Society of American Foresters

International Forestry Working Group Newsletter

Working Group B3

In affiliation with the renewal of the International Society of Tropical Foresters

March 2018

Contributed Articles

A Plea for Long-Term Haitian Reforestation Unity

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After living in Haiti as a boy at Foret de Pin in the 1940s and returning to Haiti over the past 10 years working on reforestation activities, I am impressed with the number of people realizing the need for that country's reforestation. Many NGOs, the Haitian government, a few foundations, various foreign countries and even the United Nations have all provided some short-term initiatives to assist in this effort. As most that read this article realize, this type of activity is never-ending as far as a) tree planting, b) tree protection, c) environmental/forest-related education and d) implementing alternative fuels to charcoal being accessible throughout Haiti. I was there when the Haitian Corporation, named le Societe Haitiano-Americaine de Developpement Agricole (SHADA) existed as a partnership between the U. S. and Haiti to develop natural resources—including forests. My father was the forest manager for SHADA and had started to build a sustainable forest industry with the mountainous pine (*Pinus Occidentalis*). The entire effort was stopped short of its long-term plans due to working funds being eliminated due to the U. S. having no more interest, because artificial rubber was invented—thus no need for rubber tree plantations in Haiti!

Over the past decade I have raised funds and done reforestation and school environmental club start-up work in Haiti. I have focused on teaching the children, engaging the schools to become environmentally pro-active and building small tree nurseries (about 10,000 seedlings each). These nurseries (12-14 so far) have been located so distribution and volunteers within a 10-15 mile radius could travel to and from them. Fruit, nut and other trees for near-term financial return, as well as longer-maturing lumber tree seedlings have been planted, with the different species tailored to the local Haitian conditions. A concerted effort has been made to develop a network of collaborating groups to work together on Haiti's reforestation needs. Meetings have been held with the Haitian Ministry of Agriculture, including their chief forester,

the Haitian Centre National de l' Information Geo-Spatiale (to obtain maps), various church groups, such as the Methodist Church of Haiti, the Baptist Mission in Petionville, the Catholic Church, a few Haitian private nursery folks, the Haitian Embassy in Washington, DC, the International Society of Tropical Forestry, the Lambi Fund of Haiti, and many NGOs. I have been in communication with private groups like Trees For The Future, The Clinton Foundation and the "Association des jeunes devoues' pour une Haiti verte et developpee" in Haiti. All of these entities have been and/or are trying to do something positive about Haiti's reforestation needs. A consistency in leadership and available working funds are always a challenge; just like in any other human activity that must be sustained over many decades—even generations.

I am convinced that without a real strong collaborative effort that leads, manages, funds, promotes and performs the Haitian reforestation over many decades and continues as a sustaining, priority international/national Haitian quality-of-life program, that little will be done. It is a shame, because we all know what needs to be done, we have the tools to do it, but just do not have the will to work TOGETHER to make it happen. Why cannot we as a group of interested people begin a communication to evolve a way to pull together and tackle this Haiti reforestation demand as a well understood and well supported effort? Can our many schools of environmental science and forestry take this on as an initiative?

Can the UN Tree Forum focus on doing this versus just talking about the problem? Can the Haitian government provide a stable marshalling point for the collaborative efforts? It will take time, talent, and tithe no doubt. Since all of this is really available will you engage? If so, please contact this International Forestry Working Group and perhaps "plant a seed"!

apion nursery in April 2015

A Brief Overview of the Wood Manufacturing Sector in Kenya

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Kenya's forest product sector is comprised of approximately 450 sawmills, two integrated panel mills that manufacture plywood, particleboard and hardboard, and one pulp and paper mill. The main source of raw material for these mills is state plantation forests, which are managed by the Kenya Forest Service (KFS). However, due to a decline in mature harvestable wood, farmlands and woodlands outside state forests are increasingly becoming a significant source of raw materials for these mills.

Domestic demand for wood products in Kenya (including furniture, paperboard, pulp and paper, and fuelwood) continues to grow due to a rising population and increased demand for housing and commercial buildings. However, an overall wood deficit has prompted manufacturers to seek timber imports primarily from neighboring countries such as Uganda, Tanzania, and the Democratic Republic of Congo to sustain growth of the sector.

To overcome the deficit, current efforts by the government are geared towards sustainably managing the country's forests and developing a plantation-based supply of industrial wood for manufacturers. These efforts are evident in the present supply trend of industrial wood that has stabilized at about 1 million cubic meters over the last five years (**Figure 1**), due to controlled harvesting. The trend is likely to persist for some time; however, improved plantation management is expected to lead to increased wood production over time.

Our research at the Louisiana Forest Products Development Center, a part of Louisiana State University, is focusing on improving innovation in Kenya's wood furniture industry. Downstream manufacturing of value-added products, also referred to as secondary products, increase in value in the supply chain the further that the wood product is from the forest and the closer that it is to the final consumer. Many countries and regions strive to manufacture these kinds of value-added products rather than exporting logs, only to buy finished products from the countries they exported logs to.

The Kenyan furniture sector has been growing rapidly by about 10% annually over the last decade, despite the domestic wood supply deficit. In recent years, an increasing share of domestic furniture consumption is being imported from other countries especially from China, creating significant competition for local producers. This has prompted the government to focus on shifting most of the demand to local producers to protect the sector and retain jobs.

A survey by the Ministry of Industrialization identified a lack of innovation as the main cause of diminishing competitiveness in the sector. Other factors that have led to the low level of competiveness include a lack of modern production technologies, inefficiencies in supply chains, and undeveloped marketing strategies. Based on this, we are conducting market research to address the lack of competiveness of Kenya's furniture industry. Our focus will be to determine innovation that can be used to improve competitiveness of the furniture sector in Kenya with specific emphasis on identifying innovations that can stimulate growth and competiveness. The research follows the framework developed by Barcic *et al.*, (2011) (**Figure 2**). Through this work, we hope to help furniture firms to identify their position in the furniture sector relative to other firms, to craft new strategies to stimulate growth and improve competitiveness, and to create jobs through business growth.

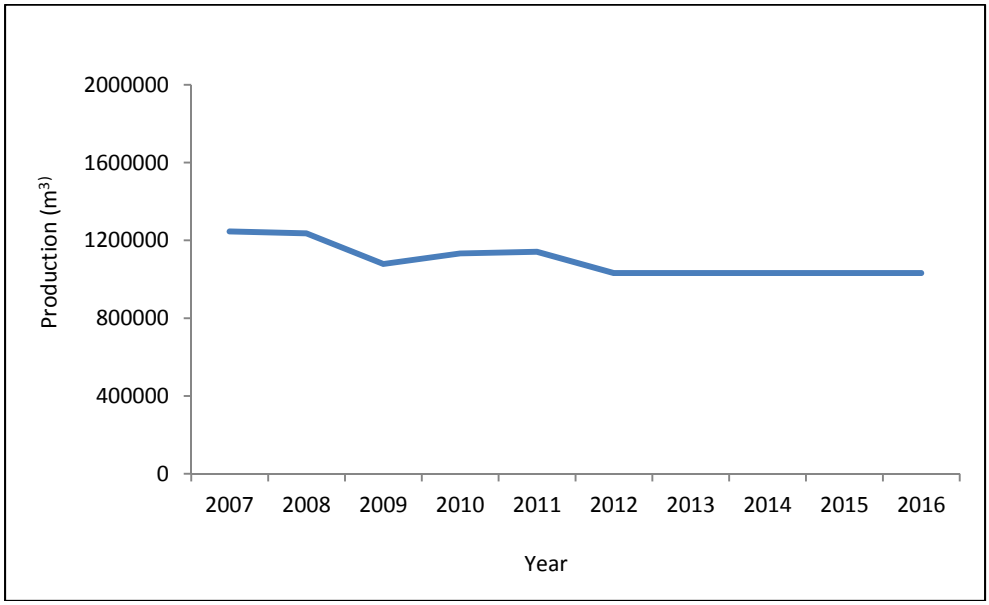

Figure 1: Total industrial roundwood production in Kenya Between 2007 and 2016 (FAOSTAT, 2018)

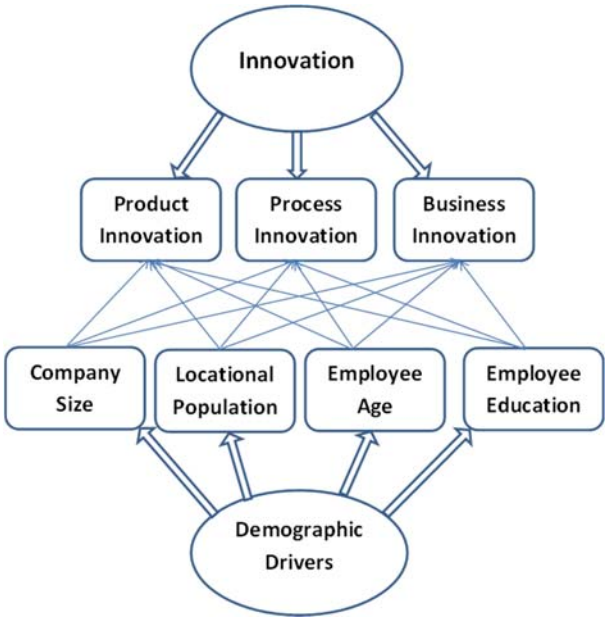

Figure 2. The framework for identifying innovations and relationship between innovation types and demographic drivers. (Source: Barcic *et al.*, 2011)

Reference

Barčić, A.P., Vlosky, R. and Motik, D. 2011. Deconstructing innovation: An exploratory study of the US furniture industry. *Forest Products Journal*, *61*(8), 635-643.

NYABYEYA FORESTRY COLLEGE

Nyabyeya Forestry College is located in Masindi District in Western Uganda 32 km from Masindi town on the Masindi-Butiaba Road. It is approximately 240 km from Kampala, some 72 km off the Kampala-Gulu high way. Nyabyeya Forestry College is situated on the fringes of Budongo tropical high forest indeed in a tropical forest environment which is ideal for tropical forestry research and training. It is the only forestry training college in the country.

The ultimate motto of the college is **"We conserve nature"**

We operate under six Core Values; ***Quality, Transparency, Time management, Integrity, Team work* and *Gender equity*.**

Vision: "To be a Centre of Excellence for Technical education and training in forestry and related natural resources "

Mission: "To produce technical human resource for forestry and related natural resources management"

Nyabyeya Forestry College offers four Diploma and two Certificate programmes as detailed below.

