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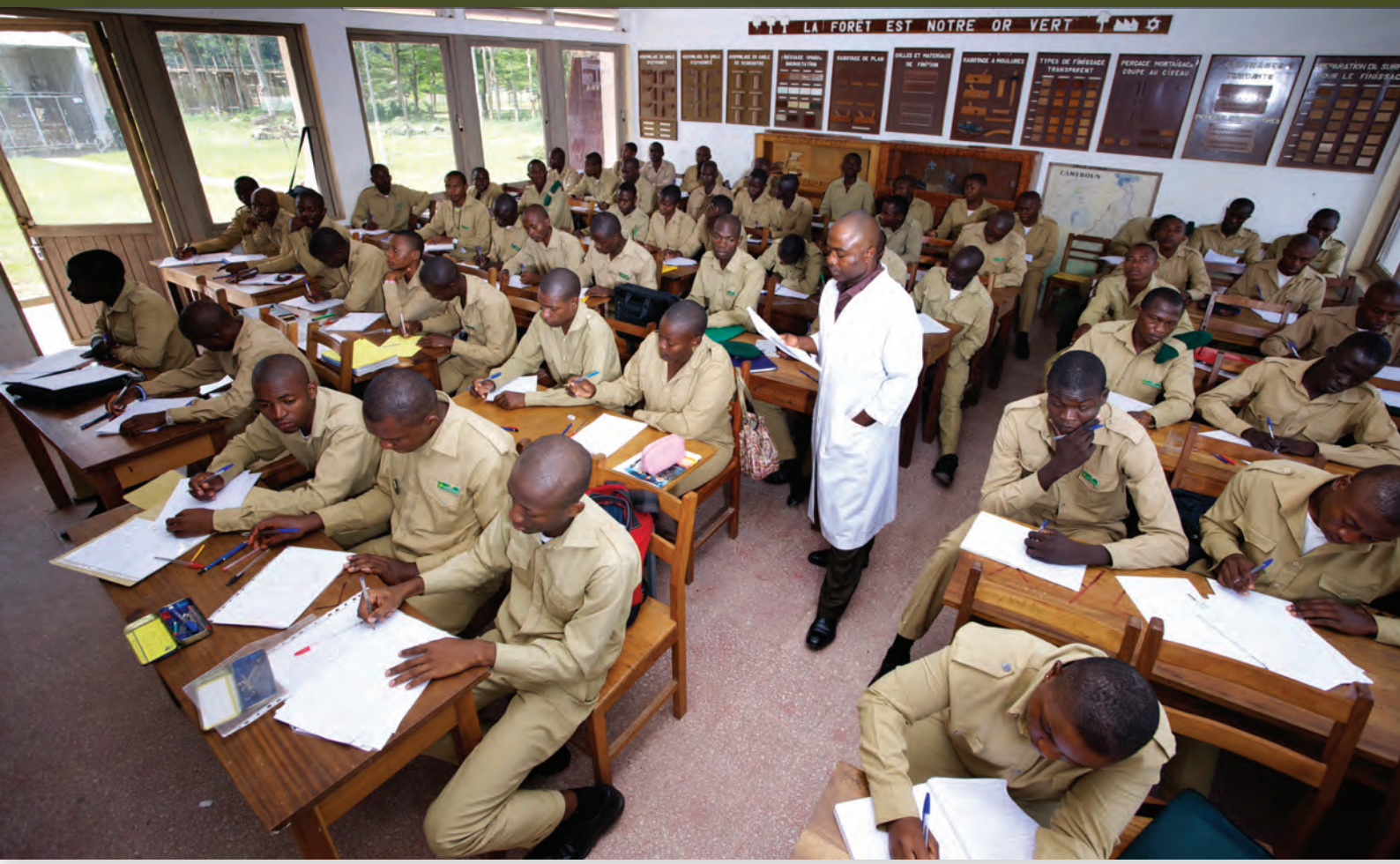

Advancing forestry education in the Congo Basin

Mastering the forestry profession has never been a mere walk in the (forest) park, but meeting the needs of sustainable forest development is an increasingly complex task. In addition to traditional fields such as forest ecology, mensuration, planning and economics, foresters must now embrace integrated landscape approaches, participatory forest management, new technologies and climate change.

An ITTO study conducted in five countries in the Congo Basin more than a decade ago concluded that there was a shortage of personnel with the qualifications needed to ensure sustainable forest development in the subregion. Several ITTO projects have since been undertaken to address this, culminating in a subregional project conducted between 2012 and 2019 encompassing seven main beneficiary education institutions across five countries. The project contributed to several of the Sustainable Development Goals (SDGs), especially SDG 4 (quality education); this edition of the TFU presents some of its results.

In his regular column (page 3), ITTO Executive Director Gerhard Dieterle says that the struggle in many African countries to achieve sustainability in the forest sector is due partly to a lack of professional capacity. "To meet the challenge of sustainability and to bring change and innovation to the sector," he says, "the younger generation must be equipped through education, training and new opportunities".

Amos Amanubo (page 5), president of the International Forestry Students Association, also believes there is an urgent need to improve forest education in Africa in both formal and informal learning institutions. He advocates

Contents

… Editorial continued

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Cover image: Students attend a class at the National Forestry School, Mbalmayo, Cameroon. *Photo: ENEF Mbalmayo*

a greater role for the private sector in education, which "would increase understanding of the gap between labour market needs and the content of forest education curricula".

Claude Kachaka and Désirée Nkwinkwa (page 6) summarize the challenges facing forestry training and education in the Congo Basin and provide an overview of the subregional ITTO project, which was implemented by the Network of Forestry and Environmental Training Institutions in Central Africa (RIFFEAC) under the auspices of the Central African Forest Commission. Among other things, the project enabled the development of six harmonized training modules; the training or retraining of nearly 300 trainers; the development of significant infrastructure; the provision of equipment for field studies; and an overall improved learning environment for forestry students. It also leveraged further funding to continue RIFFEAC's work to improve forestry education and training in the subregion.

Five other articles in this edition address the subregional project's impacts on individual institutions: Cameroon's National Forestry School (by Cyrille Bogne Sadeu and co-authors, page 10); the University of Dschang Department of Forestry, also in Cameroon (by Lucie Félicité Temgoua and Martin Tchamba, page 13); the Congo's Higher National School of Agronomy and Forestry (by Donatien N'Zala, page 15); the Regional Postgraduate School for Integrated Development and Management of Tropical Forests and Land in the Democratic Republic of the Congo (by Isaac Diansambu, page 17); and the National School of Water and Forests in Gabon (by Bruno Nkoumakali, page 20). The articles make it clear that the project has had substantial positive impacts on the curricula and facilities of these institutions but also that more support is needed for further advances.

In a complement to the feature on higher forestry education in the Congo Basin, Mafa Chipeta (page 26) sets out what he thinks is holding the forest sector back in Africa and what can be done to realize its potential to contribute to the continent's sustainable development. He identifies five "intervention areas", the two most important of which, he says, is improving the sector's mindset and increasing its ambition. Africa, says Mr Chipeta, "must take the lead in solving a problem that has largely been self-inflicted".

Elsewhere in the edition, Sarah Storck and Rupert Oliver summarize the latest annual report of the Independent Market Monitor on trade between the European Union (EU) and countries engaged in voluntary partnership agreements on timber imports under the EU's Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan. An important finding is growing recognition of the potential for FLEGT-licensing and third-party certification initiatives to work together more closely to help reduce bureaucracy and improve cost-effectiveness.

Finally, in this edition, we address the "virus in the room": COVID-19. The full impacts of the global pandemic on the tropical forest sector are yet to be seen and assessed. Nevertheless, a preliminary survey by ITTO's Market Information Service (page 30) shows that measures taken to contain the spread of the virus have caused major disruptions to tropical timber production and trade, including the laying off of workers. ITTO will work with its stakeholders in the coming months to assess the damage and explore options for restoring and expanding the sector's ongoing role in sustainable development.

From the Executive Director

Upgrading forest-sector education and training in Africa is essential for ensuring sustainable forest management, efficient domestic processing, and sustainable supply chains

by Gerhard Dieterle
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Future investment: Students listen attentively during a lecture in a new classroom at Dschang University, Cameroon, constructed as part of an ITTO subregional project. *Photo: CRESA*

The last two and a half decades have seen growing concern and intensified international dialogue on sustainable development, culminating in the adoption of the 2030 Agenda for Sustainable Development and milestone agreements such as the Paris Agreement on climate change, the Aichi Biodiversity Targets and the United Nations Global Forest Goals. As a result, the political importance of forests and trees has reached an all-time high. There is no doubt about the reasons why: forests and trees cover more than 30% of the world's land surface, harbour more than 80% of terrestrial biodiversity and contribute to the daily lives of about 2.4 billion people;[1] in fact, by providing a wide range of essential ecosystem services, forests help make life—including human life—possible on Earth.

Since the inclusion of forests and REDD+ in the global climate-change agenda and the prominent reference to forests in the Paris Agreement, much attention—financial and technical—has been given to the direct and indirect causes of deforestation. African countries—especially in the Congo Basin—have been benefiting from increased funding for REDD+. But sustainable forest-sector development relies on many factors, such as a conducive legal, institutional and policy environment, good governance, the availability of information and data for all, and a motivated and qualified workforce in both government and the private sector (Figure 1). The question must be asked whether these other key elements are receiving similar attention.

The signs are that they are not. Although the pace may be slowing in some places, harmful and damaging processes continue in Africa, including deforestation, forest degradation and biodiversity loss, caused by, among other things, competition from other land uses, perverse economic incentives, and the failure of markets to recognize the full value of forest goods and services. The growing disconnection between people and nature poses another challenge for forests.

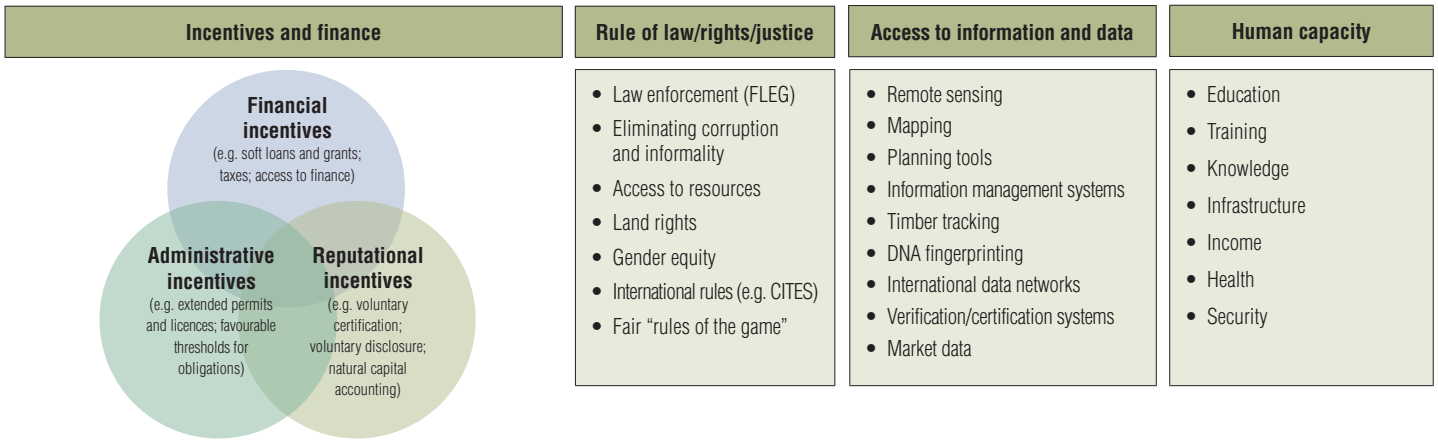
In many African countries, the forest sector is struggling to achieve sustainability. One symptom and cause of this is a lack of professional capacity, exemplified by a continued reliance on outside expertise. To meet the challenge of sustainability and to bring change and innovation to the sector, the younger generation must be equipped through education, training and new opportunities.

In the last several years, various forums—including the FAO Committee on Forestry, the United Nations Forum on Forests, and the Collaborative Partnership on Forests' Conference on Working Across Sectors to Halt Deforestation and Increase Forest Area—have raised the alert that human capacity to support the changing and increasing role of forests is insufficient and has even declined in Africa and other regions. These forums have stressed that a declining interest in forest education, shrinking curricula and forest education institutional frameworks, and diminishing environmental awareness among the public, are major impediments to sustainable forest management and industries, requiring urgent action to strengthen capacity. Moreover, warn these forums, the erosion of traditional forest-related knowledge held by local and indigenous communities could lead to the loss of vast experience, collected over millennia, and a weakening of scientific knowledge.

ITTO considers that forest education and training are essential for achieving sustainable outcomes in forest management, protection, production, processing and trade. As illustrated in this edition of the TFU, the Organization has been helping education and training institutions in the Congo Basin to upgrade their facilities and increase the capacity of their staff, with the fundamental aim of improving the quality of academic and technical training to address the

1 FAO 2014. *State of the World's Forests 2014.* Rome.

Figure 1: Ingredients for sustainable forest-sector development and good forest governance



requirements of sustainable forest management. We have been doing this by supporting the work of the Network of Forestry and Environmental Training Institutions in Central Africa (*Réseau des Institutions de Formation Forestière et Environnementale en Afrique Centrale*—RIFFEAC), with financing from the governments of Belgium, Japan and Switzerland. The subregional capacity-building project was implemented in 2012–2019 and involved strong collaboration among seven leading training institutions in the Congo Basin. It addressed five intervention areas : 1) promoting the involvement of all stakeholders in the sustainable management of forest ecosystems; 2) integrating the concept of sustainable forest management in the training programmes of member institutions; 3) harmonizing training programmes and activities among member institutions; 4) analyzing and researching solutions to common problems; and 5) promoting expertise mobility through exchanges among member institutions, particularly in training and research.

