

ITTO Tropical Forest UPDATE

A newsletter from the International Tropical Timber Organization to promote the conservation and sustainable development of tropical forests



Getting it done locally

Evidence is growing that local communities can be excellent managers of forests—to the extent that policies on land tenure, markets and other factors allow. In this edition of the *TFU*, two articles describe the outcomes of four ITTO projects where the focus was on building the capacity of communities to restore their lands and sustainably manage their forests and on creating the enabling conditions for them to do so.

Florence Soriano (page 3) conducted an ex-post evaluation of an ITTO project in Nusa Tenggara, Indonesia, the aim of which was to improve the participation of forest-dependent communities in promoting the sustainable use of non-timber forest products.

Among the activities undertaken by the project were training courses to enable



Inside: Ex-post evaluations in Colombia, Indonesia and Panama; assessing ITTO's restoration guidelines; *Dalbergia* species in Guatemala; illegal logging in Cameroon

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Images: Cover image: A local farmer (left) and a project officer stand in a patch of restored forest in farmland in the Guaviare region, Colombia. Families in the area are pursuing various tree-based land-use options as a result of an ITTO project. Photo: C.M. Carneiro

Above: A local resident stands in a mixed plantain and tree system using native tree species designed to restore degraded land in Dormaa, Ghana. Photo: E.A. Bawuah/Forest Research Institute Ghana

communities to obtain permits to use the forest; the development of training modules on various aspects of sustainable forest management and enterprise development; seminars on the economic, social and environmental benefits of sustainably managed forests; and the training of villagers as trainers in participatory forest management. The project also helped bring about changes in local government policies to support the sustainable use of non-timber forest projects. According to Soriano, the project's success can be attributed largely to the participatory approach used in the development of training modules, management plans, business models and policy options, and the active participation of stakeholders.

Carlos Marx Carneiro reports on projects undertaken in Colombia and Panama (page 7). The Colombian project helped find alternative productive activities for communities that formerly illegally cultivated coca. Families in the area are now pursuing various tree-based land-use options such as agroforestry, silvopastoral systems, rubber cultivation, and restoring degraded forest lands. In an ITTO project in Panama, three community-based forest enterprises were established to implement sustainable forest management plans, to act as commercial and marketing focal points, and to supervise and monitor the transport of timber in the area to help reduce illegal logging. A second ITTO project in Panama helped three ethnic groups in the Chepigana Forest Reserve to implement agroforestry and sustainable forest management practices. Carneiro concludes that, in all three projects, a close working relationship with participating communities and respect for their cultures, traditions and ideologies were essential for success, while long-term technical assistance was necessary for ensuring forest sustainability.

Kathleen Buckingham and Sarah Weber (page 10) report on an assessment by the World Resources Institute of the *ITTO Guidelines for the Restoration, Management and Rehabilitation of Degraded and Secondary Tropical Forests*, including case studies in Ghana, Indonesia and Mexico. According to the authors, the guidelines have had limited uptake due to a lack of user-friendliness and a lack of awareness of their existence. The forest landscape restoration movement has

gained great momentum globally since the guidelines were published in 2002; the time is right, therefore, to reassess the guidelines to increase their impact. All three case studies showed that strong stakeholder platforms and community involvement have enabled informed and sustained engagement in restoration activities—further evidence of the importance of participatory local-scale approaches. The key challenge is to ensure that restoration approaches link benefits and incentives, effective governance, and integrated management systems. Buckingham and Weber conclude that a full revision of all elements of the ITTO guidelines would not be the most efficient approach; rather, ITTO should (among other things) identify its comparative advantages within the Global Partnership for Forest and Landscape Restoration and use those to fill gaps in restoration methodologies and toolkits.

The focus shifts somewhat in the following two articles. Myrna Herrera (page 14) describes efforts in Guatemala to conduct an inventory of native *Dalbergia* species with a view to assessing their conservation status. She concludes that the survival of several species is critically at risk, due largely to illegal logging and trade, and urgent action is needed by government authorities to protect and sustainably manage the species, with support from international institutions. Jean Lagarde Betti and co-authors (page 18) report findings of an investigation into the illegal logging of *Guibourtia* species (known locally as bubinga) in Cameroon and make several recommendations to reduce this problem.

One of the recommendations of Betti et al. is to list bubinga species in CITES Appendix III. As we reported in the previous edition of the *TFU*, CITES is a treaty to regulate the international trade of endangered species. International cooperation is crucial for bringing about sustainable forest management in all its elements—for example in eliminating illegal activities from international value chains, transferring knowledge and technologies, and enabling payments for globally important environmental services. Ultimately, though, forest management is done locally. Encouraging and facilitating the participation of local people and their ownership of interventions is the essence of good forest management.

Participatory approaches work

An ITTO project used a participatory approach to catalyze policy changes in Nusa Tenggara, Indonesia, and help forest-dependent communities improve their livelihoods

by Florence Soriano

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Sustainable energy: Women gather a week's supply of woodfuel from the protected forest in Mt Mutis. Photo: F. Soriano

The forested slopes of Mount Rinjani in Lombok, West Nusa Tenggara Province, and Mount Mutis in South Central Timor, East Nusa Tenggara Province, Indonesia, are important water catchments and are classified as protected areas. Communities living in villages bordering these protected areas are some of the poorest in the region, with little access to infrastructure, markets or electricity. Households supplement their livelihoods in the forest by gathering woodfuel, grazing livestock and harvesting fruits, nuts, herbs and other non-timber forest products (NTFPs). Over the years, unsustainable harvesting and grazing have encroached on the protected areas, causing soil erosion and losses of forest cover. Consequently, water catchments have become degraded, and the water supply to nearby villages has declined.

The provincial forest service regulates access to protected areas and can issue community forest utilization permits to farmers who would like to harvest NTFPs. At least 36 kinds of NTFPs can be harvested in the protected areas, including honey, avocado, durian, jackfruit, candlenut, sugar palm, tamarind, coffee, cacao, sandalwood oil, eaglewood, resin, rattan, bamboo and medicinal herbs.

Community forest utilization permits are issued only to community-based cooperatives. The problem is that only a few communities meet the required management skills or have the knowhow to operate cooperatives. As a result, few forest-dependent communities are able to participate in the sustainable use of NTFPs in protected areas. Moreover, the provincial governments lack the institutional capacity to

formulate policies to support the sustainable use of NTFPs, and the district forest service units responsible for managing the protected forests have low capacity to implement participatory forest management programmes for forest-dependent communities.

About the project

ITTO project PD 521/08 Rev. 3 (I): "Participatory forest management for sustainable utilization of non-timber forest products surrounding the protected area of Rinjani and Mutis Mountains, Nusa Tenggara Province, Indonesia" aimed to improve the participation of forest-dependent communities in promoting the sustainable use of NTFPs found on Mount Rinjani and Mount Mutis by:

- improving their capacity to obtain community forest utilization permits; and
- developing a management plan for the economically viable extraction of NTFPs through community participatory processes.

The project was implemented by the Directorate General of Watershed and Social Forestry, which is under the Government of Indonesia's Ministry of Forestry, in collaboration with WWF and the West Nusa Tenggara Provincial Forest Service. ITTO contributed US\$490 374 to the two-year project, which commenced in June 2011. This article reports the findings of an ex-post evaluation conducted by the author in May 2015.

Project achievements

Planned vs realized outputs

The project team completed all planned outputs and activities, with a few deviations that were approved by the project steering committee. The development of training modules, business models, management plans and policy options was informed by primary data and information gathered at the pilot sites. Farmers, small-business entrepreneurs, forest gatherers, community leaders, local parliamentarians, and district and provincial officials participated in focus group discussions, consultative workshops and structured interviews. The capacity-building activities for forest-dependent communities and local government institutions were based on four technical reports prepared by local consultants, namely:

- 1) training module development to improve the capacity of local community groups for the sustainable use of timber forest products (by Muktasam, May 2012);
- 2) management policy analysis study of NTFPs in West Nusa Tenggara and East Nusa Tenggara provinces (by Gatot Dwi Hendro, July 2012);
- 3) management plan for NTFPs in the community forests of Central and North Lombok, West Nusa Tenggara (by Amiruddin Umar, August 2012); and
- 4) dealing with NTFPs for income generation in local communities in pilot villages (Rinjani and Mutis) (by Taslim Sjah, October 2012).

The project-organized training courses enabled the target communities to obtain community forest utilization permits. All participating communities completed awareness seminars on the economic, social and environmental benefits of sustainably managed forests. Forty-three aspiring training facilitators in nine villages in North and Central Lombok and two villages in South Central Timor completed a training course on participatory forest management, exceeding the project target of 20 training facilitators in nine villages.

Pilot communities adopted the recommended business models aimed at maximizing income from extractable and economically viable NTFPs. Ten aspiring small-business owners in the Rinjani and Mutis areas completed on-the-job training courses on small-scale business management and entrepreneurship.

A model NTFP management plan was prepared to map out development directions, objectives and strategies at the community, institutional and business levels. The plan stipulates the responsibilities and accountabilities of each key agency involved in the sustainable use of NTFPs and provides the rationale for policies supporting NTFP development.

Outcomes

The participating communities in North Lombok, Central Lombok and South Central Timor were able to set up and

operate their own cooperatives, and they were granted community utilization permits covering at least 3385 hectares of forests in the protected areas. Using the model management plan as a template, each district prepared a management plan for their priority NTFPs.

Impact

To complement the project achievements, the provincial government provided financial support to the districts of North Lombok and Central Lombok for the implementation of three decrees (out of six project-recommended policies) on the sustainable use of NTFPs. The decrees specifically covered:

- 1) the establishment of a district-wide NTFP working group;
- 2) the identification of priority NTFPs; and
- 3) guidelines on the sustainable use of NTFPs.

At the time of this evaluation (22 months after project completion), the district of South Central Timor had also issued a decree establishing an NTFP working group and was well along in the process of finalizing an NTFP management plan.

With the assistance of the Provincial Extension Coordinating Agency, the North and Central Lombok NTFP business groups acquired product certification and business permits and were registered with the Provincial Trade and Industry Service.

In Fatumnasi village, South Central Timor, East Nusa Tenggara, forest farmers who participated in project-organized training courses set up a community-based cooperative for the production of wild honey harvested from natural beehives in forest trees. Their produce has been commercialized and is being distributed through various outlets in the province and in other provinces as far afield as Java. Aside from receiving shares of the income generated by the cooperative, members have had access to loans to meet various needs, such as their children's education.

The North Lombok Honey Production Network, whose members produce organic honey harvested from wooden beehives, established a quality assessment and control system for their beekeeping method. The Candlenut Business Group put in place a candlenut grading and pricing scheme and improved their marketing strategy, including product labelling and packaging. Raw-material suppliers and producers of bamboo furniture, baskets and handicrafts formed the Central Lombok Bamboo Processors Organization and forged links with other NTFP-using business groups.

Notable effects of the new local government policies supporting NTFPs include the following:

- The national government increased financial support for NTFP development, such as by providing grants to enable university academic staff and researchers to provide technical assistance on various aspects of NTFP use to small business enterprises.