Course	Duration	Entry requirements	Intake dates
Diploma courses			
1. Diploma in Forestry **(Direct Entry)** **2. Diploma in Forestry (Upgrading)**	2 Years 1 Year	One principal Pass and 2 subsidiaries in Biology, Chemistry, Physics, Agriculture, Geography Certificate in Forestry	July-September, annually July-September, annually
3. Diploma in Agroforestry	2 Years	One principal Pass and 2 subsidiaries in Biology, Chemistry, Physics, Agriculture, Geography **OR**, a certificate in Agriculture from a recognized institution.	July-September, annually
4. Diploma in Beekeeping **5. Diploma in Beekeeping (Upgrading)**	2 Years 1 year	One principal Pass and 2 subsidiaries in Biology, Chemistry, Physics, Agriculture, Geography, **OR**, a certificate in Agriculture or Forestry from a recognized institution. Certificate in Beekeeping	July-September, annually July-September, annually
6. Diploma in Biomass Energy Technologies	2 Years	One principal Pass and 2 subsidiaries in Physics, Chemistry and Mathematics, **OR** a certificate in a relevant Engineering field from a recognized technical institution	July-September, annually
Certificate courses			
1. Certificate in Forestry	2 Years	Six passes at O level in Biology, Chemistry, Maths, English, Physics, Agriculture, Geography	January-March, Annually
2. Certificate in Beekeeping	2 Years	Six passes at O level in Biology, Chemistry, Maths, English, Physics, Agriculture, Geography	January-March, Annually

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10 Steps when Choosing a Forest Management System

Foresters face an array of questions when determining how to select a forest management system. How does one combine productivity and profitability with sustainability in Forest Management? How does one analyze in an agile, structured and safe way the technological, economic, social and environmental aspects in decision making? How does one plan and control operations and resource use, considering all the variables that impact on the forest process? How does one deploy the strategic planning goals in operational actions, within each forest process? How does one achieve cost goals? How does one simulate productivity and cost of operations before execution? How to analyze the impacts within the entire forest chain? How does one analyze the accomplished activities and explain deviations? A recent online article from INFLOR breaks the process into 10 steps: Supply, ROI, specific functionalities, integration, automation, consistency, GIS, mobile devices, a friendly interface, and after sales.

For the full article see: https://www.inflor.com.br/en/10-steps-to-choose-a-forest-management-system/

Contributed by Guilherme Brunoro

Whole Forest and the context for scaling the model

Garrett Siegers, garrettsiegers@wholeforest.com

Climate change and Whole Forest's opportunity: The global community is in a race to make the transition to a low carbon economy that can support a livable climate for this generation and future generations. National and international governments have a critically important role in setting the policy framework for this transition and in curbing the most damaging sources of emissions. In December, 2015, 195 nations entered the Paris Agreement, each nation making concrete pledges of actions they will take to attempt to stabilize the global climate below a 2 degree C increase in average temperature. Meeting this ambitious goal requires deep reforms in many industrial supply chains that are the source of greenhouse gas emissions.

Two industries where innovation and a transition to low carbon economy are well underway are clean tech energy and green construction. Tropical forests present an additional large business opportunity to mitigate climate change emissions. Tropical forests contain over 250 gigatons of potential CO2 emissions in their biomass and soils. Present rates of tropical deforestation are releasing roughly 15% of annual global carbon emissions, equal to the emissions from all cars, trucks, buses, trains, and airplanes. The existing projections are that the majority of this carbon will be released by road building, exploitative logging, and agricultural expansion. It is widely understood that we cannot emit that 250 gigatons without going way beyond 2 degrees centigrade increase in global temperature. The UN hope was that carbon markets would emerge to subsidize tropical forest conservation, but a viable market is still not on the horizon.

Figure 1. Whole Forest lead forest engineer, Darwin Rosero (right), working with local community forester, Robert Quezada (left), taking readings from forest study parcel, 2017.

Green construction context: Whole Forest's business model is based marketing hardwood products to green construction projects, and on providing them with a strong sustainability benefit that they currently do not have – the ability to purchase wood products that lower their climate change impact. Commercial and residential buildings are the source of 40% of total US carbon emissions. These emissions stem not only from the energy used by the buildings, but also from the life cycle emissions associated with the building materials used in their construction. Sustainable construction is a rapidly emerging international trend that currently has 18% market share in the US, and is estimated to continue growing at 13% annually through 2020.

A growing percentage of architects, developers, and contractors are seeking to gain green certification for their projects by LEED, Living Building Challenge, and other certification programs. Their motivation is to lower operating costs of buildings, to meet increasingly strict environmental regulations, and to satisfy their clients desire to build more sustainable structures that can contribute to mitigating climate change. Construction projects can gain a large carbon emission reduction by purchasing hardwood products sourced from forests that are actively being conserved to avoid deforestation.

Thus Whole Forest sees a large business and conservation opportunity to connect community forests to green construction projects. A steady market for hardwood products provides forest communities a powerful incentive to conserve their forests. Green construction projects can dramatically reduce their carbon emissions through these purchases. In the absence of viable carbon markets, this virtuous market can become a critical new strategy for reducing deforestation and meeting the 2 degree C climate change target.

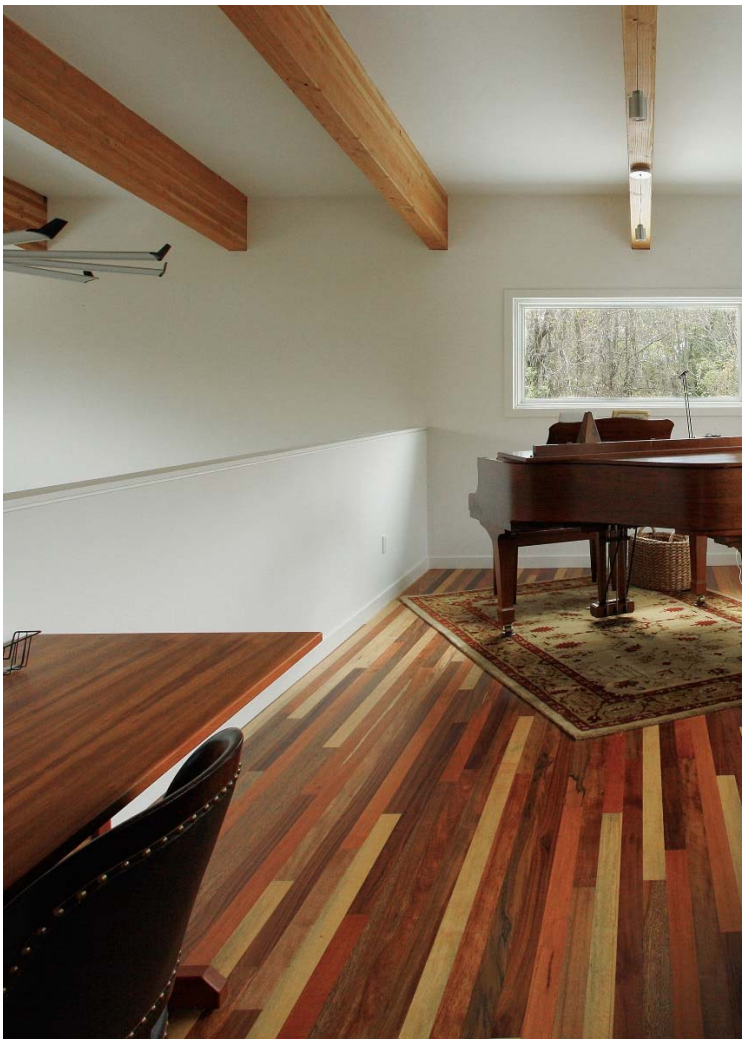

Figure 2. Whole Forest mixed species carbon negative flooring, 2017.

Community impact context: Whole Forest operates in zones where forests are disappearing because agriculture appears to offer greater opportunities than forests do for raising family income in forest communities. Many studies show that 90% of tropical deforestation in Latin America is the result of clearing forests for agricultural expansion. In the best agricultural sites, it is difficult for forests to compete economically with agriculture. However, a large proportion of deforestation occurs in areas with marginal soils and steep terrain, where agriculture is not well adapted, and does not produce good returns on labor.

This is the case where Whole Forest operates. Families settled in a heavily forested landscape after a land reform. There was no viable way to make a living from the native rainforest, so they started clearing their forests to establish cattle pasture and plantations of cacao, and coffee. Unfortunately, the hilly, shallow soil conditions resulted in chronically poor agricultural yields. The end result is progressive loss of the rainforest and families who are struggling with marginal farming to meet their basic needs for food, education, and health care. Our conclusion is that in many forest regions that are poorly suited for agriculture, conserving a healthy forest ecosystem not only preserves carbon and biodiversity, but also can support a rapidly growing forestry and forest products economy that can dramatically improve economic conditions for forest communities.

On a local scale, Whole Forest is producing this outcome - a forestry based economy that improves economic conditions. In 2017, the business generated close to $1,000,000 in community benefits from local salaries, raw material purchases, and providing local services to the company. Total income to the surrounding community in Whole Forest's 60,000 hectare area of influence over the past 10 years is near $8,000,000, benefiting 400 families.

Whole Forest's intervention has had a profound impact on the local conditions. It has taken people out of forest exploitation and given them formal employment for the first time. Income from the business has pulled families out of poverty giving them the means to cover the costs of basic needs. In many cases, community members have built new houses, paid for their children's education, and been able to afford basic health care.

In short, Whole Forest has shifted behavior away from forest exploitation and conversion for agriculture while generating economic development.

Historical context: From colonial settlement to the early 1,900's, 95% of the US hardwood forests east of the Mississippi River were logged, burned, and cleared for agriculture – a preview of what is happening now in tropical forests. Starting in 1900, the US launched a conservation agenda based on building a network of National Forests, implementing R&D and education in sustainable forestry practices, and creating a forest product industry that connects forests to construction and paper markets. Now most states east of the prairies are heavily forested, and their forest products industry is a major rural employer, in many states larger than agriculture.

Whole Forest is adapting this US conservation and forest product model to the tropical forest context, with one exception. We are building a forest products economy before the original forest is lost, and we are leveraging this economy to provide a strong economic incentive for communities to conserve their forests.