With funding from the German Ministry of Food and Agriculture, ITTO is continuing to help RIFFEAC develop training curricula for Congo Basin countries on legal and sustainable supply chains: the aim is to increase local capacity to implement sound forest management practices that comply with international tropical timber market requirements for legality and sustainability. This activity will also help create enabling institutional and policy frameworks for legal and sustainable supply chains and provide businesses with the capacities and skills they need to operate in such chains. Indirectly, it will strengthen forest governance in the subregion. The curricula will be developed around four modules:

1) Deforestation-free concepts and initiatives
2) Assessing legality and achieving accountability
3) From legality to sustainability
4) Markets, and access to markets.

In December 2019, the Government of Japan provided additional funds for strengthening the modules and ensuring their user-friendly design.

ITTO is also partnering with FAO and the International Union of Forest Research Organizations in building a platform to promote forest education at a global level. This initiative aims to:

- establish profiles of current and emerging education initiatives in managing forest landscapes, biodiversity, climate change and societal demands in regionally diverse situations;
- explore and map key ongoing activities and identifying key actors;
- assess existing approaches and potential options for addressing needs;
- develop a broad vision and modular approach for addressing key challenges in three identified dimensions of forest education (academic, workforce and the public);
- develop proposals for educational projects and support associated fundraising; and
- share knowledge and information on a common platform and establish linkages with other sectors.

Clearly, more investment is needed to increase the number of qualified workers to ensure sustainable forest management, efficient, high-quality timber processing, and sustainable supply chains. Under its new programmatic approach, ITTO will focus its education and training efforts in three main lines: 1) legal and sustainable supply chains; 2) the restoration of productive forests and livelihoods; and 3) the protection of biodiversity and ecosystem services in productive forests. Thus, ITTO will continue to help close some of the most glaring gaps in forest-sector capacity in Africa and elsewhere.

The imperative of forest education in Africa

A next-generation forester says that change is urgently needed to boost the quality of higher forestry learning

by Amos Amanubo

President, International Forestry Students Association (amos.amanubo@ifsa.net)

Visionary: Forest education curricula must be kept up to date to meet the demands of this fast-evolving sector. *Photo: ENEF, Mbalmayo*

The line between knowledge-transfer regimes and resource-use behaviour is so thin that the ineffectiveness of the former will be reflected in the latter as unsustainable exploitation. A lack of effective knowledge transfer will inevitably mean significant losses along the value chain, the degradation of the resource base, and illegal forest practices, among other indicators.

One wonders whether forest education in Africa is sufficiently competent and efficient to divert the forest sector from its current unappealing trajectories of increasing forest resource depletion and illegal and unsustainable supply and value chains. There is an urgent need to improve forest education in both formal and informal learning institutions to hone the acumen of human resources sufficiently to support sustainable forest management and thereby enable countries and communities to reap the economic, social and environmental benefits.

The International Union of Forest Research Organizations/ International Forestry Students Association (IFSA) Joint Taskforce on Forest Education prepared a global outlook on forest education in 2019. The section on Africa recommended improvements in forestry curricula—including provisions for generic skills such as human relations, leadership and communication—to ensure that graduates can meet the demands of the labour market. This recommendation was further supported unequivocally by participants at the 22nd session of the African Forestry and Wildlife Commission in March 2020, at which IFSA led a side-event on the state of forest education in Africa. The side-event emphasized the need to develop technical skills-based training in areas such as wood processing and panel production with a view to producing human resources capable of self-employment and pushing the sustainable forestry agenda. Technical skills-based training would directly support the development and growth of small and medium-sized forest enterprises, which are among the drivers of unsustainable supply and value chains due, in part, to a lack of technical skills. There is also a need to mainstream forest education into lower-level learning institutions to provide background knowledge for those denied the privilege of enrolling at institutions of higher learning—globally, Africa has one of the lowest enrolments in institutions of higher learning.

Forestry is a dynamic sector, and its transformation is being driven by wide-ranging economic, social, environmental and technological factors. Forest education curricula must be kept up to date to meet the demands of this fast-evolving sector and thereby ensure we have the necessary competent human resources to achieve the goal of sustainable forestry. There is also an urgent need to collaborate with the private sector in addressing the education crisis, because this sector has emerged in Africa as one of the biggest advocates for forestry and employers of graduates. The stronger involvement of the private sector would increase understanding of the gap between labour market needs and the content of forest education curricula.

Knowledge is the only thing you can give people that can't be stolen from them. Recent efforts to improve forest education curricula in the Congo Basin, as described in articles in this edition of the TFU, show what can be done through a cohesive coordinated effort—and these efforts must continue. It gives hope that revamping forest education curricula in Africa and strengthening forest education institutions to better meet the sector's needs will translate into sustainable forestry and sustainable supply and value chains. If it can be done, the opportunity exists for forestry to reach its full potential and emerge as a key driver of economic development in Africa.

Teaching at the heart of SFM

A regional-scale ITTO project has boosted forestry education in the Congo Basin

by Prof. Claude Kachaka[1] and Désirée Nkwinkwa[2]

[1] RIFFEAC Regional Coordinator (kachaka_sudi@yahoo.com)

[2] RIFFEAC Technical Consultant on Projects

Future foresters: Students at the Regional Postgraduate School for Integrated Development and Management of Tropical Forests and Land in the Democratic Republic of the Congo visit a warehouse as part of their coursework. *Photo: ERAIFT*

An ITTO study by Simula and Hiol Hiol (2006) in five countries in the Congo Basin concluded that there is a shortage of personnel with the qualifications needed to ensure sustainable forest management (SFM). Overall, the annual deficit in properly trained professionals is estimated at 180 engineers and 440 senior forestry technicians for activities associated with SFM and biodiversity conservation in the subregion. The study led to the development of a capacity-building project implemented by the Network of Forestry and Environmental Training Institutions in Central Africa (*Réseau des Institutions de Formation Forestière et Environnementale en Afrique Centrale*—RIFFEAC) under the auspices of the Central African Forest Commission (COMIFAC) with the aim of correcting the shortfall.

RIFFEAC comprises 26 forestry and environmental training institutions in Central Africa, the purpose of which is to contribute to the conservation and sustainable management of forest ecosystems in the subregion through training, research and communication. Its main objectives are to:

- establish a framework for consultation and experience-sharing among forestry and environmental training institutions in Central Africa;
- develop conditions to support permanent cooperation and exchanges among forestry and environmental training institutions in the subregion and prepare and implement joint research and development projects; and
- harmonize and monitor the ongoing updating of forestry and environmental training and research programmes among countries in Central Africa, with an emphasis on approaches directed toward forest conservation.

COMIFAC has identified RIFFEAC as a partner in the implementation of Strategic Area 7 of COMIFAC's Convergence Plan addressing capacity building, stakeholder participation, information and training. RIFFEAC serves as the interface for countries in the Congo Basin and international partners for building capacity in forestry and the environment.

Challenges for forestry training in the Congo Basin

Education and training in SFM in the Congo Basin face major challenges, including the following:

Teaching

- Teaching is inadequate from both an educational and technical point of view. Teaching methods are no longer always appropriate for the new learning objectives of SFM. For example, the institutions teach theory but little or no practical work.
- There is a mismatch between forest management needs and the teaching received by the professionals trained in RIFFEAC training institutions. The stock of knowledge held by the alumni of RIFFEAC schools does not tally with the job descriptions supplied by the occupational structures in the forest sector.
- SFM taught in RIFFEAC schools is limited solely to the timber industry, and teaching modules have not been regularly updated to reflect recent developments, such as the role of forests in climate change, the provision of environmental services, and social aspects of forestry.

Table 1: RIFFEAC member institutions directly involved in the subregional project

Beneficiary institutions	Country
Faculty of Agronomy and Agricultural Sciences (FASA), University of Dschang	Cameroon
National School of Water and Forests, Mbalmayo (*École Nationale des Eaux et Forêts*—ENEF)	Cameroon
Regional Center of Specialist Training in Agriculture, Forestry and Wood (*Centre Régional d'Enseignement Spécialisé en Agriculture*—CRESA)	Cameroon
National School of Water and Forests, Gabon (École Nationale des Eaux et Forêts—ENEF)	Gabon
Higher National School of Agronomy and Forestry (*École Nationale Supérieure d Agronomie et de Foresterie—ENSAF*)	Congo
Higher Institute of Rural Development (Institut Supérieur du Développement Rural—ISDR)	Central African Republic
Regional Postgraduate School for Integrated Development and Management of Tropical Forests and Land (*École Régionale Postuniversitaire d'Aménagement et de Gestion Intégrés des Forêts et Territoires Tropicaux*—ERAIFT)	Democratic Republic of the Congo

The class is in: Students receive a lecture at the Higher Institute of Rural Development, Central African Republic, in a classroom that has recently been renovated as part of a regional ITTO project. *Photo: ISDR*

- The level of skill and knowledge needed by trained professionals is increasing because of the complexity of SFM, but these needs are not being adequately met.
- Better ongoing training services are needed to ensure that practising professionals can maintain and increase their skills, as required by the job market.
- In the interest of students, it is essential to incorporate teaching modules and programmes in the bachelor's–master's–doctorate (LMD) system to facilitate student exchanges within Central Africa.
- The integration of training in national policies is generally inadequate.
- Logistics and infrastructure do not allow teachers to deliver training correctly.

Training institutions

- Training institutions are in great need of support. The need varies by institution but generally relates to the updating of teaching modules and programmes; acquiring vehicles (rolling stock), information and communication technology equipment and hardware, equipment and materials for laboratories and fieldwork; and internet access.
- There is a tendency for institutions to be isolated, and partnerships between schools and the private sector are limited.
- The orientation of training towards the job market is poor in forestry and environmental training institutions because of the lack of qualified teachers and the mediocre quality of educational modules and programmes.
- Some schools are already specialized but there is a great deal of potential for further development. The harmonization and specialization of training modules and programmes may help to develop synergies.

The subregional project

An ambitious project, "Capacity building for the sustainable management of tropical rainforests and biodiversity conservation in the ITTO Congo Basin countries" [PD 456/07 Rev.4 (F)], was launched in 2012 with the aim of helping to develop the human resource capacity needed to achieve SFM in the Congo Basin. Implemented as part of the Joint ITTO/Convention on Biological Diversity Collaborative Initiative for Tropical Forest Biodiversity, the project was designed to strengthen the capacity of forestry and environmental training institutions in Central Africa to provide their students with the knowledge, skills and qualifications needed to implement SFM in forest concessions. Table 1 shows the direct institutional beneficiaries of the project—the seven founding RIFFEAC members (in five Congo Basin countries).

The project was implemented from April 2012 to March 2019; it closed with an international workshop that brought together more than 100 participants from around the world. On completion, three outputs had been achieved: 1) the development of six harmonized training modules; 2) the training or retraining of nearly 300 trainers; and 3) the development of infrastructure (e.g. classrooms and laboratories) in participating institutions and the acquisition of equipment and materials to assist teaching. Each of these outputs is described in more detail below.

1) SFM teaching modules

The modules were developed by 12 thematic working groups featuring 144 teachers from the seven beneficiary RIFFEAC institutions. The working groups proposed a methodology for operationalizing the modules and drew up lists of the equipment needed for top-quality training. The working groups were assisted in their work by technical partners from the University of Laval and the Sainte-Foy Center of

Table 2: Technical institutions involved in the preparation of the teaching modules

Institution	Country
Wildlife School (*École de Faune*) Garoua	Cameroon
National School of Water and Forests, Mossendjo	Congo
Higher Institute of Agronomic Studies (*Institut Supérieur d Études Agronomiques*), Tshela	Democratic Republic of the Congo
Institute of Agricultural and Environmental Sciences (*Institut Universitaire des Sciences Agronomiques et de l'Environnement*), University of Sarh	Chad

Table 3: Goods and equipment acquired for beneficiary institutions

Beneficiary institution	Equipment				
	Vehicles	Rehabilitation	Buildings	Forest equipment	Computer equipment
FASA	One 30-seat Coaster bus		One instructional unit—ground floor + one upper floor	One set	One set
CRESA	One 30-seat Coaster bus	Rehabilitation of the annex building, construction of equipped borehole	Shelter for a generator	One set	One set
ENEF Mbalmayo	One 30-seat Coaster bus		One building with a ground floor and an upper-floor documentation and archives centre		
ENEF Gabon			One carpentry workshop with mezzanine		
ENSAF	4x4 off-road pick-up		One building with a ground floor and an upper floor to be used as a laboratory and classrooms	One set	One set
ERAIFT	One 30-seat Coaster bus			One set	One set
ISDR			Two buildings: one with three classrooms and one with three offices and a staff room	One set	One set

Note: A "set" is the quantity of equipment acquired on the basis of a list of priority needs sent by the director of each beneficiary institution to the RIFFEAC Regional Coordinator, drawn up on the advice of teachers and members of the thematic working groups. See Table 1 for the full names of institutions.

Education and Research in Forestry (*Centre d'Enseignement et de Recherche en Foresterie de Sainte-Foy*). The authorities involved in forest management, and operators of forest concessions, also helped in developing modules to ensure they are fully compatible with employment demands. Four technical training institutions assisted in preparing the modules (Table 2).

The training modules address the following six priority themes for forestry and environmental training institutions in the subregion:

1) Sustainable forest management (SFM): overview
2) Facilitation of appropriate strategies for preparing development plans
3) Biodiversity conservation in forest concessions in Congo Basin countries
4) Sustainable forest management as part of REDD+ strategies in Congo Basin countries
5) The implementation and monitoring of forest management plans
6) Multiresource forest inventories.