Village limits: Fatumnasi village in Mt Mutis viewed from the adjacent protected area, the border of which is lined with a rigid lattice of tree branches. Photo: F. Soriano

- The Central Bank of Indonesia (Mataram City) committed financial support for capacity building on candlenut processing, the purchase of processing equipment to improve the quality of honey and increase production, and the development of other products, such as beeswax and honeycomb.
- Local governments allocated funds to set up community-based learning hubs on NTFP-based livelihoods and businesses. An example is the beekeeping and honey-processing demonstration site in Sukadana village, which is a joint undertaking of the University of Mataram and four farmers' groups.

Sustainability

The inclusion of NTFPs as priority commodities in West Nusa Tenggara's Five-Year Plan has provided an incentive for communities outside the project to implement similar policies supporting the sustainable use of NTFPs. The National Training Center of Indonesia adopted project-developed training modules on the sustainable management of NTFPs and will offer these courses to interested communities.

The translation of local decrees on the sustainable use of NTFPs into provincial regulations is viewed as the next important step for strengthening the long-term sustainability of project impacts.

At the national level, the inclusion of viable NTFPs in the list of priority commodities under the Ministry of Forestry's Community Forest Regulation will encourage other NTFP-producing regions across the country to implement similar policies on the sustainable use of NTFPs.

Project formulation and implementation

Stakeholder participation

Stakeholder participation was evident throughout the project cycle, from identifying the problem and project planning in 2008, through to implementation from June 2011 to August 2013. The project involved community leaders, farmers, forest service staff (provincial and district levels), university researchers, and members of the local parliament and other relevant local institutions. As well as the local forest service, other local government agencies, such as the District Planning Agency, the Provincial Extension Coordinating Agency and the Provincial Trade and Industry Service, participated in the project.

Project design and effectiveness

The project demonstrated that strengthening the capacity of local government to formulate policies and spearhead participatory forest management and, at the same time, strengthening the capacity of forest-dependent communities to sustainably use NTFPs is an effective two-pronged strategy that can be adopted in future projects. The more efficient pacing of activities and shorter timelines are recommended, however; they can be achieved through careful study of the project design, particularly the vertical logic of the project elements, and the identification of appropriate indicators.

Efficiency of operational aspects

The project was completed in August 2013, for a total duration of 27 months. An unspent amount of US\$18 645 was returned to ITTO.

The implementing agency complied with all ITTO technical and financial reporting requirements. Project acquittal was achieved on 28 January 2014 (about five months after the project completion date).

Some activities were delayed due to unexpected project staff turnover and a change of leadership in some local governments. At times, project activities were not compatible with the schedule of participants' livelihood activities, such as during the harvest season.

The villages of Fatumnasi and Nenas in South Central Timor adopted the project interventions slowly compared with communities in Lombok. It is customary in those two villages for heads of indigenous communities to decide on the laws, including access to the forest. Recognizing this, the project team was able to enjoin indigenous communities to participate in training courses and helped them set up their own cooperative and operate a small business producing wild honey.

Lessons learned

- The participatory approach used in developing training modules, management plans, business models and policy options for the sustainable use of NTFPs, and the technical assistance provided to local governments on the formulation of strategic policies to support the sustainable use of NTFPs, were key in achieving the desired outcomes within the project's timeframe.
- Indigenous communities can be encouraged to participate in the sustainable management of upland forests through an approach that takes into consideration their cultural beliefs and traditional forest management practices.
- The additional income derived by forest farmers from community-based enterprises drives their participation in sustainable forest management.
- The active participation of target communities and the relevance of studies implemented by project consultants contributed significantly to the success of the project.
- The established presence of the collaborating agencies in Nusa Tenggara was key to the willingness of forest farmers and local institutions to participate in the project.
- In project planning, appropriate indicators and the availability of baseline data are crucial for the effective use of the logical framework matrix as a tool for project monitoring, review and evaluation.

Conclusions

The most important achievements of the project were the local government implementation of policies to support the sustainable use of NTFPs, and the expansion of the forest area covered by sustainable forest management. These achievements support the Ministry of Forestry's NTFP Development Policy and Community Forest Regulation.

The success of the project can be attributed largely to the participatory approach used in the development of training modules, management plans, business models and policy options, and the active participation of stakeholders.

The timely translation of district policies to provincial regulations, and the inclusion of economically viable NTFPs identified by the project in the list of priority commodities under the Ministry of Forestry's Community Forest Regulation, are envisioned as the next crucial steps for delivering wider impacts and the long-term sustainability of project impacts.

Recommendations

For the implementing agency

- Prioritize support for the implementation of the three remaining recommended policy options to support the sustainable use of NTFPs, namely:
 - 1) the development of a local government policy on partnership and trade regulation that will enable NTFP business groups to forge partnerships with major industry players;
 - 2) the timely translation of local policies into provincial regulations; and
 - 3) an executive review of the Ministry of Forestry's Community Forest Regulation and the subsequent amendment of the annex on priority commodities to include the priority NTFPs identified in the project.
- Support capacity building in indigenous communities and develop strategies to sustainably manage upland forests.
- Adopt the project's strategy in future projects with similar objectives, noting the lessons pointed out in this evaluation.

For ITTO

In the project appraisal process, conduct a more thorough evaluation of project logical framework matrices and the effectiveness of work plans in the execution of projects as designed.

The full report of the ex-post evaluation is available via the ITTO project search function at www.itto.int/project_search.

Boosting community forestry in Latin America

ITTO projects have helped establish community-based approaches to sustainable forest management in Colombia and Panama

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Network: A woman fishes in an estuary near her farmhouse in Darien, Panama. Photo: C.M. Carneiro

Community-based forest development initiatives started playing an important role in Latin America in the early 1980s, mainly in the Amazonian and Andean countries and expanding later to Central America. ITTO has always supported participatory approaches aimed at sustainably managing natural tropical forests and improving the livelihoods and food security of indigenous peoples and local communities.

This article summarizes the ex-post evaluation of three projects: one in Colombia (Guaviare region) and two in Panama (Darién Province). The three projects had similar development objectives along the lines of promoting sustainable forest production and conservation with community participation. Specific objectives included strengthening the capacities of communities in the development and adoption of productive forest alternatives and the diversification of rural production; the formulation of plans for sustainable forest management (SFM); the development of agroforestry systems; the rehabilitation of degraded forest lands; and the sustainable use of timber and non-timber products. The similarity of their objectives and environmental conditions was the main reason why the three projects were evaluated together. The project in Colombia was evaluated five years after completion, and the two projects in Panama were evaluated three years after completion.

The projects

ITTO project PD 32/99 Rev.2 (F): “Productive forest management for the Rural Reserve Area of Guaviare, Colombia” was implemented by the Corporation for the Development of the Amazon Region (CDA) in collaboration with the Ministry of Environment and Sustainable Development (MADS), in a region that formerly produced crops made illegal in the 1980s, such as coca. The project helped find alternative productive activities for the community, taking into consideration the possibilities and potential of each farm family. Some families decided to develop agroforestry or silvopastoral systems, some involving fish ponds, and others decided to create rubber plantations and agricultural systems. Some families opted to establish forest trials with *Genipa americana* to rehabilitate degraded forest lands, and some tried enriching remnant forests with commercially and ecologically high-value species, such as *Swietenia macrophylla* (mahogany). All these activities contribute to the protection and rehabilitation of Colombia’s Amazonian forests, in line with ITTO’s criteria and indicators for SFM.¹

ITTO project PD 405/06 Rev.3 (F): “Extending the area under sustainable forest management in the forest lands of the Embera-Wounaan Comarca, Darién, Panama” was implemented by WWF in close collaboration with the Ministry of the Environment of Panama (MIAMBIENTE) in El Darién Province. The project was formulated to support the indigenous communities of the Embera-Wounaan Comarca.

¹ Revised ITTO Criteria and Indicators for the Sustainable Management of Natural Tropical Forests, available at: www.itto.int/policypapers_guidelines.



Increased production: Some families in the Guaviare region, Colombia, opted to establish silvopastoral practices and agroforestry under an ITTO project as a way of improving their livelihoods while also restoring degraded forest lands. Others introduced fish ponds and rubber-tree plantations. Photo: C.M. Carneiro

Three community-based forest enterprises were established to implement the objectives of the project; they are operated by the communities based on their own bylaws. A fourth enterprise (“Ne Drua”) was created to act as forest regent (or “controller”) for the other three. The objective of the three community-based forest enterprises was to implement SFM plans prepared by the project and to act as commercial and marketing focal points. In addition, each enterprise was charged with supervising and monitoring the transportation of timber in its area, thereby helping reduce illegal logging. Monitoring showed that the project helped bring 65% (48 121 hectares) of the natural forest in the Embera-Wounaan Comarca under SFM. Three craftsmen’s associations were established (in addition to the community-based enterprises referred to above), benefiting 98 women. These associations participate actively in congresses and fairs; for example, their participation in the Central American Forestry Congress in Costa Rica helped generate potential commercial opportunities.

The project formulated a regional strategy to strengthen the capacities and knowledge of communities to sustainably manage forests and to halt practices that lead to illegal logging. The strategy focuses on forest governance by building capacity in local communities to coordinate among themselves (rather than competing) when negotiating contracts for their timber. It also encourages Forest Stewardship Council certification by community enterprises. The communities intend to cooperate closely with the Ministry of the Environment to implement the strategy and thereby minimize illegal logging in El Darien.

ITTO project PD 482/07 Rev.2 (F): “ Sustainable forest production and conservation with community participation in the Chepigana Forest Reserve of Darien, Panama” was implemented by the National Association for the Conservation of Nature (ANCON) in close collaboration with MIAMBIENTE. The forests in and around the Chepigana Forest Reserve are rich in commercially valuable timber species— such as *Prioria copaifera*, *Anacardium excelsum*, *Pachira quinata*, *Tabebuia rosea*, *Tabebuia ochracea* and *Swietenia macrophylla*—and therefore under harvesting pressure. The project aimed to assist three ethnic groups in the Chepigana Forest Reserve by creating awareness of, and capacity in, SFM practices among local communities and forest companies, such as species enrichment in local forests and the enforcement of existing laws and regulations.

Communities were assisted in adopting agroforestry practices involving products such as coffee and medicines and the manufacture of handicrafts using local species such as “chunga”, “pita” and “sanía” to provide beneficiaries with extra income. The Federation of Rural Producers Associations (FEPACHEDA) was created to support the other enterprises in implementing forest management plans formulated by the project. The Chepigana Forest Reserve is now legally equipped with an integrated management plan and a forest/ environmental management plan.



Community meeting: Members of the Embera–Wounaan Comarca meet to discuss the forest management plan. Photo: C.M. Carneiro

Lessons learned

A close working relationship with participating communities, and respect for their cultures, traditions and ideologies, were essential for the success of the three projects. Long-term technical assistance is necessary for ensuring sustainability.

In all three projects, the cost–benefit ratio was positive, but the high inflation rates in Colombia and Panama associated with a high rate of fluctuation of the US dollar (in the case of Colombia) had a negative effect on project budgets, influencing important activities.

Follow-up activities should explore aspects such as ecotourism, the carbon market and the role of communities in climate change as potentially important components of the SFM equation.

Impacts

The three projects had various and differing economic, social and environmental impacts, expressed initially by a very high level of interest and commitment among project beneficiaries. The projects also contributed to the sustainable management and conservation of their respective regions and the livelihoods of local communities. In Colombia, the introduced agroforestry practices are providing many families with supplementary income through the production of fish (in ponds), coffee, cattle and latex (from rubber trees that today are 7–8 years old). Colombia is not self-sufficient in rubber production, and the raw material now produced by families in the Guaviare region is welcome in the market.