Scaling the Whole Forest model: The potential market for offsetting the construction energy of green buildings is much, much larger that Whole Forest can address, no matter how rapidly we grow. Based on preliminary analysis, Whole Forest can offset 100% of the construction energy associated with building an average sized American house with wood harvested from one hectare of threatened forest. If we manage 20,000 hectares, we can provide offsets for 20,000 new houses (by providing their hardwood flooring). In the next three to four years, Whole Forest

plans to engage at least two additional community groups, bringing another 50,000 to 100,000 hectares under conservation management. However, that growth in our manufacturing output will not put a dent into the global construction market's need to reduce their carbon footprint.

Consequently, our strategy to scale the adoption of this new supply chain that links green construction and tropical community forestry is based on promoting new entrants into this new market opportunity. So our strategy includes:

- Achieve rapid growth of our business/conservation model over the next three years.
- In three years, establish a new business line in publicizing the business opportunity of connecting green construction markets with community forestry wood products. Start providing consulting to forestry and wood product companies and community forestry associations that want to enter this supply chain.
- Promote this idea broadly to the green construction organizations, forest product companies, REDD+ organizations, climate change organizations, and bilateral and multilateral funders and development agencies.
- Partner with organizations like Rainforest Alliance and Scientific Certification Systems to develop a new REDD+ forest products certification program that focuses on how to make this a viable opportunity for forest communities.
- Work with the green building certification programs (LEED, Living Building Challenge, WELL, etc. to integrate REDD+ wood products into their credit programs.

An example of a Reforest the Tropics forest.
Hiner Ramirez's RTT Farm Forest in Guacimo, Costa Rica

Reforest the Tropics (RTT) uses new forest designs. In the photo below, the right-hand lane of trees is formed of the tall, fast-growing Deglupta hybrid, widely spaced to allow the development of this crowns. We can to begin harvesting these trees in a light thinning for farmer income at age 7.

In between, in the same lane are shade-tolerant Klinkii trees destined to be the main storage units in our 100-year storage goal. We have been testing this species for 50 years.

In the left-hand lane are trees that produce fine hardwoods such Cedar, Mahogany and Ocora. These are mainly for mid-term harvests in the 2nd and subsequent contracts, the management of which has still to be worked out.

U. S. emitters sponsor forests. 3 U.S. emitters donated the funds to sponsor these forests in exchange for the verified carbon offsets in the first 25-year contract of this forest. Sequestration at 25 years is expected to be 500 metric tonnes of CO2 stored *permanently* in this forest.

The initial one-time donation is $7,500/ hectare (2.5 acres) of which the farmer receives a substantial grant to defray part of the establishment costs. Intensive technical assistance is provided by RTT's foresters in Costa Rica.

Aside from the initial grants, the **farmer's income** from hosting this forest comes from the periodic thinnings every 5 years, starting around age 5-7. These 15-18% thinnings provide logs for him to sell and stimulate the growth of the best trees by using a system of positive selection. Replanting with shade-tolerant species under the forest after each thinning will maintain the stocking.

RTT's goal of **100-years storage** in the live stand implies careful measurements and planning, balancing the extractions with an ever-increasing amount of stored CO2 in the forest. During a second 25-year contract, the measured CO2-offsets may be sold at close to market value to U.S or Costa Rican buyers to balance their emissions.

Our storage goals are from 1,000 to 2,000 MT CO2 equivalent/hectare in 50 years, possibly more in 100 years. Earlier research projects have already sequestered over 2,000 MT CO2/ha.

By using mixed-species this model for a **permanent farm forest** also increases the **sustainability and stability of the stand** against damage from disease or insects. With a mixture or 5-6 species, it is likely that the stand will survive with its CO2e intact.

Reports All RTT forests are measured annually and the sequestration data sent to its sponsors. Measurements occur during the first 3 months of each year. This data is also used in schools as part of our teaching activities.

For more information or to participate, contact Dr. Herster Barres in the offices of Reforest the Tropics, a U.S. non-profit, in Mystic, CT tel 860-912-7706 or hbarres@reforestthetropics.org. Or contact Greg Powell, RTT Director, tel 860-572-8199.

CENTER FOR PROTECTED AREA MANAGEMENT
COLORADO STATE UNIVERSITY

2018 Short Course Guide / *Guía de Cursos Cortos 2018*

XXVIII Curso Internacional de Manejo de Áreas Protegidas (dado en español)

3 de julio al 4 de agosto, 2018

. Ofrecido en colaboración con la Oficina de Programas Internacionales del Servicio Forestal de los Estados Unidos, este curso se centra en los desafíos involucrados en la planificación y gestión de áreas protegidas. Enseñado totalmente en español, el curso de 32 días combina clases, ejercicios en grupo y viajes al campo a áreas protegidas de diferentes categorías, tipos de usos y desafíos de gestión en Colorado y Utah. Temas cubiertos incluyen planificación y gestión de sistemas de áreas protegidas; corredores de conservación y zonas de amortiguamiento; manejo de recursos naturales; mitigación de impactos de proyectos de desarrollo; financiamiento de la conservación; gobernanza, colaboración y resolución de conflictos; interpretación ambiental; turismo y recreación; investigación, monitoreo y evaluación; cambio climático; y liderazgo personal y profesional. Para más información y para el link para postularse visite http://conservation.warnercnr.colostate.edu/. El costo, excluyendo pasajes y visas, es $6,395. La fecha límite para postularse es el 2 de febrero de 2018

VIth Mobile Seminar on Tourism in Protected Areas (given in English)

September 6-22, 2018

The Mobile Seminar on Planning and Managing Tourism in Protected Areas is an intensive, 2.5-week field-based training event for professionals working to promote sustainable tourism and outdoor recreation in protected areas globally. It is given in partnership with the US Forest Service International Programs. Seminar themes

include planning and zoning for public use and tourism in protected areas; legal, financial and policy frameworks; institutional arrangements and governance including public-private partnerships; interpretation and environmental education; and tourism infrastructure. The seminar travels through Colorado, Wyoming, Montana and South Dakota and makes visits to national parks, forests, monuments, state and local parks, a guest ranch, and a tribal reservation. The seminar visits Yellowstone, Grand Teton, Badlands and Rocky Mountain national parks, Black Hills National Forest; Devils Tower National Monument and Mount Rushmore National Memorial. Cost excluding airfare and visas is $5,395. To apply and for more information visit http://conservation.warnercnr.colostate.edu/. Deadline to apply is May 11, 2018.

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https://www.facebook.com/centerforprotectedareamanagement/

TROPICAL DRY FOREST RESTORATION INTERNSHIPS WITH THE AZUERO EARTH PROJECT, PANAMA

The Azuero Earth Project (www.azueroearthproject.org) invites students interested in tropical forestry and habitat restoration to form part of our tropical dry forest restoration field crew on the Azuero peninsula of Panama from May-August 2018. Crewmembers will participate in tree nursery management, interaction with landowners, establishing reforestation plots, reforestation and restoration fieldwork, and coordination with volunteers and collaborating institutions. For more information or to apply, please write to Ruth at ruth@proecoazuero.org.

Communicating Risks in Decision Support Systems - Conference

The Conference "Communicating Risks in Decision Support Systems: from basic research to advanced decision support tools" will take place in Solsona and Barcelona, Spain, June 6-8, 2018. More information, program and registration forms are available at:
http://suforun.ctfc.cat/june-2018-conference-solsona-and-barcelona-spain/

Applications for the 2018 Gregory Award

SAF is excited to begin accepting applications for the 2018 Gregory Award. The Gregory Award seeks to mark the achievements of Bob and Ann Gregory and further their interest in international relations by providing economic assistance to outstanding students or professionals from outside of the US and Canada to attend the SAF Convention and have meaningful engagement with foresters on the North American continent.

This year's convention will take place in Portland, Oregon on October 3-7, 2018. The award includes complimentary registration and $2,000 (US dollars) that may be utilized for travel, lodging, and tickets to SAF convention events or technical field tours. SAF will work with successful applicants to allocate the funds in the most useful manner.

Please help us spread the word about this exciting opportunity. The deadline to apply is **May 7, 2018**.

For information and details on how to apply, click here. Please contact Danielle Watson (watsond@safnet.org) with questions.

The application form is also attached to the last page of this newsletter.

Join an SAF Working Group

** Especially Because SAF Has Edited the Working Group Lists **

This newsletter goes out to people beyond SAF members, but if you are on the working group list you receive this newsletter. When SAF updated their website the membership list was reduced to 28 members. Your editor was surprised to find he wasn't on the list of IFWG members, so he had to sign up again.

As a member of the Society of American Foresters you can join SAF working groups by going to the website:

Join a working group here:

If you want to join, or rejoin, this working group, we are B3, the International Forestry Working Group. Please pass this information along to SAF members who might be interested in joining a working group – especially B3, the International Forestry Working Group.

From the archives:

Logging operations circa 1900. Myanmar/Burma.
https://horsenetwork.com/2016/10/in-the-company-of-elephants/

Reactivation of the International Society of Tropical Foresters

The ISTF Transition Team

The reactivation of the International Society of Tropical Foresters (ISTF) progressing. Founded in the 1950s and "in response to a worldwide concern for the fate of tropical and subtropical forests, ISTF is committed to the protection, wise management and rational use of the world's tropical forests". At its height in the 1990s, it had over 2000 members in over 110 countries. The organization went dormant in 2012 due to funding problems. We are looking again for that funding, but because we feel that ISTF has a role in addressing current tropical forest problems, we are proceeding with reactivation. As of January 2018, the new ISTF now has over 430 members from around the world and continues to grow. With its focus on being a communication network, ISTF is open to all those interested in tropical forests and forestry. ISTF must cooperate with like-minded organizations to have maximum impact on tropical forestry issues. Thus we are exploring how to collaborate with the Commonwealth Forestry Association.

Remainders of the old ISTF include 1) Blair Orr's continuation of the former ISTF newsletter as a newsletter for the Society of American Foresters International Forestry Working Group (http://www.orrforest.net/saf/), 2) The old ISTF web page, (http://www.istf-bethesda.org/), 3) The ISTF facebook group page (https://www.facebook.com/groups/2262122534/); and 2 students chapters: 4) at Yale University, which sponsors the annual Yale ISTF conference (http://istf.yale.edu/ , https://www.facebook.com/yalefesistf/); and 5) at North Carolina State University (https://research.cnr.ncsu.edu/sites/istf/ , https://www.facebook.com/NCSUISTF/)

We have gathered input for the renewed ISTF in several sessions: at the 2017 Convention of the International Union of Forest Research Organizations in Freiburg, the 2017 Annual Convention of the Society of American Foresters, and the ISTF-Yale 2018 student chapter conference. Outcome of these meetings emphasized building ISTF into a real two-way communication network: TO the forester in the field, and BACK to policymakers, agencies, and academics. We hope this will yield better access in the field to up-to-date information on best forestry practices, and more concrete information to improve project design and research relevance. Students who participated in sessions especially want to see results on the ground from ISTF. Many people have also expressed a strong interest in forming local ISTF chapters, which had been part of the old ISTF. At ISTF-Yale 2018, workshop participants provided valuable input on the ISTF organizing documents.