The modules are available in hard-copy and electronic forms for use by all educational institutions in the subregion; they are also available publicly.[1]

2) Training or retraining of trainers in RIFFEAC institutions

Under the project, 110 full-time trainers and 170 temporary or part-time trainers in the seven RIFFEAC founding member institutions were trained or retrained in the use of equipment and hardware purchased under the project for the implementation of the six teaching modules.

Equipment, materials and infrastructure

RIFFEAC made five categories of acquisitions available to the seven beneficiary institutions (Table 3), backed by a maintenance–security agreement signed between the director of each institution and the RIFFEAC Regional Coordinator. Improvements in infrastructure were made (i.e. the construction of classrooms, laboratories and other facilities) to meet the needs of each training institution.

1 www.itto.int/project/id/PD456_07-Rev.4-F

As a result of the project, the availability of graduates with the skills required for SFM implementation and biodiversity conservation has already increased from 50% of demand to 60%, with the expectation that this will continue to grow as programmes ramp up. These young professionals are now helping meet the staff needs of forest concessions, administrations, companies, non-governmental organizations and consultancy firms.

The RIFFEAC member institutions can now offer training in SFM and biodiversity conservation in the form of programmes and educational modules that have been revised, harmonized and validated in their content and methods. Each training institution benefiting from the project has greatly improved equipment and teaching materials to meet the requirements of the modules and methods of teaching and their staff have updated their knowledge. All involved institutions are now better able to respond to the imperative to strengthen professional skills in SFM and biodiversity conservation in the Congo Basin. These improvements will help in achieving the Sustainable Development Goals, especially goals 4 (quality education), 8 (decent work and economic growth), 9 (industry, innovation and infrastructure), 13 (climate action) and 15 (life on land).

ITTO project PD 456/07 Rev.4 (F) enabled RIFFEAC to cement its reputation as the leading network for implementing Priority Area 1 and related strategic objectives of COMIFAC's revised Convergence Plan, in connection with training, research and communication; the harmonization of programmes; the specialization of institutions; and the strengthening of specialized institutions. As a result of its work, RIFFEAC helped secure funding from other partners to continue efforts to improve forestry education and training the subregion, especially Germany's Federal Ministry of Food and Agriculture for developing training programmes on legal and sustainable supply chains in Central African countries, and the Japan Forestry Agency for implementing the modules.

Reference

Simula, M. & Hiol Hiol, F. 2006. Renforcement des capacités des membres du Réseau des Institutions de Formation Forestière et Environnementale d'Afrique Centrale (RIFFEAC) pour la formation en gestion durable des concessions forestières – étude de faisabilité. ITTO (implementation of Council Decision 10(XXXII)).

Other articles in this edition describe the impacts of the project on individual institutions in the subregion. Project outputs can be found by inserting the project code PD 456/07 Rev.4 (F) into the ITTO project search function at www.itto.int/project_search

National Forestry School, Cameroon

The regional ITTO project has enabled this school in Mbalmayo to upgrade its education programme by increasing staff capacity and acquiring new field equipment and buildings

by Cyrille Bogne Sadeu,[1] Julien Moselly Seka[2] and Germain Mbock[3]

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Minding the gap: Forestry students learn forest mensuration techniques in ENEF's arboretum as part of their studies. *Photo: ENEF, Mbalmayo*

Forestry training in Cameroon dates to the colonial era, with the establishment of the Centre for Forestry Learning (*Centre d'Apprentissage Forestier*—CAF) in 1949. The name was changed several times, to the Technical School of Forestry (*École Technique Forestière*) in 1952, the School of Water and Forests (*École des Eaux et Forêts*) in 1966 and finally the National School of Water and Forests (ENEF) (also known as the National Forestry School) in 1980.

ENEF is the main recognized institution countrywide for the training of middle-level managers in the forest sector. Today, human resource training in the forest sector faces three major challenges:

- a lack of collaboration between ENEF and the industrial private sector;
- obsolescence and lack of training infrastructure; and
- a low level of further training among trainers in light of educational and technology developments in the forest sector.

These challenges constrain the skills and availability of professionals in the sustainable management of Cameroon's forests.

About ENEF

ENEF is under the technical supervision of the administration in charge of forests. Situated in the town of Mbalmayo in Cameroon's Central Region, ENEF is one of the founder members of the Network of Forestry and Environmental Training Institutions in Central Africa (*Réseau des Institutions de Formation Forestière et Environnementale en Afrique Centrale*—RIFFEAC). It is governed by Decree No. 1980/196 addressing the status of training schools for personnel involved in rural production and by Law 2017/010 on the general status of public institutions.

ENEF's mission is the training of officers in government, the private sector and civil society through the following courses: assistant technician in water and forests; technician in water and forests; and senior technician in water and forests. ENEF also conducts applied and experimental research; specialized, ongoing and refresher courses; and project management (provision of services) related to forestry training.

In its early years, the school mainly trained personnel in the government's forestry administration, but it opened its services to the private sector in 1989. With the financial support of ITTO and technical assistance from the French Agricultural Research Centre for International Development (CIRAD), ENEF drew up and validated a master training plan in 2006 and revised it in 2010, changing its approach from phase-based programmes to a modular system to link it to the government's strategy to globalize modular education programmes. The master training plan was revised again in 2019, and the training system was restructured into two subsystems: technical and university. This reform is tied to the bachelor's–master's–doctorate (LMD) system and constitutes the professionalization of training through a competence-based approach. Since 2019, ENEF has been developing new training courses focused on the key forestry occupations most in demand in Cameroon.

Capacity

ENEF's capacity has grown significantly in recent years in light of increasing demand, and student numbers have doubled since 2015. Table 1 shows the number of students by training type in 2018.

In addition to its usual training activities, ENEF receives students from other forestry training institutions (e.g. the University of Dschang and the Higher Institute of Environmental Sciences in Yaoundé) as part of study trips, courses and field schools, making use of ENEF's multiple ancillary learning activities.

Table 1: Student numbers according to the type of training delivered, 2018

Type of training	Level/option	Number of students
Initial training	Assistant technician in water and forests	136
	Technician in water and forests	144
	Senior technician in water and forests	134
	Subtotal	**414**
Specialist training	Prospector	8
	Stock auditor	10
	Nursery worker	6
	Subtotal	**24**
Ongoing training	Forest mapping	90
	Forest inventory with geolocalization of stems	15
	Subtotal	**105**

ENEF graduates have the following main employment opportunities:

- public administration (principally government departments in charge of forests and the environment);
- logging companies;
- certified consultancies/engineering firms in the forestry and silvicultural operations sector;
- non-governmental organizations for development; and
- decentralized local authorities.

Each year, ENEF reserves 20 places for personnel from the public and private sectors who wish to retrain, as well as for vulnerable groups (e.g. indigenous forest peoples). Twenty places are also made available for nationals of other African countries.

Recent changes in training

ENEF built its reputation on technical training for the forest administration, including on knowledge of the resource and the environment, and sustainable forest management. With the systematic ending of recruitment of its graduates by government, ENEF reformed to update its training courses to ensure that graduates are competitive in the national and subregional employment market. Figure 1 shows how the recruitment of graduates has changed over the years.

Previously, many graduates of ENEF's technical courses continued on to take engineering courses at the University of Dschang's Faculty of Agronomy and Agricultural Sciences (*Faculté d'Agronomie et des Sciences Agricoles*—FASA) and other institutions. For this and other reasons, it made sense for ENEF to offer courses for engineers, in line with the LMD system.

ENEF's training constraints

Cameroon's economic conditions mean there have been shortfalls at ENEF in equipment, infrastructure and personnel, and this has constrained the institution in adapting to the changing education environment. Consequently, certain aspects of training had to be curtailed, especially regarding its professionalization. With the number of students increasing, shortcomings emerged in the logistics of practical exercises and fieldwork; the number of training courses was reduced, curricula were not updated, and innovative educational approaches could not be applied. ENEF was obliged, therefore, to seek support, especially from international partners.

RIFFEAC's role in forestry training

RIFFEAC is a platform of 26 forestry and environmental training institutions in nine African countries in the Congo Basin. RIFFEAC is a technical partner of the Central African Forest Commission (COMIFAC), implementing its Convergence Plan's strategic programme on training and research, which is the reference tool used for the subregional policy on the sustainable management of Central African forests.

Since its establishment in 2001, RIFFEAC has implemented numerous projects to benefit its member institutions. One of these was ITTO project 456/07 Rev.4 (F), the aim of which was to improve forestry training in the Congo Basin by enabling RIFFEAC member institutions to acquire modern training infrastructure, improve and harmonize training curricula, and build the capacity of trainers (see article page 6).

ENEF was one of the project's institutional partners and beneficiaries. The project supported institutional development through:

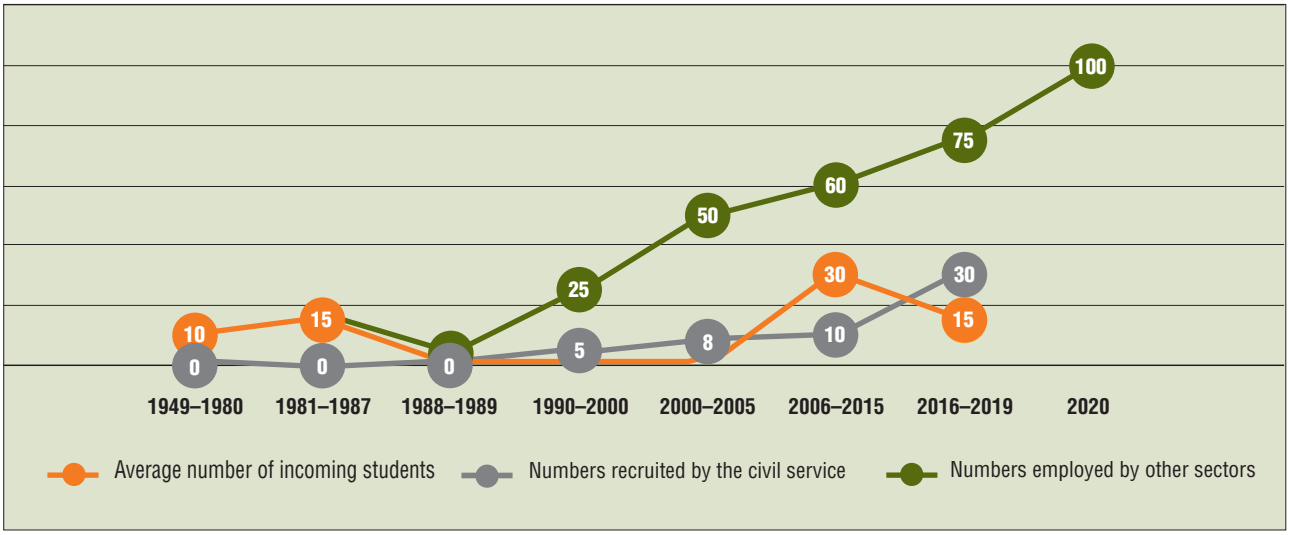
- the provision of infrastructure and equipment;
- the training of teaching staff; and
- the improvement and harmonization of curricula.

For example, ENEF acquired a 30-seater Coaster bus and a documentation centre through the project. The bus is now used regularly to transport students into the field, greatly increasing their exposure to real-world conditions and enabling them to practise the skills they have learned in the classroom. Moreover, the bus has increased community awareness of ENEF and its appeal as an institution of choice.

The development of the documentation centre has enabled ENEF to greatly improve its library and archive facilities; among other things, it has improved the work environment for staff and provides a convenient place for student study.

ENEF teaching staff were major actors in the thematic working groups established by the project to develop and harmonize technical training modules for the subregion. ENEF was the lead institution for Module 1, "Sustainable forest management (SFM): overview based on ITTO criteria and indicators", and it received a number of hard copies of the technical and university modules developed by the project. Involvement in this process

Figure 1: Number of students, and number of graduates finding employment, 1949–2020



Notes: From 1949 to 1987 (39 years), graduates were automatically employed in the civil service. This practice ended in 1988/99, with a sudden drop in student numbers. Over the next 30 years (1990–2019), the civil service recruited according to its requirements. From 2010, the school diversified its courses, with an increase in student numbers.

> "Following the acquisition of the new Coaster by ENEF through the ITTO project, we are able to organize field trips on many occasions and transport conditions have vastly improved."
>
> *Isidore Memong, Senior Technician in Water and Forests student, 2018*

enabled ENEF staff members to upgrade their teaching skills and technical knowledge; they now have the capacity to develop new training modules and programmes.

The training modules have progressively been incorporated into training programmes since 2015, and they have served as the benchmark for ENEF's training courses since 2019. They have enabled ENEF to provide training courses that meet the needs of the employment market, as seen in the increased employability of its trainees in the private sector. The training modules have also been used in ongoing training courses for practising forest professionals, delivered by the Operational Unit for Capacity Building in Forest Management (*Unité opérationnelle de Renforcement des Capacités en Aménagement Forestier*).

> "The participation of ENEF's trainers in the development of technical modules gave them the opportunity to build their capacity in the field of training engineering. In addition, the technical modules now serve as the basis for developing new training courses that are more in line with the needs of the forestry industry in Cameroon and the Central African subregion."
>
> *Pierre Claver Bissomo, Head of the Studies and Internships Department*

Future prospects

ENEF is working to elevate itself to the rank of a benchmark school in terms of both its training courses and its forestry research and innovation. Thus, it has two main aims: to place elite forestry personnel in the employment market; and to influence the management of Congo Basin forests and their biodiversity by providing personnel who are open to scientific and technical innovation. To achieve this, ENEF plans to:

- continue expanding and diversifying its training courses;
- acquiring (in both quantity and quality) new materials and equipment;
- enhancing its partnership with the private forest sector;
- securing and making best use of its ancillary learning activities in training its students; and
- equipping its documentation centre with recent publications (both physical and digital) in the fields of forestry and the environment.

