NEWSLETTER

International Society of Tropical Foresters

April 2021 Volume: 9 Issue: 1

COVER PHOTOGRAPH

Dry Deciduous Sal Forest – Kanha Tiger Reserve, India

NOTE FROM THE CHIEF EDITOR

International Society of Tropical Foresters (ISTF) is publishing its quarterly newsletter since 2013. This is the first issue of 2021 (vol. 9) and also the first under my supervision. I am grateful to ISTF Board for selecting me as a Chief Editor and trusting in me to perform this valuable task. Thanks to everyone who has contributed to this issue of the newsletter. This is a collective effort of my team consisting of people from various backgrounds, diverse cultures and different parts of the world. I take this opportunity to acknowledge the contribution of all team members and Ms. Sheila Ward, ISTF coordinator for their immense help and continuous support. The new team is fully motivated and you will see a lot of improvement in upcoming months.

Please feel free to pass the newsletter to other people related to forestry profession. If you wish to directly receive the ISTF Newsletter, please join ISTF by visiting https://tropicalforesters.org/ or sending a message to tropicalforesters@gmail.com. Stay safe from COVID pandemic!

Irfan

Call for contributions to Newsletter: JUNE 2021 issue

We are seeking your contributions to the quarterly newsletter to be shared with the community/members. We invite members to submit contributions for the following categories:

- **General NEWS ITEMS**: Announcements/Reports (Past & Future Events) and Opportunities (trainings, workshops, and conferences etc.)
- **ISTF Internal News/Updates**: chapter meetings etc.
- **BRIEF ARTICLES**: Short, topical (emerging issues related to forests, novel solutions, & innovative research findings, and publication abstracts)
- **MEMBER PROFILE**: Brief professional introduction
- **FIELD PRACTICES**: Short articles on methods that are useful for foresters working in the field, new techniques based on personal observation & experience. Probably something an academic/research journal would not publish.

SUBMISSION GUIDELINES

- All articles must be submitted in Word format and include a title. Please do not send submissions in pdf format
- Photos, images, or graphics are encouraged, jpg is preferred but other formats can probably be converted
- Word count:
  - General News Items: 50 to 200 words
  - ISTF Internal News/Updates: up to 500 words
  - Brief Articles: up to 500 words.
  - Member Profile: up to 100 words
  - Field Practices: up to 200 words
- Send the contributions at newsletteristf@gmail.com by **20 June 2021**.

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Meet the Editorial Team

Muhammad Irfan Ashraf (Chief Editor)

Rekha R Warrier (Associate Editor)

N. Krishnakumar (Associate Editor)

Mira Mishkin (Associate Editor)

Bernadette Arakwiye (Associate Editor)

INTRODUCTION OF THE NEW EDITORIAL TEAM

Chief Editor: Muhammad Irfan Ashraf

Irfan brings 19 years of teaching, research, and outreach experience to ISTF-Global. He is currently an Assistant Professor of Forestry at Arid Agriculture University Rawalpindi, Pakistan, and his PhD in Forestry is from the University of New Brunswick, Canada. His research is focused on forests and climate change, quantification of greenhouse gas emissions, and modelling natural systems using artificial intelligence. He has published 27 original research articles in peer reviewed journals. He has been a technical expert for such organizations as REDD^{+}, IUCN, USAID and the Forest Services Academy, Pakistan.

Associate Editor: N. Krishnakumar

Krishna is currently a Forest Range Officer at the Tamil Nadu Forest Department, Tamil Nadu, India. He has his PhD in Forestry from Tamil Nadu Agricultural University. He is a tree breeder involved in a varietal development programme and also in the development of composite wood products. A recipient of the Rajiv Gandhi National Fellowship, he is also interested in agroforestry and forestry in general.

Associate Editor: Rekha R Warrier

Rekha leads the Plant Tissue Culture group at the Institute of Forest Genetics and Tree Breeding (IFGTB), Coimbatore, India. Associated with various forestry agencies, she had worked in moist deciduous and evergreen ecosystems in the tropics. Presently she is the Assistant National Country Coordinator of the Asia Pacific Forest Genetic Resources Programme (APFORGEN). She received her PhD in Biochemistry from the Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, India.

Associate Editor: Bernadette Arakwiye

Bernadette is a Research Associate in the Global Restoration Initiative at World Resources Institute (WRI). Her work supports restoration monitoring in African countries, and she serves as an in-country liaison for WRI in Rwanda. Bernadette has also worked with Conservation International in the USA and with the Diana Fossey Gorilla Fund International in Rwanda. Bernadette received her PhD in Geography from Clark University. Massachusetts, and she uses GIS for terrestrial landscape monitoring to inform policy and management.

Associate Editor: Mira Mishkin

Mira is a Natural Resource scientist working in the Monarch Butterfly Biosphere Reserve in Mexico for forest conservation and in a range of projects across the globe to seek effective strategies for sustainable stewardship. She collaborates with scientists and activists from Mexico to the Philippines to seek equitable solutions to complex problems (from forest management to the cultural value of ecosystem services). Her PhD is from the Research Center in Environmental Geography of the National Autonomous University of Mexico.

THANKS TO FORMER HEAD EDITOR

BLAIR ORR

Many thanks to Blair Orr, retiring Head Editor of the ISTF Newsletter. Blair Orr served as Head Editor of the SAF-ISTF Newsletter from the time the old ISTF closed in 2012 until 2021. At the end of his tenure, there were 2,400 subscribers and the newsletter was up to 100 pages in length. ISTF newsletter has now been passed back to the ISTF, with a new editorial team headed by Dr. Muhammad Irfan Ashraf from Pakistan.

Blair is a professor of forest economics at Michigan Technological University, Houghton, Michigan, USA. During his time at Michigan Tech he has been actively involved in international forestry and community development through his teaching and research. He has been an active member and officer in the International Forestry Working Group of the Society of American Foresters, the International Society of Tropical Foresters, and the Society for Economic Botany. Blair has been involved with Peace Corps since 1978 when he served as a volunteer in Lesotho. He ran a large Peace Corps Master's International Program which combined Peace Corps service with a Master's degree, and currently oversees the Peace Corps Coverdell Fellows Program at Michigan Tech.

The former ISTF newsletters and Blair Orr's contributions are available at: http://www.orrforest.net/saf/

Many thanks to Blair for his years of leadership!

BRIEF ARTICLES

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WHICH SEED-SOURCING STRATEGY IS APPROPRIATE FOR FOREST LANDSCAPE RESTORATION?

Daniel Kwame Debrah,

Research Technologist, CSIR-Forestry Research Institute of Ghana

Introduction

Society of ecological restoration (SER) defines restoration as the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. The main aim of forest landscape restoration is to improve ecosystem structure as close as possible to a reference ecosystem. Studies have shown that forest restoration either by enrichment planting, agroforestry or plantation often ends up restoring the same site again and again due to unsuitable seeds used in the restoration. For example, the growth performance and sustainability of seeds from savannah forest grown in the moist semi-deciduous (Table 1) cannot put up equal growth performance with seeds from their natural environment. The seeds from a rain forest zone will perform better as compared to the latter due to differences in geo-climatic conditions, which is a major driver of species distribution. Given this, I would say growing the right trees at the right place with the right management is very vital to successful establishment in a restoration project.

Table 1. Plant species distribution in ecological zones in Ghana

Ecological zone	Mean Annual Rainfall(mm)	Characteristics species
Wet Evergreen	≥ 1750	*Angylocalyx oligophyllus, Cynometra ananta, Lophira alata*
Moist Evergreen	1500-1750	*Angylocalyx oligophyllus, Diospyrus gabunensis*
Upland Evergreen	1500-2000	*Alchornea floribunda, Asplenium dregeanum, Childlowia sanguine*
Moist Semi-deciduous	1250-1750	*Entandrophragma utile, Guibo urtiaeie, Chlamydocaryathom soniana*
Dry Semi-deciduous	1250-1500	*Afzelia africana,Anogeissus leiocarpus, Antidesma membranaceum*
Guinea Savannah	950-1300	*Vitalleria paradoxa, Parkia biglobosa, Accacia spp*
Sudan Savannah	600-1000	*Terminalia spp, Combretum spp, Accacia spp*

Why eco-sourcing is the best Paradigm?

The concept of the origin of planting material for restoration projects emerged in the 1990s-2000s. This revelation has led to ecological scientists advocating the use of local seeds in restoration or plantation establishment. Many plantation development efforts are bound to fail in restoring a resilient and productive ecosystem because of unsuitable seeds. The use of non-local seeds for restoration project has a higher risk of adapting to the new environment or can make the offspring unfit through crossbreed with the local species. Local seeds in this context can be defined as seeds from the same ecological district or geographical area whilst a non-local seed is one collected from a different geographical area outside restoration project area. An example is the kusia (*Naucleadider richii)* provenance trial undertaken, where seed-source from dry semi-deciduous forest showed poor growth and resistance to pest attack. The choice of seed-source for restoration depends on the goals or reference ecosystem chosen for the project.

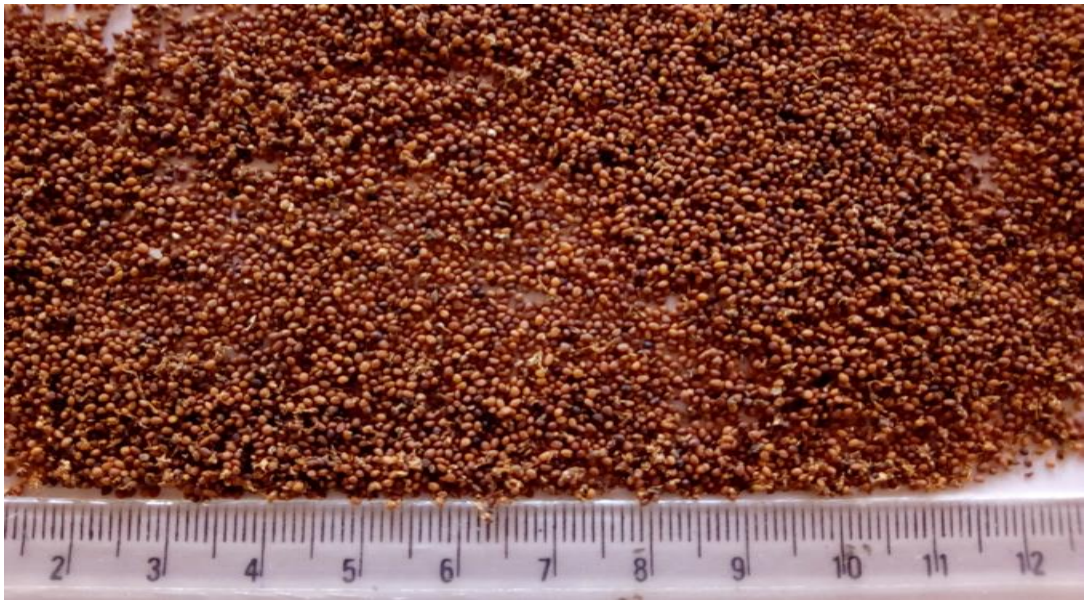

Figure 1. *Naucleadider richii* (Kusia seeds)

Restoration managers often encounter problems on where to collect viable seeds for restoration. Many countries in the developed world have a specified radius within which seeds can be collected. Local seed sourcing (eco-sourcing) is a benchmark in European forestry and other countries with well-defined seed transfer zones. In New Zealand, seeds for restoration are sourced from the same ecological district. United Kingdom also ensures collection of germplasm within a 5-mile radius of the site to be restored and Western

Australia Forest Management Plan 2004-2014 also has a seed collection zone of a 9-mile radius within the restoration site.

Figure 2. Shea tree in fruits (*Vitellaria paradoxa*)

Eco-sourcing plant material for a restoration project is appropriate if you want to preserve the genetic diversity and restore the local gene pool of degraded sites. Seeds from local provenance for restoration project have home-site advantage and are well adapted to prevailing conditions. In addition, seeds grown outside their natural ranges are likely to be maladapted to the new site and can lead to restoration project failure. In Ghana, seeds from shea (figure 2) can only be used to restore sites in the savannah zones. It tends to bear fruit early in the southern part of the country. Certain non-local species tend to suppress most local genotype growth and survival, resulting in cryptic invasion. Cryptic invasion occurs when introduced species spread and overshadow local species.

Non-local species have a damaging effect on fauna too. Hubert (2007) describes the role of genetic resources in helping the British respond to climate change; he notes that introduced hawthorn plants flowered 5 weeks earlier than local hawthorn endangering

breeding cycle of birds and insects that coincide with the phenology of local plants. Therefore, the use of non-local species for revegetation has an injurious effect on biodiversity, especially when disturbed sites have remnant local species.

What strategy is appropriate for sourcing seeds in changing environment?

In situations where large volumes of seeds are required for restoration, sourcing seeds on a broader scale becomes appropriate. Besides, the changing climate, coupled with persistent agents of degradation makes it imperative to use the right non-local seeds to deal with the existing condition. In certain situations, a range of new environmental conditions exists in which local species would not adapt. The best strategy would be use of local provenances, which involves the collection of seeds from the natural geographic range or site. Predictive provenance sourcing is also another seed sourcing strategy that seeks to collect seeds from areas with a similar climatic condition as the target site. In Ghana, if a forest landscape is highly degraded by persistent wildfire, teak seeds (Figures3 & 4) are mostly recommended for use in restoring the landscape because of the tree bark's fire-resistant properties. Tree seeds can also be collected from multiple areas across the species natural distribution to enhance the adaptive potential and increase the overall genetic diversity of species in the project area.

All these seed sourcing strategies is to ensure the success of a restoration project. However, there is no straightforward means of sourcing seeds for ecological restoration, especially in the changing climate.

Figure 3.Seeds of Teak (*Tectona grandis*)

Figure 4. *Tectona grandis* (teak seedlings)

Concluding Remarks

In conclusion, sourcing genetic material for restoration should consider climate variability, edaphic factors, altitude, socioeconomic barriers and adaptive potential of the genotype. The concept of developing guideline for delineating seed transfer zones should be supported with predictive provenance sourcing. When the extent of degradation is high, reliance on the local provenance cannot make restoration successful unless supported with scientific evidence. Provenance trials should be carried out frequently on local seed transfer zones to ascertain their adaptive potential before recommending for use in restoration. There should be a decision tree method to help landscape restoration managers use the right seed sourcing strategy.