Schedule. The schedule for ISTF reactivation is as follows:
April 15, 2018 The ISTF Reformulation Committee aims to the ISTF organizing documents out to the IST membership for comment. The documents include: 1) Parent ISTF mission, vision, objectives activities, 2) Parent ISTF bylaws, 3) ISTF Chapter guidelines, and 4) ISTF strategy for web-based presence and communications. We aim for elections this October for the reactivated parent ISTF.
May 15, 2018. Membership return comments to Reformulation Committee

August, 2018. Membership vote on ISTF organizing documents, Nominations made for ISTF Board
October 2018. Elections for ISTF Board
January 2019. Elected ISTF Officers assume positions

Become an ISTF member. With its focus on being a communication/education/dissemination/collaborative network, ISTF can help you connect with others interested in tropical forests and forestry. To join ISTF, send a message to tropicalforesters@gmail.com.

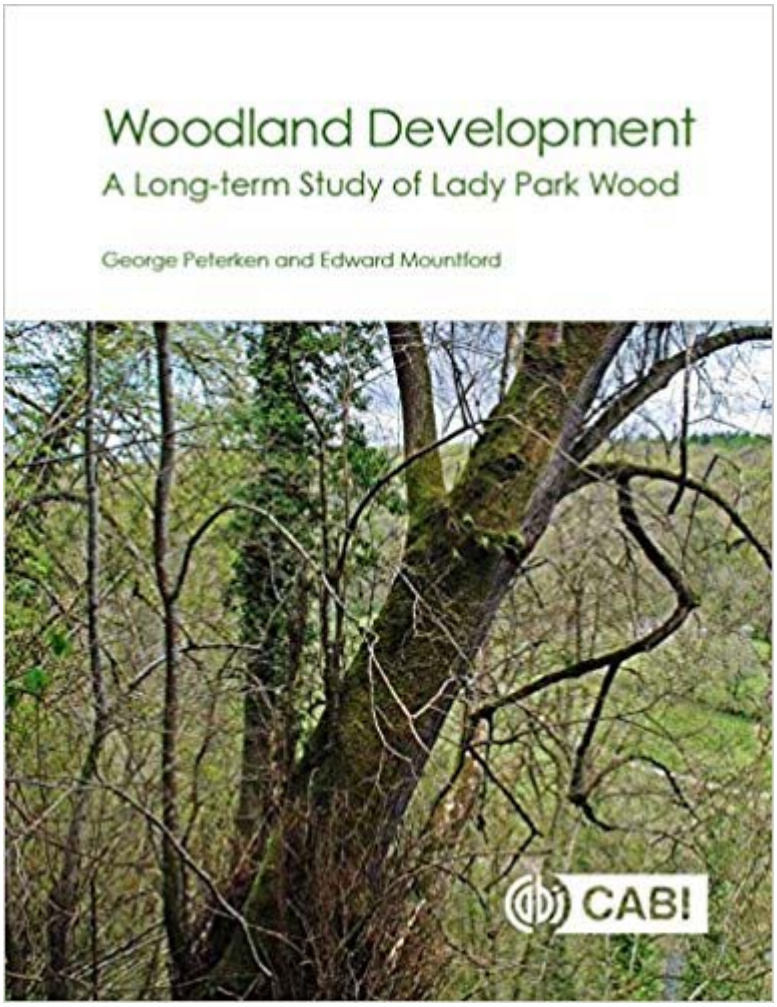
Form an ISTF Chapter. Many have expressed interest in forming local chapters of the International Society of Tropical Foresters organization. The vision behind the International Society of Tropical Foresters is as a central secretariat with a network of chapters around the world, identified by institution, community, country, or region. These chapters are essential to ISTF, and will be vibrant foci of activity, and sources and recipients of the information conveyed through the ISTF network. If you are interested in creating a local ISTF chapter, please complete this survey. Participants in the survey will be given additional information on next steps for chapter organizing and provided with draft chapter guidelines. The ISTF Transition Team will also use these responses to indicate interest in creating a new ISTF global network when we apply for funding for ISTF. We look forward to communicating with you about your prospective chapters. We hope that through this process, interested groups will prepare chapter proposals to deliver to the ISTF central board when it is in place next year.

Invitation to help us with ISTF. We are especially looking for help in writing proposals and finding funding. If you are interested in helping in this or other ways, please send a message to tropicalforesters@gmail.com

ISTF-Yale 2018. The ISTF-Yale annual conference from the surviving chapter at Yale draws an international audience, with over 150 people participating in 2018. This year's theme was "Attending to Socio-ecological Complexity in Tropical Forest Landscapes". Keynote speakers, flash talks, and breakout sessions covered topics ranging from applying insights from landscape ecology to the complexities of human-modified tropical forests, to examining decision-making complexities in the oil palm industry using network analysis. This year's innovation first prize went to a community group in the Philippines and their researcher partners who are using traditional honey hunting to promote forest conservation. For more on the conference see https://istf.yale.edu/2018-conference, https://yaledailynews.com/blog/2018/02/05/conference-explores-complexities-in-forestry/ https://yibsfieldnotes.atavist.com/istf-2018, or https://environment.yale.edu/news/article/annual-tropical-foresters-conference-at-yale-tackles-socioecological-complexity/

Book Review

Peterken, G.F. and Mountford, E.P. (2017). *Woodland development: a long term study of Lady Park Wood.* CAB International, Wallingord, UK. 286pp.



Jeff Wright, *DPhil. Oxon*
2 February 2018

This is a well written and illustrated book that will be invaluable to those interested in long term studies of natural forests in the temperate zone and to those that should have ambitions to establish similar areas in the tropics and sub-tropics. Lady Park Wood, along the Wye River on the border of England and Wales, was formally inventoried in 1944 though the authors cite sources and documents dating back to the 1200s. Other than fencing to keep out fallow deer the wood has been left to nature. Various individuals, groups and researchers have collected data, reported on their analysis and the authors have summarized many of these. Beyond the scope of most refereed journal articles, numerous first person accounts (oral history) are included. The

References in the book give ample opportunity to review in scientific reporting format the published research results but they in no way can give you the “feel for the Wood” that authors Peterken and Mountford have achieved.

Protected forests are numerous but long term studies of forest ecosystems are rare. Long term studies on natural forests such as Lady Park Wood are important if for no other reason that there are surprisingly so few of them. The authors conclude, correctly, that success in long term studies is more dependent on individuals rather than on institutions.

The first measurements on tree species and biometrical measurements are now accompanied by research on carbon sequestration, ground flora, dead wood, mammals including bats, lichens, and ferns, amongst others. Continuing the current management of Lady Park Wood will allow ecological concepts far distant from the inception in 1944 or this reviewer’s ideas in 2018 to be researched and reported on in the coming years and decades.

This book would suggest that other long term studies in forest ecosystems be written and published as a review work of similar style. For those with interest in temperate but especially in tropical and sub-tropical forest ecosystem management the reviewer suggests a thorough reading of Box 14.1, pgs. 235-236 which give a practical explanation of how to go about long term studies. The authors began their work at Lady Park Wood in the early 1980s. Their vision and experience would be critical to individuals and institutions wanting to achieve something similar from their natural forests which in the opinion of this reviewer is sorely needed.

Forest legislation in Columbia

Abstract: Tropical forest of the world is home of several species of flora and fauna and it serves as a source of income for thousands of people. To maintain the current forest covers is a complex endeavor, there is a wide variety of ecosystems that compete with other land uses, there is also large volumes of tropical timber sold in the market that serve to reduce poverty, and a large number of forest dwellers pursuing different benefits from the forest. The objective of this study was to understand stakeholders´ values about Colombian forest legislation and its implications for legal timber trade. Participants of this study represented stakeholders from the three forest regions that produce 71% of the total timber from natural stands. By using Q methodology, a technique that combines qualitative and quantitative methods to systematically study subjectivity, four distinct perspectives were found. These perspectives show the complexity to enforce the law because this does not include regional particularities, there are high levels of bureaucracy as a product of the previous factor; there is also a lack of quality in the forest management plans and government transparency. Although the management of natural resources of Colombia is decentralized, forest legislation is part of a comprehensive national legal system that does not consider the wide variety of forest types that require different forestry practices and serve several social needs. This implies that effective compliance with forest law rests on a devolution of the legislation that could include particularities of each forest productive region.

Rodríguez-Piñeros Sandra, Martínez-Cortés Oscar, Villarraga-Flórez Liz, Ruíz-Díaz Alejandra, 2018. Timber market actors' values on forest legislation: A case study from Columbia. Forest Policy and Economics. 88: 1-10.

CBFM in the Philippines.

Abstract: This research was conducted in Cienda, Gabas and San Vicente, Kilim, Baybay City, Leyte. This study draws on the effectiveness of the Community-Based Forest Management (CBFM) program on the aforementioned communities through Cienda-San Vicente Farmers Association (CSVFA) as the CBFM holder. The assessment was based on the CBFM program's main principle, "people first and sustainable forestry will follow". Moreover, an interview schedule was used in collecting primary data. During the survey, the sampling method used was the combination of Slovin's formula and Finite Population Correction (FPC), wherein 41 respondents were interviewed from the CSVFA members and 50 respondents from the non-members.

All the data were encoded and results were analyzed using the Statistical Packages for Social Studies (SPSS). Moreover, independent samples t-test was used to compare the means of the two variables. However, other results of the data were simplified in a descriptive statistical analysis such as those data with no significant relationship between the two variables.

Generally, it was noted that the effectiveness of the CBFM in the two communities was affected by various pillars which include the a) CSVFA and its b) tenurial instrument which is the CBFM agreement as the foundation of the program; c) innovation of natural resources and income-generating activities which serves as its wealth; and lastly, the d) governance which is responsible for the distribution of responsibilities and decision-making process.

Compendio , Serica Joy M. and Marlito M. Bande. 2017. Effectiveness of Community-based Forest Management Program as a Strategy on Forest Restoration in Cienda and San-Vicente, Baybay City, Leyte, Philippines. Asian Journal of Agricultural Extension, Economics & Sociology 15(4):1-20.
http://www.sciencedomain.org/abstract/18328.