In its commitment to excellence, ENEF relies on the support of the Government of Cameroon and partners such as ITTO and RIFFEAC. Project PD 456/07 Rev.4 (F) is one of several ITTO projects that have contributed to this long process. ENEF is going through a crucial period characterized by considerable change, both at the institutional level and in its training courses. For example, it intends to introduce a postgraduate course (in sustainable forestry management and silviculture) in 2021 and masters-level online training in silviculture; it will also continue to strengthen research in sustainable forest management.

Project outputs can be found by inserting the project code PD 456/07 Rev.4 (F) into the ITTO project search function at www.itto.int/project_search

University of Dschang, Cameroon

Assistance from the subregional ITTO project is enabling the university to provide students with greatly improved classroom- and field-based learning

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House of learning: The new Department of Forestry building constructed as part of the subregional ITTO project. *Photo: L. Temgoua*

The forest estate in Cameroon covers 22.5 million hectares (De Wasseige 2009), which is the second-largest forest area in the Congo Basin after the Democratic Republic of the Congo. The forest sector contributes about 4% of Cameroon's non-oil-based gross domestic product and constitutes the third most important source of public revenue after agricultural and oil exports (Eba'a Atyi et al. 2013). The biggest challenge in the sector is to improve the monitoring, evaluation, auditing and implementation of forest management, which requires, among other things, an improvement in the skills of forest managers.

Forestry and environmental training has become a priority in Cameroon in view of the window of opportunity for national and international development presented by the forest sector. There are four specialist public forestry and environment training institutions in the country, two at the technical level and two at the university level. The technical level is covered by the National School of Water and Forests (ENEF) in Mbalmayo (see article page 10), and the Wildlife School (*École de Faune*) in Garoua. University-level training is provided by the Regional Center of Specialist Training in Agriculture, Forestry and Wood (*Centre Régional d'Enseignement Spécialisé en Agriculture*—CRESA), which offers master's degree programmes; and by the Department of Forestry in the Faculty of Agronomy and Agricultural Sciences (FASA) at the University of Dschang, which offers bachelor's degrees, master's degrees and doctorates. Several private technical- and university-level institutions complement this training system.

FASA was the first institute of higher education in the subregion to offer advanced level agronomic training. It was founded in 1993, emerging from the ashes of the Cameroon National School of Agriculture (*École Nationale Camerounaise d'Agriculture*, 1960), the Higher National School of Agronomy (*École Nationale Supérieure Agronomique*, 1972), the Dschang University Centre (1977), and the National Institute of Rural Development (*Institut National de Développement Rural*, 1988).

Established in 1978, FASA's Department of Forestry (DEPFOR) is the longest-established institution providing advanced forestry training in Cameroon and the subregion. To date, DEPFOR has produced more than 3000 graduates from ten countries, representing more than 95% of professional forest management personnel in the public and private sectors and civil society in Cameroon. The Department of Forestry offers the following:

- a professional/engineering degree in water, forests and hunting;
- a master's degree in water, forests and hunting; and
- a doctoral programme—research master's degrees and doctorates in the management of forests and agroforestry systems, and forest governance.

Like other forestry training institutions in Cameroon, DEPFOR is experiencing difficulties due to the shortage of skills and infrastructure and equipment inadequacies. In particular there is:

- a skills deficit, including a lack of personnel with the qualifications to implement sustainable forest management;
- a lack of capacity to update the skills of trainers;
- an insufficient use of active and interactive teaching methods;
- inadequate infrastructure and equipment;
- insufficient practical work and field trips; and
- training content that is not entirely relevant to the needs of professionals.

Roadworthy: The University of Dschang acquired this bus used for transporting forestry students to the field thanks to the ITTO project. *Photo: L. Temgoua*

Hence there is a need to strengthen the human, material and financial capacities of DEPFOR and other forestry training institutions.

Forestry training provided by RIFFEAC

The forest and environment sector is a priority area for development in Central Africa. The Central African Forest Commission (COMIFAC) identified training as one of the levers for ensuring the sustainable management of ecosystems in the Congo Basin by generating a sufficient quantity of qualified human resources. The Network of Forestry and Environmental Training Institutions in Central Africa (*Réseau des Institutions de Formation Forestière et Environnementale en Afrique Centrale*—RIFFEAC) is a collaborative platform of 26 forestry and environmental training institutions in nine African countries in the Congo Basin. As a technical partner of the COMIFAC, RIFFEAC is implementing the COMIFAC Convergence Plan's strategic programme on training and research in Central African forests.

RIFFEAC, which was established in 2001, has a mandate to strengthen capacities in member institutions in the field of research, training and communication. RIFFEAC is consequently taking action to:

- develop and harmonize training curricula and programmes to meet current and future requirements;
- promote high-quality specialist training in Central Africa; and
- create or strengthen centres of excellence in the subregion.

Impacts of the subregional project

FASA, which has been a member of RIFFEAC since 2001, is one of several beneficiary institutions of the RIFFEAC-implemented ITTO project PD 456/07 Rev.4 (F): "Capacity building for the sustainable management of tropical rainforests and biodiversity conservation in the ITTO Congo Basin countries". Under the project, FASA acquired a two-storey building consisting of four offices and six classrooms. By helping resolve a lack of sufficient classroom space, this new building has enabled FASA teachers to better plan classes and ensure compliance with academic school years. The purchase of a diesel generator under the project has ensured a reliable electricity supply, thereby enabling the uninterrupted delivery of teaching.

The Department of Forestry's teaching programme is gradually integrating the content of the six harmonized and targeted training course modules developed as part of the project. Classes can be delivered in more innovative and interactive ways through the use of newly acquired computers and projectors.

A 30-seat Coaster bus, also purchased as part of the project, is being used to take students on study visits and field trips. Students are using new forest measurement equipment, such as measuring tapes, dendrometers, compasses, clinometers and chains, in their practical work. Training support is enabling a new generation of students to build capacity in meeting the needs of the public and private sector and ultimately to enter the working world with the skills required to succeed.

Demonstration forest

The FASA Department of Forestry will continue the activities started with project support, including by intensifying field work, updating course content and adopting harmonized modules. In addition, building on the momentum created by the project, the Department of Forestry plans to develop its Teaching and Research Forest, a 2400-hectare forest in Deng-Deng, East Cameroon, which was handed over to the University of Dschang in April 2016. This forest is intended as a dedicated place for training, research, experimentation and demonstration, with a mission to develop forest management practices that ensure ecological functioning and take into account socioeconomic needs.

The following activities will be conducted in the short term in the Teaching and Research Forest:

- the marking of the forest's boundaries;
- multiresource inventories;
- the development of a management plan for the forest;
- the construction of a hut for use by students and researchers; and
- the establishment of dendrology and phenology trails for the monitoring of stand dynamics.

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Project outputs can be found by inserting the project code PD 456/07 Rev.4 (F) into the ITTO project search function at www.itto.int/project_search

National School of Agronomy and Forestry, Congo

The subregional ITTO project has enabled the school to upgrade its field equipment, establish new buildings and brighten prospects for forest education

by Prof. Donatien N'Zala

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Looking up: Professor Mbeté demonstrates forest-measuring equipment provided by the ITTO project to a group of students. *Photo: Mamonékéné*

Forests cover more than 65% of the Congo and are one of the country's main resources. Postgraduate forestry education, therefore, has emerged as a requirement for ensuring that sufficient human resources are available to carry forward the country's quest for sustainable forest management and sustainable forest industries.

Formal higher forestry education began in the Congo in 1984 with the establishment of a forestry department at the Institute of Rural Development (*Institut de Développement Rural*—IDR). The IDR offered a three-year course in forest engineering.

In 2012, the IDR introduced the bachelor's–master's–doctoral (LMD) system and became the Higher National School of Agronomy and Forestry (*École Nationale Supérieure d'Agronomie et de Foresterie*—ENSAF). The school's recruitment of undergraduate students involves a competitive examination for baccalaureate holders in science subjects and employees with equivalent diplomas, and selection for master's degrees is based on the applicants' academic records.

ENSAF's courses have three main focus areas: agronomy, forestry, and the environment. The six-semester bachelor's degree course in forestry has two specializations: a professional option on science and forestry techniques; and a general option on agronomy, forestry and environmental sciences. The master's degree course has four semesters, and it also has two options: a professional master's degree in sciences and forestry techniques; and a master's degree in research into sustainable forest management. For the focus area on the environment there is only one option: a master's degree in research into environmental management. ENSAF has offered doctoral degrees in agronomy and forestry since 2016/17.

Student numbers at ENSAF have more than doubled in the last two decades, from about 400 in 2000 to more than 900 today—30% of whom are studying in the areas of forestry and the environment.

Teaching is provided by two full professors, four associate professors, 11 lecturers and 17 assistants. Part-time specialists are called on to deliver certain courses and lectures on specific topics, particularly from among researchers (e.g. at the Forestry Research Center and the Research Center on Productivity and Sustainability of Industrial Plantations) and teachers from other institutions at the Marien Ngouabi University. Part-time lecturers also include staff at foreign institutions (e.g. the universities of Bordeaux, Gembloux, Montpelier, Nancy and Toulouse; and the French Agricultural Research Center for International Development—CIRAD). Opportunities for teacher exchanges and training with international institutions are diminishing, however, due to a lack of funding.

Graduate training for future professionals consists of lessons, directed studies and practical exercises as well as work in the field and internships. ENSAF does not offer training (with certification) for professionals already in employment; such a service will be essential in the future, however, to ensure that professionals in the field can keep up to date with standards of professional excellence.

ENSAF graduates mainly find employment in forestry administration, logging companies, forest industries, forestry consultancies, forestry research structures, forestry education at high schools and technical schools, and conservation non-governmental organizations.

"When carrying out fieldwork to collect data, I brought with me and used equipment from the school provided by ITTO including a global positioning system, forest compass, dendrometric band and Suunto clinometer. The fact that this equipment was available made me independent and allowed me to work with complete peace of mind."

Saint Fédriche Ndzaï, doctoral student, ENSAF

Improving forestry training, with ITTO support

The quality of training is linked inevitably to the availability of educational resources, which have dwindled considerably over time, due partly to economic conditions in the country. On the other hand, demand for forestry training is increasing, particularly on aspects related to sustainable development (e.g. forest certification, traceability and legality, payments for environmental services, and forest governance) and climate change (e.g. deforestation, forest degradation and REDD+). Bringing training programmes into line with this demand requires more resources, which the country cannot provide alone. To meet demand, ENSAF needs to find public–private partnerships at the national level and seek cooperation and assistance both regionally and globally.

As a member institution of the Network of Forestry and Environmental Training Institutions in Central Africa (*Réseau des Institutions de Formation Forestière et Environnementale en Afrique Centrale*—RIFFEAC), ENSAF is part of a subregional effort to improve forestry education and training. RIFFEAC comprises more than 20 forestry and environmental training institutions in nine countries in Central Africa—Burundi, Cameroon, Chad, the Congo, the Central African Republic, the Democratic Republic of the Congo, Equatorial Guinea, Gabon and Rwanda.

RIFFEAC was the implementing agency of ITTO project 456/07 Rev.4 (F), the aim of which was to improve forestry training in the Congo Basin by enabling RIFFEAC member institutions to acquire modern training infrastructure, improve and harmonize training curricula, and build the capacity of trainers (see article page 6). Involvement in the project enabled ENSAF to construct a modern building containing two new research laboratories, a herbarium and a xylotheque (collection of wood samples) on the ground floor. The building's first floor has three spacious, well-ventilated classrooms, a research laboratory and an office for the laboratory manager. The laboratories, however, still need to be equipped with the necessary tools and materials. The project also enabled the purchase of a four-wheel-drive pickup vehicle, which has given teachers much more mobility for preparing courses and conducting field visits, although a minibus would also be useful for conveying students. The school acquired various pieces of technical equipment for forest field work.

Overall, the project has had a significant impact on teaching quality at ENSAF, as testified by ENSAF lecturer Ayessa Leckoundzou:

"I have been a teacher at ENSAF for ten years. The acquisition of this technical equipment provided by ITTO has been a great help with our practical work and our research activities. For three years, I merely passed on information to students rather than providing actual training per se. I managed to borrow a few instruments from professionals, but students were unable to use them for very long due to their restricted numbers and limited availability. Now students can use the instruments for longer and conduct surveys, which they can then discuss together.

"I have also participated in seminars and workshops organized by RIFFEAC as part of ITTO project PD 456/07 Rev.4 (F), consisting of exchanges with trainers from other forestry schools in the subregion and capacity building in forest management.

"RIFFEAC must continue to be a force for cohesion uniting the forestry schools in the subregion. I would like to thank ITTO for this support and I would like to see this cooperation between ITTO and the RIFFEAC strengthened. The support provided to RIFFEAC has more impact than if it involved only a single institution or a single country, especially as we are managing the same forest ecosystem."