Finally, the societal objective can be different from restoration objective, and this can interfere with restoration success. For example, the local community or indigenous people may prefer the use a local species for restoration, but the site condition might not support its adaptation, or such seeds are not readily available. The local gene pool is an excellent starting point for restoration, but a non-local seed source is also appropriate when the landscape to be restored is highly modified.

A flashback from Chief Editor

March 2011 (Fredericton) Canada
Muhammad Irfan Ashraf (Left) with Harold Burkhart (Right), a world renowned forest mensuration and modelling expert and lead author of pioneer forestry text book "Forest Measurements" in North America.

CINCHONA PLANTATION IN THE EASTERN HIMALAYAS IN INDIA: PAST AND PRESENT

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Cinchona is a tropical tree and is the primary source of anti-malarial drug quinine, found in the bark of the tree. Several reports show anti-cancerous, anti-microbial, anti-parasitic and anti-inflammatory properties of the plant (Kacprzak, 2013). The Cinchona cultivation in Bengal Presidency in India was initiated by Dr. Thomas Anderson, the Superintendent of the Royal Botanical Garden, Calcutta. Dr. Anderson started his experimental trials for cultivation of Cinchona in Darjeeling hills of Bengal and selected Mungpoo Hills in 1862 for commercial cultivation of Cinchona. He successfully established Cinchona plantation at Mangpoo in 1864. Subsequently Munsong (Kalimpong district) Cinchona plantation started in 1901 (figure 1), Rongo (Kalimpong district) in 1938, Latpanchar (Darjeeling district) in 1943 (figure 2) and Ambotia (Darjeeling district) in 1977 (WBFPIH, 2020).

Four species of Cinchona are under successful cultivation in Darjeeling hills of West Bengal, India: *C. ledceriana, C. succirrubra, C. robusta and C. hybrida.* Due to high Quinine content and good quality bark, *C. ledgeriana* forms more than 80% of the existing plantations of West Bengal. The Directorate of Cinchona and Other Medicinal Plants started functioning since 1862, from the foothills to an altitude of 1800 meter in the hilly terrain of Darjeeling district. Initially there was only Directorate of Cinchona, later the Directorate of Medicinal Plants was created in the early 1950 and both the Directorates were merged to form a single entity in 1968. The initial objective of the Directorate was to grow different species of Cinchona trees to produce lifesaving Anti-Malaria drug Quinine from the bark. Later on, the activities of the Directorate expanded and the cultivation of *Cephaelis ipecacuanha*, *Dioscorea* composite, large Cardamom, Rubber, Mulberry, Turmeric, *Taxus bacata*, Broom stick, Citronella, Vetiver, Lemongrass, Artemisia annua, Mandarin Orange etc. started. The Munsong Plantation is the famous plantation of Cinchona with high alkaloid content.

Recently experimental plantation has been initiated at Latpanchar cinchona plantation which include plantation of black pepper, strawberry and mushrooms. However, extensive

research and management tools are needed to establish the newly introduced species in the area (Bhattacharya et al., 2019).

The present infrastructures available in the cinchona factories in the Eastern Himalayas are old and their overhead expenses are too high. Modification of available research units and establishment of new research units equipped with modern infrastructures would be helpful in sustainable conservation of cinchona plantation and subsequent development of local economy through its cultivation. Cinchona industry in West-Bengal needs quality improvement of plantations and increased efficiency in alkaloid extraction processes. A well developed and organized marketing division would be further helpful in understanding demand and supply and subsequent standardization of market prices. An integrated system of cinchona plantation coupled with micro scale rainwater harvesting systems, multi-cropping practices with special focus on the cultivation and conservation of the local medicinal plants, organic farming practice, afforestation and most importantly involvement of the local people in conservation and decision making would be immensely beneficial.

Figure 1: Cinchona plantation at Munsong

Figure 2: Cinchona plantation at Latpanchar

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INNOVATIVE PLOT DESIGNS FOR FIELD SURVEY AND SAMPLING FORESTS IN MALAYSIA

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Abstract

Malaysia currently has about 18.2 million ha of forest and rich with diverse flora and fauna species. Forests have been recognized as the most important resources that contribute to the economic sector and human well-being and environmental protections. Inventory of these resources requires a lot of efforts, huge cost of operation, require time and cost. Malaysia is moving toward a rapid assessment of forest resources, and nationally, it requires to be updated every five years. This information is crucial for both national and international reporting. Therefore, a common plot design is necessary and the sampling design must be systematic. This article details about a design for forest survey and sampling for forest resources inventory, suitable for Malaysia's forest types and conditions. The design was developed for three major types of forests: inland dipterocarp forest, peat swamp forest, and mangrove forest. It is designed to provide solutions for three common issues in forest inventory and surveys, which are (i) quick observation at the field, (ii) engaging minimal man-power, (iii) instance data collection, and (iv) systematic maneuvering of field crew at the field. The data collection protocols allow data to be analyzed for calculation of basic biophysical properties of forest i.e. tree species, tree density, basal area, volume, and aboveground biomass. Moreover, the design allows systematic data collection for carbon stock of forest that includes five carbon pools i.e. aboveground, belowground, deadwood, litterfall, and soils organic carbon. A sampling unit comprises a cluster of four (4) subplots for inland forest and six (6) subplots for peat swamp and mangrove forests. The shape of the plot is circular and is divided into nests (subset) with varying radius. Distance from the measured trees to the plot's center is determined by Distance Measurement Equipment (DME) that uses sound waves. The clustering multiple subplots method allows field crew to sample large areas per sampling unit. This design has been tested in various types of forests in Peninsular Malaysia, Sarawak, and Sabah. It was proven to be an ideal design, practical to be implemented, saves time, manpower, and systematic data recording and handling. On top of that, this design represents all forest conditions that are common in Malaysia regardless of

the management practices. It is also able to maintain accuracy at an affordable cost and within a short timeframe.

Keywords: plot design; nesting; forest inventory; systematic survey

Design for Inland Forest

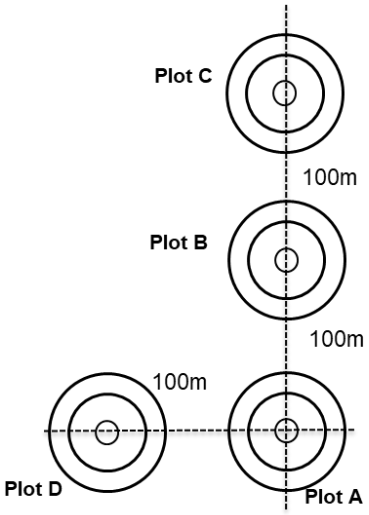

Figure 1. Layout of a cluster for inland forest

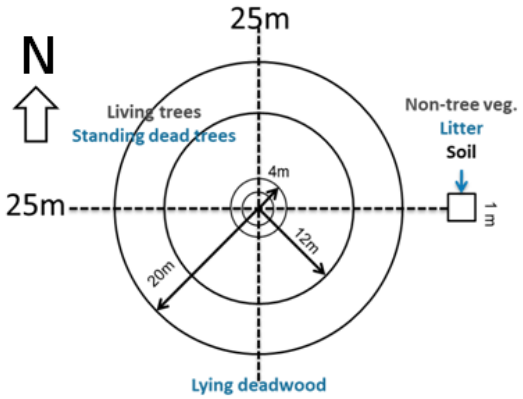

Figure 2. Layout of a sampling plot for inland forest

Table 1. Summary living trees measurement in a plot in inland forest

Nest radius (m)	Size	Tree size, dbh (cm)
2	Sapling	< 5 cm &> 1.3 m height
4	Small	5 – 14.9 cm
12	Medium	15 – 29.9 cm
20	Large	≥ 30 cm

Design for Peat Swamp Forest

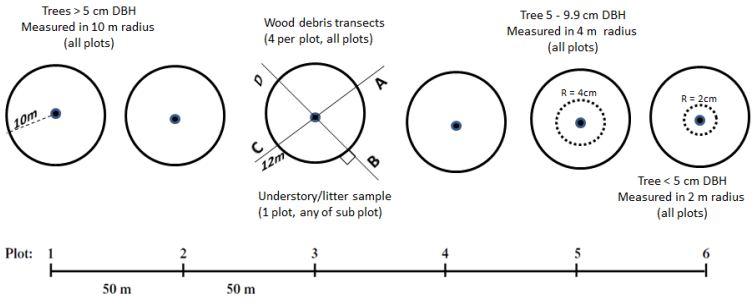

Figure 3. Layout of a cluster for peat swamp forests

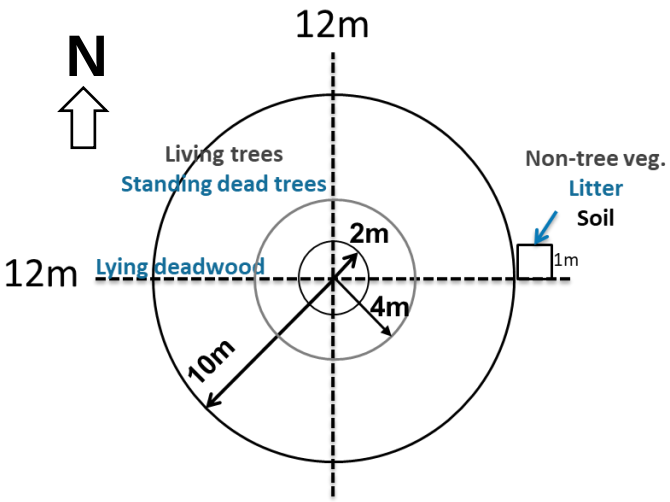

Figure 4. Layout of a sampling plot for peat swamp forests

Table 2. Summary living trees measurement in a plot in peat swamp forests

Nest radius (m)	Size	Tree size, dbh (cm)
2	Sapling	< 5 cm &> 1.3 m height
4	Small - Medium	5 – 9.9 cm
10	Large	≥ 10 cm

Design for Mangroves Forest

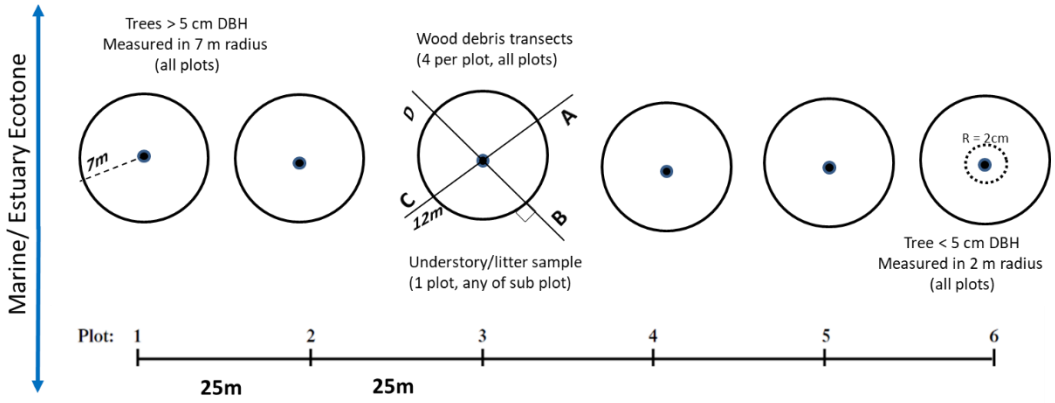

Figure 5. Layout of a cluster for mangroves

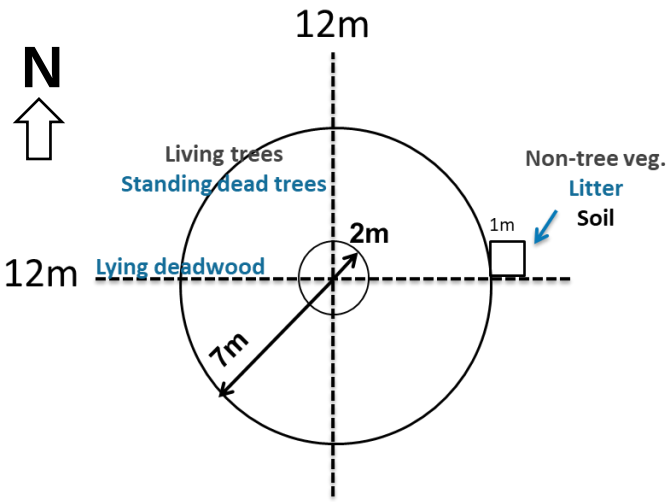

Figure 6. Layout of a sampling plot for mangrove forest

Table 3. Summary living trees measurement in a plot in mangrove forest

Nest radius (m)	Size	Tree size, dbh (cm)
2	Sapling	< 5 cm &> 1.3 m height
7	Small - Large	≥ 5 cm

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INCLUSIVITY STARTS WITH THE ISTF-IDEA WORKING AND LEARNING GROUP: REFLECTIONS FROM A PARTICIPATORY DESIGN WORKSHOP

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"*Every social movement that has been successful in this country has had a strong youth and student component*" (Dr Robert Bullard, the father of environmental justice). As natural resources students at NC State University, we have the responsibility to be the agents of change in our discipline. Inspired by Dr Bullard, we aim to bring more attention to inclusion, diversity, equity, and accessibility in professions related to natural resources and forestry. To achieve this goal, we led a participatory workshop at the ISTF 2021 conference on February 19, 2021, entitled "Inclusivity Starts with our Design! Participatory Design Workshop for Inclusion, Diversity, Equity, and Accessibility (IDEA) in Tropical Forestry and Natural Resources."

We applied the SWOT framework to collect participants' opinions during the workshop to help us identify Strengths, Weaknesses, Opportunities, and Threats related to IDEA in forestry. To facilitate the conversation, we provided slides to introduce our team, and make our participants familiar with the format and content of our workshop. Some of the questions posed include, "What are your perceived Strengths of ISTF, with regard to IDEA?" Questions related to weaknesses, opportunities, and threats, were also shared anonymously through the Poll everywhere platform. Table 1 consolidates the information collected during this workshop.