In Panama, the activities promoted by the projects could have a significant and long-lasting beneficial impact on the El Darien forests while helping communities increase their incomes. All stakeholders in Panama are awaiting the implementation of the regional strategy for combating illegal logging (one of the most serious problems in the country's forests). The gender-based approach stressed in the projects created beneficial outcomes for women in the communities.

Conclusions

The strong commitment shown by family farmers and indigenous communities, combined with the capacity-building components of the projects, were vital for success. More than 500 families were trained through the “learning by doing” approaches taken by the projects, which formulated 32 forest management plans and established five community-based forest enterprises, thereby helping ensure the sustainability of outcomes.

All three projects contributed to ITTO's objectives, as expressed in the International Tropical Timber Agreement (2006) and ITTO's criteria and indicators for sustainable forest management.

In view of the large number of community forestry projects in Latin America and the Caribbean, it is recommended that a regional technical cooperation network be established to increase the exchange of experiences, data, information and knowledge on the contributions of community forestry to SFM. ITTO may wish to finance the early stages of the network (which would be hosted by an institution in the region), for example its first meeting. Ultimately, however, the network would need to seek national or international financing.

The full report of the ex-post evaluation is available via the ITTO project search function at www.itto.int/project_search.

Revising the restoration guidelines

Case studies in Ghana, Indonesia and Mexico were used to assess the ITTO restoration guidelines with a view to their revision

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Good neighbours: Farmers chat in a degraded forest area in Mexico subject to restoration using *Acacia milleriana*. Photo: D. Douterlungne/Pronatura, A.C.

The *ITTO Guidelines for the Restoration, Management and Rehabilitation of Degraded and Secondary Tropical Forests*, published by ITTO in 2002 in collaboration with the Center for International Forestry Research, the Food and Agriculture Organization of the United Nations, the World Conservation Union and WWF International, describe a conceptual framework for restoration and recommend actions and principles to guide those working in degraded or secondary forests.

The guidelines consist of eight objectives, 49 principles and 160 recommended actions arranged in two parts: 1) policy, planning and management; and 2) stand-level principles and actions. They have had limited uptake due to a combination of a lack of user-friendliness and a lack of awareness of the guidelines among forest managers, professionals and practitioners at different levels. Experts agree that the guidelines need significant revision in their structure and presentation (Douterlungne 2014). In 2015, ITTO commissioned the World Resources Institute to assess the guidelines; this article summarizes the full report of that assessment (Buckingham & Weber 2015).

The guidelines were created more than ten years ago. Since then, the forest landscape restoration movement has gained tremendous momentum globally. Restoring degraded lands and landscapes is now considered essential for human livelihoods and well-being, long-term food security, climate stability and biodiversity conservation (Buckingham et al. 2015). The Bonn Challenge—a commitment to begin restoring 150 million hectares by 2020—aims to motivate action for restoration, and already more than 20 countries have

committed to restoring productivity to more than 80 million hectares of degraded land. The Bonn Challenge seeks to catalyze early action on REDD+ under the UN Framework Convention on Climate Change, as well as help achieve the Convention on Biological Diversity's Aichi Biodiversity Target 15, which aims to restore at least 15% of the world's degraded ecosystems by 2020.

A simplified framework of key needs was created to address the perceived shortcomings of the guidelines, comprising the six key needs of restoration: 1) integrated management systems; 2) benefits and incentives; 3) stakeholder platforms; 4) effective governance; 5) financial viability; and 6) monitoring and evaluation (Table 1).

Application of the key needs framework to Ghana, Indonesia and Mexico

ITTO tasked forest professionals in Ghana, Indonesia and Mexico to assess sites according to the restoration guidelines (Blay et al. 2014; Sidabutar 2014; Douterlungne 2014). The key needs framework was used to summarize these findings.

Ghana has 9.4 million hectares of forests covering 41% of the country (FAO 2015). Pressure on land is intense, and Ghana has one of world's highest deforestation rates (2%; FIP & MLNR 2012). In rural areas, about 60% of the population relies to some extent on land or forest resources, and 69% of the total land area is estimated to be prone to severe or very severe soil erosion (Profor 2011). About 1 million hectares of forest land are degraded, constituting potential areas for restoration (FC & MLNR 2013).

Table 1: A framework of key needs to simplify the principles of the ITTO Guidelines for the Restoration, Management and Rehabilitation of Degraded and Secondary Tropical Forests

	Key needs framework	Description
1	Integrated management systems	<ul style="list-style-type: none"> Enabling the active management of a variety of productive systems within the landscape matrix, considering the landscape context, sources of degradation, needs, restrictions, adaptive management requirements, sustainable yields and available livelihood options Ensuring landscape integrity, with a focus on increasing ecosystem function for biodiversity, regeneration and carbon values
2	Benefits and incentives	<ul style="list-style-type: none"> Providing stakeholders with social, ecological, cultural and economic drivers to participate in restoration
3	Stakeholder platforms	<ul style="list-style-type: none"> Facilitating opportunities for engagement, participation, inclusion, communication, knowledge, information-sharing and capacity building
4	Effective governance	<ul style="list-style-type: none"> Considering the opportunities and challenges faced by existing regulations and complementary and contradictory policies, with a particular focus on property and access rights Focusing on the structure of institutions, opportunities for decentralization, transparency and accountability
5	Financial viability	<ul style="list-style-type: none"> Ensuring that costs are covered and resources are allocated for effective results and sustainability
6	Monitoring and evaluation	<ul style="list-style-type: none"> Providing an effective monitoring and evaluation framework and baseline assessment, as well as a cost-efficient ecological restoration strategy

Indonesia has 91 million hectares of forest land covering 53% of the country (FAO 2015). An estimated 27.3 million hectares of forests and lands are degraded (Walsh et al. 2012). Mexico has more than 66 million hectares of forest covering about 34% of the country (FAO 2015). The annual deforestation rate there is 0.3% (FAO 2012), which is considerably lower than the average rate in Central America (Douterlungne 2014). Mexico's flora and fauna is estimated to constitute approximately 12% of global terrestrial and aquatic biodiversity (CONABIO 2009), and restoration and conservation are high national priorities.

In all three case studies, strong stakeholder platforms and community involvement have enabled informed and sustained engagement in restoration activities. The key challenge, however, is to link benefits and incentives, effective governance, and integrated management systems. Providing economic

alternatives to industry is a huge challenge for restoration efforts. Laws on environmental management are not being implemented or enforced, leading to illegal activities and degradation and reducing the incentive to change practices.

In Indonesia, for example, oil palm is proving a major challenge for restoration efforts. Oil-palm plantations are one of the most profitable land uses in the humid tropics. The expansion of those plantations occurs mainly at the expense of rubber plantations, as well as agroforestry, highly logged secondary forests, and certain primary forests (Gunarso et al. 2013). Demand for palm oil is likely to continue to increase in response to a growing and increasingly affluent population. Biodiversity in oil-palm plantations is far lower than in the natural forests they often replace, yet oil-palm plantations store more carbon than alternative agricultural land uses (Sayer et al. 2012). It is important, therefore, to consider the role of oil palm in integrated management systems. Gold and bauxite mining in Ghana and cattle ranching and sugarcane plantations in Mexico present similar challenges.

In each of the three case studies, shifting cultivation is a mainstay of livelihoods for smallholder farmers and represents the primary source of food security in many rural households. In many circumstances, prohibiting shifting cultivation and promoting a transition to a combination of intensified permanent agriculture systems and protected forest land is neither socially nor environmentally desirable.

Ending deforestation, protecting local tenure rights for smallholder farmers and meeting growing demand for commodities are all legitimate goals that should be strived



Protected: A seedling planted in a forest restoration initiative in Ghana is protected by a woven guard. Photo: E. Antwi Bawuah/FORIG

Figure 2: Summary of the relationship of case studies to the key needs framework

Key needs framework	Ghana	Indonesia	Mexico
Integrated management systems	Interventions included apiculture, snail farming, fish farming, agroforestry and woodlots	Interventions included sedentary demonstration units, non-timber forest products and nature-based tourism	A local programme for payments for environmental services enabled the restoration of agroforestry and woodlands and the conservation of forests
Benefits and incentives	Short-term income-generating activities were created while waiting for trees to mature. Participation was often dependent on free project equipment	Non-state forest areas can generate income beyond project completion. In general, the opportunity cost of restoration is high compared with rubber and palm oil	If less-sustainable land uses (such as livestock breeding) remain more profitable than carbon, smallholders are unlikely to switch to long-term forestry options
Stakeholder platforms	The engagement of traditional leaders is key—without adequate restoration knowledge, they have often sold land into mining	Active participation is important—most projects have employed “mass mobilization” instead of interactive participation because it is considered less time-consuming, but in the long term this has discouraged community involvement	Community members have received social and ecological training on sustainable land use. Collaborative planning has enabled local farmers to incorporate traditional techniques into project design
Effective governance	Role-sharing and decentralization are key. Natural resource management committees have mobilized other committees to plant, patrol, enforce laws and guide natural resource management. Land ownership can be claimed through “long use and association”, however, which deters tenants from allowing subtenants to engage in restoration activities	Land boundary conflicts are rife. Weak law enforcement by local governments jeopardizes the sustainability of projects due to weak institutional coordination, inadequate strategies and a lack of required resources. The conversion of forest lands to other non-forest uses and illegal mining exists, even within project boundaries	Clear land tenure and allocation is important—and is a communal resource under “ejidos”, or traditional settlements. Ejidos have agreed on the division of land uses for permanent agriculture, shifting cultivation and forest, but the institutions are complex. Mexico’s political structure faces structural reforms every six years, hampering the execution of restoration projects
Financial viability	Most restoration projects are funded by donors, and more needs to be done to engage the private sector	The main source of income is wages from labour activities on restoration sites. The continuity of funding is a challenge	Carbon credits are paid in advance, but carbon prices have been lower than expected. Small communities need investment and economies of scale to attract commercial buyers
Monitoring and evaluation	Farmers have been trained in simple geographic information system techniques to trace their farm boundaries. Initial farm inventories have been conducted, including land holdings and crops	Long-term management plans, monitoring and evaluation plans and feedback mechanisms for many restoration projects are missing. Poor baseline data have resulted in inappropriate restoration techniques	The science of quantifying carbon is still in its infancy. It is unrealistic to create site-specific equations for each site, which results in inaccurate carbon estimates

for simultaneously at the landscape scale. Governments, private-sector leaders and civil society need to work together to adapt supply-chain management practices, regulations and incentives to stop deforestation and encourage restoration (Pacheco 2015).

Shifting cultivation is considered to cause forest degradation rather than deforestation because its cycle of operation involves clearance followed by forest regrowth, creating a landscape with lower biomass density that still qualifies as forest (Morales-Barquero et al. 2015). It is important, therefore,

to consider the landscape approach and integrated land management when making restoration decisions. Landscapes are made of mosaics of land uses that serve different functions, from agriculture to conservation. A landscape approach facilitates sustainable land use and management and provides sustainable land-use options for the environment, society and the economy. For example, restricting livestock browsing to certain areas within a shifting cultivation landscape promotes forest regrowth in other areas (Morales-Barquero et al. 2015).