Prospects

Given the many challenges in the Congo Basin and the need to adapt to the national, subregional and global quest for sustainable forest management, the provision of high-quality forest education and training for the stakeholders and organizations involved is imperative. With this in mind, the following is still required at ENSAF:

- fit out the new laboratories with equipment;
- set up a site for forestry experiments—ENSAF already has land for this purpose to establish experimental plantations;
- improve the condition of the existing classrooms;
- acquire a 24-seat minibus for transporting students;
- develop a training package for a master's degree in forest governance;
- put in place a programme for ongoing training for the benefit of professionals already in the sector;
- establish partnership agreements with logging companies to enable students to undertake internships and research projects;
- increase teaching staff mobility and exchanges among RIFFEAC member institutions with a view to harmonizing programmes and improving teaching quality; and
- strengthen and diversify international cooperation to ensure access to the most up-to-date technologies and information.

Project outputs can be found by inserting the project code PD 456/07 Rev.4 (F) into the ITTO project search function at www.itto.int/project_search

Regional Postgraduate School, DRC

The subregional project has added to the school's capacity to provide postgraduate degrees and ongoing training

by Isaac Diansambu

Internship Coordinator for Land and Integrated Development, Regional Postgraduate School for Integrated Development and Management of Tropical Forests and Land (i.diansambu@eraift-rdc.org)

On-site learning: Students visit a forest concession to learn about the management regime there as part of a course offered by the Regional Postgraduate School for Integrated Development and Management of Tropical Forests and Land. *Photo: J.L. Doucet/Liège University*

The Democratic Republic of the Congo (DRC) has a vast area of tropical forest that is rich in biodiversity and which plays a well-established role in maintaining a liveable planet. DRC's forest area is estimated at around 155 million hectares, which represents around 60% of the forest area of the Congo Basin and 70% of the national territory. Despite its potential, however, the forest sector remains marginal in the country's economy.

Improving forest governance in the DRC is an ongoing challenge. This is despite the effort made in recent years, beginning in 2002 with the promulgation of a new forest code aimed at making the forest sector an essential economic lever while taking into account social and environmental sustainability. The protection and enhancement of biodiversity are major objectives in the country's new forest policy. Currently, protected areas cover about 13% of the national land area, and the government plans to increase this to 17%.

But the approach of isolating forests in "glass cases" has been questioned, and doubts have been raised about the promotion of transboundary protected areas. There is a need for compromise among stakeholders to reconcile conservation and development objectives and secure the livelihoods of local communities through, for example, the sustainable harvesting of timber, the sustainable use of wild meat and other non-timber forest products, and promoting protected areas through ecotourism.

Forest development and sustainable forest management are still nascent in DRC. They require a holistic vision that takes into account the multiple functions of forests through an interdisciplinary and intersectoral approach and technologies such as the use of digital mapping. Forest managers are still too few, given the country's vast forest areas. Thus, logging companies must usually bring in specialized foreign consultancies and engineering firms to conduct forest operations. The timber sector is mainly characterized by primary processing—sawing, peeling and slicing for the production of plywood. Secondary processing generates much more added value and jobs, but it is lagging behind.

Faced with this situation, the forestry administration has undertaken to promote investment in the forest sector through requirements linked to the allocation of concessions to process timber locally. Fauna management outside protected areas follows the same principles: the aim is to promote sustainable wildlife management to meet food-security needs and provide local people with livelihoods. Generally, protected areas lack qualified personnel and sufficient financial resources to ensure proper functioning, and the qualifications of most managers are below what is necessary for adequate performance.

The regional postgraduate school

The Regional Postgraduate School for Integrated Development and Management of Tropical Forests and Land (*École Régionale Postuniversitaire d'Aménagement et de Gestion Intégrés des Forêts et Territoires Tropicaux*—ERAIFT) in Kinshasa, DRC, was established in 1999 based on the United Nations Educational, Scientific and Cultural Organization (UNESCO) Man and the Biosphere Programme with the aim of promoting sustainable human development in harmony with the environment. Since 2016, ERAIFT has enjoyed Category II Centre status under the auspices of UNESCO, with regional governance.

ERAIFT provides postgraduate training linked to the bachelor's–master's–doctorate (LMD) system to students who have completed three, four or five years of university studies in various fields. Since 2017, it has offered two

professional master's degree courses and one master's research degree course in three professions: 1) management of protected areas; 2) forest development techniques; and 3) integrated development and management of forests and tropical land.

Master's programmes are organized into four semesters, in which a common core curriculum is taught in semesters 1 and 2 to introduce the fundamentals of a holistic approach; specialization courses are taught in semester 3 to develop skills specific to the course of study; and the end-of-study master's thesis is prepared in semester 4. Students and teaching staff are able to move between partner institutions for the specialized courses in semester 3.

ERAIFT also offers doctoral degrees through partnerships with various international scientific institutions, including Laval University, the University of Liège and the University of Paris-Est Marne-la-Vallée, and it conducts research.

ERAIFT's uniqueness lies in its holistic educational and conceptual approach—intersectoral, interdisciplinary, participatory, global and integrated. This approach enables the development of appropriate solutions for complex issues of development, especially in the forest sector.

ERAIFT is expanding its professional development courses for national and regional management personnel and decision-makers from ministries and institutions responsible for the management of natural resources, protected areas and the environment.

Students at ERAIFT come from various professional backgrounds and from many francophone countries in Central Africa, West Africa, the Indian Ocean and the Caribbean (Haiti); ERAIFT has now also opened its doors to anglophone Africa. ERAIFT's teaching staff comes from diverse university and research institutions, such as the Royal Museum of Central Africa, the National University of Benin, the University of Dschang, the University of Kinshasa, the Catholic University of Congo, the University of Marne-la-Vallée, the University of Liège, the Notre Dame de la Paix Faculty and the French National Center for Scientific Research (*Centre National de la Recherche Scientifique*).

As of the end of 2018, ERAIFT had trained 249 high-level African management personnel (228 master's degrees and 21 doctorates). Sixty-two executive managers are studying at the institution in 2020 (42 master's students and 20 doctoral students).

A survey conducted in 2018 found that the employment rate of ERAIFT students was over 90%. In DRC, for example, the majority of executive managers in the Ministry of Environment and Sustainable Development are graduates of ERAIFT, and a large number of civilians working in the environmental sector have also graduated from ERAIFT. ERAIFT alumni are organized in a large, well-functioning platform called RADDI.[1] ERAIFT often makes use of the RADDI network in calls for tenders and for improving its education system.

1 RADDI = Network of Elders for Sustainable and Integrated Development (*Réseau des Anciens pour le Développement Durable et Intégré*).

Support under the subregional project

ERAIFT is a member of the Network of Environmental and Forest Training Institutions in Central Africa (*Réseau des Institutions de Formation Forestière et Environnementale en Afrique Centrale*—RIFFEAC). RIFFEAC is a collaboration platform consisting of more than 20 member training institutions in the Central African subregion devoted to developing the skills and structures necessary for the joint and sustainable management of environmental and forest resources. In 2006, RIFFEAC became the Central African Forest Commission (COMIFAC)'s partner in charge of implementing Strategic Area 7 ("Capacity building, stakeholder participation, information and training") of its Convergence Plan. It was the implementing agency of ITTO project 456/07 Rev.4 (F), the aim of which was to improve forestry training in the Congo Basin by enabling RIFFEAC member institutions to acquire modern training infrastructure, improve and harmonize training curricula, and build the capacity of trainers (see article page 6).

ERAIFT benefited from support extended through this project. According to Professor Jean-Pierre Mate Mweru, ERAIF's Academic Secretary and Officer in Charge of Research:

> "Support provided—capacity building for teachers, rolling stock, information technology and forestry equipment—through ITTO project PD 456/07 Rev.4 (F) has allowed ERAIFT to reduce the gap between theory and practice, thereby improving professionalization. The equipment has enabled ERAIFT to steer teaching towards the practical, allowing students to acquire knowledge of methods involving quantitative tools (dendrometry, for example) and practical tools (e.g. forest botany). This equipment also means that students enrolled in the professional master's course have been able to visit forest logging areas under management, protected areas and biosphere reserves as well as various other sites. They have been given the opportunity to understand, under exceptional conditions, the details involved in the sustainable management of natural resources. With improved professionalization, the link between training and employment has been enhanced, as promoted through the LMD system."

Postgraduate pose: Students visit a forest as part of their studies at the Regional Postgraduate School for Integrated Development and Management of Tropical Forests and Land. *J.L. Doucet/Liège University*

Measured: A student at the Regional Postgraduate School for Integrated Development and Management of Tropical Forests and Land measures a tree circumference as part of a training exercise. *Photo: I. Diansambu/ERAIFT*

According to graduates contacted for this article, the assistance provided by the ITTO project enabled ERAIFT's activities to come fully into line with global perspectives on the conservation and sustainable management of tropical forests and their contributions to tackling climate change. The support also helped address the regional need to increase technical capacities for the integrated management of tropical lands and to improve living conditions for rural communities.

Project support enabled ERAIFT to establish an ongoing-education unit to provide education services for managers specializing in protected-area management to keep them up to date on approaches and techniques in this field and to enable them to better address complex and changing conditions. The unit will focus on those managers of protected areas and biosphere reserves who have been unable to undertake vocational diploma courses due to their age or education level. For example, as part of ongoing-education courses, ERAIFT is deploying tailored training for managerial personnel at the Management Research Center (INERA) at Yangambi in the first half of 2020, based on their expressed needs. ERAIFT is also developing a knowledge database for the Yangambi Biosphere Reserve and supporting a number of research projects there to contribute to the reserve's sustainable management.

Future prospects

ERAIFT faces a number of challenges, including a need to increase:

- bilingualism (English and French) in the school's teaching, research and ongoing training;
- cooperation with partner institutions, such as RIFFEAC, the Central African Protected Areas Network (*Réseau des Aires Protégées d'Afrique centrale*) and the Trans-Africa Universities Partnership;
- partnerships at the national, regional and international levels;
- research activities and monitoring of doctoral students and researchers in partnership with international and regional research programmes;
- its role in the management of DRC's three biosphere reserves; and
- the diversification of courses for graduates and ongoing training to meet the future requirements of employment markets and research at the national, regional and global levels.

Despite the enormous forest resources available in DRC, national efforts towards their sustainable management are still scarce and fragmented. There is a desperate need for high-quality education and research structures at the national level. Fortunately, a number of international entities are working towards this end, including ITTO, the Center for International Forestry Research (which has been supporting the University of Kisangani for many years to improve forest education, research and development), the French Agricultural Research Center for Development (*Centre International de Recherche Agronomique pour le Développement*), UGent, the Meise Botanic Garden and the Royal Museum of Central Africa. With strong partnerships in place, ERAIFT is well placed to meet the country's increasing demand for forest-sector professionals and thereby to assist in realizing the full potential of sustainable forest management in DRC and elsewhere in the region.

Project outputs can be found by inserting the project code PD 456/07 Rev.4 (F) into the ITTO project search function at www.itto.int/project_search

National School of Water and Forests, Gabon

The subregional project has helped modernize the school with new equipment and buildings

by Dr Bruno Nkoumakali

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Career pathway: The main entrance to Gabon's National School of Water and Forests near Libreville. *Photo: Dr B. Nkoumakali*

In Gabon, the Water and Forests Administration is responsible for enforcing the Forestry Code, including by overseeing forest logging and management. The country's National School of Water and Forests (*École Nationale des* Eaux *et Forêts*—ENEF-Gabon, commonly referred to as the National Forestry School) has a key role to play in the training of officers required to enforce the Forestry Code; nearly 14 000 such officers are employed in Gabon today.

Located 30 km from Libreville, ENEF-Gabon was established in 1953 as the Training Centre for Forestry Personnel with a view to training compass specialists, topographers and loggers. This centre became the Cap Estérias Forestry School (*École Forestière de Cap Estérias*) in 1959 and then the subregional National Institute of Forestry Studies (*Institut National des Études Forestières*) in 1967. In 1975, the government created ENEF-Gabon with a mission to train highly qualified managers in the fields of forestry, fisheries and aquaculture, wildlife management, protected areas, timber industries, and the environment. Over time, ENEF has transformed to become an internationally renowned academic institution.

About the school

ENEF-Gabon students are subject to a boarding-school regime in accordance with its paramilitary status conferred by the government. The campus has 20 dormitories with 200 rooms and a capacity to accommodate 300 students. In the 2018–2019 school year, ENEF housed 256 students.

ENEF-Gabon provides two types of training courses—those referred to as "traditional training courses" and those known as "new training courses"; the latter are aligned with the bachelor's–master's–doctorate (LMD) system.

ENEF-Gabon is engaged in an ongoing process of reform, including the implementation of post-university training in specialist areas in forestry, the environment and biodiversity conservation. In the 2018/19 school year, ENEF-Gabon provided 14 courses, comprising five technical degree courses, four bachelor's degree courses and five master's courses (Table 1).

The courses offered by ENEF are in line with market demand for skilled personnel in government agencies (Water and Forests, Environment, Research); private institutions (forest companies and consulting and engineering firms); national parks and other protected areas; and non-governmental organizations (e.g. the Wildlife Conservation Society, WWF and Global Forest Watch). ENEF's curricula have been improved with a view to complementing other educational curricula. This has led to the creation of a joint doctoral school between the Teacher Training College (*École Normale d'Enseignement Supérieur*) and the Advanced Teacher Training College for Technical Education (*École Normale d'Enseignement Technique*). Within this framework, ENEF is positioned as a centre of excellence in the fields of forest sciences and geomatics.

In organizational terms, ENEF is managed by a chief executive, supported by a director of research and innovation and a director of studies. The director of research acts as coordinator of all research activities at ENEF-Gabon and the director of studies is responsible for the coordination of education-related operations.

Twenty-seven students obtained master's degrees in wood sciences between 2013 and 2018, as shown in Table 2 by country of origin.