Table 1. Participants' opinion in the SWOT framework

Strengths	Weaknesses
• International community, especially with ISTF-Global • Diversity & Networking • Greater accessibility by using an online program • Ability to collaborate on niche foci with people from diverse backgrounds	• Hard to meet the needs of different disabilities • Making sure all perspectives are heard, seen, encouraged (i.e. indigenous knowledge) • How members are recruited • Acknowledging and overcoming the colonial legacy of forestry • Funding/power inequities

Opportunities	Threats
• Forming strong collaborations • Deeper stakeholder engagement • Global internet connectivity allows for greater accessibility • Diverse, international perspectives • Partnerships with groups who are strong in diversity • Connecting people to share expertise	• Forestry professions are built on privilege • How to know if we are reaching everyone • Getting people on board who do not want to be (who's opposed to IDEA?) • Performative vs actual engagement • Little value to indigenous knowledge by taking part (possibly opportunity) • Conflict between sustainable forestry and livelihoods; People enjoying nature only vs those who use it and appreciate it

Summary of Participants:

We report information as aggregated data for the seven participants in the workshop to protect their privacy. The majorities of our participants were US citizens, white, female, between 20-30 years old, and employed in academia. 42% of our participants had Master's degree and 57% held PhD degrees. Disciplines represented include environmental science, economics, climate adaptation, public policy, tropical forest genetics, agriculture and natural resources, and ecology.

One of the goals and expected outcomes from this workshop was the establishment of the ISTF-IDEA working and learning group (to be led by ISTF-NC State). We aim to use the results of this workshop to learn more about our colleagues' needs and preferences early in the design process. This will hopefully reflect real needs in tropical forestry and natural resources, which will improve the group's effectiveness. Finally, we would like to receive feedback from the extended forestry community to improve our work. Please do not hesitate to reach out to us with any questions, concerns, suggestions, or feedback.

MAKING DISCOVERIES AFTER A LOCKDOWN IN AN URBAN FOREST IN PUERTO RICO, USA

Yogani Govender, Dayamiris Candelario, Yaritza Bobonis Vazquez and Ernesto Torres Rivera

As climate change brings new challenges to species' survival, documenting biodiversity is critical to determine the best management strategies for their conservation. Faced with restrictions due COVID-19, Centro Ambiental Santa Ana of the Interamerican University of Puerto Rico, Metropolitan Campus embarked on a BioBlitz to record species found in Julio Enrique Monagas National Park in Bayamón, Puerto Rico. This park, also known as "Bosque de Santa Ana," is a protected natural area with great ecological, cultural, recreational, and educational value. Due to its rugged topography and its proximity to San Juan, it is subjected to light, noise, and air pollution with high recreational use.






A BioBlitz was held last February, provided insights about its value for the island's biodiversity. Eight (8) partnering organizations and 44 people joined the two-week fieldwork sessions. Researchers documented 93 exotic, native, endemic, and migratory species over 42 hours: bats (3), birds (43), plants (12), trees (17 to date), snails (17), frogs (6), lizards (4), snakes (3). The high diversity in the fourteen sampling plots stimulated positive engagement among all participants. Researchers proposed future research activities in this unique forest.

FROM OAK TO BOURBON: NORTH AMERICAN FOREST COMMISSION SILVICULTURE WORKING GROUP 2019

Mary Ann Fajvan
Research Forester, USDA Forest Service, Morgantown, WV, USA

The following report would perhaps be considered "old news", but this event represented the last in-person field tour I attended before the professional world embraced virtual meetings and conferences to keep us all safe. The North American Forest Commission Silviculture Working Group was invited to attend the 2019 (Oct. 28-30)Silviculture Instructors Tour. Historically, the tour serves as a preamble to the annual Society of American Foresters National Convention. Our members from Canada, Mexico and the United States assembled in Louisville KY, with other silviculture professionals from across the USA. We embarked on an amazing field tour coordinated by Dr. Michael Saunders (Purdue University) on a mission to explore how the value added to a wood-dependent product influences the silviculture practiced in the field.

We began with a woodlot tour at Tallow Creek Farm, a private, family landownership in Bradfordsville, KY. There we learned about silvicultural practices being implemented to promote the white oak resource. With the global expansion of whiskey production and other spirits, there is increased demand for oak staves to make fermentation barrels. Silvicultural efforts at the farm were targeting understory control of competing vegetation that is hampering oak regeneration.

We then worked our way up the value chain by visiting Independent Stave Co. Kentucky Cooperage facility in Lebanon, KY. We watched the barrel assembly process and learned how the degree of internal "charring" the barrels receive is key to the flavor imparted to the spirits within. In Lorretto, KY we toured the Maker's Mark Distillery and saw the corn mash fermentation process that drives bourbon production and the barrel aging "rotation" process. Of course, there was also some sampling of the final product.

The following day we travelled to Indiana and spent the morning touring Norstam Veneers. We viewed the entire process from grading hardwood logs in the wood yard, prepping the bolts for soaking and then slicing paper-thin veneer at incredible speeds. They processed just about every hardwood species in the Appalachian region. They market the raw veer as well as assembled sheets for paneling.

We also visited the Hoosier National Forest to learn about their efforts with prescribed fire and oak restoration. The trip concluded with a tour of Vallonia State Tree Nursery.

White oak silviculture on a private woodlot

White oak staves assembly process

Jean-Martin Lussier, Chair of Silviculture Working Group, observes barrel storage and rotation process.

Corn mash preparation the old-fashioned way

Tasting room at Maker's Mark Distillery

ISTF REGIONAL TOWNHALL MEETINGS – DECEMBER 2021: REFLECTIONS ON WAYS FORWARD FOR ISTF

In early December 2020, the International Society of Tropical Foresters held three regional town hall meetings to hear from members their ideas for furthering the ISTF mission. The summary of the meetings is as follows. Each meeting offered different perspectives on issues faced by the membership and useful observations for future directions for ISTF.

AMERICAS TOWNHALL: Focus on Sustainable Value Chains for Communities and Small Producers and Forest Education

The Town hall Meeting for the Americas was held on 3 December 2020, with 21 participants (including 5 board members) from Mexico (3), Puerto Rico (9), Brazil (1), the USA (2), and Malaysia (1). The meeting began with a presentation by René Zamora (ISTF Americas representative) on ISTF and how ISTF members might participate in larger reforestation efforts, such as Iniciativa 20x20 for Latin America. Comments followed, grouped here by country. The discussion emphasized on forest education and developing sustainable value chains of forest products for communities and small producers.

- **René Zamora**: ISTF aims to create a community of practice. Themes for interaction include conservation and forest restoration. The mission of ISTF is to promote the sharing of best practices for the sustainable management, conservation, and equitable use of the forests and natural resources of tropical regions. Benefits of membership include participating in this community of practice, learning and transfer of knowledge, and professional visibility and development. Regional restoration initiatives, in which ISTF members and chapters can participate, include the UN Decade of Ecosystem Restoration, and platforms to meet the Bonn Challenge, such as *Iniciativa20x20* for Latin America, *AFR100* for Africa, and the *Asia-Pacific Regional Strategy and Action Plan for Forest and Landscape Restoration*. In joining with larger efforts, ISTF can promote synergy for greater impact. In Latin America and the Caribbean, 56% of greenhouse gas emissions are from land use and land use change, and 37 million hectares of forest and grassland have been converted to agriculture since 2000. Under *Iniciativa 20x20*, 53.2 million ha in the region have been committed for restoration in the region. ISTF can help make this

restoration a reality. *20x20* includes numerous technical and financial partners with which ISTF can share knowledge.

- **Brazil**: The representative is the director of a research center in Minas Gerais, and would like to connect with ISTF members interested in the restoration of Brazil's Atlantic Forest. There is a group of Brazilian universities, agencies, and other experts committed to the topic. It would be good to have more frequent encounters like this on topics like urban forestry. Or agro-ecology, which is not seen in Brazil as economically viable.
- **Mexico**: Mexican concerns are strongly linked to the social aspects of tropical forests. One representative works with Rainforest Alliance and 17 forest communities (ejidos) in Campeche and Quintana Roo. There are concerns about identifying and strengthening the value chains for tropical forest products, including incentives, forest management, making products from raw materials into products, searching for markets and diversifying products. With collaborators, they are using morphological diversity and genetic markers to test how good management affects biodiversity. Mexican concerns are tightly linked to community forest management and forests as a social resource.
- **Puerto Rico**: There are concerns about rescuing good wood from trees knocked down by major storms. For example, planted mahoganies can end up chipped and in landfill, not used for wood! How can we make people conscious of the value of these wood resources? Historically, the people of Puerto Rico have been somewhat separated from the land since the 1930s-1950s with migration to the cities, even though forest cover has increased from about 5% to 50% during that time. We need to rebuild the cultural connection with forests. One local plantation site and business, Tropic Ventures, experienced extreme damage after Hurricane María in 2017, but Tropic Ventures is building back. They are an important site for practical forestry education in Puerto Rico. Other members work to conserve the flora of Puerto Rico and the diversity of native forests through education and research. An ISTF chapter is being formed in Puerto Rico. Also of concern is how to accelerate the process of reforestation by seeding and use of nurseries And how can we make use of carbon markets. The *Wood Innovations Initiative* is working to increase sustainably increase wood production and utilization in Puerto Rico. *Wood Innovations* will work with the wood product chain, also look at non wood forest products, and payment for environmental services to help maintain water resources and the associated forest. One problem in PR is the big divide between agriculture and forest management/policy, which also happens other places. These areas may be

separated by Agroforestry is a possibility for bringing these together. We would like ISTF to consider producing some videos demonstrating practical topics, such as management of urban trees, plantation management such as at Tropic Ventures.

- **USA**: Many veterans, practicing foresters in the USA with international experience are outside of professional networks but they are still interested in improving their knowledge, and they have expertise to share. ISTF can offer them a way to connect, share their knowledge, and gain continuing education.
- **René**: ISTF recently participated in a webinar on forest restoration with IUFRO and the *Initiative 20x20*. About 400 people attended. ISTF is about connecting individual people, including practitioners and the private sector, not just government agencies, research institutes, and NGOs. The internet and the cell phone give us new ways to connect people, and these are reaching deeper inside developing counties.

AMERICAS TOWNHALL

Thrity Vaki, Puerto Rico

Christian Torres Santana, Puerto Rico

Mike Sterner, ISTF Treasurer

Alfredo Tadeo, Mexico

Luis Aznar, Mexico

Ideas for ISTF regional activities, especially trainings were presented,

- Participants want to have regular meetings like this town hall in the future.
- In future regional meetings, we could have a short presentation on a selected theme.
- Meetings could be on topics such as urban forests or how agroforestry can be economically viable. Both technical and more general topics could be included.
- Workshops for improving forestry education could be offered, with certification, and be broadly advertised for participation and to recruit ISTF members.
- Universities could offer mini courses for students for credit.
- Need training in how to adapt management to recurrences like hurricanes.
- We also need to recruit the next generation into forests natural resource science and management.
- Major storms will increase in frequency and intensity in the Caribbean, and will impact forest resources. We need more information on these impacts and how to recover from them.

We need to focus on strengthening the connections in the ISTF Network, strengthening the competencies of the membership. Once we know better the members in our countries and chapters, we can develop workshop activities to meet member needs. Mexico has many needs for specialized training for students, for forestry practitioners, and for producers of different types of forest products: honey, chocolate, etc. There are many institutions in Mexico now offering training on line. How do we link with them?

- **Financing**: There are two options for ISTF to seek funding: ISTF-Global can obtain funding and individual chapters can also seek it. ISTF-Global is in the process of getting tax-exempt status in the US, and then it can go for support. Funding is a big need for projects training events, product development, and market development for products. ISTF may be able to help in these areas. Members need information on different sources of financing and how to obtain it. Mexican members look for funding to attend national and international congresses. ISTF should consider facilitating collaborations for research and projects between institutions in different countries, to help make use of funding available in different countries. Funding could be sought for visits between countries.
- **On the young**: Funding is needed also to promote the education of university AND community youth in the management of forest resources, and projects with them to put their skills into practice. We should think about funding for an ISTF Youth Corps. These

youth could also train others. ISTF could involve youth to help systematize and disseminate information.

- **Publishing**: If the Spanish speaker can find a partner in another country through ISTF, this could help with publishing in English in higher-profile journals. Mexican journals have lower impact and Mexican research should have a broader audience.
- **Farm and forest**: Governments may see farms and forests as distinct, but in reality, they are intermixed on the ground, and the management issues are intertwined. The problems of forests are not only in the forest, but also result from the pressures from agriculture. Training and projects need to be able to bridge different areas that may seem distinct.

ASIA-AUSTRALIA PACIFIC TOWN HALL: Focus on Forest Research for Mitigation

The ISTF Town hall for Asia-Australia took place on 8 December 8 with 16 participants (including 3 board members) from Malaysia (1), Indonesia (4), India (2), Australia (2), Bangladesh (1), Nepal (1). Keith Moser (ISTF-Global President) started the meeting with an overview of the organization. The emphasis of this town hall was on research needs to meet changing climate, etc. In spite of the current interest in tropical forests, they are not in good shape.

Forty years ago, ISTF was a lifeline for a Peace Corps volunteer to keep in touch with foresters around the world. ISTF needs to develop more ISTF chapters in Asia, for example, in Indonesia, an important country for tropical forests, with varied geography and landscape. Listed here are the concerns expressed by participants from each country. Online connectivity issues limited the participation from some locations.

- **Australia**: The replacement of the forestry program at Southern Cross University by a science degree with skeletal forestry course work is typical of what is going on world-wide, with reduced emphasis on education for forestry/forest management. But new graduates do not know enough for forestry work, unlike recipients of the old forestry degrees. On the other hand, we have opportunity for involvement with many students who come to study, especially from Vietnam, Indonesia, and the South Pacific. They do their research project based on data collected in their home countries, sometimes an Australian project.

The representative's work on forest dynamics in a subtropical forest rainforest, where more forest fires are now occurring: 5.5 million ha of the New South Wales Estate, including rainforest, burned in summer 2020. We need to understand the impacts of fire on dynamics in this forest, how the increased fire regime impacts biomes where fire was not previously expected. We know very little about what to expect. We are using long-term plots (back to 1930s and 1940s) to study fire impacts, working close to the Queensland border at the Border Lands National Park. This sub-tropical rainforest has many of the characteristics of tropical rainforest. The species are not adapted to deal well with fire, for example in terms of resistance (thin bark) and resilience (regeneration mechanisms). The question is what are we going to do about these rainforests with significant biodiversity? We thought that parts of these were in somewhat protected climate and topographic refuges. But rainfall has been declining over the last 50 years. Tree growth is seasonal, related to temperature and rainfall; the winters are dry and the summers are wetter. Spring growth depends on spring warming

and rainfall. If the rain is delayed, the early growth flush will die, resulting in more leaf shedding, increased fuel load, and increased fire hazard. We want to learn from other places about the impacts of fire on rainforests. Also, the boundary between lowland subtropical forest and upland temperate forest was thought to be determined by climate, but the soils are playing a role in the community boundaries. The soil differences may be keeping climate impacts at bay for now, in terms of species shifts. You need a long-term data set to see these sorts of changes.