Recommendations

A full revision of all restoration elements in the *ITTO Guidelines for the Restoration, Management and Rehabilitation of Degraded and Secondary Tropical Forests* would be inappropriate. Many organizations are working in the restoration field, and ITTO should therefore focus on the key areas most relevant to its strengths. It would be most beneficial, therefore, to:

- identify ITTO's comparative advantages within the Global Partnership for Forest and Landscape Restoration and use these to fill gaps in restoration methodologies and toolkits;
- align the revision of the guidelines with global emerging issues and priorities; and
- use the Global Partnership for Forest and Landscape Restoration to create visibility for the guidelines and to support forest and landscape restoration globally.

The full report and individual case studies are available at www.itto.int (see "References" below for citations).

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Species under threat in Guatemala

An investigation by a forensic laboratory established with assistance from the ITTO–CITES Programme has found that *Dalbergia* is critically at risk in Guatemala

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Species investigation: Foresters establish a monitoring plot during a national inventory of *Dalbergia* species in Guatemala as part of a project funded by the ITTO–CITES Programme. Photo: R. Martinez/FNPV

The national institutions in charge of forest governance in Guatemala have established that illegal timber trade constitutes a major threat to biodiversity. Botanical and wood research at a forensic level is needed to provide a sound scientific basis for legal procedures to stop this illegal trade.

The project “Establishment of a forensic laboratory for wood identification and description in the implementation of legal procedures and traceability systems for CITES-listed products” arose from a joint initiative of the National Council for Protected Areas (*Consejo Nacional de Áreas Protegidas*—CONAP), the National Forest Institute (*Instituto Nacional de Bosques*—INAB), the Ministry of Justice (*Ministerio Público*), the College of Agriculture of the University of San Carlos of Guatemala (*Facultad de Agronomía de la Universidad de San Carlos de Guatemala*—FAUSAC) and the Nature for Life Foundation (*Fundación Naturaleza para la Vida*—FNPV), with financial support from the ITTO–CITES¹ Programme for Implementing CITES Listings of Tropical Timber Species.

The three objectives of the project were to: 1) develop the capacity to legally identify the wood of Guatemalan forest species listed in CITES Appendix II by 2014—the species are mahogany (*Swietenia macrophylla* King, *Swietenia humilis* Zucc), guayacan (*Guaiaacum sanctum* L., *Guaiaacum officinale* L.), rosul (*Dalbergia stevensonii* Standl.) and cocobolo (*Dalbergia retusa* Helms); 2) generate

phenological and botanical information on these species as well as other *Dalbergia* tree species found in Guatemala; and 3) generate macroscopic, microscopic, histochemical and physical information on the wood of these target species.

The forensic laboratory was inaugurated on 21 September 2015 in a ceremony attended by representatives of CONAP, INAB and the Public Prosecutor’s Office for Environmental Crimes attached to the Ministry of Justice, as well as representatives of the Ministry of Justice, the CITES Authority for Guatemala, ITTO, and many other national and international organizations and forest communities. The Chancellor of the University of San Carlos of Guatemala and the Dean of FAUSAC also attended.

Scientific certainty on the botanical identification of species is essential for macroscopic and microscopic studies on their wood. The project began with a literature review of botanical descriptions and distributions of the target species in Guatemala. The main source of information continues to be *Flora of Guatemala* (Standley & Steyermark 1946); other sources consulted were *Mesoamerican Flora*², *Flora of Nicaragua*³, the national inventory of *Cedrela*, *Dalbergia* and *Swietenia* species, and INAB and CONAP databases, among others, including personal communications. Based on the information collected, potential distribution maps for the target species were developed using ArgGis (a mapping platform).

¹ Convention on International Trade in Endangered Species of Wild Fauna and Flora.

² www.tropicos.org/Project/FM.

³ www.tropicos.org/Project/FN.

Botanical description of *Dalbergia calycina*

Grows to 12 metres high, with stem 3–6 m long to the first branches; irregular crown; smooth brown-coloured bark covered by moss in humid environments or with longitudinal fissures in dry environments. Sapwood changes colour from white to yellow when exposed. Leaves are pinnate, with 5–11 alternate folioles that are ovate to oblong-ovate in shape, with a retuse apex. Several axillary racemes (clusters). Flowers are 1.1–1.9 cm long with a brown-coloured gamosepalous, pubescent calyx covering half the flower. White-coloured vexillary corolla with a lime green spot at the base-centre of the vexillum (standard). Flat, winged pod containing 1–2 seeds, and rarely four. Wood is extremely heavy, and reddish when cut with numerous black or dark streaks.

Flowering occurs in January and February, when trees are defoliated. Leaves emerge in February, with young leaves showing in March and April. The rainy season extends from May to November, when there is an abundance of foliage. Fruits reach maturity in August.



Pinnate leaf of *Dalbergia calycina*. Photo: M. Herrera

A botanical exploration was carried out in four regions: 1) the Pacific Range [Coast (*Costa*) and Piedmont (*Boca Costa*)]; 2) the Eastern Region; 3) the Northern Transversal Strip (*Franja Transversal del Norte*—FTN); and 4) the Department of Petén.

Exploration activities, botanical sample collection and phenological studies began in June 2014, with 90% of the work completed by November 2015. Throughout the project, emphasis was placed on the collection of botanical photographic documentation.

Results

The results for *Dalbergia* species are as follows.

Dalbergia calycina Benth

Dalbergia calycina is commonly known in Guatemala as nogal, ébano, quebracho or chiquibalché (in the Kakchiquel language). Its geographic range is very limited in Guatemala, with only three known populations in two stony volcanic areas in the Pacific Range region. The species grows at altitudes ranging between 1500 and 1880 metres above sea level in the following Holdridge life zones: subtropical very moist (temperate) forest; and sub-tropical low montane moist forest.⁴ Box 1 contains a botanical description of the species.

⁴ This information is derived from the map of *Holdridge Life Zones in the Republic of Guatemala*, based on De la Cruz (1983).

Botanical description of *Dalbergia retusa*

Grows to 10–15 m high, with a cylindrical stem of 3–6 m to the first branches; greyish-brown bark, with longitudinal fissures. Yellowish-brown heartwood with streaks; sapwood changes colour from white to yellow when exposed to the environment. Leaves are 21.5–31 cm in length and pinnate. Leaves have 11–15 alternate folioles that are oblong to elliptical-oblong in shape, 4–11 cm long and 2–5 cm wide; mostly retuse apex; glabrous and glossy face; deciduous stipules; growing in terminal or axillary racemes or panicles. Flowers are 9–18 mm long; calyx is 4–7 mm and 3.5–6 mm in diameter. White-coloured, vexillary corolla with lime-green pigmentation at the base-centre of the vexillum (standard), often with black spots caused by insects or pathogens. Flat, winged, glabrous pods that are oblong to elliptical-oblong in shape; 6–17 cm long and 1.5–2 cm wide; containing 1–4 seeds.

Flowering occurs from February to April, and fruits develop from February to October/November, with mature fruits from October to December. Total defoliation occurs in March, with leaves reappearing in May and June. The weather is dry during the flowering/defoliation periods, with an average temperature of 24 °C. Leaf and fruit development occurs in the rainy season.



Flowers of *Dalbergia retusa* var *retusa*, with black spots caused by insects. Photo: M. Herrera

After an intensive search, it was concluded that there are no *D. calycina* plantations in Guatemala; thus, only wild populations of this species exist in the country. According to local people, the wild populations are depleted due to a loss of habitat as well as illegal logging and trade. The survival of *D. calycina* is critically at risk, and urgent actions are required for its protection, restoration and sustainable management.

Dalbergia retusa Helms var *retusa*

According to *Flora of Guatemala*, this species (known locally as granadillo or nogal) used to grow in abundance in the coastal plains and Boca Costa (piedmont) in the country's Pacific Range region; despite an intensive search, however, only one extant population was found in Suchitepéquez, with scattered trees in the departments of Escuintla and Santa Rosa. The species was found in the following two life zones: subtropical very moist (warm) forest; and subtropical moist (warm) forest⁵, in volcanic soils at altitudes of 400–500 m above sea level.

⁵ This information is derived from the map of *Holdridge Life Zones in the Republic of Guatemala*, based on De la Cruz (1983).

Botanical description of *Dalbergia stevensonii*

Grows to 15–30 m high with an irregular crown, a diameter of up to 80 cm, and a stem of 6–11 m to the first branches. Bark is greyish, with rectangular scales. The species can regenerate from the stump when logged. Pinnate leaves with 5–7 folioles that are elliptical or cordate in shape, 3.5–9.5 cm long and 2.5–4.5 cm wide, with obtuse or rounded apex and sometimes emarginate; dark green face; glossy and glabrous; whitish-coloured back. Much-branched panicles are shorter than the leaves. Very small flowers, 4–5.5 mm long, with an almost glabrous calyx 1.5–5 mm long and 1–2 mm wide. White petals; light green pigmentation at the base-centre of the vexillum (standard). Small, flat, oblong, winged pods, 4–4.5 cm long and 12–14 mm wide, rounded or apiculate in the apex, more or less glabrous, containing one seed. Heavy and dense wood; the heartwood is pinkish, with purple to deep brown and/or black veining.

Defoliation occurs in May–June; foliate shoots come out in June–August; flower buds start to appear in May with the start of the rainy season; and full blossoming occurs in June–July. Fruit development should begin in July, but fruiting has been limited in most of the monitored sites. Possible causes of limited fruiting are: insect attacks on young, unripe fruits; and the early abscission of fruits due to adverse climatic conditions. On the latter, the area was subject to severe drought in 2014–2015; during the rainy season, strong rains led to the fall of a large number of flowers. There were sharp changes in temperature and evapotranspiration during the day; temperatures reached up to 30 °C and rain was intense at night. *D. stevensonii* seems vulnerable to these drastic climatic changes.



Fruits of *Dalbergia stevensonii*. Photo: P. Ruiz

According to local people, the logging of natural populations of *D. retusa* var *retusa* for timber export began in the 1970s. Natural populations of the species have largely been depleted due to: illegal logging and associated trade at the international level; loss of habitat due to land-use change; and the extraction of plant roots for illegal trade (thus reducing regeneration capacity). There are virtually no plantings of this species in Guatemala.

Botanical description of *Dalbergia tucurensis*

Grows to 10–25 m high, with a diameter of 25–90 cm and a stem 4–10 m to the first branches. Regular and cylindrical stem up to at least 5 m. Bark is greyish-white, with vertical fissures. The sapwood oxidizes with environmental exposure, changing from whitish to yellow. Branches are densely pubescent. Its pinnate leaves are 18.5–36.5 cm long, with 9–15 folioles that are oblong to oblong-ovate in shape, 5–8 cm long and 1.5–3 cm wide, with an acute, obtuse or retuse apex; usually densely brown-hairy on the back. Stipules are deciduous. Small corymbiform panicles are shorter than the leaves, with numerous flowers. Flowers are small (4–6 mm long) and white-to-cream in colour. Green, gamosepalous calyx, 1.5–5.5 mm long, densely hairy. Pre-flowering vexillary corolla, white-coloured; vexillum (standard) with a greenish spot at the base. Pods: flat, winged, glabrous, oblong, 4.5–6 cm long and 1–1.5 cm wide; with obtuse, rounded or mucronate apex; reticulate venation. One seed per pod. Foliate shoot development and full blossoming occur in February and March, when rainfall is low and the mean temperature is 24 °C. Fruiting occurs from February to May, when fruits reach full maturity. The June rains accelerate foliation development. The lowest rainfall and temperatures are in December and January—rainfall decreases to 50 mm or less per month and the mean temperature is 23 °C. In these climatic conditions, leaves turn yellow and fall.