Landsat Data and Tree Species Diversity

Abstract: The diversity of forest trees as an indicator of ecosystem health can be assessed using the spectral characteristics of plant communities through remote sensing data. The objectives of this study were to investigate alpha and beta tree diversity using Landsat data for six dates in the Gönen dam watershed of Turkey. We used richness and the Shannon and Simpson diversity indices to calculate tree alpha diversity. We also represented the relationship between beta diversity and remotely sensed data using species composition similarity and spectral distance similarity of sampling plots via quantile regression. A total of 99 sampling units, each 20 m × 20 m, were selected using geographically stratified random sampling method. Within each plot, the tree species were identified, and all of the trees with a diameter at breast height

(dbh) larger than 7 cm were measured. Presence/absence and abundance data (tree species number and tree species basal area) of tree species were used to determine the relationship between richness and the Shannon and Simpson diversity indices, which were computed with ground field data, and spectral variables derived (2 × 2 pixels and 3 × 3 pixels) from Landsat 8 OLI data. The Shannon-Weiner index had the highest correlation. For all six dates, NDVI (normalized difference vegetation index) was the spectral variable most strongly correlated with the Shannon index and the tree diversity variables. The Ratio of green to red (VI) was the spectral variable least correlated with the tree diversity variables and the Shannon basal area. In both beta diversity curves, the slope of the OLS regression was low, while in the upper quantile, it was approximately twice the lower quantiles. The Jaccard index is closed to one with little difference in both two beta diversity approaches. This result is due to increasing the similarity between the sampling plots when they are located close to each other. The intercept differences between two investigated beta diversity were strongly related to the development stage of a number of sampling plots in the tree species basal area method. To obtain beta diversity, the tree basal area method indicates better result than the tree species number method at representing similarity of regions which are located close together. In conclusion, NDVI is helpful for estimating the alpha diversity of trees over large areas when the vegetation is at the maximum growing season. Beta diversity could be obtained with the spectral heterogeneity of Landsat data. Future tree diversity studies using remote sensing data should select data sets when vegetation is at the maximum growing season. Also, forest tree diversity investigations can be identified by using higher-resolution remote sensing data such as ESA Sentinel 2 data which is freely available since June 2015.

Arekhi, M., Yılmaz, O.Y., Yılmaz, H. et al. Environ Monit Assess (2017) Can tree species diversity be assessed with Landsat data in a temperate forest? 189: 586. https://doi.org/10.1007/s10661-017-6295-6

Tertiary Education and Sustainable Development in the DRC.

Abstract: This paper presents a case study to stimulate debate and action concerning the lack of capacity to plan and manage development sustainably in the Équateur province of the Democratic Republic of the Congo (DRC). The case study examines environmental literacy of higher education students enrolled in programs focused on rural sustainable development in the context of human resource needs to effectively implement complex sustainable development programs financed through international climate change initiatives. Written surveys of students and teachers and semi structured interviews with key informants in a higher institute of education's administration revealed low comprehension of key environmental issues in the region (climate change, deforestation impacts), low French literacy, and limited access to teaching and learning materials as well as the Internet. Overall, this case study illustrates those immediate interventions which are needed to avert a current crisis in the ability of the DRC to scale up planned sustainable development programs. Curriculum revisions and improved access to current information and training methods are especially needed in order to create a foundation for sustainable development within the country.

McNamara E.A., Kermarc M., Mandea J.Z., Bush G. (2018) Tertiary Education Knowledge and Standards in Sustainable Development: A Crisis for the Democratic Republic of the Congo. In: Azeiteiro U., Leal Filho W., Aires L. (eds) Climate Literacy and Innovations in Climate Change Education. Climate Change Management. Springer, Cham.
https://link.springer.com/chapter/10.1007/978-3-319-70199-8_6

Evapotranspiration Equation Validation.

Abstract: Numerous daily reference evapotranspiration (ETo) equations were developed for different climatic conditions with different performance even within the same climatic region. Their calibration and validation to the local climate usually increase their performance. The objective of this study was to evaluate Valiantzas' daily grass ETo equation with comparison to Penman-Monteith equation at 61 weather stations across 10 countries in Africa for the period of 1980-2012. The results showed good performance of Valiantzas' ETo equation with very low RMSE varying from 0.03 to 0.27 mm/day, low percent error PE from 0.87 to 5.46%, MBE from -0.09 to 0.23 mm/day and MAE from 0.03 to 0.23 mm/day. For the pooled data set, RMSE averaged 0.10 mm/day, mean PE was 1.95%, mean MBE was 0.02 mm/day and the mean MAE was 0.08 mm/day. These indexes indicated the very high performance of the Valiantzas' ETo equation compared to the Penman-Monteith equation and its adaptation to very broad conditions from humid to semiarid climates.

Djaman K., Koudahe K., Allen S., O'Neill M. and Irmak S. 2017. Validation of Valiantzas' Reference Evapotranspiration Equation under Different Climatic Conditions. *Irrigation & Drainage Systems Engineering*. Vol 6:3. doi: 10.4172/2168-9768.1000196

For the full article:
https://www.researchgate.net/publication/321777566_Validation_of_Valiantzas%27_Reference_Evapotranspiration_Equation_under_Different_Climatic_Conditions

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A Teak Growth Model for Gujarat State, India.

Abstract: *Tectona grandis* (teak) is one of the most important tropical timber species occurring naturally in India. In India, teak is the single most important commercial timber species. Scientifically sound growth models, based on advanced modelling techniques, are often not available, although they are necessary for the successful management of teak stands in the country. Long-term forest planning requires mathematical models. In this paper, an attempt is made to develop a dynamic growth model based on the limited data, consisting of three annual measurements, collected from 15 teak sample plots in Gujarat state of India. A biologically consistent whole-stand growth model is presented, which uses the state-space approach for modelling rates of change of dominant height, stand density and stand basal area. A simple model containing few free parameters performed well and is particularly well suited to situations where available data are scarce.

Vindhya Prasad Tewari & Bilas Singh (2018) A first-approximation simple dynamic growth model for forest teak plantations in Gujarat State of India. Southern Forests: a Journal of Forest Science, 80(1): 59-65.

The article is available at: https://doi.org/10.2989/20702620.2016.1277644, alternatively interested may send request for the article to the author at vptewari@yahoo.com, tewarivp@gmail.com

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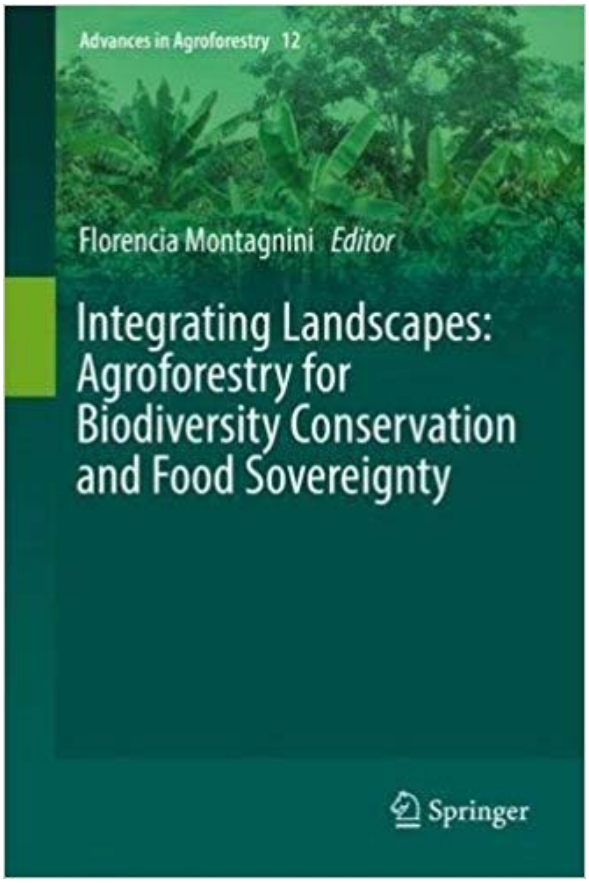


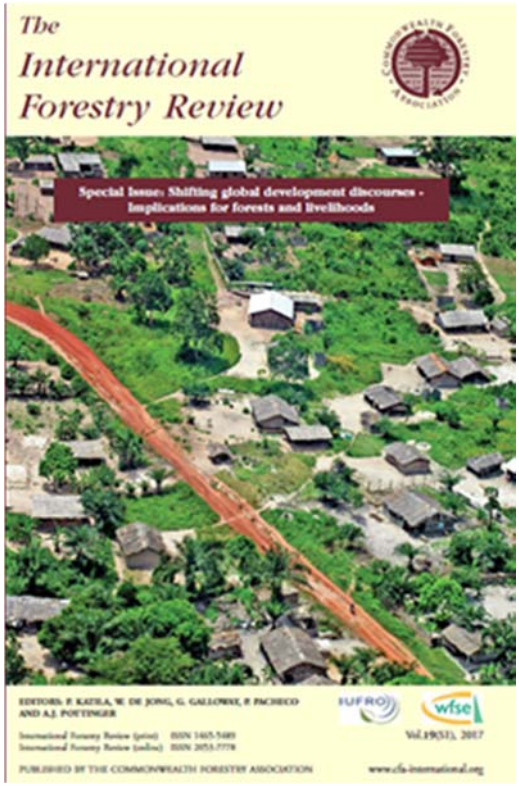
Agroforestry systems (AFS) are becoming increasingly relevant worldwide as society has come to recognize their multiple roles and services: biodiversity conservation, carbon sequestration, adaptation and mitigation of climate change, restoration of degraded ecosystems, and tools for rural development. This book summarizes advances in agroforestry research and practice and raises questions as to the effectiveness of AFS to solve the development and environmental challenges the world presents us today. Currently AFS are considered to be a land use that can achieve a compromise among productive and environmental functions. Apparently, AFS can play a significant role in rural development even in the most challenging socioeconomic and ecological conditions, but still there is a lot of work to do to reach these goals.

Montagnini, F. (Ed.) 2017. Integrating landscapes: Agroforestry for biodiversity conservation and food sovereignty. Advances in Agroforestry Series 12, Springer, Cham, 501 pp.

