course, the loss of elephants will reduce the biomass of African forests by about 3 gigatonnes of carbon. That's equivalent to 14 years' worth of carbon emissions from the UK.

"Globally, this is a contribution to the problem, but since it's a complex problem and this is a completely free service, I think it's quite important," says Berzaghi.

Elephants have other helpful roles in these ecosystems, he adds, such as distributing seeds and nutrients that help forests to grow faster.

newscientist.com

UK: Ash dieback will cost £15 billion

A recently published study shows that the full cost to the UK's economy of ash dieback, a deadly disease caused by the fungus *Hymenoscyphus fraxineus*, could be at least £15 billion a team of researchers led by the University of Oxford's Dr Louise Hill based the estimate on costs relating to the felling of sick ash trees, replanting lost trees and the loss of ecosystem services such as timber, flood mitigation and shading for both woodland and non-woodland trees. The study published in *Current Biology* found that the felling of trees for safety reasons could cost almost £5 billion alone. This is mainly because ash loses stability as the fungus infects it, leaving the wood brittle and liable to fracture, meaning that felling has to be done in stages. Replanting costs are relatively modest by comparison at £611 million. By far the greatest cost at around £9.4 billion is through the loss of ecosystem services with £5.4 billion of that caused by loss of non-woodland trees (for example street trees, trees on farms and riparian trees).

The recovery of ecosystem services to pre-ash dieback levels will happen faster if more is invested in replanting, the study's authors argue. However, even the best-case scenario suggests that it will take decades, and other issues such as rising deer populations, climate change and other tree diseases could impact on the recovery process.

This is the first attempt globally to estimate the full economic cost of a major tree disease. The shocking results have thrown light on the overlooked nature of trees and suggests that greater investment in improving bio-security measures is easily justifiable. The authors identified a further 47 tree pests and diseases from the UK's plant health risk register with the ability to cause over a billion pounds worth of damage should they become established.

www.woodlandtrust.org.uk