Fruits of *Dalbergia tucurensis*. Photo: J. Hernández Herrera

Dalbergia stevensonii Standl.

This species, known locally as rosul, a'akute or que'kiche (q'eqchí), grows in the FTN and Petén regions. It occurs in the subtropical very moist (warm) forest life zone, in karstic soils with flat to undulating relief and on lowlands that are flooded during some months of the year. It inhabits broadleaved forests at altitudes ranging between 50 m and 350 m above sea level, with a bimodal rainfall pattern with rainfall peaks in May–July and August–October. The maximum annual temperature in the region is 42.8 °C; the mean temperature is 25.3 °C; and the minimum temperature is 17 °C.

Natural populations of *D. stevensonii* in the FTN and Petén regions have decreased due to illegal logging and trade. Even though the species has the capacity to regenerate, the roots are often extracted. We found natural populations of more than 100 individuals on farms; but many of these farms are requesting harvesting permits due to the high value of the timber and because such trees are subject to theft and illegal logging.

Dalbergia tucurensis Donn.

This rare species, known locally as granadillo, acute and q'eqchí, grows in the FTN and Petén regions at altitudes of 120–550 m above sea level, mainly in subtropical very moist (warm) forest life zones and on karstic soils. The species grows in areas with bimodal rainfall patterns, with rainfall peaks in June and September and lows in February–April and July–August.

After an intensive search we found only one population and scattered trees of *D. tucurensis* in the FTN and southern Petén. It has been reported that this species has been intensively logged for its timber and that its survival is threatened. With only one exception, there are no plantations of this species in Guatemala, and all the timber traded therefore comes from natural populations.

Conclusions

The survival of the species described above is critically at risk. This statement is based on the following findings and data collected during the research:

- The populations of *D. retusa* var *retusa*, *D. calycina* and *D. tucurensis* have high degrees of endemism; are strongly depleted due to a loss of habitat and indiscriminate logging from the 1970s; and are still subject to illegal logging and trade. Moreover, even though *Dalbergia* species can coppice, traffickers are extracting tree roots, thus reducing the species' capacity to regenerate; there are virtually no forest plantations of these species, either. Thus, urgent action is needed by government authorities to protect and sustainably manage the species, with support from international institutions.
- There are natural populations of *D. stevensonii* in the FTN and Petén regions. The following factors are affecting their survival, however: intense illegal timber logging and trade, including root extraction; insects, which are damaging fruits and seeds, affecting germination; and the vulnerability of the species to climate change because its capacity to flower and develop viable fruit and seed decrease under adverse conditions.

- *Dalbergia* species are subject to plant pathogen attacks to leaves and flowers (indicated by black spots).
- *D. calycina*, *D. tucurensis* and *D. retusa* defoliate between November and March and bloom mainly in February; *D. stevensonii*, on the other hand, defoliates between March and June, blooming in May–June. Under adverse conditions, trees can remain defoliated and dormant, limiting their growth.
- Within the FTN, the largest populations of *D. stevensonii* were found in the Laguna Lachúa National Park. The adequate conservation and management of this park is important, therefore, for the survival of this species (and many others).
- The implementation of the forensic laboratory is strengthening national institutional capacities to improve forest law enforcement.

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The illegal logging of bubinga

Why has the volume of seized *Guibourtia* wood increased in Cameroon?

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Caught: This load of illegal bubinga wood (*Guibourtia demeuseii*) was on its way to Douala, Cameroon. Photo: J. Lagarde Betti

Guibourtia, a genus of tree species commonly known as “bubinga”, is of considerable sociocultural and economic importance in Cameroon and elsewhere (Tasso et al. 2015). Bubinga wood is hard, red and high-value; it is sought-after in Europe and Asia for the manufacture of furniture and musical instruments.

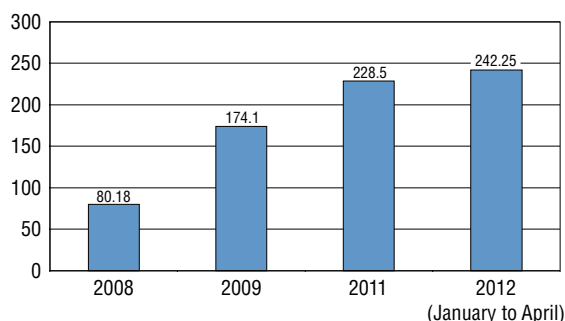
Guibourtia species are potentially under threat from illegal activities in Cameroon.¹ The information presented in this article is based on a literature review and web search, discussions with stakeholders, and field observations.

Twenty-four people were interviewed, comprising 23 forest officers and one villager living in a bubinga production site in Cameroon. Four of the interviewed officers work in the central administration at Yaoundé, and 19 work in extension services in the Centre, Littoral and South regions (the three main regions hosting bubinga production in Cameroon).

Illegal logging has various forms, such as exceeding allowed cutting boundaries, not adhering to minimum exploitable diameters, cutting more than the legally allowed volume, illegal fellings, and false declarations. Illegal fellings and false declarations are said to be the two major types of illegal practices found in the forest sector in Cameroon (Betti & Bobo 2007).

About 75% of the people interviewed attributed the illegal logging of bubinga in Cameroon to the “Asian phenomenon” (an increase in prices due to increased demand, especially

Figure 1: Evolution of the volume of illegal bubinga wood seized, Regional Delegation of the South, Cameroon, 2008–2012



in Asia): 1 m³ of bubinga at Douala can cost 1 million Central African francs (CFA) (about US\$1700, as of mid-2016). Illegal logging operations for bubinga are often conducted at night with the complicity of local villagers and civil servants, even extending into protected areas such as the Mengine Gorilla Sanctuary in South Region. Control is difficult: illegal loggers will cut bubinga trees in one area (such as in a forest management unit, a community forest, or a protected area), cross the border of that area, and present false papers to the chief of the forest post in the adjacent area.

One way to assess the pressure on a given timber species or group of species is to compare the volume seized or the revenues yielded from the seized wood with other species' groups. In the Littoral and South regions of Cameroon, three groups of timber products can be distinguished: white wood, bubinga wood, and other. The total value of seized products in the two regions between January 2011 and April 2012

¹ Betti et al. (2016) presented the results of a recent assessment of the conservation status of several *Guibourtia* species.

Table 1: Revenues (Central African francs) yielded by illegal forest products seized by the Regional Delegation of Forest and Wildlife, Littoral Region, Douala, from January 2011 to April 2012

Product	2011	2012	Total
Other timber species	18 080 052	4 186 912	22 266 964
Bubinga	9 205 960	12 860 615	22 066 575
White wood	1 115 500	3 122 653	4 238 153
Charcoal	138 175	0	138 175
Yohimbé (bark)	421 200	200 000	621 200
Total	28 960 887	20 370 180	49 331 067

was 49 331 067 CFA (US\$84 300), with bubinga products yielding 22 066 575 CFA (US\$37 700), or 45% of the total. In South Region, 1200 m³ of bubinga were seized between 2008 and 2012 (Figure 1).

The volume of illegal bubinga seized increased from 2008 to 2012, most likely because of an increase in value. In Littoral Region, for example, the volume of illegal bubinga wood seized in four months in 2012 was higher than the total volume seized in all of 2011.

The Cameroon Minister of Forests and Wildlife has taken several measures to reduce the illegal logging of bubinga, including the suspension of all logging of bubinga species in Cameroon and the punishment of corrupt forest officers. After a report issued by the National Forestry Development Agency (ANAFOR), which acts as the CITES Scientific Authority for floral species in Cameroon, the minister banned the export of bubinga in April 2011. This decision was later revised, and the ban was restricted to the harvesting of bubinga species in forest management units in which densities are below 0.05 stems per hectare, and minimum exploitable diameters were fixed at 100 cm for *G. demeusei* and 60 cm for *G. tessmannii*. In 2012, the minister punished or replaced all forest officers and agents suspected of involvement in the illegal logging or the illegal trade chain of bubinga products, including some senior regional officers, but these measures were insufficient to discourage illegal loggers. In November 2012, the minister took another decision to temporarily suspend the logging of bubinga tree species in Cameroon until the listing of those species in the CITES Appendixes.

Similar actions to punish illegal loggers of bubinga and corrupt officials are now being taken in Gabon. The Gabon Minister for the Protection of the Environment has decided to “suspend temporarily and as a preventive measure the exploitation of kevanzingo [the local name for bubinga] across the whole territory” while making an inventory with a view to better protecting them.

Measures to reduce illegal logging

The following recommendations, based on the views of interviewees and the authors’ observations, would help ensure that the trade of bubinga is not detrimental to the conservation of bubinga species:

- propose the listing of bubinga species in Appendix III of CITES;
- conduct detailed research on the biology, ecology, phenology and silviculture of bubinga species;
- strengthen forest control by increasing the number of controllers at forest exit points and equipping forest officers with suitable equipment (e.g. geographic positioning systems, cell phones and vehicles) to better tackle illegal logging and export;
- strengthen the capacity of forest officers to identify bubinga species at all levels, including forests, log yards and sawmills;
- allow villagers to use their bubinga trees by easing procedures for obtaining “special permits” or promoting the development of community forests in areas where bubinga is found; and
- train forest and customs officers in procedures for controlling forest products and encourage their collaboration in procedures for loading containers.

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Fellowship report

Increasing understanding of wildfire in Togo

by Bareremna Afelu

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University of Lomé, Togo
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Hot topic: A difficult-to-control late-season fire in the Oti-Kéran National Park (close to the Naboulgou Ranger Station), Togo. Photo: B. Afelu

In Togo, setting fire to vegetation is an ancestral and widely used practice in agriculture, village land development, and cultural rites (Kpeli 2006; Afelu 2009). Except for some ecological standards (Devineau et al. 2010; Dosso et al. 2011), however, the negative impacts of fire on ecosystems and populations counteract its utilitarian aspects. Due to a lack of reference data on fire dynamics, most fire managers use remote sensing (satellite) data of medium or low resolution, which do not fully reflect the situation on the ground (Ichoku et al. 2008).

The lack of reference data on fire in Togo raises many questions. What is the current situation of fires and burnt areas, and what are their spatial-temporal dynamics? How accurate are remote-sensing data? What values are yielded by an evaluation of fire-behaviour-related physical parameters (such as fire propagation speed and fire intensity) in Togo?

Despite the strong commitment of senior authorities in Togo's forest administration, existing political will, and the involvement of stakeholders through awareness-raising activities, uncontrolled fires continue. How is it that stakeholders have failed to adopt appropriate fire management, and why are Togo's fire regulations so ineffective?

Objectives

The study carried out with the assistance of an ITTO Fellowship aimed to help improve wildfire prevention and management in Togo. The specific objectives were to: prepare a description of fire dynamics across time and space; establish the accuracy with which remote-sensing data reflect reality

on the ground; establish fire behaviour parameters through assessment; and analyze the effectiveness of fire regulations in Togo. Some of the results are reported here.