Table 1: Courses offered by ENEF-Gabon, and the number of students in 2018/19

Degree type (number of students)	Course name
Technical degree (132)	Wildlife and Protected Areas
	Aquaculture Operations
	Forest Operations
	Timber Industries and Technologies
	Forest Geomatics and Environment
Bachelor's degree (51)	Fishery Science and Conservation of Aquatic Ecosystems
	Forest Geomatics and Environment
	Timber Industries and Technologies
	Sustainable Forest Management and Utilization
Master's degree (73)	Biodiversity Management and Conservation
	Environmental Assessment
	Wood Sciences Research
	Forest Geomatics and Environment
	Quality Health and Safety in the Environment

As a member of the Network of Environmental and Forest Training Institutions in Central Africa (*Réseau des Institutions de Formation Forestière et Environnementale en Afrique Centrale*—RIFFEAC), ENEF-Gabon is positioned as a subregional centre of excellence in the processing of timber materials through its master's degree in wood science research. This training course will be supported in the near future by the introduction of training courses for engineers specializing in timber-processing.

Build it, they will come: ENEF's impressive new carpentry workshop requires more equipment to make it fully operational. *Photo: Dr B. Nkoumakali*

Impact of ITTO support

RIFFEAC was the implementing agency of ITTO project 456/07 Rev.4 (F), the aim of which was to improve forestry training in the Congo Basin by enabling RIFFEAC member institutions to acquire modern training infrastructure, improve and harmonize training curricula, and build the capacity of trainers (see article page 6). The following two aspects of ENEF-Gabon's involvement in the project illustrate its benefits:

1) **Participation in the development and delivery of training modules.** ENEF-Gabon participated in the development of training modules on sustainable forest management. These modules, which were delivered in digital and hard-copy formats, have been incorporated into ENEF-Gabon's training programmes.

2) **Construction of a building to house the ENEF-Gabon carpentry workshop.** Covering 176 m^2, ENEF-Gabon's carpentry workshop consists of a floor area for machinery plus a mezzanine for offices and a washroom. It serves as a training support structure for various courses, especially the masters in wood science research. More support now would ensure the workshop is fully set up (Box 1).

ITTO has assisted RIFFEAC and ENEF-Gabon in other ways, including through involvement in research projects and the awarding of fellowships to students to pursue master's and doctoral degrees at ENEF-Gabon. ITTO has also funded training seminars to increase the capacity of ENEF-Gabon staff and provided support, through ENEF-Gabon, to train private-sector workers in fields such as sustainable forest management, sustainable forest use, and the use of navigation and decision-support tools. All such training courses have involved the development of validated curricula and collaboration with international experts.

Table 2: Number of students undertaking the ENEF-Gabon master's degree in wood sciences, by country of origin

Country of origin	No. of students			
	Academic years			Total
	2013–2014	2015–2016	2017–2018	
Benin	0	1	0	1
Cameroon	1	0	1	2
Central African Republic	1	0	0	1
Chad	2	0	0	2
Democratic Republic of the Congo	4	0	0	4
Gabon	5	9	3	17
Total	**13**	**10**	**4**	**27**

Box 1: Equipping the ENEF-Gabon carpentry workshop

The following "shopping list" would help ensure that the ENEF-Gabon carpentry workshop can play its important role in the provision of high-quality training in Gabon's forest sector:

- equipment in the form of stationary and portable woodworking machines (e.g. stationary machines, circular saws, bandsaws, sanders, 7-operation combined machines, mortising machines, tenoning machines, grinding machines and accessories);
- portable machines (e.g. jigsaws, circular saws, rippers, sanders, planers, drills and accessories);
- woodworking implements;
- the electrification of the machine area;
- construction of adjacent rooms (assembly, varnishing, grinding, storage); and
- installation of a waste-management unit (shavings, sawdust, etc.).

ITTO has helped build ENEF-Gabon's capacity to deliver high-quality education by providing vehicles enabling students to travel to the forest to undergo field training in forest harvesting. With the collaboration of the International Tropical Timber Technical Association (*Association Technique Internationale des Bois Tropicaux*—ATIBT), ITTO also helped improve ENEF-Gabon's curricula through its assistance in validating the new training programme in the grading of logs and sawn timber.

All these examples show ITTO's unwavering commitment to enhancing the quality of forest education at ENEF-Gabon.

Project outputs can be found by inserting the project code PD 456/07 Rev.4 (F) into the ITTO project search function at www.itto.int/project_search

The evolving legality-based timber trade

ITTO's Independent Market Monitor project presents its latest annual report on trade between the European Union and countries engaged in voluntary partnership agreements

by Sarah Storck[1] and Rupert Oliver[2]

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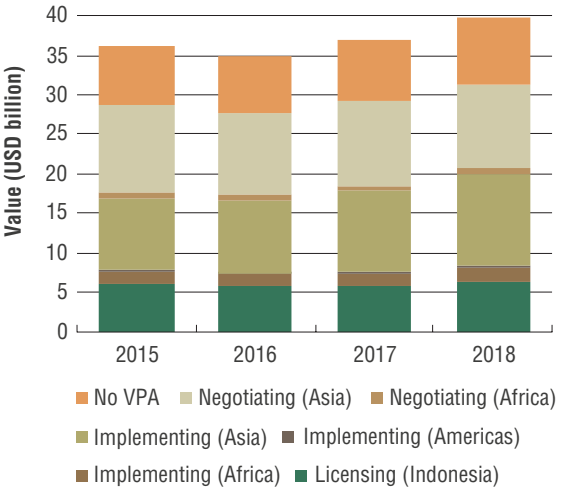
Piece by piece: Sawmill workers in Ghana, a VPA partner country. *Photo: Sarah Storck, IMM*

The Independent Market Monitor[1] (IMM)'s latest annual report, *FLEGT VPA Partners in EU Timber Trade 2018*,[2] shows that the combined share of voluntary partnership agreement (VPA) partner countries in global tropical wood products trade[3] was 78.8% in 2018, down from 78.9% in 2017 and 79.4% in 2016. The slight decline occurred in the context of an 8% rise in global tropical wood products trade in 2018, to USD 39.8 billion (Figure 1).

The growth in global wood products trade in 2018 continued the 2017 rebound from the dip in 2016, which occurred during a period of slowing economic growth and the end of the speculative rosewood boom in China. Unlike in 2009–2014, when rapid trade growth was driven largely by China's imports of primary wood products, the increases in 2017–2018 were due mainly to rising wood furniture exports, notably from Viet Nam and India to the United States of America (USA). The value of the tropical plywood trade rose significantly in 2018, particularly from Indonesia destined for the USA, Japan, the Republic of Korea, the European Union (EU) and Australia. Exports from the Congo Basin countries increased by 17%, but exports from East and West Africa declined.

Timber market prospects deteriorated in the EU in 2018 after a positive performance in 2017. The pace of growth of gross domestic product and construction slowed and activity in the wood product manufacturing sectors levelled off after trending upwards the previous year. There was evidence in 2018 of wood regaining a little of the share it had lost previously to substitute materials, although the competitive pressure from these alternatives was still intense.

Figure 1: Global tropical wood-product trade, by FLEGT VPA status, 2015–2018



Note: "Implementing (Americas)" is not visible because of the low values involved. Source: IMM STIX.[4]

Beneficiaries of rise in EU timber imports

Other European suppliers—notably the Russian Federation, Ukraine and Belarus—were the major beneficiaries of a significant rise in EU imports in 2018 (Figure 2). The share of VPA partner suppliers in total EU imports continued to decline in 2018, although at a slower pace than in the past. In 2018, China's share of EU imports fell to its lowest level since 2007.

Overall, the EU's timber trade with VPA partner countries fell in 2018 (Figure 3). On the other hand, imports from Indonesia (all covered by Forest Law Enforcement, Governance and Trade—FLEGT—licences since 15 November 2016)

1 The IMM was established under an ITTO project funded by the EU as part of the implementation of bilateral VPAs between the EU and timber-supplying countries.

2 The IMM annual report for 2019 will be prepared by September 2020. The time-lag between the end of the reporting period and publication of the report occurs because the necessary statistics become available only in April–August of the following year.

3 All products in Harmonized System (HS) category 44 and wood furniture products in HS 94.

4 The Sustainable Timber Information Exchange (STIX) is a joint initiative of ITTO and the Global Timber Forum to provide an open-access, dynamic and evolving wood products data platform. More at www.stix.global

Table 1: Results of a survey of timber traders on the causes of decreased EU tropical timber consumption

Consumption of tropical timber in Europe has declined sharply since 2007. In your opinion, what are the main reasons? (Please arrange the suggestions below from most relevant (1) to least relevant (10)) (total responses 83)			
Driver	**Weighted score**	**Relative weighted score**	**Overall rank**
Substitution by temperate, chemically and thermally modified wood, composites and non-wood materials	634	100	1
Economic downturn in 2008–2013	583	92	2
Diversion of supply to other markets	553	87	3
Environmental prejudices and uncoordinated marketing	545	86	4
Competition from China for material access and in markets for finished goods	485	76	5
Import and financial sectors' aversion to commercial risk	420	66	6
Just-in-time favouring more-regular, less-volatile supply	398	63	7
Prefabrication and the switch from adaptable utility woods to tightly specified materials	394	62	8
Erosion of infrastructure for EU supply	366	58	9
Other	187	29	10

increased slightly (by 0.1%) to EUR 815 million. There was a notable rise in EU imports of doors and plywood from Indonesia in 2018 and a rebound in imports of sawnwood and logs from VPA-implementing countries in Africa. EU imports of wood furniture, flooring and glulam from VPA partners in Asia continued to slide.

IMM survey ranks drivers of downturn in imports

IMM surveys of trader opinion in 2018 identified drivers for the lasting downturn in EU consumption of tropical wood products (Table 1). The top-ranked driver was "substitution by other materials", followed by "economic downturn 2008–2013" and "diversion of supply to other markets" (the latter closely linked to "competition from China for material access and in markets for finished goods"). "Environmental prejudice and uncoordinated marketing" was ranked by respondents as the fourth most important driver.

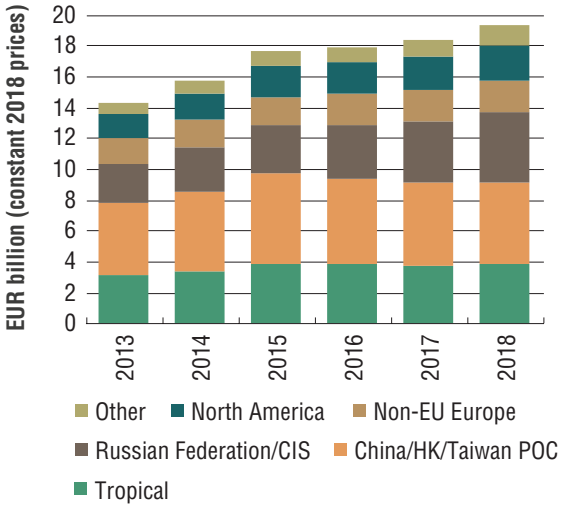
Nearly all respondents to the 2018 IMM EU trade survey said that FLEGT-licensing was making it easier to import wood products from Indonesia compared with the EUTR due diligence required for other countries. A survey of traders in Indonesia confirmed a high overall level of support for FLEGT-licensing, with more than 90% of respondents fully (56%) or partially (38%) confirming that achieving SVLK [*Sistem Verificasi Legalitas Kayu*] certification was beneficial for their operations.

Forty percent of EU respondents to the IMM trade survey in 2017 indicated that they would be willing to pay a small price premium for FLEGT-licensed timber; the 2018 survey found, however, that no such premiums are being paid. The perception among importers that licensing is no more than an assurance of legality, which customers would expect anyway, continues to limit the willingness to pay premiums. Some respondents suggested that price premiums might be an option in the future if the wider benefits of FLEGT licensing become better understood.

Mixed performance of Indonesian wood products in the EU

An analysis of trade data found that the performance of Indonesian wood products in the EU market was mixed in 2018. Broadly consistent with Indonesian export data, the EU import value of Indonesian timber and timber products increased by 6% in 2018, to USD 1.25 billion. By quantity, however, EU imports from Indonesia decreased by 5% in 2018, to 678 000 tonnes. The EU import volume of Indonesian wood products (HS 44) increased consistently in the five years to 2018, from 277 000 tonnes in 2014 to 325 000 tonnes in 2018. The import volume of furniture declined over the same period, however (to 99 000 tonnes in 2018) (Figure 4). EU imports of Indonesian paper products were volatile, rising by 15% (to 278 000 tonnes) in 2017 and falling by 9% (to 252 000 tonnes) in 2018.

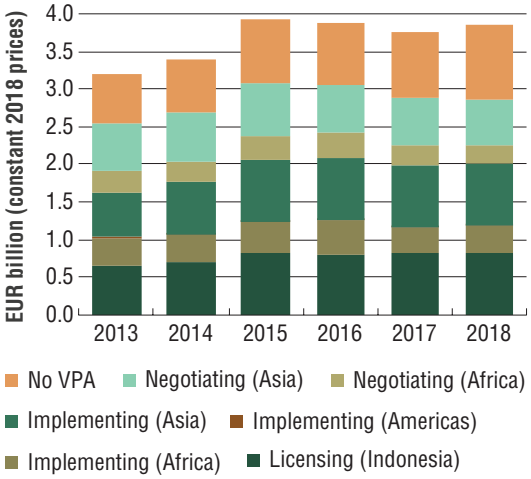
Figure 2: EU imports of wood products, by source of supply, 2013 to 2018



Note: CIS = Commonwealth of Independent States; HK = China, Hong Kong SAR; Taiwan POC = Taiwan Province of China.