At some point, we will need to pass the questions and data sets on to new researchers. Long-term data is often used for purposes for which it was not collected. Plots in NSW were set up to study silviculture impacts for harvesting and managing an ongoing tree crop. We are using them to see how to advise conservation land managers on various issues, but still rooted in the same basic questions – about canopy dynamics, how it regenerates, grows, dies. These are the same questions that conservation land manager deal with, only they are not managing for an income from projected harvests. Old data is continually in danger of being thrown out or lost, and those who understand the data retire and then die. These data need to be curated for answering long-term questions. The accompanying metadata about how the studies were set up, and trees measured, is critical.

ACIAR is the Australian agency for projects in international agricultural research. An example project is in NW Vietnam, where there is a large problem with deforestation and erosion, from growing crops on steep slopes. Other ACIAR projects include Vanuatu and Solomon Islands in the South Pacific and native forest management in Papua New Guinea.

- **Keith**: You only get about 10-15%of the value out of the data collected for publications. There are always additional queries to make of a dataset. Climate change, heat, drought, and fire are all linked. How resilient can species be to a changing moisture regime? How do we improve resilience for forests? Breeding for resilience rather than top yield is one option being used in breeding in agriculture.
- **Malaysia**: Represented by a soil scientist working on tropical soil ecology and fertility, phytoremediation of mined lands using native timbers, rejuvenating soils by reforestation with timber species, and microbial diversity in mangroves. Landscape restoration, is not well explored in Malaysia, and we are interested in working with that. In the 1990s there was more focus on agroforestry and regenerative agriculture. We need to bring that back to fight climate change. I also work on sensitive ecosystems like mangroves, montane forest, coastal areas, which we need to know how to protect and conserve. To do

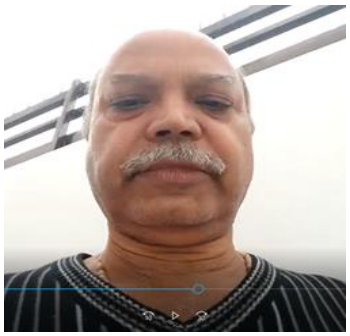
this, we need knowledge, know-how, and experience. I would like to look at how soil can be an important tool for ecological restoration in different ecosystems in the tropics around the world, not just Malaysia.

- **Indonesia**: One representative was also a soil scientist who worked with carbon stocks in mangroves, helping communities to access the carbon market, and converting old shrimp ponds to rejuvenate mangrove areas. Another representative did research on forest biometrics. There is the new Bunaken Tangkoko Minahasa biosphere reserve in in North Sulawesi that is mostly mangrove. Maybe we can help farmers and fisheries around the area, through knowing how mangrove can help us to mitigate the effects of climate change. We have worked with allometric equations for mangrove biomass, and also with a Papua New Guinea climate change team to look at carbon stock in some mangrove areas, The nipa or mangrove palm is a possible resource.
- **Bangladesh**: The representative works with sustainable urban forestry, community development, black dunes, collaborative forest management, and forest restoration.
- **India**: One representative works on forest biometry, growth modeling, agroforestry, and restoration. India is a mega bio-diverse country. But most forests are degraded, only about 5% are in good condition. Forest restoration is very important, and the government is now focusing on that. One problem is that the supply of raw materials from forests to industry is insufficient, so industries are dependent on agroforestry. We need to motivate farmers to grow tree crops, and need a functional agroforestry policy to promote this. Contract farming is one way to go: industry contracts with farmers to meet needs of what to grow. The government is trying to reduce dependence on oil and sustain the wood-based industry. A result could be more dependable income for farmers. Agroforestry in general helps to counteract climate change.

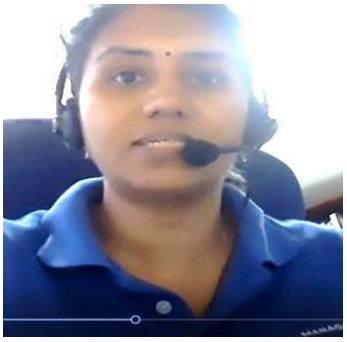
In my area, about 17% of the land is available for restoration. One possibility is forest protection another is restoration at different scales. A big problem is that restoration often does not give the desired result. For successful restoration in India, we need to get appropriate germplasm and quality nursery stock for planting, not just take seedlings from anywhere. So we need to develop guidelines and certification of nurseries. India is committed to the Paris agreement and has committed to restoring 26 million ha of forest. We also need better, cost-effective technology for planting for degraded lands. What India learns can also be used to help other south Asian countries, through the proposed Advanced Center for Land Degradation and Desertification.

Another person from India is a plant ecologist and taxonomist working on species recovery and assessment of the threatened status of plants in the western Ghats.

ASIA-AUSTRALIA-PACIFIC TOWNHALL



V.P. Tewari, India



Jeyanny Vijayanathan, Malaysia

Ross Peacock, Australia

Patrick Durst, Asia-Austraila-Pacific Representative

- **Nepal**: The representative works at the interface between forests, climate science, and the important role of forestry in mitigation and adaptation. In the past I worked with agroforestry. The new ISTF Chapter is developing a memorandum of understanding for a partnership with the Agriculture and Forestry University of Nepal.

In wrapping up, Patrick Durst mentioned restoration and agroforestry. These present opportunities for action are related to the UN Decade on forest restoration. An explosion of new tools, technology, financial strategies, and creative policies should help with achieving restoration goals. But practitioners and policy makers in different countries may not be aware of these tools and need help to understand and use these new developments in restoration.

AFRICA TOWNHALL Focus on Funding Chapters

The ISTF townhall for Africa-Europe was held on 10 December 2020, with 8 total participants (including 5 board members) from Nigeria (1), Uganda (1), and the USA (1). Keith Moser (ISTF-Global President) started the meeting with an overview of the organization. From the perspectives of Ghana, Nigeria, and Uganda, funding for ISTF Chapters is a central issue that the organization needs to address.

- **Fund raising and ISTF-Global**: The organization needs to develop a global strategy for fund raising: a strategic plan with a financial component. You need some funds to get your organization up and running, even at the global level for ISTF. But ISTF has a good concept that should easily make a connection with any donor. ISTF's strategic plan should be flexible to potentially involve chapters. Chapters will go dormant if they do not have a means to raise funds. ISTF Global could apply for seed money for different chapters to get established in areas where resources are very limited, so that they can get off the ground. But that sort of funding is rare. Multiple countries on a proposal are a challenge. It was not certain that ISTF-Global wants to take on the role of overseeing projects all over the world. This seems to be more a role for local chapters. But ISTF-Global can help with sharing information on how to get funding.
- **Funding for Chapters**: Getting funding for a new chapter or organization is very difficult. But for the chapters to run effectively, they do need some sort of funding. Chapters will need to be acting on their own behalf for resources to carry out activities. For countries like those in Africa, it could be hard for members to pay dues, especially students. But if a member feels there are professional advantages to belonging to ISTF, they may be willing to do it. So it is important that ISTF members see benefits in being part of ISTF. Chapters need to think about other funding strategies than just dues.
- **Legal recognition**: One of the first things for organizations to do is get legal recognition to be able to obtain funding, especially in the African terrain. If you are legally incorporated, you have the legal right to exist within your country. A university chapter may not need to be officially recognized. The chapter is then subject to auditing and the laws of the country. This applies across most of Africa. Donors are skeptical if you are not well structured or recognized. To register in a country itself might also require funding.

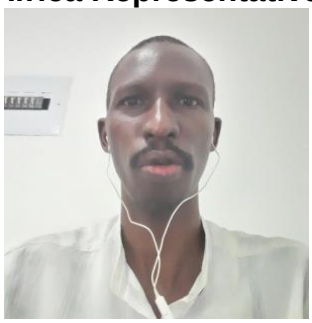
For Ghana, you need to register as an association in the legal records of Ghana, so that you can apply for funding outside of Ghana. Getting incorporated in Ghana costs around $200. Maybe these sorts of funds could be included in ISTF-Global seed funds. Members of the local executive committee/board would need to apply for registration, and get a tax identification number.

AFRICA TOWNHALL

Sheila Ward, ISTF Coordinator

Daniel Kofi Abu, Africa Representative

Samuel Olajuyigbe, Nigeria



Arthur Arnold Owiny, Uganda

In some countries it is more difficult for a new organization to get established than others. In Nigeria organizations register with the Corporate Affairs Commission of Nigeria. But it is a long process. So while the process is underway, how can the Nigeria chapter get recognition, get its name out, begin to have an impact? It also seems to be more difficult to get legal recognition in French-speaking countries. ISTF-Global was encouraged to develop its linkages with Francophone Africa. We do have the chapter organizing documents now translated to French.

Organizations also need to be well structured with officers and defined rules for operation to obtain funding. ISTF chapters in general are well structured.

- **Strategic planning**: The next step is to develop the chapter's written strategy or plan of action, and the budget to carry out the strategic plan. This should be a short document on what you want to do over one to three years. Include with it the amount of money it will take to carry out your activities, and then you have something to take

to different donors. Rwanda is an example of a chapter with a strategic plan: they want to implement agroforestry activities with communities on the boundaries of reserves, to reduce pressure on reserves.

- **Theory of change**: Then take the main objectives for your chapter, and use them to develop a postulated (hypothetical) theory of change. This means – if we carry out a certain activity, we can expect certain specified results. Once you have your theory of change, you can scale up to broader, larger applications. If you follow through rigorously on your activities and monitor for the expected results, you should have a success story to report. This will then help you to go for larger grants. ISTF-Global could help with developing a broader theory of change that chapters could fit into. We can make explicit the ISTF-Global theory of change which is imbedded in the organization objectives.
- **Applying for funding**: Then consider what organizations to target for funding. Go for funding opportunities in line with your organization's size and strengths. Investigate target funding sources, the kinds of funding they provide, and what they want funded projects to accomplish. Then look at the format they use for applications. Do they have a particular template, or do they use a general proposal format? Beyond that, you need to look at grant writing, using platforms that exist in each country. This can also help students applying for programs to study, within and outside of a country.

  Start with applying for small grants first, like those from National Geographic, Mohammed bin Zayed Species Conservation Fund, the Prince Bernhard Nature Fund. ITTO does some smaller grants. USAID and the US embassies fund self-help projects, US$10,000 to 20,000.The Australian Embassy supports small community grants. UNDP has a small grants program that may be a possible funding source for chapters; they are open to communities.
- **Partnering**: An effective way to get funding is to network and to partner with similar organizations. You need to be connected to a network to be aware of the funding that will become available, to be positioned to apply. You need to recognize the opportunities that exist within your country for networking. What networks are available to connect with? NGOs, the forest sector, the health sector should be considered. There can also be associations that help shape forest law and policy. A chapter needs to map for its country the possible players to interact with, networks to join. This helps to see how to tap into the local funding landscape. It helps for an

organization to belong to national and regional platforms, like Forest Watch in Ghana. Will they permit new organizations to join? If so, you should join them.

For larger grants a chapter should consider partnering with other organizations, even larger ones, and leverage support from other international NGOs. An existing organization can let a new organization participate in some activities, just to get the name out of the new entity. This is a way to get your foot in the door, get known to donors. A potential example would be if ISTF-Ghana were to partner with Tropbenbos-Internationalor Global Forest Watch. If Tropenbos applies for a multimillion euro EU grant, ISTF-Ghana could have a small part of the action.

You can look at the program components of the potential partner organizations that will be a good fit with your chapters projected activities. You can also approach these other organizations informally to see if they would like to work with you on developing an idea. Sometimes another NGO or government agency might approach you and ask you to make an application

In Nigeria, there is a large Nigerian conservation foundation and there is the Forestry Association of Nigeria. Most of the forestry policy is driven by the government. The connectivity among NGOs in Nigeria needs further development. The connectivity among NGOS in Ghana seems to be further developed with platforms like Forest Watch, and with NGOs contributing to the formation of forestry law and policy.

Local politics are also a challenge. Can you develop good relationships with the national and local governments, with national and other NGOs? They can see a new player as competition. One way is to show them how you can help them achieve their program.

- **Larger funding**: Grow larger as your programs grow. Once you have connected with one or two funding sources, you will be able to implement your program. You will be able to develop your reputation and make yourself known. But networking is key. For the major funders, you need to win their confidence. When the reputation is established, a chapter can maybe get on the radar of larger funders like FAO, UNDP, GIZ, ITTO. One coming funding source for Africa that might be considered is the Green Bond program sponsored by the European Union (CHECK).
- **Other thoughts**: It might also be possible for local chapters to come together to develop a proposal. That has worked for organizations connecting between Liberia

and Ghana. But it depends on how donors are targeting funds to particular regions and topics.

Another aspect that can be very helpful is having someone else look at your grant proposal. Of course, there can also be the worry that someone else will take your idea. Maybe ISTF could form a voluntary buddy system, where members of one chapter partner with another for reviewing each other's proposals.

How can ISTF-Global provide some guidance to young chapters? Provide training, list of funding sources, template for a theory of change or an overall theory of change. Need to post webinar for forming chapters.

With the new chapters in Africa we should have more regional encounters to share ideas, for projects funding, and to discuss the challenges we face.

PRESENTATION AT THE ISTF TOWNHALLS FOR ASIA-AUSTRALIA AND AFRICA-EUROPE

W. Keith Moser (ISTF-Global President)

I am going to give an introduction about our view of ISTF, but the main purpose of this meeting is to hear what you are thinking, what you want to see from us. Are we meeting your expectations? What would you like to see from ISTF going into the future?