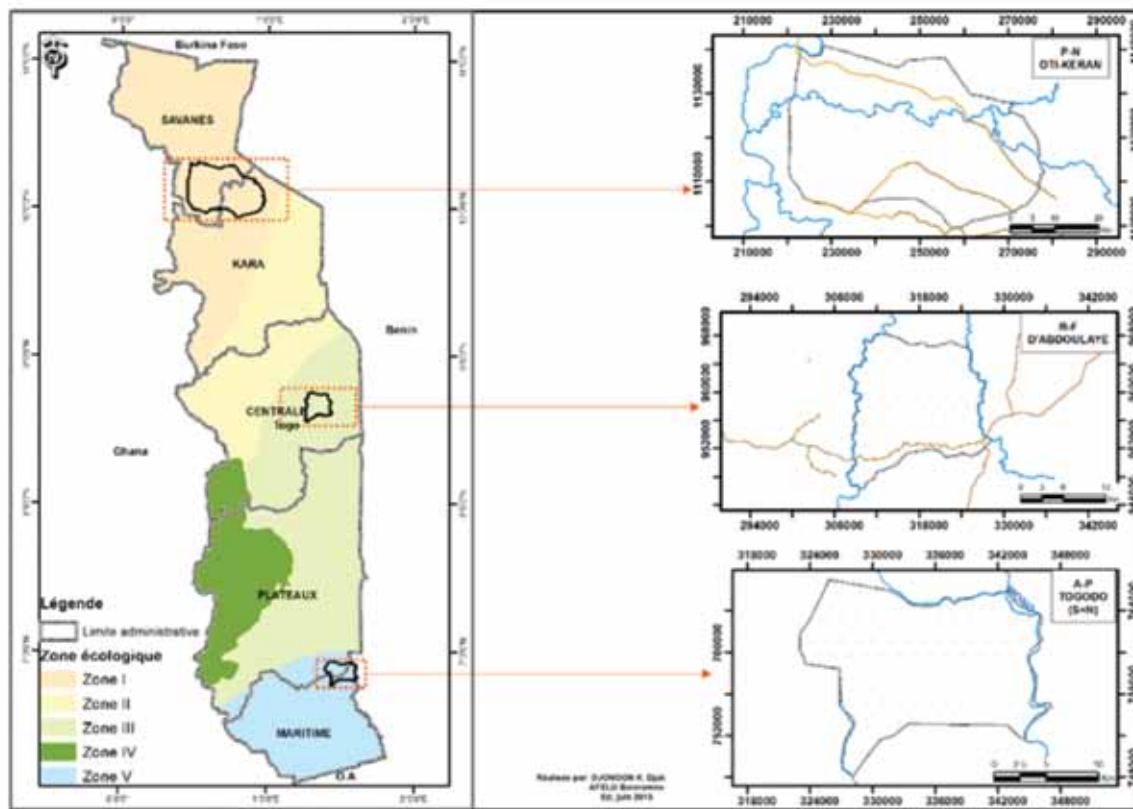
Methodology

Remote-sensing data were analyzed and compared with ground measurements (Poilecot & Loua 2009; Freeborn et al. 2011) in three priority protected areas—Oti-Kéran-Mandouri, Abdoulaye and Togodo (Adjonou 2011; N'dri et al. 2011) (Figure 1). The ArcGis suite (Afelu & Kokou 2015) was used to map active fires and burnt areas. Surveys were conducted among local communities and with protected-area managers (Eriksen 2007; Houehounha 2009) to analyze the effectiveness of awareness-raising activities and of fire regulations.



Ground work: A team of researchers (including the author, second from left) takes field measurements as part of a study of the accuracy of remote-sensing data. Photo: B. Afelu

Figure 1: Location of the three priority protected areas



Findings

According to Moderate Resolution Imaging Spectroradiometer (MODIS) data, an average 28.7% ($\pm 7.8\%$) of the protected areas burn each year, although ground measurements suggest that the rate is even higher—56.8% ($\pm 18.6\%$). The area actually burnt (according to surveys in the three priority protected areas), therefore, is 2.08 (± 1.02) times larger than the burnt areas detected by remote sensing. Savannas are the most vulnerable forest type, representing 87.5% ($\pm 3.9\%$) of the burnt area in the surveyed protected areas.

Fire propagation speed was 11 (± 1) cm per second in the Sudanese savanna and 9 (± 1) cm per second in Guinean forest areas, with fire intensity ranging between 1184 (± 192) and 3207 (± 357) kilowatts per square metre; fire propagation speed and fire intensity were lower for early-season fires than for late- and mid-season fires.

Sector-based interventions address the issue of fire management only narrowly, without achieving synergies with other sectors. Fewer than 8% of surveyed stakeholders were adequately informed of fire regulations; most (70%) belong to the non-official sector, and their low levels of literacy and high levels of poverty explain their lack of involvement in fire management.

Conclusion

The effectiveness of fire management depends on a good understanding of fire behaviour and the impacts of fire on ecosystems, and on the effective use of fire prevention and

management tools by stakeholders. Only a holistic approach is likely to be effective in the mid to long term; among other things it would generate a better understanding of fire behaviour in its ecological and sociocultural contexts and help raise the awareness and capacity of stakeholders. The risk of wildfire remains high and systemic across a large part of Togo. Ground measurements in three protected areas show that the area actually burnt in a given year could be twice as high as that detected using remote sensing. Data collected in the study (but not presented here) show that the total biomass in burnt sites is relatively low compared with unburnt sites, suggesting that fire has a negative impact on plant production in the surveyed areas. Local stakeholders have little awareness of the official fire prevention and management framework, which helps explain its ineffectiveness.

Recommendations

On the basis of the study's findings, I make the following recommendations for fire authorities in Togo:

- support scientific efforts to improve understanding of fire behaviour, including ecological and socioeconomic aspects;
- complement satellite data (remote-sensing) with ground measurements (field work); and
- increase awareness-raising and capacity building among stakeholders (schoolchildren and rural communities) on wildfire prevention and fire management.

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TFU goes mobile

ITTO has released a free app that makes the *TFU* instantly available on smartphones and tablets. The app, which can be downloaded at Apple's App Store and Google Play, enables users to:

- receive alerts when new editions of the *TFU* are published;
- download issues and save them to their smartphone libraries;
- create bookmarks and share them via other applications;
- view thumbnails in full screen;
- view the *TFU* in one- or two-page modes;
- access editions dating from 2014 in English, French and Spanish; and
- navigate to ITTO's website.

More information: www.itto.int/tfu



If prospects for profit were high, the intra-African trade in wood products would already be flourishing

Compiled by Michael Adams from reports of ITTO's Market Information Service, with statistical analysis by Jean-Christophe Claudon

Long distances over poor roads, unofficial road tolls, corruption, burdensome paper work, payment risks, complicated and poor banking facilities, undeveloped distribution networks—the intra-African trade in wood products faces many well-documented hurdles. But even if all these could be overcome, there is one other massive but largely ignored challenge to intra-African trade: market competition.

Is there really a sound business case for the cross-border marketing of added-value products in Africa, which would have to compete with shipments from other highly successful and well-established international exporters? If a sound business case did exist, surely the African private sector would have grasped the opportunity already?

Competition from non-African shippers—the greatest hurdle

Wooden furniture is a highly priced added-value product, and the development of trade in furniture to two of the largest African markets, Nigeria and South Africa, offers clues as to just how tough it would be for African manufacturers to expand intra-African business.

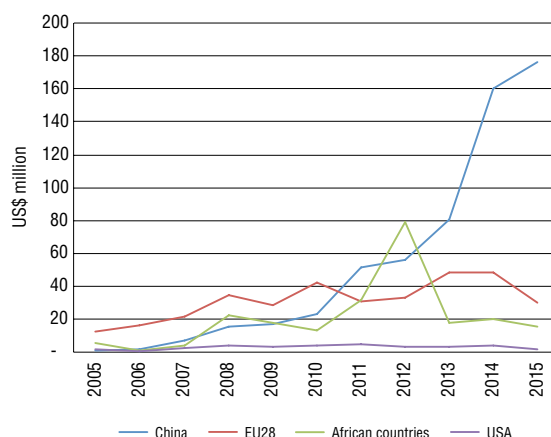
There are three segments in the African market for wooden furniture: 1) the small upper-income market, which consumes high-priced furniture from mainly western suppliers; 2) the middle-income earners (the biggest segment, by value); and 3) the low-income market, which consumes low-priced, mainly domestically made furniture.

The huge middle-income segment of the African market is the target of most international furniture exporters. For a wide range of consumables, including furniture, this group is demonstrating a marked preference for imported goods, thereby opening the door to extraregional exporters. As much as 70% of demand from middle-income earners is for imported furniture.

A look at import trends in Nigeria and South Africa demonstrate the challenges for African companies trying to export to neighbouring African markets. Figure 1 and Figure 2 show the value of furniture imports by Nigeria and South Africa and the rapid penetration of the two markets by Chinese shippers. In 2015, Chinese-made wooden furniture targeted at middle-income consumers accounted for about 75% of all Nigeria's recorded wooden furniture consumption; the equivalent figure for South Africa was above 80%. These figures underline the challenge facing African manufacturers contemplating a foray into Africa's regional markets.

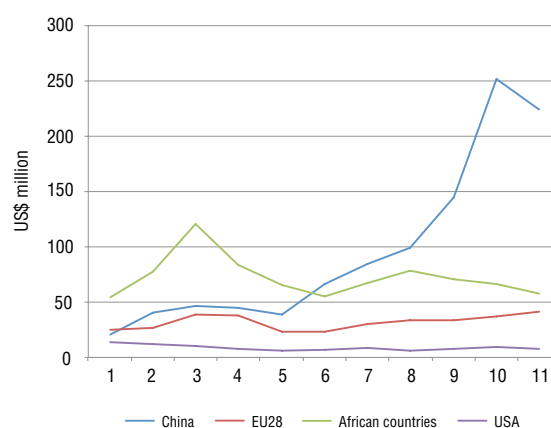
Exports from China represented only 3% of total Nigerian wood product imports in 2005 but 73% in 2015. In 2005, African countries accounted for 25% of Nigeria's imports, but this had fallen to about 6% by 2015. The European Union accounted for more than half Nigeria's furniture imports in 2005, but this share had declined drastically—to 12%—by 2015. China's share of South African furniture imports grew from 10% in 2005 to 48% in 2015, but the share of African shippers halved from 25% in 2005 to an estimated 12% in 2015.

Figure 1: Value of wooden furniture imports to Nigeria by source, 2005–2015



Sources: Comtrade and ITTO.

Figure 2: Value of wooden furniture imports to South Africa by source, 2005–2015



Sources: Comtrade and ITTO.

Attempting to develop intraregional markets for added-value wood products may be unappealing for businesses, but, on the face of it, expanding regional trade could bring economic benefits. Trade is one of the most effective engines of economic growth, and many countries have achieved development by expanding manufacturing for export. In Africa, however, manufacturing and trade are not serving well as a tool for sustainable economic growth. Africa's share of global trade is insignificant, at around 3%, and most of it is in primary commodities for external rather than regional consumption.

The African Union has estimated intra-African trade at around 13% compared with approximately 30% in Association of South East Asian Nations—ASEAN—countries, 40% in North America and 60% in Europe. The lack of intraregional trade has prevented African countries from taking full advantage of the benefits it would bring in terms of income and employment generation.