New IUFRO Special Issue: Shifting global development discourses - Implications for forests and livelihoods

The Special Issue focuses on forest development discourses while taking into consideration broader development, climate change and conservation discourses. It brings together 12 articles and an Editorial. The papers place special attention on the drivers that lead to the emergence of the forest discourses and how they are reflected in forest policy, administration, management and forest development support.

The Special Issue confirms that forest development discourses are diverse, changing, and allow for the exploration of new options and opportunities for forest development initiatives. Each of the forest development discourses have clear linkages with major societal and environmental issues and thus with higher level meta- or even macro-discourses. The articles provide rich insights into current forest development thinking, and also into how this thinking is transmitted and shared. The articles also offer some glimpses into how contemporary forest development discourses influence what multiple actors do to regulate, administer and implement forest development.



This Special Issue in the International Forestry Review was developed by the IUFRO Special Project World Forests, Society and Environment IUFRO WFSE (https://www.iufro.org/science/special/wfse/)

The articles of the Special Issue are available at:
https://www.iufro.org/science/special/wfse/shifting-global-development-discourses/

TROPICAL NOTES:
Recent findings of ecology or management of forest and fauna that tropical foresters should understand

Isabel Mariana Fernandez, Frank H. Wadsworth and Library Staff
International Institute of Tropical Forestry
USDA Forest Service
San Juan, Puerto Rico

Elephant dependence

The tropical tree balanites (*B wilsoniana* (Zygophyllaceae) depends on elephants for seed dispersal. Non-dispersed seeds germinate only 3%. Elephants are reliable at visiting fruiting trees, (46%), ingesting available fruits (55%) and dispersing the fruit crop (26%). Elephant gut passage is expected to increase germination by 60%. The actions of elephants greatly increase seedling establishment and move a large proportion of seeds.

Although elephants are not essential for B. wilsoniana their actions greatly increase seedling establishment and moves a large proportion of seeds. This high degree of effectiveness, together with very low non-dispersed seed survival, provides strong evidence that B. wilsoniana is dependent on elephants for long-term persistence.

E. P. Cochrane The need to be eaten: Balanites wilsoniana with and without elephant seed dispersal [Journal of Tropical Ecology 19/5 2003

Owl attracted by altitude and forest in Ecuador

Habitats of 11 owl species included forest fragments a t high elevation and more open landscapes without evidence of preference, either to environment or human influences.

S. T. Waters, Nocturnal bird diversity in forest fragments in Northeast Ecuador. [Journal of Tropical Ecology] 33 (6): 357-364 December 2017.

Amazon tapir: browser and seed disburser

One of the largest terrestrial herbivores in Amazonia is the lowland tapir (Tapirus terrestris) j. Browsing sign and fecal analysis data were collected March, April, August, and September. Fiber consumption was 70-90% and fruits 10-30%. Both percent increased with abundance of selected material. When fruiting intake

increased browsing selectivity and seed distribution became intensified but limited to preferred species.

J. Velez Effects of seasonality and habitat on the browsing and frugivory preferences of *Tapirus terrestrris* in Nortwestern Amazonia. [Journal of Tropical Ecology 33 (6):395-406 2017]

Bat height in Atlantic Forest

Fifteen species were captured exclusively in the forest canopy and six were exclusively in the forest understory. Many were represented by a low number of captures. Chiraderma villosum was exclusively in canopy, and Artibeus lituratus was mostly in the canopy. Corolla perspicuillata and Desmodus rotundus were mostly captured in the understory. The use of different forest strata is little understood because of rare data.

R. Gregoria Vertical stratification of bat assemblages in the Atlantic Forest of southeastern Brazil. [Journal of Tropical Ecology 33 (5) 2017]

Puma presidence reduces prey richness

Signs of Puma concolor, an apex predator, were followed on 23 forest fragments in Sao Paulo Brazil for 2 years to see effect on richness of large-bodied mammals. The presence of the puma reduced the richness of prey species by 45%. Larger forest fragments and darker nights strengthened the effect on the mammal community. Large mammals live in fear.

C. Paulo Effects of puma on the diversity and composition of Neotropical mammals. [Journal of Tropical Ecology 33, 2017]

Cameroon gorillas distribute seeds

The western lowland gorilla of Cameroon (Gorilla gorilla) was studied for three years. The total of intact seeds found was 289, of 58 species. Germination is not reduced by passage through the gut. On sleeping sites 47% of the seeds were found. Above them the canopy is open, favorable for seeds of light-demanding tree species. It is hypothesized that gorillas on sleeping sites directionally distribute forest tree seed, especially of species light-demanding.

C. Albert Quantity and spatial distribution of seeds dispersed by Western Lowland Gorilla population in south east Cameroon [Journal of Tropical Ecology 31 (3) 2915]

Great Apes disperse tree seed in Gabon

Using 172 hours of direct observation and 796 days of camera-trapping it was discovered that Dacryodes normandii, an endemic in Gabon tree species with seeds distributed only by animals, was found subject to gorillas and Central Chimpanzee as main seed distributers. Seeds passed through gorilla gut proved high in germinative success. Seed distribution takes place during long visits by the animals, during which seed consumption is heavy.
B. Haurez The role of great apes in seed dispersal of the tropical forest tree species Dacryodes normandii (Burseraceae) in Gabon.[Journal of Tropical Ecology 31 (5) 305-402 2015]

Selectively logged Brazil nut distribution

The distribution of Brazil nut trees in logged forest is unclear in three concessions of Madre de Dios, Peru in southwestern Amazonia. The strong peak of aggregation of mature trees and juveniles occurred at long distances, such as 300 to 900 meters, suggesting disturbed forests as a cause. In the 1,413 ha sampled juveniles, adults, and cut stumps were determined. Juveniles and adults were found in each concession. Regeneration apparently follows disturbances.

C. A. Rockwell Spatial distribution of Bertholletia excels in selectively logged forests of the Peruvian Amazon (Journal of Tropical Ecology 114-127 2017).

Ivory in China

The ivory trade of China, strongly related to elephant poaching in Africa, is said to threaten the elephant with disappearance. There are three trades in tusks, white, gray, and black. They are driven by motivation stemming from socially constructed economic, social, cultural, aesthetic, religious, and medicinal values. Legal outlets increased from 40 in 2004 to 182 in 2013. Black markets thrive in online platforms. Gray markets mushroomed to year 2009 when essentially closed by government intervention. Elephant conservation in China requires more comprehensive understanding of the domestic trade.

Y. Gao. Elephant ivory trade in China [Biological Conservation 180 23-30 2014]

Teak and maize in Java

Teak silviculture practices included 2.5m, 3m, and 4m., thinning of 25%, 50% and 75% of tree density, and crown pruning of 40% and 60% of biomass. Integration with maize proved higher yields because of the use of fertilizer.

Maximum timber yield came from 4mx4m thinned 25% at 5 and 15 years and 40% of the crown pruned in 4, 10, and 15 years. Highest net value and return to labor was provided by a 50% thinning at age 5.

N. Khasanah. Intercropping teak (Tectona grandis) and maize (Zea mays) practices in Gunungkidul, West Java.[Agroforestry Systems 80 (6) 1019-1033 2015]

Integrated beef

In Uruguay there are extensive level plains dedicated to the production of beef cattle. A survey exposed 104 cattle farms larger than 100 ha. Among these forest silvopastoral was practiced. Forests were most prevalent on the larger farms and the educational level of the owners. The area is subject to almost continuous strong east winds. The cattle farmers applied forestry mostly for protection but incidentally received better calving rates for better yield both in beef and timber. These forests are largely of densely planted eucalyptus trees.

A.Bussonni Integrated beef and wood production in Uruguay: potential and limitations [Agroforestry Systems Vol. 89,(6) pp. 1107-1118, 2015]

Eucalyptus growth variation in Brazil

In large stretches of degraded pasture Brazil has promoted recovery by agroforestry. At the outset dense planting of Eucalyptus monocultures was an initial choice. Special arrangements at spacings of 3;6 x 2.5 and 3,6x2,9x2m, with 1,111, 918, 833, 379, and 356 trees per hectare were used. Differences in height and growth did not appear for 50 months. Initial volumes in high density monocultures were lower than in agroforestry mixtures. The agroforestry areas presented another advantage over strict monocultures **in** that pasturing was possible. The highest timber value came from 9x 3m spacing.

R. R. Paula. Eucalypt growth in monoculture and silvopastural systems with varied initial densities and special arrangements. [Agroforestry Systems 87 (6) 1205-1307 2013].

Riparian forest width?

Birds in The Amazon were questioned in the search for the width of riparian forest along streams. Mist-netting of understory birds. Reduced quantitative abundance was an indicator. Distances as indicated by the birds also included clay soil but was unrelated to slope. Brazilian environmental legislation dictates a

width of 30m on both sides of streams. The birds dictated from 90 to 140m, covering a much wider area of distinct forest that needs protection.

S. Bueno and others. The width of riparian habitats for understory birds in an Amazonian forest [Ecological Applications 2012]

Forests conserve reefs

In Fiji coral reef conservation was related to adjacent land conservation. Protection of forest can deliver the greatest return on investment for coral reef systems. Forest conservation benefits to reefs are highly variable, making prioritization necessary. In Fiji the results indicate with complete forest protection reefs could be improved up to 58% by forest protection instead of deforestation These results support decisions of the Fiji Protected Committee as they aim to protect 20% of the land and C. 30% of the inshore areas by 2020.

J. Klein and others. Forest conservation delivers highly variable coral reef conservation outcomes. [Ecological Applications 22 (4) 2012].

Birds and bats assist restoration

Birds and bats are important predators of insects that damage leaves in restoring forests. Herbivorous damage to leaves can negatively affect the survival and growth of tropical plants and thus can influence the success of restoration efforts. In branches where birds and bats were excluded the insect biomass was higher and where present the biomass of insects was lower. In general, birds and bats have about equal impact on herbivorous insects, but on row plantations bat impacts were highest. The conclusion is that both birds and bats play important roles as top predators in restoration systems by reducing herbivorous insects. Restoration projects should include efforts to attract and provide habitat for birds and bats, given their ecological importance.

E. B. Morrison and others. Birds and bats reduce insect biomass and leaf damage in tropical forest restoration sites. [Ecological Applications 22 (5) 2012].

Illicit bushmeat from the Serengeti

Illicit practices are difficult to assess. A technique of asking sensitive questions, termed Unmatched-CountT6technique was applied to provide estimates of poaching with anticipated biases due to respondent understanding and discomfort. Eighteen percent of households admitted being involved in hunting. This was more likely in small household size, those long connected to a village, and those

with full-time employment. The results suggest that poaching remains widespread in the Serengeti.