You are going to hear a lot about data, information, and knowledge and ISTF's role in knowledge transfer. The 10,000-meter view of ISTF and tropical forestry is that we want to be a communication network that facilitates tropical forest conservation. There are many scientific research groups out there that are very good generating knowledge, including some that you belong to. There are committed advocacy groups, also collectors and purveyors of knowledge. There is a lot of knowledge out there, but there are not a lot of ways of getting it back and forth. Because of the uneven nature of access to knowledge, we are concerned about "knowledge deserts" and we do not wish to reinforce them. On the contrary, we wish to reduce the structural issues that prevent getting knowledge of tropical forest conservation to folks who are able to do something with it. We want to make sure there is no knowledge left on the shelf, but that we are getting it out to people. So that is one of our goals.

ISTF was originally founded in the 1950s and in response to a worldwide concern for the fate of tropical and subtropical forests. It is interesting, as concerned as people were back then, the worldwide tropical forest ecosystems were probably in a lot better shape than they are now. So, we almost wish we were back in the 50s in some ways, because of the destruction, the land use conversion, and the climate change issues that have accelerated in the last 60-some years.

The original focus of the Society was a commitment to the protection, wise management, and rational use of the world's tropical forests. ISTF operated for about 50-60 years and then went dormant in 2012 for a variety of reasons. We were fortunate that there were people who were carrying the torch in the interim, and we were able to reactivate the society in 2017.We now have least 1700 members in 102 countries around the world, and it is exciting to be able to share similar views and similar hopes with people and countries in all 24 time zones. At the global level ISTF is dues-free. Local chapters may charge dues to support their activities. It is up to the local chapters how they want to do that.

ISTF is open to everybody who is interested in and committed to sustainable use and conservation of tropical forest resources. Notice that we talk about conservation and use, because part of the tropical forest resource is the people that are there. We want to make sure that what we do is empowering them and future generations for forest conservation.

Our vision is a knowledge-sharing world that values, conserves, and sustainably uses tropical forests. Our mission is to facilitate and promote sharing of best practices for the effective management, protection, and equitable and ecologically sustainable use of tropical forests and natural resources in tropical and subtropical regions across the globe. These especially include locally-appropriate and evidence-based practices. The neat thing about ISTF is that it is basically a bottom-up organization. The knowledge is down at the member level and the job of ISTF-Global is the transfer of information back and forth.

ISTF-Global has a board of directors. I (Keith) live in northern Arizona (USA). Ruth Metzel is the vice president and used to be in Panama but has recently moved back to the USA. Our secretary is Paula Sarigumba who is from the Philippines, then in Bangkok, and is now in Canada. The treasurer is Mike Stern in Oregon (USA). Daniel Kofi Abu is the tropical Africa representative and lives in Ghana. The tropical Americas representative is Rene Zamora from Guatemala, but he is now in Washington, DC. Patrick Durst is the Asia-Australia-Pacific representative and is based in Bangkok. Sheila Ward is our coordinator and long-time ISTF torchbearer and lives in Puerto Rico.

We have talked about the ISTF vision and mission. Here are some of our objectives:

1. As a center, to communicate information about professional activities and tropical forest-related issues, to promote the understanding of tropical forestry and sustainable use practices.
2. To recruit members from throughout the world, especially in tropical countries, and create this global online community. We did not realize how “online” it was going to be until this year. We an online community of people interested in tropical forest science.
3. Promote research and dissemination of scientific knowledge, particularly the dissemination part. There are people on the ground like many of you who are generating the knowledge as we speak, but the main thing is to get the information back and forth. An old professor of mine said that all the environmental problems of the world were solved, they are just on the shelf somewhere. I do not know if it is

true. But his point was that while we generate knowledge, we do not always do a good job of transferring that knowledge. That is one of the main purposes for ISTF.

In a previous life, I was editor of two journals, and I believe in effective knowledge transfer and making sure that there are no gaps in knowledge availability in any part of the tropical world to be important roles for ISTF. There are two parts to this process: One is to make sure that everybody with an interest in tropical forestry can receive information, is able to gain knowledge. But in some ways even more important, we should recognize and value the people on the ground with their experiences and their values who can inform us. I have a vision someday where, say, someone who is practicing forestry in Rwanda and their process or practice can be used to inform improved tropical forest management in Vietnam. That is my dream: global information exchange and global knowledge empowerment.

I used to have a job working for the US state natural resources agency. One of my main roles was transferring knowledge from one forester to another, because if one forester had been on a property for 20-30 years, there is not too much I could have told them, but I can take their knowledge and transfer to another part of the state. So, just expand this model globally, and that is really what we are trying to do.

4. We want to identify and promote international and local activities that advance tropical forest conservation. We keep that fairly broad, in that we are looking at practices that could affect tropical forest science, but we are not telling someone they must do it a particular way. It is a very challenging line to avoid crossing, to make sure that we are informing but not pronouncing. We want to explain how and why we think tropical forests are important to the local population and the global environment, but we do not want to get in the weeds of any specific advocacy. I think there are groups out there that do that, particularly locally-based, and they are the best suited to talk about advocacy in a specific sense.
5. The fifth objective is to cooperate and collaborate with government and non-government organizations. That is another part of the ISTF knowledge transfer function. There are literally hundreds of organizations interested in tropical forests. We are not trying to replace any of them, just to collaborate to promote development and implementation of equitable and ecologically sustainable land use practices that value and conserve tropical forest, and always with respect for local policy, cultures, histories, practices. Our job is to inform but not to judge.

6. Also, in every aspect of this mission, to respect the diversity in all its cultural, religious, economic, personal, and other dimensions. That is why it is important to have participation of ISTF members at the local level, because our members at the local level know best what can work in their particular situations. We look for good governance and chapter autonomy. We provide a lot of leeway to the individual chapters to chart their own path, because they know what is best for the local area, better than those of us on the ISTF-Global board. We really want the local chapters to display the character, the cultural beliefs, and the ecological questions of their particular locations. How people use a forest, how they see it, what they get out of it, are going to differ from person to person and region to region. It is really up to the local members to decide.
7. We are also committed to non-partisanship. Non-partisanship really is a good idea in general, sin today's world you will have to work with people with different beliefs to get anything done. We would hope that ISTF members, united by a common passion for conservation and sustainable use of tropical forest resources, will be forgiving of each other. Fairness, transparency, collegiality, accountability (just to be responsible), for both the assets and the goals of the local chapters, and then staying within the framework of the ISTF-Global bylaws, mission, vision, and goals. These are broad guidelines, so there is still a lot of room for creativity at the member and chapter level.

One of the true pleasures of my job is meeting people passionately committed to tropical forest conservation from around the world. We have many new chapters: Rwanda, Nigeria, Ghana, India, Nepal, Mexico, and the Duke Student Chapter. The two other chapters that are furthest along in finalizing their bylaws are Puerto Rico and Panama (edit., they are approved chapters at the time of this printing). There are also the veteran student chapters remaining at Yale and NC State that carried the torch from the old to the new ISTF. Then we also have chapters in formation in countries throughout the world: Kenya, Liberia. Malawi, Sierra Leone, Ethiopia, Bolivia, to name but a few. Interest has been expressed in many other countries. It has been a challenging time for tropical forest conservation even before the pandemic, as you know, so things might take a while.

We at ISTF-Global learn from interacting with members and local chapters throughout the planet. We have different situations in different countries. In Nigeria there are 500-600 members, in other countries only a few dozen. Chapters in some countries have jumped in with both feet and others are taking it more slowly. It will be interesting as we

evolve as a Society and how we work with the local chapters. If you want to be a national chapter, or you want to be a local chapter at University or whatever, that will be up to you. We are all feeling our way.

In the end, ISTF relies on you. We rely on your local knowledge to make sure that we are doing the best job in terms of transferring data, information, and knowledge to you. We have a lot of information sources. We have the ISTF Newsletter and the ISTF Update. We have a new website and the old website still up. We have a Facebook page, LinkedIn page, YouTube channel, and a Twitter handle. The websites are also available from the student chapters at Yale and NC State that were able to keep functioning. We are still working on some of the stuff. Remember I talked about how the society went into hibernation and came back up? Well, we are still "regenerating", but we cannot do it without you. We are doing it for you and the tropical forest resource we all love.

Thank you.

Keith

THE INTERNATIONAL SOCIETY OF TROPICAL FORESTERS

Shalini Dhyani

1. **A discussion on Himalayas and Ecosystem Restoration**

Landscape Institute South East (LISE), UK invited Dr Shalini Dhyani, in the LISE member event supported by Department of Environmental Conservation, University of Greenwich, UK on 20 February, 2021. She made a presentation Shalini on her work in the Himalayas. Land degradation is a mega driver of ecosystems and biodiversity loss across Asia. Shalini provided examples based on her work in the Himalayas and other forests on how anthropogenic pressure is worsening the issue in the warming world with a special focus on keystone forest species that provide benefits to local populations. She shared her experiences of different models of restoration schemes, including her work focusing on climate sensitive restoration planning and need to include more hybrid approaches such as citizen science and AI in Asia.

2. **"IUCN Red List of Ecosystems (RLE) Typologies and Principles of Classification: Assessing ecosystem risks for prioritising conservation in Mountain Ecosystems of S. Asia"** on 14 December 2020.

On behalf of South Asia Regional chapter of the Commission on Ecosystem Management of the IUCN (IUCN, CEM) in association with FAO-Mountain Partnerships Dr. Shalini Dhyani as S. Asia regional chair organised a strategically important virtual event to celebrate the International Mountain Day 2020 (IMD2020) with the theme 'Mountain Biodiversity'. The event was strategic for understanding the needs, opportunities, data gaps

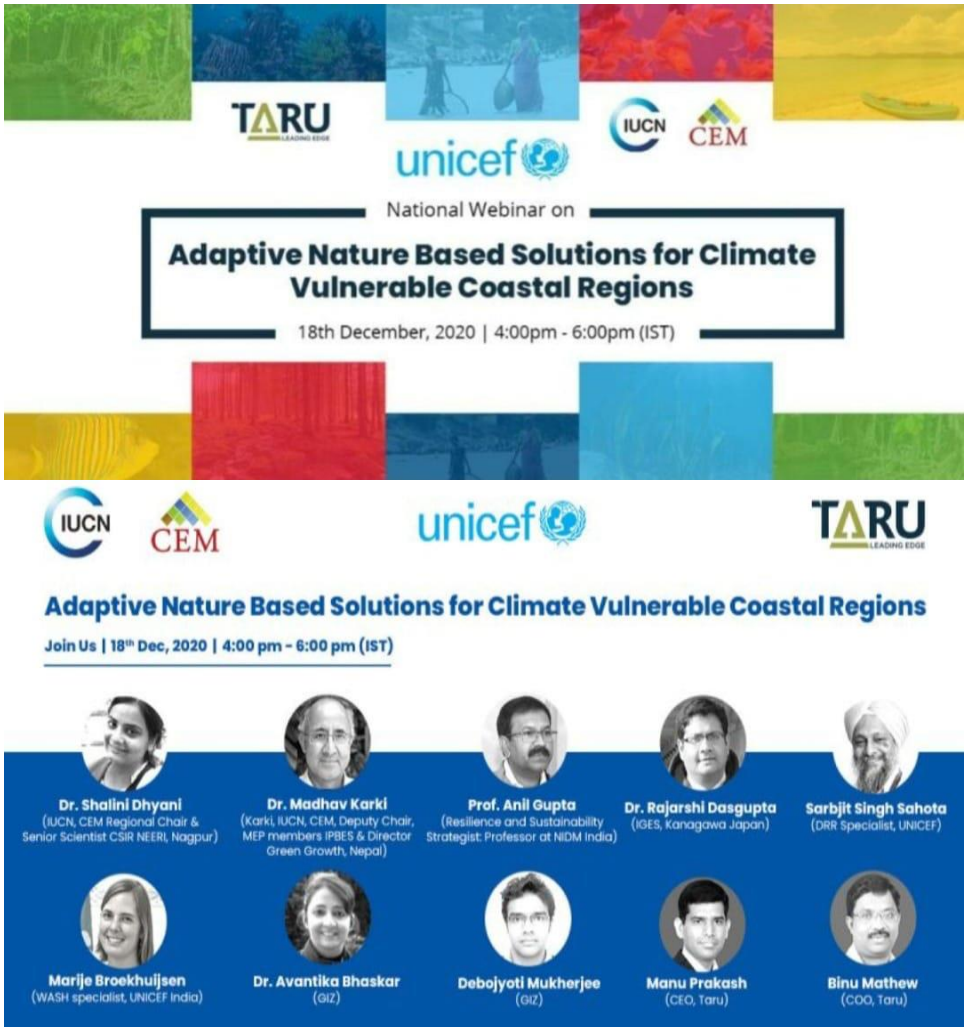
and expert inputs required for realizing the goal of resilient Himalaya. The two-hour-long event facilitated an exchange of ideas and deepening of knowledge on the importance of multidimensional threats posed by climatic and socio-economic changes and challenges on diverse types of Mountain Ecosystems in South Asian Region by using the emerging tools and methods, with particular emphasis on Red List of Ecosystems (RLE) developed by the IUCN CEM.

Details of the programme can be seen here:

https://www.youtube.com/watch?v=gZHP7pBfoOU

3. National Webinar on Adaptive Nature Based Solutions for Climate Vulnerable Coastal Regions

Dr. Shalini Dhyani, was a keynote speaker in the event organized by IUCN CEM S. Asia inassociation with Taru Leading Edge and UNICEF webinar series to facilitate an exchange ofideas and deepening of the knowledge on the role of Nature based Solutions and Ecosystem based Approach to address climate change challenges in the coastal regions of India. As a part of the series, the first webinar was organized on 18 December 2020 between 4 pm to 6 pm IST. As a part of the webinar series on the potential of NbS and EbA approach to adaptation planning. The session focus was on deepening the conceptual understanding on NbS and the EbA approach as an adaptive strategy to climate change. The session introduced the concepts and its validity, presence, and potential in the South Asian region.