Table 1: Population and consumer spending in 2010 (actual) and 2020 (projected), selected African countries

	Population, 2009 (millions of people)	Consumer spending, 2010 (US\$ billion)	Projected consumer spending in 2020 (US\$ billion)
Angola	19	14	18
Ghana	24	15	29
Nigeria	151	115	167
Senegal	13	10	16
South Africa	49	215	315
Zambia	13	10	23

Sources: Euromonitor, Africa Consumer Spending 2010.

Conventional economic thinking says that boosting intra-African trade and deepening regional marketing will provide a stepping stone to faster economic growth. But how best to create a production and marketing environment in which the African private sector could challenge entrenched international competition in regional markets is yet to be seriously discussed.

Why are international furniture exporters focused on Nigeria and South Africa?

After a decade of growth in gross domestic product (GDP) averaging around 5%, the global financial crisis knocked African economies—but not too seriously. Prospects in the region are for sustained economic growth, much of it deriving from a steady increase in the number of middle-class consumers whose growing disposable incomes will lead to higher spending, especially in Nigeria and South Africa (Table 1).

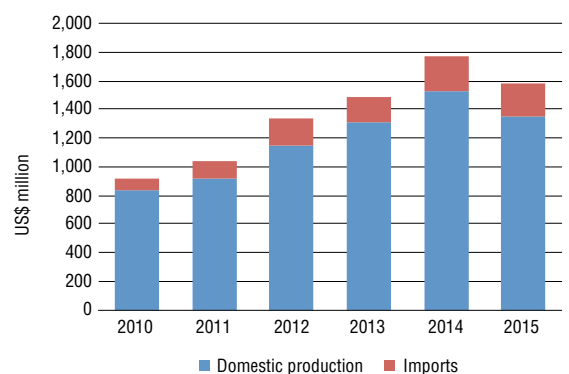
South Africa

The South African economy avoided the worst of the fall-out of the global financial crisis. As disposable incomes rise in the rapidly expanding middle class, demand for retail and consumer goods is set to rise further. South Africa's economy is the most sophisticated in Africa; its retail market is the biggest in sub-Saharan Africa and the 20th-largest worldwide.

According to Euromonitor, domestic trade by furniture and homeware stores in South Africa began to grow in 2012 after several years of decline. Improving consumer confidence, the availability of credit (despite stricter client evaluations), and growth in the housing market have boosted demand for furniture, leading to annual growth forecasts to 2018 of 6% in the furniture retail sector.

Despite optimistic projections, however, the domestic furniture industry in South Africa has been in slow decline, both at home and in export markets, due to the success of Asian imports and declining investment by South African companies in training and technological innovation.

Figure 3: Nigerian production and imports of wood products, 2010–2015



Source: Nigeria Central Bank, COMTRADE and ITTO.

China is the single largest contributor to South African furniture imports: its imports were worth more than US\$200 million in 2015. Five of the top ten sources of furniture imports by South Africa were Asian in that year.

Nigeria

Nigeria has a rapidly growing domestic market of perhaps 180 million people in 2016, and consequently its economy has a complexity not seen elsewhere in Africa. Official estimates of GDP put annual economic growth at around 7%. This growth is leading to an expansion in consumption; although a very high proportion of Nigerians have very little disposable income, 10% of the population can be classified as middle-income earners—a staggering number in the African context and a target market for international exporters. According to estimates, 5–10% of Nigerian households have annual incomes above US\$10 000, and a further 10–20% have annual incomes above US\$5000. This expanding middle class constitutes an attractive pool of potential consumers, which is steadily increasing its contribution to GDP.

Much of the income growth in the middle class stems from migration to cities, where jobs are available. Nigeria's rate of urbanization is said to be one of the highest in the world, with eight Nigerian cities home to 20% of the population.

In 2010, Nigerian imports of wood products represented 11% of total domestic wood product manufacturing. In the five years to 2015, imports grew faster than output from the wood product manufacturing sector (Figure 3).

Nigeria banned furniture imports more than a decade ago, but the ban was never seriously implemented, which means that imported furniture has continued to eat away at the market share held by domestic manufacturers. Despite the lax implementation of the ban, however, the sheer size of the increase in demand has boosted domestic furniture-makers and this, combined with competition from imports, has driven the local industry to innovate. Domestic manufacturers, who previously suffered poor sales because of quality and design issues, have gradually found a receptive market.

Even today, however, the perception of analysts is that Nigerians still prefer to buy imported furniture, and the new middle-class consumer is undoubtedly attracted to the well-made, low-cost furniture coming from Asia.

The saga of limits to imports has recently taken a new twist: in an effort to maintain stability in the domestic foreign exchange market, importers of some goods and services have been denied access to foreign exchange. The Central Bank of Nigeria has issued a list of items for which foreign exchange will not be provided, including furniture and many other wood products. Importers will be compelled to resort to the parallel market to pay for imports.

Timber traders will find a way

The question posed at the beginning of this article was to the effect of whether there was a sound business case for the cross-border marketing of added-value African wood products in the face of competition from global exporters.

The case would be helped if all existing hurdles to trade could be removed, but this would also make trade easier for the global competition. The answer lies in reality; the intra-African trade in added-value wood products has not taken off because prospects for profit are low. Flowing water will always find a path under, over, around or through obstacles. Timber traders worldwide are the same—if the motivation is strong enough.

If the timber industry in Africa is to have the impact on jobs and income that it has achieved in Asia and Latin America, we need to start thinking outside the box. For starters, the sector needs much better information on what wood products are being traded, by whom and at what prices. A first step on the long road to expanded intraregional trade would be to ratchet up the availability of commercially relevant market intelligence.

In parallel, because government efforts have often failed miserably, private-sector organizations, associations and chambers of commerce should be supported to be more professional and then encouraged to network throughout the region to promote business-to-business contacts. When that happens, timber traders will find a way.



Using drones to replant forests

In an article on the tech site Geekwire, the creators of Droneseed—a technology startup—discuss their plan to use drone technology to help restore forests. Droneseed, which is based in Oregon, believes it can reduce the cost of replanting forests by at least ten-fold by using precision forestry involving drones in forest assessment, planting and tree care. The drones can precisely deliver seeds and sprays and—according to Droneseed—are well-suited to determining ideal planting sites (to the nearest centimetre), thereby helping ensure tree survival and maximize growth. The company hopes its technology can work in tropical forests.

More information: www.geekwire.com/2016/droneseed

ITTO and BirdLife International extend collaboration to 2020

ITTO and BirdLife International have renewed their commitment to work together for biodiversity conservation and forest restoration by signing a memorandum of understanding (MOU) in March 2016 in the presence of Her Imperial Highness, Princess Takamado of Japan, who is also Honorary President of BirdLife International. The new MOU, which is valid for five years, was agreed after the successful implementation of a previous MOU spanning 2012–2015.

More information: www.itto.int/news_releases/id=4727

FLEGT website takes flight

The EU FLEGT Facility recently launched a website, flegt.org, dedicated to sharing accurate information and practical knowledge on the European Union (EU) Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan. The site serves as a portal where users can access and share news, research, training materials and many other resources on timber legality. The aim of the website is to serve as a place for networking among individuals and organizations in civil society, the private sector and government working to achieve the EU FLEGT Action Plan's goals of combating illegal logging and fostering good forest governance.

More information: flegt.org

Malaysian palm-oil giant suspended

The Malaysian palm-oil conglomerate, IOI Group, has been suspended from the Roundtable on Sustainable Palm Oil (RSPO), a group of which it is a founding member. The suspension in March 2016 was due to violations of RSPO standards (which are intended to prevent rainforest destruction and social conflict) and other laws in the company's operations in the Ketapang area of Indonesian Borneo.

More information: news.mongabay.com/2016/03/malaysian-palm-oil-giant-ioi-suspended-from-rspo

PNG forest authority launches forest inventory

The Government of Papua New Guinea and its National Forest Authority announced in March 2016 the establishment of a continuous multipurpose national forest inventory. The inventory will assess, among other things, timber and carbon stocks, biodiversity, non-timber forest products and soils. The data will also be available for use by the public, non-governmental organizations, and the Climate Change, Mining and Petroleum, and Agriculture departments of government.

More information: www.forestry.gov.pg

Satellite technology to combat illegal logging in real time

A cutting-edge satellite-based alert system could help policymakers and conservationists address illegal logging by notifying users in real time of new clearings in tropical rainforests, according to a report published in *Inside Climate News* in March 2016. The system, known as Global Land Analysis and Discovery, was developed by Google and the Department of Geographical Sciences at the University of Maryland. It downloads new images of tropical rainforests in Peru, the Republic of the Congo and Indonesian Borneo from US Geological Service satellites and uses an algorithm to compare each pixel in the new images with the previous four years of images. Alerts are triggered if the system senses significant differences in pixel patterns, and the alerts are published on the Global Forest Watch website.

More information: insideclimatenews.org

Google partners with FAO to improve forest monitoring

FAO and Google are collaborating to make high-resolution satellite data a regular part of managing the world's natural resources, with an initial focus on the forest sector.

As a result of the collaborative effort, users can combine FAO software and Google's geospatial data archives to undertake forest mapping and classification exercises, taking only hours to do what previously might have taken weeks or months. FAO used the technology in conducting the world's first global assessment of trees and forests in drylands. The results of that assessment, which took less than a year using the new approach and involved national experts, university researchers, partner institutions and FAO, will be published later this year. Future collaboration between FAO and Google could lead to innovations in approaches to a range of land-use issues, such as pest control, water management and climate change.

More information: www.fao.org/news/story/en/item/410307/icode

REDD+ on the runway for airlines

Carbon Pulse has reported on a debate between interest groups on whether a global deal to rein in aviation emissions should include carbon offsets, as officials gathered to study the latest proposals for a global market-based measure. Although investors and some non-governmental organizations say an offset-based agreement could plug a shortfall in funds for tropical forest protection and kick-start a global REDD+ market, dozens of environmental campaign groups have warned that the use of offsets would be a dangerous distraction from curbing the sector's rapid growth in emissions.

More information: carbon-pulse.com

ITTO Vacancy Announcement

Position: Finance/Administrative Officer (P4)

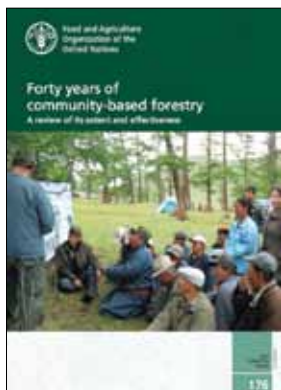
Duty station: Yokohama, Japan

Starting date: 1 December 2016

Duration: Two years (fixed term, renewable)

The Finance/Administrative Officer will be responsible for ITTO's financial activities as well as for human resource management and general administrative services. Full descriptions of duties and responsibilities, qualifications and experience, competencies, duties, and salary, and information on how to submit applications, are available at: www.itto.int. The deadline for applications is 15 October 2016.

Recent editions



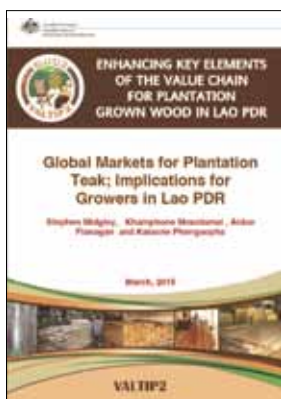
Gilmour, D. 2016. *Forty years of community-based forestry: a review of its extent and effectiveness.* FAO Forestry Paper No. 176. Food and Agriculture Organization of the United Nations (FAO), Rome.