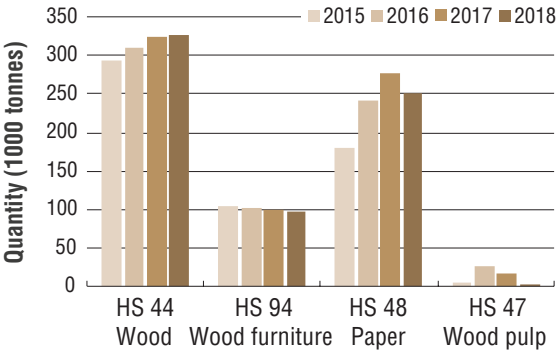
Source: ITTO IMM analysis of Eurostat COMEXT.

Figure 3: Value of EU imports of wood products from the tropics, by VPA status, 2013–2018



Note: "Implementing (Americas)" is not visible because of the low values involved. Source: ITTO IMM analysis of Eurostat COMEXT.

Figure 4: EU import quantity of timber and timber products from Indonesia, by product group, 2015–2018



Source: IMM STIX.

Overall, the data indicate that, as of the end of 2018, FLEGT licensing had had little impact on the market share of Indonesian products in the EU and had not overridden the ongoing effects or direction of larger economic trends. Equally, licensing does not seem to have had any detrimental effect on import share.

Trade-flow data show that there was strong growth in the EU import value of wood furniture, plywood, mouldings/decking and wooden doors from Indonesia in the first nine months of 2019. There was also a particularly sharp upturn in imports of Indonesian wood furniture, as well as imports of charcoal (which are not subject to FLEGT licensing). The 2019 IMM annual report will analyze the reasons behind these developments.

The 2018 IMM annual report provides an update on the market constraints on FLEGT-licensed timber identified in the 2017 report. The number of HS-code and other FLEGT-licence mismatches related to, for example, shipment weight or volume was reduced in 2018, and there was also progress on the introduction of e-licensing, with plans to pilot a tool and make a final decision in 2020. Several organizations stepped up their communication and marketing of FLEGT licences in the EU in 2018, but the profile of FLEGT licences was still low compared with forest certification initiatives such as the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC).

An analysis of private-sector and EU member-state public procurement policies shows that third-party certification initiatives are the preferred mechanism for demonstrating the "sustainability" of timber products. Nevertheless, 18 public procurement policies in the EU recognize FLEGT licences in some way.

The 2018 IMM annual report finds that acceptance of FLEGT licences (or equivalent documents issued by FLEGT-licensing VPA partner countries for exports to non-EU countries) as evidence of legality in non-EU countries has the potential to provide new opportunities for market development. This is particularly significant given the EU's falling share in VPA partner exports and the emergence of other dominant consumer markets and processing hubs, notably in China and Viet Nam.

Data analyzed in the 2018 IMM annual report suggest that the move to develop timber legality assurance systems (TLASs) in VPA partner countries did not distract from efforts to promote third-party certification in these countries. IMM found that progress towards certification in most cases was very slow before VPA implementation began; by far the most rapid recent progress in third-party certification in the tropics has been in Indonesia, the country that was also the first to achieve FLEGT licensing. Moreover, there has been no uptick in third-party certification in non-VPA tropical countries, some of whose exports to the EU have been rising in recent years (e.g. furniture from India, charcoal from Nigeria, and decking from Bolivia and Peru).

Shift towards supply regions with greater access to legality verification

Although there has been a shift in EU timber trade towards supply regions with higher identifiable access to various forms of legality verification, the EU continues to import high volumes from countries and regions with low access, notably China and India, raising questions about the form and credibility of legality assurance offered by suppliers in those countries and regions. IMM survey data suggest that much of this assurance may be provided by third-party legality verification systems operated by individual certification companies and agencies, but no centralized and consistent data are published on these systems relating to the standards used, the operators covered, and the costs involved.

Analyses of data on trade flows and access to certification, and feedback from IMM surveys, suggest that the challenges of obtaining reliable legality assurance have contributed to the decline in tropical timber's share in the EU market. It also highlights that FLEGT licensing has a crucial role to play in reversing this trend, particularly for suppliers in Africa and Southeast Asia. Moreover, the FLEGT-licensing process may be particularly beneficial for smaller operators that have struggled to engage in private-sector certification systems.

Stakeholders are increasingly recognizing the potential for FLEGT-licensing and third-party certification initiatives to work more closely together. This could, for example, help simplify verification, reduce the bureaucratic burden, limit duplication, improve cost-effectiveness and market access, and prevent unnecessary competition between systems. An immediate market issue that can only be resolved through closer dialogue is that the FSC Controlled Wood National Risk Assessment in Indonesia does not acknowledge FLEGT-licensed wood as "low risk" on the FSC legality criteria. This has significant potential to cause market confusion in the EU (where around 20 000 companies hold FSC chain-of-custody certificates). Ultimately, if the aspiration of VPA partner countries is to achieve market recognition for TLAS timber products beyond regulatory compliance with the EUTR and other consumer country laws, the most efficient way to do so may be to find an accommodation with the FSC or the PEFC.

The report makes recommendations for building on the market opportunities presented by FLEGT licences and to help overcome existing market constraints.

FLEGT VPA partners in EU timber trade 2018, by Sarah Storck and Rupert Oliver, is available at www.flegtimm.eu/images/IMM_2018_Annual_Report/Final_clean_version_Natalie_VPA-Partners-in-EU-Timber-Trade-Annual-Report-2018.pdf. A limited number of hard copies is available on request from ITTO.

Dreaming to industrialize: how can Africa achieve its long-postponed forest industry ambitions?

by Mafa E. Chipeta

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Dreaming to industrialize: The author listens to the ITTO Annual Market Discussion, held on 3 December 2019 during the 55th Session of the International Tropical Timber Council in Lomé, Togo. *Photo: H. Apedo*

When I studied wood science at university in the early 1970s, the ambition to move away from exporting raw logs towards adding value to tropical forest products was already old in tropical forest countries. All three regions—Africa, Asia-Pacific and Latin America and the Caribbean—had the same ambitions, and log-export bans were already being adopted.

Some 50 years later, tropical Asia and large swathes of tropical America have largely industrialized in forestry. Why, then, is local processing still just an ambition in most timber-rich African countries, rather than a reality? More importantly, how can we change this?

The current situation

Africa has nearly 17% of the global population, but its contribution to world gross domestic product (GDP) is only around 2–3%; its share of trade is 1.5–2% and its share of agricultural trade (including forest products) is about 3% in a good year. Such a small share of global GDP and trade can only be explained by low value adding in almost everything Africa produces: the continent is a quintessential exporter of raw materials.

In forestry, Africa accounts for only about 10% of log production but for 33% of log exports. Asumadu (2004) identified the following reasons for the generally low level of domestic wood processing in sub-Saharan Africa:

- the domination of the forest sector by foreign business interests, especially in Central Africa;
- the small size of national and international markets for their products;
- the use of inadequate and obsolete processing equipment mismatched to the generally high quality of the logs. This partly justifies the export of logs to be processed in modern manufacturing facilities in Europe and Asia, particularly (today) China;
- the generally low volume of log production per unit area, which increases the unit cost of production; and
- the increasing demand from Asian countries, particularly China, for high-quality tropical African logs.

The share of processed products in production was practically stagnant in Africa between 2012 and 2016, and it declined for exports (by 9% in the case of sawnwood). Not only is the African wood-processing industry small, the little that does exist is not performing well. (There are exceptions, however—such as Ghana, which has been processing nearly all its log production since 1996, and Côte d'Ivoire.)

For decades, there has been a perception in Africa that banning log exports would automatically force the growth of domestic wood-processing industries. Time has shown this view to be oversimplified. In Africa, the best performers in wood industrialization (Ghana and Côte d'Ivoire) have gone well beyond log-export bans. In Asia-Pacific and Latin America, energetic pro-investment policies have probably done much more than log-export bans to foster growth in the forest industry.

Asumadu (2004) reported that the major wood-producing countries in West and Central Africa have all had log-export bans of varying severity, yet the industry has not flowered. He suggested that such bans may even have been counterproductive where countries have lacked the capacity to embark on competitive domestic processing. In other words, bans must be accompanied by much more if they are to succeed.

Forestry is not the only sector in which Africa has failed to industrialize—the continent is way behind in all sectors. It should shock us that Africa's second-largest and most-

industrial economy, South Africa (with a population of about 59 million), has only a marginally higher GDP than Singapore (with a population of about 5.9 million), a tiny island state.

Given that the lack of industrialization is a generic challenge in Africa, a solution is unlikely to be found by focusing on the forest sector alone. Africa must diagnose correctly and address the challenges for all manufacturing and its overall economy. Success will be attained only if both intra- and extra-sectoral issues are addressed.

What will it take to industrialize African forests?

When failure is all-encompassing—covering all sectors and the entire continent's economy—it is time to look beyond economics in seeking an African renewal. Governments and the private sector in forestry must look beyond their own comfort (or discomfort?) zones and see what ails African society to the extent that it cannot uplift itself. The failure of private investment in Africa is almost certainly mostly due to a failure of government policy, commitment and discipline; nevertheless, both government and the private sector must play a role in the solution. Put simply, Africa's governments and private sector must jointly take ownership of the problem, and they must stop being daunted by it. Africa should take heart from the success of other regions but develop solutions specific to its situation. In my view, this will involve the following five "intervention areas":

1) mindset and discipline;
2) ambition and persistence;
3) a local stake in the industry;
4) the African market; and
5) invest, invest and invest.

1. Mindset and discipline

Africa's development in all areas has been weak, and a culture of laying blame on others instead of finding our own solutions has taken root. Within its limits, Africa has invested heavily in education and institutional development, yet its development in all sectors is dominated by outsiders making the critical decisions, including in forestry. This suggests a problem of mindset which, if not solved, will keep Africa dependent even if it is overflowing with its own natural resources and capacities. Honest dealing and the avoidance of corruption are prime elements in discipline. This applies to both the public and private sectors in Africa.

The omission from the list of intervention areas of "human and institutional capacity building" is not accidental: this aspect is crucial, but it is referred to so often it is superfluous here. In any case, I believe that it is not so much the capacity to develop, plan and execute policies that is lacking but discipline, self-confidence and a "can do" attitude. This is exacerbated by Africa's long-nurtured tendency to act helpless and rely on the assistance of others.

Developing an improved mindset involves the following: self-confidence, discipline, ambition and a refusal to be satisfied with small achievements (Africa is the continent of endless pilot-scale trials that never grow and become mainstream).

Much of Africa's failure to industrialize is self-inflicted. Declarations are often made and laws passed, but there is a lack of implementation. Plans are adjusted to suit donor preferences or implemented only in areas of interest to donors and investors; Africa becomes a spectator rather than an actor in its own development.

In the forest sector, another crucial challenge is the attitude that an abundant forest resource is an adequate comparative advantage for launching forest industries. In reality, the existence of the resource is only the first rung on the ladder: a country must also invest in good infrastructure, good institutions, incentives and human capacities. Only then will the comparative advantage exist. There exist sensible proposals for actions to develop wood processing in Africa, such as ensuring firm political will; creating a favourable business climate; guaranteeing access to inputs and production means; creating a structured wood value chain; and structuring up profitable markets. But putting such proposals into effect and ensuring their sustainability requires a change in mindset.

It is embarrassing but perhaps worth mentioning that a self-confident Africa will not be possible if the continent continues to be externally dependent for basics such as food and other daily necessities. This reliance on outside help makes it difficult for others to respect Africa's preferences and voice.

2. Higher ambition and persistence

Ambition and persistence are components of mindset. Africa is geographically centrally located among the three major economic regions: Asia, the Americas, and Europe. Yet it does not seem affronted that it is unable to capitalize on this to be the major trading partner of any (except, in a few cases, for oil, coal and diamonds).

Africa is dominant in its natural endowment of many commodities, but one would not realize this from the meagre benefit accruing to its peoples. This is not a self-correcting situation. Africa will only achieve more with a level of ambition and persistence commensurate with that of other regions.

3. Promote a local stake in the industry

Gabon can serve as an example here because the ownership profile of its forestry businesses is similar to the norm across Africa. Terheggen (2011) reported that, as of 2009, 52% of all industrial concession areas in the country belonged to European-owned companies, 21% to Malaysian firms, 16% to Chinese and 7% to Gabonese nationals (which were generally also the smallest businesses, involved only in logging and sawmilling). By 2011, the share of concessions had fallen to around 40% for European-owned companies, risen to 28% for Chinese companies, and fallen to 19% for Malaysian companies; meanwhile, the share held by Gabonese-owned firms had barely shifted, at 8%. There has been an impressive increase in local processing in Gabon in recent years but from a very low base, and local enterprises—which seem unable to move beyond the scale of "small and medium-sized"—find it enormously difficult to compete in international markets.

Level playing field: A locally made table in a showroom in Libreville, Gabon. Africa will only achieve more with a level of ambition and persistence commensurate with that of other regions. *Photo: ITTO*

The question is why there has been so little movement, despite various fiscal incentives designed to attract foreign direct investment in downstream timber processing and facilitate local participation in the nascent industry.

To move forward will require that both government and the private sector stop accepting this as "the natural order of things". It is not an iron law that local companies will always perform more poorly. Nevertheless, the local industry is still characterized by "… low yields and an underutilization of the residues and by-products. Wood processing through to the finished product is carried out mainly in the informal sector and supplies a market that is not governed by the same rules of taxation, traceability and work specifications and requirements as the formal industrial sector" (Anonymous 2013). Changing this will require public-policy support to enable small local enterprises to join forces in consortia and the most promising to grow with ambition rather than remain hand-to-mouth businesses.