Recent Publications

- **Dhyani, Shalini** & Kumar, Biju & Sinha, Neha & Raghavan, Rajeev & Selvaraj, Gayathri &Divakar, Nithin & V K, Anoop & Kannan, Shalu & Sinha, Alolika & Kulkarni, Apoorva & Das, Sandeep & Molur, Sanjay & Ajayaghosh, Ramvilas. (2021). Insights on COVID-19 impacts, challenges and opportunities for India's biodiversity research: From complexity to building adaptations. Biological Conservation. 255. 109003. 10.1016/j.biocon.2021.109003.
- Joshi, Rajendra Kumar & **Dhyani, Shalini** & Gujre, Nihal & Singh, Ajay. (2021). Quantifying tree carbon stock in historically conserved Seminary Hills urban forest of Nagpur, India. Acta Ecologica Sinica. 10.1016/j.chnaes.2021.01.006.
- Dasgupta, R., Hashimoto, S., Basu, M. **Dhyani, S.** Spatial characterization of non-material values across multiple coastal production landscapes in the Indian Sundarban delta. Sustain Sci (2021). https://doi.org/10.1007/s11625-020-00899-3

SEARCH FOR LEGACY TROPICAL FOREST DATA IN NEED OF CURATION

Sheila Ward

We are searching for tropical forest data, including inventory and plot data, that are in danger of being lost. Many projects over the years have generated tropical forest data. But the data are scattered among different institutions and people, some still only on paper, some digitized but in older formats. If you know of any such legacy databases in danger of being lost, please send a message to tropfordat@gmail.com .

These legacy datasets are valuable for understanding how tropical forests change through time, including the cumulative impacts of change in land use and climate, as well as changes in patterns of biodiversity and carbon storage. These data are also useful for planning sustainable forest management and forest restoration.

TROPIS and ATROFI-UK are two previous databases that compiled metadata on forest plots and inventories. The data for certain plots are available at www.forestplots.net and its associated networks. But other tropical forest data still need attention.

Therefore, we are compiling information on tropical forest datasets that need to be digitized or moved to an up-to-date digital format. The goals are to locate these legacy datasets in need of rescue, compile their metadata (descriptions), obtain funding, archive the data, and make them available (probably at existing repositories). We are also developing best practices for giving credit to data sources and for appropriate use of these data. We are not compiling these data for our own use.

We have redirected the *IUFRO Working Party 4.02.01 Resource Data in the Tropics* towards achieving these goals (https://www.iufro.org/science/divisions/division-4/40000/40200/40201/). If you would like to join the discussion on legacy tropical forest datasets, please join our mail group at https://lists.iufro.org/mailman/listinfo/wp40201/ .

SUSAN MUTE - PAN-AFRICANIST

I am Susan Mute, a young lawyer from Kenya. I have been a leader in various capacities, some of which resulted in an honorary ambassadorial position with the International Human Rights Protection Organization. I am passionate about environmental conservation in relation to peace as well as human rights. I am a very strong Pan-Africanist and am held by my Pan-Africanism ideologies. I am driven by the spirit of Ubuntu which translates to 'I am because we are'. I am also the founder of the mazingira Na Amani, which is an environmental based organization that deals with environmental conservation in relation to peace. I was inspired to register with the organization after seeing the existing environmental conflicts in the informal settlements in Nairobi, Kenya. I love writing, reading, and researching to help me better articulate the issues touching on ecological injustices.

EDO FORESTRY COMMISSION LAW IS STILL IN THE MAKING

Osehobo Ofure
President, Initiative for Climate Education and Energy Awareness, ICEEA

It is close to three years since the Governor of Edo state in Nigeria's Niger Delta, Mr. Godwin Obaseki, sent a bill for a law to set up the State Forestry Commission, to the State Legislature. The Commission according to the governor is aimed at giving legal backing to state efforts at managing her forest resources.

Obaseki also spoke of plans to make the study of Forests part of the school curriculum. He said that forestry is one subject that we will introduce in the curriculum of our basic education system in the state to inculcate in pupils the importance of our forest reserves.

The Governor had promised that before the bill is passed, he may explore the option of an Executive Order to implement his vision for the sector. He said this is necessary to begin the process of ensuring the state defines the agenda along critical principles it had laid out on forest management for implementation.

The governor noted that the state is already considering creative and sustainable ways of driving consciousness on the need to preserve forests. Obaseki said that one of the problems Nigeria faces is poor environmental practices and called on stakeholders to join hands with the government to stop the degradation of forests, as failure to do so will result in dire consequences in the years ahead.

"We are facing a looming disaster and if nothing is done quickly and urgently, all of us will be consumed as our economy will be affected," he argued.

LEARNING FROM THE BELIZE TROPICAL FORESTRY CTIONPLAN

Nick Brokaw

Nick Brokaw sharing personal experience as a member of Tropical Forestry Action Plan (TFAP) team: In 1988, I was fortunate to be a member of the Tropical Forestry Action Plan (TFAP) team for Belize, Central America. I worked with a team of forestry experts and saw much of Belize. I learned how complex forestry is, and that tropical forestry can be sustainable, in principle.

TFAP was a pan tropical program organized by FAO (Food and Agriculture Organization of the United Nations) to study the state of forestry and make recommendations in those countries that requested it. Forestry in Belize was in overall decline (Fig. 1), so Belize asked the UK to organize a Belize TFAP. Team members came from Belize, USA, UK, Canada, and Turkey and were mainly sponsored by the development agencies of those countries. Members focused on their individual specialties: forest management, forest economics, forest industries, land use, institutions, and environmental conservation. As a forest ecologist my specialty was conservation. (I was sponsored by the US Agency for International Development).

We worked in Belize during May and June 1988. Our headquarters was the Bull Frog Inn in Belmopan, capital of Belize. We did archival research and field work to get the background for our assessments and recommendations. Unless we were elsewhere in Belize, we met each day at the Bull Frog for meals and to discuss progress. Then in September 1988 we met at the Oxford Forestry Institute, UK, to integrate our reports. We submitted the 272 page (A4 paper) final report to the Government of Belize in September 1989.

My archival research was to study conservation policy and progress in Belize, using documents supplied by the Belize Forest Department, other government offices tasked with resource management, and conservation NGOs. My field work was to visit protected areas and speak to Belizean conservationists. For practical reasons I was paired with Ozzie Bender, a veteran forest industries consultant from Tacoma, Washington. Ozzie had worked in 35 countries and was a deep source of wisdom and stories. He and I drove around Belize visiting protected areas, offices, logging sites, sawmills, furniture makers, even a match company (Figs. 2-8).

In my report I:

1. Described laws, regulations, and conventions governing environmental conservation,
2. Enumerated the public and private protected areas,
3. Presented results of a "gap analysis", showing what habitats were not protected, and
4. Made suggestions for studies, a data center, new reserves, and improved management.

I did the gap analysis by taping onto a picture window a big map of Belize's protected areas on top of a same-sale map of Belize showing its 34 major vegetation types, assumed to represent distinctive habitats and constituent organisms. Brightly backlit on a sunny day, I could see which vegetation types were not included in protected areas. The main conclusion was that 16 of the 34 vegetation types were not protected.

Other reports in the Belize TFAP suggested:

1. Using band saws instead of circular saws for milling (to reduce milling waste),
2. Abandoning polycyclic for monocyclic silviculture, because the latter creates bigger forest openings, in which mahogany (*Swietenia macrophylla*) regeneration does best,
3. Establishing a series of long-term forest dynamics plots (to assess growth and natural regeneration of multiple species),
4. Changing royalties(stumpage fees) to increase Forest Department revenue),
5. Adding personnel to the Forest Department (to extend expertise and oversight),
6. Improving data collection (to optimize wood products output and income), and
7. Many other changes. And we included an action plan to effect these changes, including the establishment of long-term plots and research on promoting mahogany regeneration, which I helped with.

I got my consulting fee and a lot more from working on the Belize Tropical Forestry Action Plan. At the Bull Frog, on the road with Ozzie, at Oxford, I gained understanding of industrial, economic, silvicultural, and institutional forestry. It was course in forestry, greatly expanding my outlook. There is lot more to it than trees, making it hard to achieve sustainability, but there are clear steps to take toward success, if we can keep all these parts in mind and summon the collective will. ISTF makes the parts of forestry available and foments the collective will.

The conservation section of the Belize TFAP report can be found at: https://mayaforestbelize.files.wordpress.com/2016/11/tfap-conservation.pdf

Author Nick Brokaw can be reached at nvbrokaw@ites.upr.edu

ANNOUNCEMENTS/

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EVENTS/MEETINGS/OPPORTUNITIES

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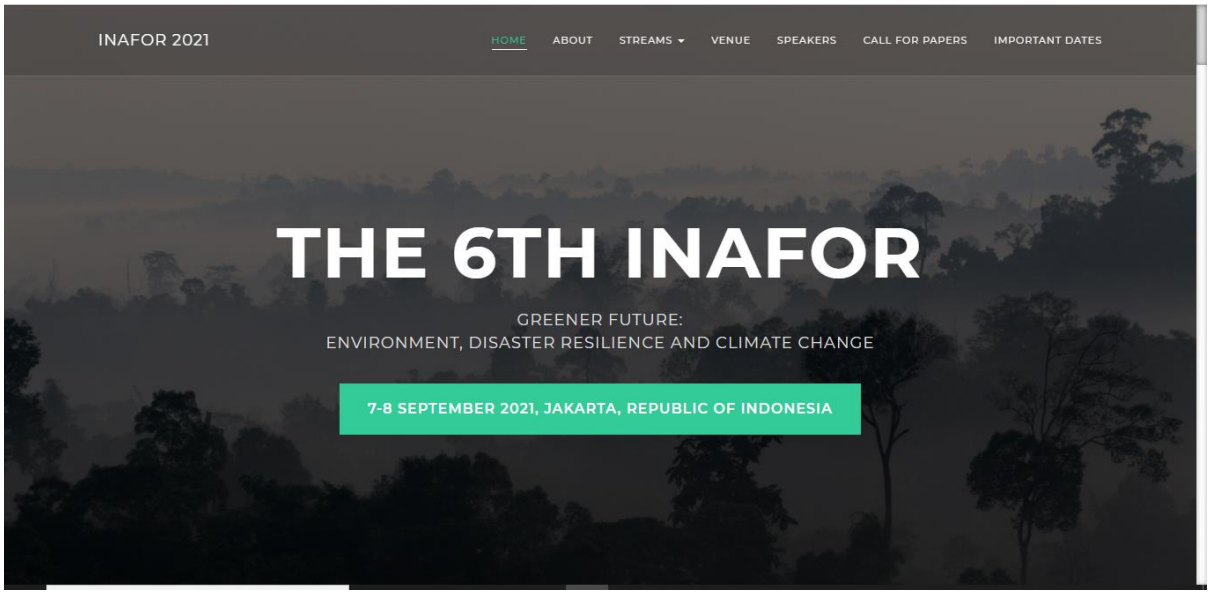
20TH COMMONWEALTH FORESTRY CONFERENCE: VIRTUAL

We are pleased to announce the 20th Commonwealth Forestry Conference: VIRTUAL– August 16-18, 2021

This Conference was first held in London in 1920. The Faculty of Forestry at the University of British Columbia will host this year's three-day conference in a virtual format, for the first time in its history. We invite members of the Commonwealth and the world forestry community at-large, regardless of their professional affiliation, to join the conversation. The Call for Abstracts is now open till the end of April, 2021. We encourage submissions within the seven Conference topics, and in three categories: oral and poster presentation, and presentation for the Three Minute Talk Challenge (students only). Accepted abstracts will be included in the post-Conference e-book publication. Conference registration will open on April 1, 2021.We look forward to exciting interaction – please join us in August.

Visions	Conference Topics
• We strive for a global forest sector that champions sustainability, diversification, equity and innovation. • We promote collaborations across Commonwealth countries at various levels from policy to on-the-ground actions. • We encourage the showcasing of existing projects while focusing on cross-country collaboration that makes a difference. • We demonstrate how and when having good national policies makes a difference, yet positive changes can occur even when national policies leave much to be desired.	• New Markets • Education and Careers • Communication • Climate Change • Technology and Innovation • Conservation versus Consumption • Urban Forests

INAFOR 6TH INTERNATIONAL CONFERENCE OF INDONESIA FORESTRY RESEARCHERS



INAFOR 6th International Conference of Indonesia Forestry Researchers

Visit the conference website at: http://inafor.forda-mof.org/

Conference streams

The INAFOR 6th 2021 will stream on forest and environment management while supporting Sustainable Development Goals-SDGs, thereby, the general theme may has ***"Greener Future: Environment, Disaster Resilience, and Climate Change"***.

Stream 1: *Emerging Environment Quality for better living*

Stream 2: *Managing forest and natural resources, meeting sustainable and friendly Use*

Stream 3: *Enhancing resilience capacity of disasters and climate change*

Stream 4: *Engaging social economic of environment and forestry, better social welfare*

Stream 5: *Cutting COVID-19 transmission, handling health and economic impacts*

Structure, Time, Venue, and Participants

The virtual platform would be broadcasted from FORDA's main office at Jakarta. The conference would be running at 3 pathways: 1) discussion at plenary and also parallel session 2) exhibition and virtual tours, and 3) photo/video competition. Registered papers/abstracts which presented would be considered to proceed published at Indonesian Journal of Forestry Research-IJFR which has been indexed by Scopus. The organizer

committee also offers to publish the registered papers at **IOP Publishing**. Please seek more information if interested.

The conference is inviting partners to hold side events in terms with the streamline topics. A digital experience would also be involved during the meeting. There also invite to bilateral meeting and other negotiation towards potential collaboration on forest and environment

The 6th INAFOR 2021 will be convened on 7-8 September 2021, at Manggala Wanabhakti Building, Jakarta Indonesia and Forestry and Environment Research, Development and Innovation Agency (FORDA) Campus, Bogor, Indonesia, also FORDA sites office in provinces.

The INAFOR 2021 will arrange collaborations across researcher, institutions, and governments. Audience may have the governments, policy makers, practitioners, academia, experts, youth, gender, journalists, for approximately 3,000 participants, either virtual pathway or real room meetings.

2021 Digital Exhibition & Marketing and Virtual Tour

Digital exhibition of Environment and Forestry will be set up during the conference, shows various issues, progress, and information in advances pertaining to the research products and contribution of Environment and forestry for greener future. There are products; foods, beverage, clothes, cosmetics, medicines, etc. **Digital marketing** would also be involved during the exhibition.

A**Virtual tour** will be held to show sites, present actions and also pioneers on the ground, inviting all registered participants to showcase their experiences for a greener future.

2021 INAFOR Photo Competition

INAFOR invites people for photograph that highlight the value of tropical forest in the world, both professional and amateur photographers. 10 most favorite photos will be selected based on votes from attendants.