ISBN: 978-92-5-109095-4

Available at: www.fao.org/3/a-i5415e.pdf

This publication covers 40 years of experience, building on FAO's two previous global reviews of community-based forestry (CBF) in 1991 and 2001. FAO conducted the review not only as an update on the status of CBF but also to assess the extent to which CBF is meeting expectations and the factors that can explain successes and failures. The review

demonstrated that CBF is a powerful vehicle for moving towards sustainable forest management while bringing about significant improvements in local livelihoods. It looks at changes in social capital (livelihoods, food security and nutrition, influence over decisions, and access to and control over forest resources), economic capital (employment and household incomes) and environmental capital that CBF has generated, as well as other impacts, and it identifies key issues for the future of CBF. The publication targets a range of actors, from policymakers, practitioners and researchers to communities and civil society. It will provide them with inspiration and guidance in supporting local communities, indigenous peoples and family smallholders to sustainably manage forests.



Midgley, S., Mounlamai, K., Flanagan, A. & Phengsopha, K. 2015. *Global markets for plantation teak: implications for growers in Lao PDR.* Australian Centre for International Agricultural Research, Canberra.

Available at: <http://aci-ar.gov.au/publication>

This publication investigates global markets for plantation teak (*Tectona grandis*) and the implications for growers in the Lao People's Democratic Republic. Teak is one of the world's most highly valued tropical timbers and one of its most popular plantation species. The global area of planted teak is estimated at 6.8 million hectares, with a theoretical capacity to produce over 30 million m³ of wood annually. Only 2.5 million m³ of plantation teak has been harvested

in recent years, however, of which 1.2 million m³ has been traded internationally, but this volume is expected to increase as plantations mature and logs reach a commercial size.

Although the markets for mature teak from both native forests and older plantations are well established, markets for small-sized, fast-grown teak logs are still emerging. An understanding of the magnitude, location and requirements of the global markets for these smaller plantation-grown logs is essential when governments consider policy options for encouraging plantation investment and for growers as they consider management and market options. Information on trade flows is fundamental for understanding the external factors influencing the global trade of plantation teak and assessing their impacts.



Blankespoor, B., Dasgupta, S. & Lange, G. 2016. *Mangroves as protection from storm surges in a changing climate.* Policy Research Working Paper No. 7596. Research Support Team, World Bank Group.

Available at: www-wds.worldbank.org

This paper describes the extent of coastal mangrove forests in developing countries with previous exposure to tropical cyclones; how mangroves will be affected by climate change; the geographic area and human resources at risk due to the loss of coastal protection from mangroves in a changing climate; and the potential for adaptation.



FAO 2016. *Forest products 2010-2014.* FAO Forestry Series No. 49 and FAO Statistics Series No. 205. Food and Agriculture Organization of the United Nations (FAO), Rome.

ISBN: 978-92-5-009176-1

Available at: www.fao.org/3/a-i5542m.pdf

This publication compiles statistical data on basic forest products for all the world's countries and territories. It contains series of annual data on the volume of production and the volume and value of trade in forest products, as well as tables showing the direction of trade and average unit values of trade for some products. Statistical information in the yearbook is based primarily on data provided through the Joint Forest Sector Questionnaire, a collaborative initiative of FAO, Eurostat, ITTO and UNECE.



Mohd Azahari, F., Siti Yasmin, Y. & Abd Rahman, K. 2016. *Annotated bibliography of publications on ramin and karas (1927-2015).* Forest Research Institute of Malaysia, Kuala Lumpur.

Available at: www.itto.int/country_activities/id=2082

This book is an output of the project "Development of an information database for the conservation & sustainable use of *Gonystylus bancanus* (ramin) and *Aquilaria malaccensis* (karas) in Malaysia" financed through the ITTO-CITES Programme. It compiles publications—from the oldest records available—on ramin and karas for the benefit of researchers, students and other interested persons. Some of the findings reported in this publication could also be useful for the future planning of ramin and karas management in Malaysia and elsewhere.



Rights and Resources Initiative. 2016. *Closing the gap: strategies and scale needed to secure rights and save forests.* Rights and Resources Initiative, Washington, DC.

ISBN: 978-0-9864402-5-0

Available at: <http://rightsandresources.org/en/publication/closing-the-gap/#.VzVB7McdclUF>

This publication is the Rights and Resources Initiative's annual review of the state of forest rights. It reflects on two major milestones in 2015: 1) that a critical mass of countries were in the early stages of implementing the recognition of community land rights at a national scale; and 2) that indigenous peoples, local communities and their allies established an unprecedented platform of institutions, initiatives and tools for stopping deforestation and scaling up the recognition of community forest rights. The review suggests that 2016 will be instrumental in achieving the target set by the Rights and Resources Initiative that at least 50% of the developing world's forests will be under formal community control by 2030, in keeping with the Sustainable Development Goals.

Meetings

29 August–1 September 2016
Annual Meeting of the Forest Communicators Network
Portland, Oregon, USA
Contact: www.iufro.org/joint-forest-communicators-workshop-2016-registration

1–10 September 2016
IUCN World Conservation Congress
Honolulu, Hawaii
Contact: iucncongressregistration@spargoinc.com; www.iucnworldconservationcongress.org

5–6 September 2016
Aerial Firefighting Asia Pacific Adelaide, Australia
Contact: www.tangentlink.com

7–9 September 2016
UNFF Ad-Hoc Expert Group New York, USA
Contact: www.un.org/esa/forests/events/unff-ahcg-2/index.html

8 September 2016
Central America Forest Business Round Guatemala City, Guatemala
Contact: denise.jarquin@inab.gob.gt

13–26 September 2016
71st Session of the UN General Assembly New York, USA
Contact: www.un.org/ga/search/view_doc.asp?symbol=A/INF/67/1

14 September 2016
Fourth Meeting of the Team of Specialists on Green Jobs in the Forest Sector Geneva, Switzerland
Contact: elina.warsta@unece.org

14–16 September 2016
Fourth Meeting of the UNECE/FAO Team of Specialists on Monitoring Sustainable Forest Management Zagreb, Croatia
Contact: florian.steierer@unece.org

17–25 September 2016
London Design Festival London, UK
Contact: www.londondesignfestival.com

19–21 September 2016
Global Timber Conference 2016: “Harnessing Sustainable Global Growth” Kuala Lumpur, Malaysia
Contact: www.globaltimberconference.com

20–21 September 2016
Scientific Expert Meeting of the GFEP Rapid Response on Illegal Timber Trade Vienna, Austria
Contact: purrel@iufro.org

21–22 September 2016
1.5 Degrees: Meeting the Challenges of the Paris Agreement Oxford, UK
Contact: www.1point5degrees.org.uk

24 September–5 October 2016
17th Meeting of the Conference of the Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora Johannesburg, South Africa
Contact: www.cites.org

26–29 September 2016
Between Tradition and Increasing Challenges: Future Development of Small-scale and Community Forestry in Times of Global Change Foz do Iguaçu, Brazil
Contact: www.latinamericajointiufromeeting.com

27–30 September 2016
World Congress on Silvo-Pastoral Systems Evora, Portugal
Contact: www.silvopastoral2016.uevora.pt

10–14 October 2016
28th Meeting of the Parties to the Montreal Protocol Kigali, Rwanda
Contact: ozone.info@unep.org

12–14 October 2016
Mexico’s Forestry Expo Guadalajara, Mexico
Contact: expoforestal@conafor.gob.mx; www.expoforestal.gob.mx

16–21 October 2016
2016 DANA Plywood and Wood Panels Tour Various Locations in China
Contact: Julie Bell: admin@dana.co.nz; <https://danaevents.co.nz/2016china/>

17–22 October 2016
BELUM Rainforest Summit 2016: International Conference on Conservation and Sustainable Use of Tropical Rainforests Pulau Banding, Gerik, Perak, Malaysia
Contact: info@belumrainforestsummit2016.com; www.belumrainforestsummit2016.com

18–20 October 2016
Timber Expo Birmingham, UK
Contact: www.ukconstructionweek.com/timber-expo

18–20 October 2016
World Mountain Forum 2016: Mountains for our Future Mbale, Uganda
Contact: www.mountainpartnership.org/events/event-detail/en/c/380269/

18–20 October 2016
74th Session of the ECE Committee on Forests and the Forest Industry Geneva, Switzerland
Contact: roman.michalak@unece.org

19–20 October 2016
7th Carbon Dioxide Utilization Summit Lyon, France
Contact: www.wplgroup.com/aci/event/co2

21 October 2016
Workshop on Measuring the Value of Forests in a Green Economy Geneva, Switzerland
Contact: www.unece.org/index.php?id=42822/

24–26 October 2016
Asia Forest Investment Conference Bangkok, Thailand
Contact: www.danaevents.co.nz/2016bangkok

24–27 October 2016
51st Meeting of the Global Environment Facility Council Washington, DC, USA
Contact: secretariat@thegef.org

24–27 October 2016
IUFRO Regional Congress for Asia and Oceania 2016 Beijing, China
Contact: www.iufro-ao2016.org

6–9 November 2016
First International Agrobiodiversity Congress 2016 New Delhi, India
Contact: www.iac2016.in

7–12 November 2016
52nd Session of the International Tropical Timber Council and Associated Sessions of the Committees Yokohama, Japan
Contact: www.itto.int; itto@itto.int

7–18 November 2016
22nd Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change Marrakesh, Morocco
Contact: secretariat@unfccc.int

14–18 November 2016
Third Meeting of Parties to the Convention on the Conservation of Migratory Species of Wild Animals Gorillas Agreement Jakarta, Indonesia
Contact: cms.secretariat@cms.int

14–18 November 2016
ForestSAT 2016 Santiago, Chile
Contact: <http://forestsat2016.com>

21–26 November 2016
16th Meeting of the Parties of the Congo Basin Forest Partnership Kigali, Rwanda
Contact: dany.pokem@pfbc.cbfp.org

24–25 November 2016
Streamlining the Next Round of Forest Sector Outlook Studies Moscow, Russian Federation
Contact: www.unece.org/index.php?id=43170/

4–17 December 2016
13th Meeting of the Conference of the Parties to the Convention on Biological Diversity Cancun, Mexico
Contact: secretariat@cbd.int; www.cbd.int/meetings

16–20 January 2017
United Nations Forum on Forests Working Group and Special Session New York, USA
Contact: unff@un.org

1–3 March 2017
2017 Timberland Investment Conference Amelia Island, Florida, USA
Contact: www.ugacfb.com/timberlandasset

4–6 March 2017
Forum Association Technique Internationale des Bois Tropicaux Dubai, United Arab Emirates
Contact: info@atibt.org

7–9 March 2017
Dubai Wood Show Dubai, United Arab Emirates
Contact: www.dubaiwoodshow.com

3–7 April 2017
19th Commonwealth Forestry Conference Dehradun, India
Contact: www.cfc2017.in

29 May–2 June 2017
XVI World Water Congress Cancun, Mexico
Contact: www.worldwatercongress.com

14–16 June 2017
2017 IUFRO Division 5 (Forest Products) Conference Vancouver, Canada
Contact: www.iufro2017.ca

2–6 October 2017
3rd International Conference on Scaling-up Global Efforts to Secure Community Land and Resource Rights Stockholm, Sweden
Contact: conference@rightsandresources.org

8–13 October 2017
FSC General Assembly Vancouver, Canada
Contact: <https://ic.fsc.org/en>



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