Nuno and others. A novel approach to assessing the prevalence and drivers of illegal bushmeat hunting in the Serengeti. [Conservation Biology 27 (6) 20]

Forests and fruit crops in Thailand

Ten pairs of orchards were compared, one < 1 km from a forest edge and the other >7 km from a forest edge. The crop species were rambutan, durian, and mango. Rambutan, visited by a stingless bee, was significantly affected by distance from the forest. The other two, durian and mango flowers, were visited by nectarivores bats and flies and were not affected by distance from a forest. However, durian fruit set was negatively affected by proximity of caves inhabited by nectarivores bats. Dispersal success of pollinators is related to isolation from source habitats. Maintaining forest patches in fragmented landscapes may attract greater numbers of pollinators.

T. Sritongchuay and others. Effects of forest and cave proximity on fruit set in tropical orchards in Southern Thailand. Journal of Tropical Ecology 1.10(2) 2015].

Hurricane followers in Tonga

In the Vava'u Island Group in the Pacific hurricane disturbances reportedly are followed mostly by recruitment of shade-tolerant tree species que in the later secondary forest where they constitute the canopy trees.

J. Franklin and others. Heterogeneous tree recruitment following disturbance in insular tropical forest Kingdom of Tonga.[Journal of Tropical Ecology 1.10 (2) 2015].

In the post-hurricane Caribbean it is the opposite trees that take over, light-requiring Cecropia spp.

Bamboo carbon potential

A study of 70 species of bamboo worldwide finds them a major carbon sink, a total ecosystem carbon of 94-392 MgC/ha, less than most forests but greater than agroforest and, oil-palm plantations. High carbon biomass is associated with common and giant bamboos: *Phyllostachys, Bambusa, Giglantochloa,* and *Guadua*. Bamboo also provides ecosystem services and livelihood benefits available to millions of needy people.

J. Q. Yuen and others. Carbon stocks in bamboo ecosystems worldwide: estimates and uncertainties. [Forest Ecology and Management393:113-138].

Silviculture may attract bee pollinators

Selective felling generally leaves forests with open gaps. Studies have shown that bees are significantly more abundant in forest openings than in mature forest. Bee abundance and diversity were found with the extent of early successional habitat. Within openings bee abundance and diversity increased with floral richness and abundance and decreased with vegetation height growth. The creation of small forest openings helps to promote some guilds of bees in openings and adjacent natural forest.

H. P. Roberts and others. Factors affecting bee communities in forest openings and adjacent mature forest. [Forest Ecology and Management 394:111-122 2017].

Thinning from below

Thinning from below, a most benevolent treatment, appears to merely accentuate what nature already has under way. Thinning of 20, 35 and 50% of the basal area and 35% more removal from pruning of *Eucalyptus* in northeast Bahia, Brazil had expected effects on the average diameter and the distribution of diameter classes over the stand. Less predictable were effects on the dominant height and dominant height growth before and after treatment. There were no significant changes. This permits the use of dominant height over age as site index equally applicable before and after treatment.

R. A. Medeirosi and others. Thinning from below: effects on height of dominant trees and diameter distribution in *Eucalyptus* stands. [Journal of Tropical Forest Science 29 (2) 2017]

The Baobab of India.

Abstract:
"The District Gazeteer of Allahabad (1968) contains an account of a massive tree supposed to be 500 years old, locally called "vitaiti imli" which" has not been identified botanically" It is growing on the left bank of Ganga at Pragya and is sacred to Hindus and Muslims alike. It is connected with many legends and myths dating back to the hoary past. Botanically it is *Adansonia* digitata L. commonly known as Baobab, native of Africa and classed among the fantastic trees of the world. Baobabs are known to live to an incredible age besides being the most useful tree for certain"

J.C Varmah and other.Baobab – the Historic African Tree at Allahabad.

Crown fire control

Wildfire damage has been a serious source of forest loss in tightly spaced timber plantations of *Pinus taeda* in Australia. For decades multiple thinning, early in the rotation, have contained fire intensity. Pruning fuel treatments significantly changed the fuel complex, relocating the ladder and canopy fuels to the surface layer. The effect was a short-lived increase in surface fuels and a long-time durability of the loss of the vertical continuity of fuels necessary to support crown fires. First thinning reduced H.H.fire intensity to less than one tenth, and second pruning reduced crowning during high fire danger, from 25% to 0.Each silvicultural treatment should not be viewed independently but rather as a succession of treatments that, early in the rotation, transforms a highly inflammable fuel complex into a low one.

M. G. Cruz and others. The effect of silvicultural treatments on fire behavior potential in radiata pine plantations of South Australia [Forest Ecology and Management 397:27-38 2017].

Sustainable bamboo In North-East India.

Seventy-eight species of bamboo have been reported from North-east India. Most of the consumption of the bamboo resource is by four paper mills, and other bamboo-based major industries. Bamboo is commonly used also for house construction, fences around farm fields, and for household articles including furniture. Sixteen of the species are edible, twelve of commercial value. Newly emerging bamboo shoots and their processed forms are consumed as vegetables and food additives. Annual sales of fresh bamboo shoots averaged a net value of 18.85 million rupees whereas sales of fermented, roasted, and boiled bamboo shoots bring an annual net income of 22.9 million rupees. Generating edible bamboo employs continually 100 workers.

L. B. Singha and others. Understanding bamboo for income generation, employment opportunity, and sustainable development of the North-east India, [Indian Forester 134 (9) 2008]

Bamboo soil and water conservation

In the Yamuna Ravine in Uttar Pradesh, India two rows of bamboo were so planted as to create a vegetative barrier in the bed of the ravine. In four years the average culm height was 11.76 m, runoff was reduced from 9.6% to 1.8% and soil

loss from 4.2 to 0.6 tons/ha/yr. By the 7th year onwards annual financial yield was 48,000 rupees/ ha, an improved livelihood for resource poor farmers.

K. Singh and others. Resource conservation and economic utilization of Yamuna Ravine land through bamboo. [Indian Forester 143 (4) 2017]

Pioneer removal for restoration

Reduction of stand density is commonly prescribed for increased growth of preferred trees and incidental composition improvement in tropical forests. Forests during restoration commonly are covered by pioneer tree species requiring full light and producing fast growth. The effects of selective removal of these pioneer species on the progress of restoration were tested. The treatments substantially reduced the abundance of pioneers but with only slight increase in canopy openness (3.7-4.3%) as compared with 1.8% for the control. Late-successional stems showed enhanced growth only in the low intensity treatment while small pioneers increased with the intensity of the treatment. Selective removal of understory pioneer stems is seen a practical option for manipulating stand composition and accelerating restoration.

T. Swinfield and others. Accelerating forest restoration through the selective removal of pioneer species. [Forest Ecology and Management 381: 209-216 2017]

Eighteen-month *Eucalyptus* nutrient allocation

Biomass allocation and nutrient pools were assessed in full-soil availability of fertilizer maintenance of great consumption of nutrients, particularly P, K, and Ca in the grassland biome of southern Brazil, when 37-41% of total above-ground biomass was still Streamwood. For all macronutrients except Ca and Mg the concentration gradient followed the order: wood<bark<branches<leaves. For all micronutrients except Cu the concentration gradient followed the order: wood<branches<bark<leaves. The importance of the components as nutrient pools followed the order: leaves<branches<wood<bark. The branches hold the majority of Ca in biomass and are important 77 pools of Mg, K, P. and B. The bark stores a similar amount of Ca as leaves. The dose of fertilizer should be adjusted to each soil type after fertilizer trials.

M. Viera and others. Biomass and nutrient allocation to aboveground components in fertilized *Eucalyptus saligna* and *E. urograndis* plantations. [New Forests 48(3) 2017].

Rubber and butterflies

The expansion of rubber tree plantations in Brazil has raised a question **as** to the effects on biodiversity. It led to an assessment of fruit-feeding butterflies in the Brazilian Atlantic Forest. A total of 5,800, individuals of 85 species was captured and it became clear that there were two distinct habitats: one of concentrated management with loss of understory vegetation, and the other of low intensity, leaving the understory vegetation, and a better habitat for diverse species. This understory vegetation compensates for fragmented plantations.

E. C. B. Cambiar and others. [Forest Ecology and Management 397 Positive forestry The effect of rubber tree plantations on fruit-feeding butterflies:150-156 2017].

Protected Area forest protection

Africa's tropical forests house a substantial portion of the world's biodiversity. They are heavily affected by human activity. In general, Protected Area effectiveness was reviewed in 224 Areas in 23 countries across Africa. Protected Area forest loss within their boundaries generally was significantly less than in control areas. Forest loss was higher in small areas than in large areas and in new areas compared to older areas. Accessibility and geographical location also relate to capacity to prevent forest loss.

J. N. Bowker and others. Effectiveness of Africa's protected areas for maintaining forest cover. [Conservation Biology31 (3):559-569 2017].

Restoration with native species

The importance of using native plant materials for forest restoration depends on their genetic variation within the scope of the ecosystem contemplated. Genetic variation of native species lies within the boundaries of projects leading to long-term ecosystem success in restoration. It is a benefit on which to rely if in doubt. Three locales are considered for genetic selection with native material. (i) species selection and the sourcing of forest material, (ii) increasing resilience by fostering natural selection, ecological connectivity, and species associations, and (iii) measuring the success of restoration activities.

E. Thomas and others. Genetic considerations in ecosystem restoration using native tree species. [Forest Ecology and Management 333:66-75 2014].

Riparian forest benefits

A study of 15 small watersheds in Brazil showed significant effects from forest tree density and height, structure, basal area, and dbh affected the fine sediment cover, electric conductivity, and dissolved oxygen, and aluminum and dissolved P concentrations in the water. In other words, the structure of the riparian forest can influence stream water quality. Riparian forest structure due to degradation or restoration should be considered when evaluating the buffer effect of riparian zones.

L. T. Souza and others. Influence of riparian vegetation and forest structure on the water quality of rural low-order streams in SE Brazil. [Forest Ecology and Management 298:12-18 2013].

Forest production in Brazil

The wide range of eucalypt species with different climatic and edaphic suitability facilitates easy propagation by seeds and cloning allow the adaptation of plantations to various regions of Brazil, a total of 4.9 million de ha. Selection is for wood characteristics, productivity level, drought tolerance, and resistance to pests and diseases. The development of propagation techniques led to plantations of clones. Most eucalyptus plantations are managed on short rotations, 6-8 years. Round wood yields range from 25 to 60 m3/ha. Natural resources use efficiency is improved by breeding and matching genotypes to sites and applying appropriate site managements.