OPPORTUNITIES OPEN FOR NEW STAFF APPOINTMENTS IN FOREST SCIENCES AND SOCIAL SCIENCES AT *BANGOR UNIVERSITY*

Forestry is a major focus of the current investment by Bangor University to recruit four new lecturers to the School of Natural Sciences. We seek to appoint applicants who work in forest environments across a range of disciplines within Environmental biology (such as forest ecology, genetics, entomology, pests, pathogens,wildlife or conservation biology in a forest context). In addition, within the theme of Sustainable natural resources development, we see great potential to appoint in disciplines that are key to forest management and policy, including forest economics and a range of other analytical and modelling approaches including life cycle assessment, as well as qualitative research with forest stakeholders. The role of forests in mitigating and adapting to climate change, as well as the delivery of the full range of other ecosystem services remains a key research focus. We place an emphasis on 'whole-systems' assessment, not just at the ecosystem level but also up to the scale of the landscape, socio-ecological systems and the value chain, including the processing and utilization of land-use products as a key component of the bioeconomy.

Bangor's research and teaching in forestry has a global perspective and we welcome applicants whose expertise relates to any forest types across the range from tropical to temperate and boreal, from moist to dry, and from natural forests to plantations, urban forests or agroforestry. We have a passion to advance and teach understanding of the world's forest resources to underpin their sustainable management and related policy.

The Bangor forestry group and its research

Bangor University is a leading UK and international academic centre in the field of forestry, with a strongly upward trajectory.

The forestry group comprises 12 academic staff, with other Bangor staff working in fields, such as conservation, microbiology, environmental geography, hydrology, human geography and wood science, closely associated with the group. More than 20 PhD students are researching forest projects and form the core of our frequent forest research seminars.

The group is carrying out high-profile research across a range of subjects, with an important inter-disciplinary component, including:

- Tropical and temperate forest ecology, biogeochemistry and soil function; forest restoration and resilience

- Biophysical and socio-economic aspects of agroforestry systems and non-timber forest products
- Forest conservation including the impact of forest operations and effectiveness of conservation interventions (from both biodiversity and social equity considerations)
- Broad applications of remote sensing, in particular Lidar, to inventory and monitoring of forest structure, biomass, dynamics and management
- Tree pathogen microbiology and mitigation of disease impacts
- Impacts of forest management, agroforestry and land use change on water resources
- Landscape-scale modelling of deforestation and forest degradation impacts on biodiversity and ecosystem function
- Economic and systems modelling of ecosystem service delivery
- Social science of forest governance, management (including participatory forest management) and wildlife (including Rewilding).

A key link that we are re-strengthening, to enable full system assessment of the forest production value chain, is to the University's Bio-composites Centre, which specializes in bio-renewable products, with a strong tradition in wood science.

Key cross-cutting themes are:

- Climate change mitigation through forest carbon sequestration and production
- Elevated CO_2, climate change and disturbance impacts on forest ecosystems.

We have very strong national and international networks that play a key role in facilitating Bangor's forestry research and education. Bangor University is a partner in the Natural Environment Research Council Doctoral Training Partnership 'Envision', with Lancaster and Nottingham Universities and three other research organizations that is funding multiple PhDs in tropical and temperate forest sciences, many based in Bangor. Bangor University leads the Welsh National Research Network for Low Carbon, Energy and Environment. Of rapidly growing importance is our partnership with the Central South University of Forestry and Technology in Hunan, China (where Bangor University has its China campus), which is fostering a rapidly expanding set of collaborative research projects (including access to their large research forest). In addition, we have well-established collaborative partnerships with both the World Agroforestry Centre (ICRAF) and the Tropical Agricultural Research and Higher Education Center (CATIE), resulting in many joint PhDs, as well as project collaboration with the Center for International Forestry

Research (CIFOR). We are members of the International Union of Forest Research Organizations (IUFRO), the UK's forest industry confederation (CONFOR) and are currently applying for membership of the European Forest Institute (EFI).

Forestry students and teaching at Bangor

Bangor University is both the first and largest educator of students in the forestry subject area in the UK, spanning a biggroup of PhD students, full-time and part-time distance-learning MSc degrees, and BSc degrees. These are characterised by highly motivated cohorts of students, many with considerable existing experience, and highly innovative teaching, with many new opportunities. Bangor's excellence in education in forestry is recognised by its overall ranking of 3rd in the UK for Agriculture and Forestry and 1st for teaching quality and student experience (Times/Sunday Times Good University Guide 2021).

At the MSc level, our part-time distance-learning degrees in Forestry, Tropical forestry, and Agroforestry and food security have experienced an increase in recruitment of more than 100% over the past ten years up to a current level of 70 students per year. The Commonwealth Scholarship Commission has recently renewed its award of prestigious studentships for the highest quality applicants to the MSc in Tropical Forestry and recognizes the international leading status of this innovative degree programme. Delivery of these innovative degrees is blended with our full-time MSc degrees, including the long-established course in Environmental Forestry. A notable feature is the composition of the student body on our MSc degrees, which is highly international (from more than 20 countries across 5 continents), including many professionals from government forest departments, NGOs and research organizations, creating excellent opportunities for collaboration.

At the BSc level our degrees in Forestry and Conservation with forestry have a more UK focus, yet attract a student intake with a notably global perspective on the subject. Bangor alumni are becoming increasingly prominent in leading positions across the whole range of UK forestry/woodland organizations. Student recruitment averages 25 per year, though application numbers for entry in 2021 have more than doubled over the level in recent years. We are also in the process of introducing a new BSc degree in Woodland Management and Conservation. At Bangor College China we teach a very successful and expanding BSc degree in Forestry and environmental management.

We have a very activestudent-led society (the Bangor Forestry Students Association) and an outstanding network of forestry alumni who work in key roles across a wide range of forestry organisations worldwide. Our biennial newsletters communicate developments in forestry@bangor to our alumni and other stakeholders.

Bangor as a location for forestry research and education

Bangor is a major institutional location for environmental sciences and natural resources management. One of the four units of the NERC UK Centre for Ecology and Hydrology is located on the university campus, forming the joint Environment Centre Wales with the School of Natural Sciences, which also hosts the Head Office of the Forest Research agency in Wales. The Welsh Government's Natural Resources Wales agency (responsible for conservation, environmental regulation and management of the public forest estate) has one of its largest offices and scientific centres in the City. We have a growing portfolio of collaborative research with all these partners.

Bangor is adjacent to the Snowdonia National Park and within 30 km of Bangor there is a wide diversity of different forest ecosystems providing excellent opportunities for research and education, including the Bangor DIVERSE tree diversity experiment and large silvopasture experiment at the University's Henfaes Research Centre; the adjacent internationally important Coedydd Aber woodland National Nature Reserve (an EU Special Area of Conservation); and the 18 ha of high canopy forest, including ancient woodland, at the University's Treborth Botanic Garden on the outskirts of the City of Bangor.

Further information

If you want to discuss this opportunity you are welcome to contact John Healey, Professor of Forest Sciences (j.healey@bangor.ac.uk ; https://www.bangor.ac.uk/natural-sciences/staff/john-healey/en).

CALL FOR PAPERS:
SPECIAL ISSUE FOCUSING ON NATURAL FOREST MANAGEMENT IN THE TROPICS: "QUESTING FOR SUSTAINABILITY"

OVERVIEW

Since harvests of tropical timber accelerated in the middle of the last century, researchers have recommended practices that support responsible natural forest management. Due to tradeoffs associated with these recommendations, both avoidable and unavoidable, stated and unstated, few research-based recommendations for increasing future timber yields and sustaining other forest values are widely applied. Instead of well-managed tropical forests that contribute substantially to the achievement of conservation and development goals, most are exploited for their timber in unnecessarily damaging ways that reduce prospects for sustainability.

In articles to be collected in this special issue of *Forests*, the recommended practices for natural forest management and restoration will be evaluated based on silvicultural effectiveness, financial viability, ecosystem function maintenance, climate change mitigation, biodiversity retention, hydrological impacts, deforestation avoidance, worker safety, and other grounds. Studies on the impacts of conservation efforts, silvicultural treatments, and other interventions, including harvesting, should include specification of counterfactuals or otherwise employ robust analytical approaches. Similarly, all invocations of sustainability such as in the phrase "sustainable forest management" need to be supported by explicit definitions and reliable evidence. Studies on the financial constraints on and opportunities for natural forest management should consider different stakeholder perspectives and address issues of equity and other socially relevant considerations

Journal: Forests (ISSN 1999-4907; Impact Factor = 2.221)

Special Issue: Natural Forest Management in the Tropics: Questing for Sustainability

Submission Deadline: 15 November 2021

https://www.mdpi.com/journal/forests/special_issues/forest_management_tropics_sustainability

ISTF – NEWS

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Dear ISTF members:

We hope the ISTF Community is safe and well at this time of COVID-19.

ISTF - NEWS

1. **ISTF Global is looking for applicants for the following volunteer positions:**
   - **Blog editor(s) for the ISTF-Global website.** Nonpaid volunteer position to edit blog posts for weekly to monthly posting on the ISTF Website. Please apply at this link by 15 April 2021.
   - **Manager(s) for the ISTF-Global website.** Nonpaid volunteer position to manage posts, help develop new pages and sections of the website. Please apply at this link by 15 April 2021.
2. **Virtual Workshop topics needed.** Can you offer a virtual workshop for ISTF, or is there a topic that you need to learn more about? Please send your suggestions to tropicalforesters@gmail.com.
3. **Want to do a blog, podcast, or webinar for ISTF?** Please fill out this brief survey. Do you have recent reports or publications to share? Do you have any reminiscences of ISTF? Do you have quotes or cool photos (your photo or open source) to share for the developing website? For these, please send to tropicalforesters@gmail.com
4. **Global Landscapes Forum – Africa.** Restoring Africa's Drylands: Accelerating Action On the Ground-3 June 2021 FREE for Africa Residents! https://events.globallandscapesforum.org/africa-2021/ Register at https://events.globallandscapesforum.org/africa-2021/register/?ct=t(CIFOR_ICRAF_news_update_March_2021_Eur_Africa)
5. **20th Commonwealth Forestry Conference: VIRTUAL – August 16-18, 2021** This Conference was first held in London in 1920. The Faculty of Forestry at the University of British Columbia will host this year's three-day conference in a virtual format, for the first time in its history. We invite members of the Commonwealth and the world forestry community at-large, regardless of their professional affiliation, to join the conversation. The Call for Abstracts https://cfc2021.ubc.ca/submissions/ is open until 30 April 2021. We encourage submissions within the seven Conference topics, and in three categories: oral and poster presentation, and presentation for the Three Minute Talk Challenge https://cfc2021.ubc.ca/program/3-minute-talk-

challenge/ (students only). Accepted abstracts will be included in the post-Conference e-book publication. For more information, see https://cfc2021.ubc.ca/

6. **The 6th INAFOR International Conference of Indonesia Forestry Researchers 7-8 September 2021, Jakarta, Republic of Indonesia**. INAFOR is a global network for forests and environment science in Indonesia, uniting more than 2,500 scientists in almost 50 organizations in over 20 countries. The most global problems are degraded environments, deforestation, and deteriorated lands. The conference and all accompanied programs will engage partners to present their latest knowledge and instruments, measuring progress towards environmental solution and actions, disaster resilience, social welfare, enhancing benefits from the forests, also mitigation and adaptation climate change, and the COVID pandemic. Abstracts accepted until 30 April 2021. For more information, see http://inafor.forda-mof.org/
7. **2nd International Electronic Conference on Forests (IECF) — Sustainable Forests: Ecology, Management, Products and Trade** will be held online from 1 to 15 September 2021 The deadline for abstract submission is 20 May 2021. The conference is free of charge. Information can be found at https://iecf2021.sciforum.net/
8. **Welcome to Samoa.** From ISTF Member Marco Kappenberger**:** Dear ISTF Friends globally: Receive heartfelt greetings from still corona-free Samoa in Polynesia (nor do we have access to the vaccine to prevent it once here). This is a heartfelt invitation for everyone in our ISTF to visit someday when possible, our Forest Park Bird Sanctuary here in Samoa !! Congratulations to all for what each does for our ISTF goals! Receive my heartfelt greetings and best wishes. Marco can be reached at kappenberger@gmail.com
9. **Recorded sessions from the ISTF-Yale Conference 2021**. ISTF-Yale 2021 "Timelines and critical junctures: Re-examining crises as opportunities for change" 18-20 Feb 2021 was a great meeting. The recorded sessions are now available at this link under "Created Playlists". The website for the meeting is available at this link. You can subscribe to The Overstory, the newsletter of the Yale Forest Forum at this link. The Forests Dialogue, based at Yale, can be found at https://theforestsdialogue.org/ .

10. **Featured newsletters.** FAO and the SDG indicators newsletter - April 2021 | Special issue on data disaggregation for the SDGs http://newsletters.fao.org/q/1x4iH7NdMVr5mA23O/wv
11. **Featured Media. CIFOR Forest Film Festival**. https://www.cifor.org/event/forest-film-festival/ | https://www.youtube.com/watch?v=GEO-X0wtJ0U
    CIFOR - Nature at the heart of a global circular economy
    https://www.cifor.org/event/nature-at-the-heart-of-a-global-circular-bioeconomy/
12. **Featured Resources.**
    - BBC Science and Environment News https://www.bbc.com/news/science_and_environment
    - Climate change: Will planting millions of trees really save the planet? https://www.bbc.com/news/science-environment-51633560
    - Scientists address myths over large-scale tree planting https://www.bbc.com/news/science-environment-55795816
    - ESPAÑOL: QVSIG Asociación - La mayor red de profesionales en geomática libre http://www.gvsig.com/es/inicio
    - QGIS – A free and open source Geographic Information System https://qgis.org/en/site/

For more resources see the ISTF-Global website at https://tropicalforesters.org/resources/

ISTF CHAPTER NEWS

13. **Active ISTF Chapters.** The active ISTF Chapters are ISTF-Duke, ISTF-Ghana, ISTF-India, ISTF-Mexico, ISTF-NC State, ISTF-Nepal, ISTF-Nigeria, ISTF-Panama, ISTF-Puerto Rico, ISTF-Rwanda, and ISTF-Yale. We are growing our global community!
14. **If you are interested in starting an ISTF chapter** but have not told us yet, please fill out this survey. Updated documents for developing ISTF chapters (in English, Spanish, and French) can be accessed at the NEW website at https://tropicalforesters.org/form-an-istf-chapter/ . If you have any questions, please contact tropicalforesters@gmail.com.