J.L Leonardo- de Moraes Goncalalves and others. Integrating genetic and silvicultural strategies to minimize abiotic and biotic constraints in Brazilian eucalypt plantations. [Forest Ecology and Management 301:6-13 2013].

Additional Tropical Articles
Laura Burmann, RPCV Senegal, MS student, Michigan Technological University

Acoustic Monitoring

Soundscape analysis was used to determine impacts on local avian and anuran species through acoustic monitoring at a natural gas extraction site in Peru. The study site is located within the transition zone between the Andes Mountains and the lowland forests of the Amazonia near a new exploratory gas well platform. Recorders were placed throughout the area in pairs at five distances from the gas platform, which monitored sound sources during construction phase and during drilling phase. Soundscapes were compared along sites in order to evaluate the richness of frequencies. Analysis revealed

avian species richness to have increased in distance from the platform, but anuran richness declined with distance. These results and others from the study illustrate the usefulness of soundscape analysis for monitoring biodiversity in an impacted area.

Deichmann, J.L., Hernandez-Serna, A., Delgado, J., Campos-Cerqueira, M., Mitchell, T. 2017. Soundscape analysis and acoustic monitoring document impacts of natural gas exploration on biodiversity in a tropical forest. *Ecological Indicators*. 74:39-48

Alternative Stable States in Guinean Tropical Forests

Nearly 80% of Upper Guinean Forests have been lost due to land use change and historical disturbance events. This area is now highly susceptible to continued fires compromising forest resilience and shifting it past a tipping point and into an alternative stable state. A study was conducted to test the hypothesis that the Upper Guinean Forests currently exists in this state by using remote sensing data from the past 30 years and by analyzing precipitation trends. Data analysis concluded that two of the four reserves, which research was conducted in, had experienced forest loss to the extent that a vegetation community dominated by shrubs and grasses was being maintained by fire-vegetation feedbacks. The other two retained higher forest density and resisted fire encroachment. These differences emphasize the impacts of human land use and changes in fire regimes.

Dwomoh, F.K. and Wimberly, M.C. 2017. Fire regimes and forest resilience: alternative vegetation states in the West African tropics. *Landscape Ecology.* 32:1849-1865

Climate Change and the El Oro Parakeet

The El Oro parakeet is threatened due to potential habitat loss from climate change. This species is endemic to a small range on the western slope of the Andes. In such tropical montane cloud forests, the range of species distribution moves higher in elevation with climate change. This is foreseen as problematic for the El Oro parakeet since higher elevations have a reduced forest habitat of only 10% of the current habitat range, and connectivity between habitats is decreasing. It will be necessary to restore forests along a large elevation span in order to prevent population decline of the El Oro Parakeet.

Hermes, C., Keeler, K., Nicholas, R.E., Segelbacher, G. Schaefer H.M. 2018. Projected impacts of climate change on habitat availability for an endangered parakeet. PLoS ONE. 13(1):e019191773. https://doi.org/10.1371/journal.pone.0191773

Carbon Credits for Conservation

Carbon credits were calculated to assess the economic value of coastal wetlands in the Papaloapan River Basin in the Gulf of Mexico. The cost-benefit analysis was used to

encourage conservation efforts. The land cover in the Alvarado Lagoon system has seen an increase in livestock and sugarcane production by 25% in 2005 and 50% in 2010. Results of a study indicate that carbon credits received from the conservation of mangroves outweighs the economic value of livestock; however, sugar cane production poses more complications due to government subsidies.

Vázquez-González, C., Moreno-Casasola, P., Hernández, M. E., Campos, A., Espejel, I., Ferman-Almada, J.L. 2016. Mangrove and freshwater wetland conservation through carbon offsets: A cost-benefit analysis for establishing environmental policies. *Environmental Management.* 59:274-290

Butterfly assemblages in South America

A study conducted in four different lowland Neotropical rainforest locations found that fruit-feeding nymphalid butterflies had higher spatial and temporal beta diversity in the canopy layer than in the understory layer. The vertical distance between the two strata was relatively small and, yet, each strata has its own community specific dynamics.

Fordyce, J.A. and De Vries, P.J. 2016. A tale of two communities: Neotropical butterfly assemblages show higher beta diversity in the canopy compared to the understory. Oecologia. 181:235-243.

Pollutants and Chlorophyll Levels in Leaves

The effect of automobile pollutants on plant growth was studied by measuring chlorophyll content of four tree species growing along the roads in Karachi, Pakistan. Significant changes in chlorophyll levels were found in the leaves of trees growing in the study site as compared to the control site. This study indicates that vehicular exhaust emissions significantly affected the concentrations of chlorophyll; which, as a result, can influence the amount of sunlight absorbed by the plant during photosynthesis.

Iqbal, M.Z.; Shafig, M.; Zaidi, S Qamar; Athar, M. 2015. Effect of automobile pollution on chlorophyll content of roadside urban trees. Global Journal of Environmental Sciences. 1(4):283-296

Tracking Genes in Teak

The desirability of teak wood as an economic resource has led to countries outside the natural range of the species to grow forestry plantations. Seeds from the early introduction of the species around a hundred years ago have formed the basis for the expansion of plantations throughout the twentieth century in several countries of Africa and South America. The genetic origin of the domesticated species had been largely unknown. Comprehensive research was undertaken to study the genetic diversity and

differentiation of the original 29 provenances in parts of India, Thailand, Myanmar, and Laos. Microsatellite makers were used to trace the genotype origin center to India, from which it spreads eastward.

Hansen, O.K., Changtragoon, S., Ponoy, B., Kjaer, E., Yazar, M., et al. 2015. Genetic resources of teak (Tectona grandis Linn.f.)—strong genetic structure among natural populations. *Tree Genetics & Genomes*. 11(1):1-16

Guava Rust in Puerto Rico

Guava rust (Austropuccinia psidii) has been affecting native and non-native Myrtaceae throughout the tropics. The rust is found commonly on an invasive tree species in Puerto Rico, Syzygium jambos, and raises concerns of a possible host-shift to native species. In a recent study, all trees surveyed showed varying signs of infection. The severity of infection was consistently associated with annual mean temperature, but tree size and precipitation variables were also found to have an associated effect. The demise of Syzygium jambos may benefit native species, so long as the rust does not jump to native Myraceae.

Burman, E., Acherman, J.D., Tremblay, R.L. 2017. Invasive Syzygium jambos trees in Puerto Rico: no refuge from guava rust. *Journal of Tropical Ecology*. 33(3):205-212

Note from the editor

Feel free to send this newsletter on to others.

First, a welcome to the hundreds of new subscribers who have started receiving the newsletter in the last few months. Many thanks to the many contributors to this issue. The next issue is scheduled for June 2018.

If you would like to be added to the distribution list for the newsletter, send an email to Blair Orr (blairorr@ymail.com).

- Blair Orr, IFWG Newsletter Editor
(blairorr@ymail.com)

Sign up for the ITTO Tropical Timber Market Report

The International Tropical Timber Organization (ITTO) releases the Tropical Timber Market Report two times per month. You can receive a free email subscription by signing up at their website:

http://www.itto.int/market_information_service/

IUFRO Electronic News

The newsletter is also available for download as a PDF or Word file at:
http://www.iufro.org/publications/news/electronic-news/.

FAO InFO News
A newsletter from FAO Forestry

The Food and Agriculture Organization's Forestry newsletter is available at this link:

http://www.fao.org/forestry/infonews/en/

Unasylva

http://www.fao.org/forestry/unasylva/en/ - An FAO forestry publication going back to 1947.

Global Forest Information Service (GFIS)

https://www.gfis.net/gfis/en/en/ (also available in Spanish and French) Global Forest Information Service contains up-to-date information on news, events, publications and job vacancies (on the homepage) and lists other info resources such as databases, as part of the GFIS system.

Society of American Foresters
2018 Gregory Award

G. Robinson (Bob) Gregory was a pioneer in forest economics and resource development, but always thought of himself as a forester. Bob had a special interest in assisting low-income countries develop their forest resources in thoughtful ways for the good of society. With his wife Ann, Bob traveled much of the world consulting for the Ford Foundation, the United Nations Food and Agriculture Organization, and host countries on matters related to forest development. Ann's intuition and social awareness of cultural attributes of each country were integral to Bob's success in partnering with individuals, governments, and companies in various cultures and countries.

The Gregory Award seeks to mark the achievements of Bob and Ann Gregory and further their interest in international relations by providing economic assistance to outstanding students or professionals from outside of the US and Canada to attend the annual convention of the Society of American Foresters (SAF) and have meaningful engagement with foresters on the North American continent.

The 2018 SAF Convention will be held in Portland, Oregon on October 3-7, 2018.

The award includes complimentary convention registration and $2,000 US to use toward:

- Travel
- Lodging
- Tickets to convention events or technical field tours.

SAF will work with successful applicants to allocate the funds in the manner most useful to the recipients.

Award criteria:

1. Applicants should be graduate students or practicing professional foresters from a country other than Canada or the US, and working or planning to work in such a country.
2. Applicants shall have demonstrable past performance, desire and/or promise to contribute to their home or host country's forestry education, government or industry.
3. Applicants shall have demonstrated potential for future leadership in forestry.
4. Applications must be received electronically (preferred) or in hard copy on or before 23:59 EDT (US) **May 7, 2018**.

Applications must include:

1. Information requested in Application Form (below).
2. A letter from the applicant describing:
   - how the applicant meets the award criteria,
   - how attending the SAF convention will help the applicant meet professional goals in their home or host country, and
   - the probability that the applicant will be able to travel the United States.
3. A résumé or vita.

The successful applicants will be notified by June 11, 2018 and must accept the award by July 2, 2018.

For more information about SAF and convention, please visit our website: www.eforester.org.

2018 Gregory Award Application

Name:

Email:

Phone (including country code):

Mailing Address:

Academic Institution, if applicable:
Institution Name:

Academic Major or Department:

Employer, if applicable:

Organization Name:

Position:

Supervisor's Name:

Supervisor's email address:

Phone (including country code):

Mailing Address:

Submit application to:
World Forestry Committee Liaison
Society of American Foresters
10100 Laureate Way
Bethesda, MD 20814

Email: policyintern@safnet.org

For more information about SAF and convention, please visit our website: www.eforester.org.