ISTF-GLOBAL NEWS

15. **ISTF Townhalls.** Thanks to all who participated in the ISTF Regional Townhalls: Americas (3 Dec 2020), Asia-Australia-Pacific (8 Dec 2020) and Africa-Europe (10 Dec 2020) Many useful ideas were contributed that will help the ISTF Board develop activities. An article on the Townhall discussions will be included in the April ISTF Newsletter.
16. **ISTF Senior Resource Pool.** ISTF senior resource people who are happy to receive questions include:
    - **Swoyambhu Amatya** swoyambhu_amatya@yahoo.com Agroforestry (since 1994, wrote a book on it), also forest research and management.
    - **Sujoy Banerjee** banjoy@gmail.com Managing forests for biodiversity and wildlife conservation; landuse planning at landscape level; grassroot level work with local communities for conservation of forests and wildlife; and effective control of forest and wildlife crimes.
    - **Jim Barborak** jim.barborak@colostate.edu: protected area planning, management, policy, governance, finance, and public use, as well as conservation capacity development and sustainable tourism. English/Spanish/Portuguese.
    - **Ron Billings** ronbillings41@gmail.com Forest pest management, pine bark beetle management in the Caribbean and Central America.
    - **Nick Brokaw** nvbrokaw@ites.upr.edu Tropical forest ecology: Tree growth, abundance, spatial distribution, diversity, population dynamics, community dynamics, field identification; Forest types: spatial variation; Three-dimensional forest structure: spatial and temporal variation; Ecology of lianas
    - **Eberhard F. Bruenig** ebruenig@yahoo.de Integrated Conservation and Management of Forests; 70 years of practice and research in forests of the temperate and tropical zones
    - **Dorian A. Calderón-Sanchez** dorian.calderon@gmail.com Forestry Operations Planning, Logging Systems and Methods, Production Studies, Biomass operations, Safety in Forestry, practical Certification Issues.
    - **Carol Colfer** cjpcolfer@gmail.com Social Science: Anthropology, gender, governance, health, adaptive collaborative management of forests

- **Patrick Durst** pdurst.asiaforest@gmail.com Natural resources policy, economics, forest and landscape restoration, assisted natural regeneration, agroforestry, bio-energy, community forestry, forest foods (including edible insects), project development and management.
- **Bernardo Giraldo** giraldober@gmail.com Mi experiencia en la amazonia colombiana es en el tema de crecimiento y rendimiento (volumen, biomasa) de especies forestales del bosque humedo tropical
- **Hans Groenendijk** groenendijkjj@gmail.com Landscape Conservation, Assisted Natural Regeneration (ANR); Agro-forestry; Biodiversity, Wildlife and Climate Changes Management (GCCA+), Forest dynamics, Non Timber Forest Products (NFTP)
- **Richard Guldin** rwguldin@gmail.com Forest resource assessments, forest economics and policy, improving connections at the science-policy interface, and strategic planning for forest research programs. 45 years of experience as a researcher, program leader, and executive--all outlined on http://www.guldinforestry.com.
- **Prize Jacobs** prizejacobs@gmail.com Postgraduate Researcher; Data Entry and Analyses Specialist; Monitoring, Evaluation and Learning Support; Creative and Technical Writer; RENAC certified Climate and Energy Transformation Expert
- **K Kumaran** kumaran.k@tnau.ac.in More than 25 years of teaching and research experience in Forestry, with specialization in Forest Biology and Tree Improvement; particularly in Neem and Natural dyes, sustainable value chain development in forest based products
- **Muralidharan Enarth Maviton** emmurali@gmail.com Forest Biotechnology and research on bamboo and rattan, including tissue culture of forest trees, DNA barcoding, bamboo and teak germplasm collections, cultivation, management of nurseries and plantations and utilization of bamboo and rattan
- **Carl Mize** carlmize@gmail.com: For help with designed experiments - Experimental design of field and lab experiments.
- **John Schelhas** John.schelhas@usda.gov: Social and cultural aspects of private forests, including landowner decision-making, ways of valuing forests, diverse forestry options, and ethno-forestry.

- **Simon Shomkegh** sshomkegh@uam.edu.ng: Forest resources management, ethnobotany and climate resilience building
- **V.P. Tewari** vptewari@yahoo.com: 28 years of experience with forest biometrics, growth & yield modelling, forest inventory & assessment, agroforestry, forest landscape restoration.
- **Frank Wadsworth** frankhwadsworth@gmail.com: Tropical silviculture and tropical forestry in general
- **Jeff Wright** patula.wright@gmail.com: Planted forests, nursery, genetic improvement, silviculture, wood quality, sustainable forest products.

If you are a senior forester and would like to be resource person for others to contact with questions, please send a message to tropicalforesters@gmail.com. Please include your name, preferred email address for contact, and a two-line description of your expertise.

17. ISTF online resources. The current online resources for ISTF include:

- New ISTF website: https://tropicalforesters.org/
- Old ISTF web page, still at http://www.istf-bethesda.org/
- ISTF Newsletter (Available at: http://www.orrforest.net/saf/).
- ISTF Updates at this link
- ISTF InfoLinks at this link
- ISTF organizing documents at this link
- The ISTF Facebook group page at: https://www.facebook.com/groups/2262122534/
- The ISTF Linked-In group page at: https://www.linkedin.com/groups/12150640/
- The ISTF Twitter handle is @tropforester; https://twitter.com/tropforester
- The ISTF YouTube channel is at YOUTUBE CHANNEL
- ISTF-North Carolina State University: https://research.cnr.ncsu.edu/sites/istf/ , https://www.facebook.com/NCSUISTF/
- ISTF-Rwanda Chapter: Twitter: @IstfRwanda, Facebook: @ISTF-RWANDA
- ISTF-Yale University, which sponsors the annual Yale ISTF conference: http://istf.yale.edu/ , https://www.facebook.com/yalefesistf/

18. **ISTF membership**. ISTF now stands at over 1900 members. Help us keep growing! If you have any contacts that you would like to invite to join ISTF, you can use the following message:

Dear friends:

We would like to invite you to join the Central International Society of Tropical Foresters (ISTF). The organization has been reactivated. Anyone with an interest in tropical forests and forestry is encouraged to join! With its focus on being a communication network, ISTF connects members with each other and recent work in the field. ISTF was 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".

So far, over 1900 people from around the world have joined. The newest ISTF Chapters are in Rwanda and Mexico, with at least six other chapters under development. The enthusiastic response we have seen has been heartening, especially as the organization reactivates to face global challenges in inclusive and equitable ways. For now, ISTF membership will be dues-free. If you would like to join, please fill out the membership form at Google Forms.

For questions and comments, please send a message to tropicalforesters@gmail.com.

Please communicate with your friends, Scholars and etc., this message for joining ISTF Community

Sheila Ward,

ISTF Coordinator

RECENT PUBLICATION & RESEARCH NOTES

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Book Review

ACHIEVING SUSTAINABLE MANAGEMENT OF TROPICAL FORESTS

Edited by Jurgen Blaser and Patrick D. Hardcastle

About Editors

Dr Jürgen Blaser is Professor of International Forestry and Climate Change at Bern University of Applied Sciences, Switzerland. Professor Blaser is a former Chair of the International Tropical Timber Organization (ITTO) and former Senior Forestry Advisor at the World Bank. Pat Hard castle is an internationally-respected Forestry Development Specialist with over 35 years' experience of forestry development and management. Pat has worked with organizations such as the ITTO, World Bank and the FAO.

by
Jeff Wright *DPhil Oxon*
Durania LLC

This reviewer's interest in the management of tropical forests commenced in the mid-1970s.There were few books on this important topic then, and most of the research publications were not widely available. During the ensuing years, the amount of research, documentation and dissemination on the many complex aspects of tropical forests have significantly increased.

The book, *Achieving Sustainable Management of Tropical Forests*, provides an excellent and essential read for those with responsibility for managing the world's tropical forests. Recent years have seen an ever increasing need for better management of the world's tropical forests given the reality of deforestation, societal needs, climate change, sustainable development goals and loss of biodiversity, amongst others. This book covers many important issues. The chapter's authors have reviewed their topics with clarity and excellent summaries of published literature that would assist future researchers and managers for many years to come. The editors, Dr.Blaser and Dr.Hardcastle are to be congratulated for editing the chapters into a very consistent read.

The book has twenty-six chapters divided into six parts: Challenges faced by tropical forests, Ecosystem services provided by tropical forests, Management structure to support sustainable forest management, Monitoring and management techniques in sustainable forest management (SFM), SFM of different types of tropical forests and the future. Each chapter is

authored by an expert or experts in the particular geography and/or discipline such as social, governance, tenure, biology, rural livelihoods, climate change, products *etc*.

The Introduction gives a brief overview of each of the book's six Parts. The Index is handy for readers wanting to rapidly find specific areas of interest. Many of the chapters have a section: Where to Find Further Information. It would be very valuable as most of the sources cited are web-based.

Two of the most important chapters for this reviewer cover forest certification (Chapter 13) and forest landscape restoration (Chapter 21). The reviewer has experience in tropical forest certification, beginning in Colombia and Ecuador in the 1990s and most recently in East Kalimantan, Indonesia. The chapter on forest certification provides a historical perspective of the "beginning" in the 1980s of certification of tropical forests and some of the current concerns to improve the entire forest certification process. Given the loss and degradation of millions of hectares of tropical forests, forest landscape restoration is critical for agroforestry, promoting biodiversity or planted forests essential for industrial round wood production. Forest landscape restoration needs to be scaled up, and this would involve private sector investment.

Important geographical areas of tropical forests in Asia are not well represented in the book; only Indonesia and Malaysia are included. Along with the Congo and Amazon basins, the tropical forests of Indonesia and Malaysia have long provided log and lumber exports. Today the tropical forests face the threats of conversion to agriculture with special reference to oil palm plantations. The reviewer is very familiar with tropical forest management activities in Borneo (Sabah, Malaysia and East Kalimantan, Indonesia), and these would be important chapters in a future revision.

The book brings into perspective the universal nature of global issues such as governance, while issues of livelihoods and biodiversity are often more critical at national and regional efforts. The authors of the various chapters and the editors have done well to include these nuances in their writing and literature references.

Burleigh Dodds Series in Agricultural Sciences Number 80, Cambridge UK, 716pp., 2020.

ABSTRACTS & KEY MESSAGES

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LAND RESTORATION FOR REVERSAL OF CLIMATE CHANGE IMPACTS

Anuj K. Singh
Meghalaya Climate Change Centre, Shillong, India

Land is a complex system, and any alteration in its properties and health entails implications influencing the ecosystem. Unfortunately, land is subjected to ruthless degradation leading to disruptions in the supply of the ecosystem services that all life forms are availing from time immemorial. According to United Nations Environment Programme (UNEP, 2019), approximately 20% of the earth's vegetated surface is either degraded or undergoing high rates of degradation and around 120 million hectares of land are lost. The productivity of land being lost so rapidly is equally alarming which is attributed to climatic change along with many other anthropogenic factors. The implication of land degradation is limited to affect ecological functions and its provision of services and poses a number of socio-economic challenges to human society. The nations and communities with lower adaptive capacity are more vulnerable to these challenges which may manifest as resource scarcity, food insecurity and hunger, reduced employment opportunities, poverty leading to mass migration and aggressive social conflicts.

Urgent actions at the global scale are the need of the hour to halt and reverse land degradation. Soil and water conservation actions coupled with afforestation, reforestation and natural regeneration interventions may prove to be an effective approach for forest and land restoration in the degraded regions. The UN decade on Ecosystem Restoration (2021-2030) is a timely stimulus to accelerate the global efforts to enhance the planet's resilience against the challenges driven by climate change. Land restoration is the most immediate action for mitigating ecosystem degradation and can reverse most of the consequences caused by climate change catalyzed land degradation.

Reference

- UNEP.2019.Land Restoration for achieving the Sustainable Development Goals. International Panel Resource Report, UNEP.

ESTABLISHMENT OF RATTAN PLANTATIONS

Muralidharan Enarth Maviton
Senior Principal Scientist (Retired),
Kerala Forest Research Institute, Peechi, India

The non-wood forest products, often shadowed by the importance given to timber, nevertheless have a role in the economies of several countries.

Rattans, the spiny climbing palms (of sub family *Calamoideae*, Family *Arecaceae*), are among the most important non-wood forest products of tropical forests. Rattans (canes) play a significant role in the livelihoods of rural communities in several countries across continents that are engaged in collection and utilization for the manufacture of a range of products and also for use as edible shoots. Since significant quantities of rattan are extracted from natural forests in an unregulated manner, loss of genetic diversity and depletion of stocks of many of the important species has resulted. Scientific management of the rattan resources that allows for the regeneration of stocks and implementing rational harvesting practices is seen as the only way in which sustainability of the resources can be ensured. Establishment of plantations of the key rattan species has been experimented with in Southeast Asia to a limited extent. Plantations on a larger scale and management on a scientific basis will go a long way in ensuring that the demands for good quality canes are met in a sustainable manner.

The INBAR Technical Report on Establishment of Rattan Plantations examines the different aspects of rattan plantations including the species of importance, the justification for cultivation of rattan and its ecological benefits. Other chapters describe the various rattan planting materials in use, the operations in the nursery and plantation site as well as management operations including harvesting.

The report also looks at rattan plantations in the context of climate change resilience and the ecosystem functions of healthy forests and tree plantations and examines the issue of policy changes that could impact the viability of plantations in the face of competing land use patterns that are emerging in the major rattan growing countries.

Extracted from

- *Muralidharan, E.M., Sreekumar, V.B., Kaam, R. (2020) Establishment of Rattan Plantations. INBAR Technical Report No. 42. INBAR: Beijing, China.*

https://www.inbar.int/wp-content/uploads/2020/09/Establishment-of-Rattan-Plantations_final.pdf

IMPORTANT URLs

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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.

Cámara Forestal DE BOLIVIA

http://www.cfb.org.bo/noticias

UN Forum on Forests

https://www.un.org/esa/forests/index.html