4. The African market

Although Africa is forest-rich, much of its wooden furniture and finished products comes from abroad, including items manufactured from logs exported from Africa. This is a sign of not just an immature economy but a diseased one. Indeed, the Global Environment Fund (2013) predicted that Africa will become a net importer of wood: Africa's consumption of sawnwood was 75 million m^3 in 2010, and it is projected to reach 300 million m^3 by 2030, a compounded annual growth rate of 7.1%. Africa's natural forests barely have the capacity to meet this demand, with an estimated annual increment of 675 million m^3 per year. Nevertheless, there remains much latent potential, and the growth of local markets represents a huge opportunity for African forest industries.

5. invest, invest, invest

The many reasons for the underdevelopment of further processing and in favour of log exports can only be surmounted if Africa invests. There is a need for much more investment in both processing and the forest resource—including in planted forests, processing facilities, and infrastructure (such as roads and bridges) to access the raw materials and for storing and trading processed outputs.

A white paper on a strategy for further processing in the Congo Basin produced by a consortium of international organizations, including ITTO (Anonymous 2013), found that tax incentives alone would not be sufficient; what is also required is the rationalization of the multiplicity (at many levels of government) of "parafiscal" or informal levies. In Central Africa, investments are unlikely to pay off if such levies already make international competitiveness a challenge.

Investment in industrial-scale forest plantations has immense potential. Such plantations can be located near existing transport routes for easy access. It helps that, according to Sand and Lewis (2012), Africa offers among the lowest plantation establishment costs of any region worldwide. Moreover, tropical Africa has an estimated 300 million hectares of degraded formerly forested land not being used for agriculture, settlements or other purposes. The Global Environment Facility (2013) estimated that only about 1% of global timberland investments are in Africa—the future is wide open for growth.

"Soft" investment in human and institutional capacities is also essential for higher productivity and quality. But, as stated earlier, all financial investments into assets will count for nothing if attitudes remain negative (intervention areas 1 and 2).

Africa must lead

Africa must take the lead in solving a problem that has largely been self-inflicted (or which we have allowed outsiders to inflict upon us). But the problem is not so much a failure to grow forest industries as to develop economies in all their aspects. Conditions in Africa are unfavourable for all manufacturing, not just in forestry. And the solutions cannot be implemented by the forest sector alone, let alone by its still-nascent private sector.

This is a governmental and societal problem, and, if governments do not step up to the plate, the private sector will not succeed in industrializing forestry or any other sector. In my view, of the five intervention areas described above, the most important are 1 and 2: "mindsets and discipline" and "higher ambition and persistence".

Thus, African governments must enable the private sector to invest and make a difference by:

- making political commitment a reality by acting on policies and laws to add value to natural resources, including timber;
- investing in critical transport and related infrastructure to make access to raw materials affordable;
- complementing natural forests with planted ones that are close to key transport routes for easy harvest;
- negotiating better trade and investment deals with partners to increase value adding in Africa;
- reviewing concession agreements so that the stick of log-export bans is cushioned by offering foreign investors sensible incentives to pursue further processing in Africa, even if there may be initial losses (absorbed by the state) from doing so;

Where to? A worker labels a log at a log landing in Gabon. In forestry, Africa accounts for only about 10% of log production but for 33% of log exports. *Photo: Li Q./ITTO*

- valuing their own markets more and serving them better, thereby also building capacities to better serve markets further afield; and
- acting with determination to support local-entrepreneur (or consortium) leadership in industry—some form of business incubation may prove necessary.

The private sector cannot just sit back, either: local entrepreneurs should organize themselves into consortia that can grow into industry champions in their countries. Some of this may involve initial incubation of corporate champions by governments (provided corruption does not kill these) or partnerships with foreign investors already established in the sector. Of course, this must be done with goodwill and honesty among both local and foreign investors and not with intent to defraud the state by abusing incentives for their growth.

The international community needs to go beyond being a neutral analyst to become a catalyst for developmental dialogue involving both government and the private sector on improving the forest economy in Africa. ITTO could be a lead player in this proactive role.

Finally, and perhaps most crucially, domestic entrepreneurs must seize the ambition to become giants and champions of their countries' forest industries.

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This is an edited version of Mr Chipeta's presentation at the ITTO Annual Market Discussion, held on 3 December 2019 during the 55th Session of the International Tropical Timber Council in Lomé, Togo.

Pandemic pandemonium in the tropical timber sector

Measures to contain COVID-19 are having devastating impacts on the tropical timber sector

Complied by the ITTO Secretariat

Virus-affected: A wood-processing factory in Viet Nam. Timber enterprises in many tropical countries have reduced production, and some have closed. *Photo: J.C. Claudon/ITTO*

Tropical timber producers are facing a crisis due to the measures taken to contain the spread of COVID-19. Some governments have instituted total lockdowns, others have restricted movement and others have adopted less stringent approaches. An ITTO survey of stakeholders shows that the measures are having devastating impacts on the tropical timber sector.

Impact of pandemic—early results of a survey

Correspondents in Brazil, Ghana, India, Indonesia, Malaysia, Myanmar and Viet Nam writing for the twice-monthly *Tropical Timber Market Report* (a product of ITTO's Market Information Service—MIS) were asked in April to use their networks to seek answers to questions on the impacts of the pandemic. Highlights from the responses received are provided below, with the full results available in the *Tropical Timber Market Report* 24(7), published on 16 April 2020.[1] The same questions have been distributed to members of the ITTO Trade Advisory Group (TAG), and their responses will be compiled and made available on the ITTO website and in the *Tropical Timber Market Report* in due course.

Africa

There is no clear picture on how the pandemic is affecting timber companies in Africa. Almost all countries are reporting cases of COVID-19 and, as the number of infections grows, more countries are finding that the virus has spread beyond the main cities.

Considerable variation in responses to the pandemic in African countries makes analysis difficult. What is certain is that jobs are being lost, and African economies will see a drastic drop in export earnings from the timber sector in coming months.

ITTO MIS correspondents report that sawmills in Cameroon are unable to operate. There is a lockdown in the Democratic Republic of the Congo, although some timber companies there have authority to continue operations. A similar situation prevails in the Congo, where some companies are still in production. Correspondents report that timber shipments are continuing from Equatorial Guinea, despite a "national state of alarm" declared there.

Mills in Ghana with available raw materials and outstanding orders are maintaining production, although government-driven COVID-19 containment measures are restricting movement in Accra and Kumasi. Workers in the timber sector outside the cities have not yet been laid off, and mills outside the lockdown zones are producing for both domestic and international markets. The ITTO MIS correspondent for Ghana reports that, should the virus be brought under control and measures lifted, the time needed to ramp up production to pre-crisis levels will vary by company and the number of orders held. Nevertheless, "all things being equal with raw-material availability," he says, "production levels could be raised [back to pre-crisis levels] within three months."

Asia

Malaysia's lockdown, which started on 17 March 2020, has been extended to 28 April. This requires everyone to self-isolate at home, and only essential services are allowed. The correspondent for Malaysia reports that production in the forestry and timber sector has slowed drastically, and trade associations are negotiating with authorities to allow

1 The information in this article was current as of mid-April 2020. The situation is highly dynamic and subject to change. Subscribe to ITTO's *Tropical Timber Market Report* for updates.

at least partial operations. Some states, such as Sarawak and Johor, have permitted scaled-down manufacturing operations.

A survey of members by the Muar Furniture Association found that the cash reserves of 48% of factories had been exhausted by March 2020. Thirty-eight percent of members indicated that they anticipate losing MYR 1 million–5 million in the next six months, and most members thought the government's support package would be inadequate to enable them to maintain their businesses.

The ITTO MIS correspondent for Indonesia reports that most wood industries in that country are still operating but are slowing production. Some factory operations will continue for the next few months because Indonesia has implemented only a semi-lockdown in Jakarta, beginning 10 April, to be followed by a lockdown in West and East Java in the near future.

Slower production is due to the postponement of orders by importers in Europe, the United States of America and some Asian markets. Nevertheless, Indonesia's 2020 first-quarter wood product exports were not seriously affected by the pandemic.

On the time required to ramp up production in Indonesia to pre-crisis levels (should conditions stabilize), the consensus is that it could be more than one year, assuming that the government provides the industry with incentives, such as reduced taxes and low interest rates.

According to media reports, the Secretary General of the Indonesian Furniture and Crafts Industry Association, Abdul Sobur, said that, in addition to the thousands of workers laid off in the retail, hotel, and restaurant sectors, furniture manufacturers have indicated that they have had to (or soon will) lay off some 280 000 workers.

In Myanmar, COVID-19 and measures to combat it are hurting small businesses, and the informal sector is particularly hard hit. Myanmar celebrated its national New Year holiday on 10 April, and all factories were open until then. In response to the pandemic, however, the government has urged "voluntary home stay" and suspended domestic travel. Some orders have been postponed in the timber industry, but it is difficult to get accurate information. Should the virus outbreak be brought under control, it is estimated that the sector will need at least two months to raise production to pre-crisis levels.

The COVID-19 pandemic is having a devastating impact on the timber sector in Viet Nam. The situation is changing fast, and the worst is still to come. Responding to a questionnaire circulated by VIFOREST and its associates, 76% of enterprises said they are facing losses estimated at VND 3.066 trillion (around USD 130 million); only 24% of surveyed enterprises said they are not yet affected financially. More than half of respondents said they have had to reduce production; 35% of enterprises assume that their businesses can be maintained for some time, but closures may be inevitable in the near future; and only 7% of enterprises remain fully operational. The survey also revealed that about 45% of workers in the wood-processing sector have lost their jobs due to the pandemic.

India has extended its lockdown until 3 May 2020 and imposed strict measures to fight the pandemic. India's economy is at a standstill, and unemployment is at about 20%—although this doesn't include millions in the informal sector now without incomes.

Indian ports are closed to both imports and exports. Containers cannot move because, in most cases, the receiving ports are closed. Import containers are waiting to be offloaded and transported, but workers cannot travel. Until restrictions are lifted, nothing can move.

South America

The economic impact of COVID-19 and the measures adopted to slow its spread are having a huge impact in Latin American countries.

Brazilian manufacturing activity declined in March at the fastest rate in three years. This has damaged small and medium-sized enterprises, especially those in the informal sector, with lockdown restrictions and containment measures meaning that most workers in the sector are now without incomes.

Brazil's pulp and paper sector continues to operate, but the production of solid wood products varies by state and municipality. Most states have no significant restrictions, but some municipalities have completely halted industrial operations.

The government has made provisions to mitigate the impacts of worker lay-offs. To date, few timber companies have laid off workers, but the effects of the virus and associated measures are only starting and will intensify in coming weeks. Some domestic and international orders have been cancelled, invoking *force majeure*.

Forestry and timber operations in Peru have been paralyzed by the nationwide lockdown, which was announced 16 March. All activities in the sector have stopped until further notice.

Road to recovery

These are extraordinary times, and extraordinary measures will be needed to reverse job losses and rebuild revenue flows in the tropical timber sector.

The ITTO survey of TAG members, currently underway, will deliver additional information on the impacts of the pandemic in the tropical timber sector. This will help generate ideas on how best to assist in the recovery of jobs, production and exports in ITTO's tropical timber-producing member countries—when the worst of the impacts of COVID-19 have passed.

Meetings

ITTO meetings

Postponed—new dates to be determined
International Conference on Forest Education
Rome, Italy
Contact: tetra@itto.int

This conference will address the problems and challenges encountered in forestry education by analyzing relevant ongoing education initiatives, approaches and key players on forest education. It will assess ways forward for enhancing forest education and develop a long-term vision and strategic plan to coordinate international efforts to advance forest education, including through an online platform.

The conference is being co-organized by the Food and Agriculture Organization of the United Nations (FAO), the International Union of Forest Research Organizations (IUFRO) and ITTO under the Collaborative Partnership on Forests, with financial support from the German Federal Ministry of Food and Agriculture.

23–26 August 2021 *New dates!*
4th World Teak Conference: Global Teak Market: Challenges and Opportunities for Emerging Markets and Developing Economies
Accra, Ghana
Contact: www.worldteakconference2020.com

This conference, which ITTO is co-organizing, will address the most crucial issues facing the global teak sector, including:

- the sustainable management of smallholder teak farming systems to supply markets with high-quality teakwood;
- improving existing silvicultural systems and practices for better stand management to achieve high-quality teakwood;
- market structures and value chains for teakwood trading and their impacts on the profitability of teak investments; and
- evaluating private and public investments in the teak sector and their impacts on socioeconomic conditions and rural livelihoods.

The conference will make strategic, conceptual and operational recommendations to support the sustainable development of the teak sector.

9–14 November 2020
56th Session of the International Tropical Timber Council and Sessions of the Associated Committees
Yokohama, Japan
Contact: www.itto.int/events
The International Tropical Timber Council is ITTO's governing body. It meets once a year to discuss issues related to the legal trade of tropical timber and the sustainable management of tropical forests. Council sessions are open to official delegates and accredited observers.

Other meetings

Postponed—new dates to be determined
International Conference on Forest Education
Rome, Italy
Contact: tetra@itto.int

Postponed—new dates to be determined
15th Session of United Nations Forum on Forests
New York City, USA
Contact: www.un.org/esa/forests/index.html

Postponed—new dates to be determined
Forests in Women's Hands: International Conference on Women in Forestry 2020
Traunkirchen, Austria
Contact: www.forstfrauen.at/en/conference-2020

25 June 2020
ATIBT Ordinary General Assembly
Nantes, France
Contact: www.atibt.org/en/diary

Postponed—new dates to be determined
16th International Peatland Congresses 2020
Tallinn, Estonia
Contact: www.ipc2020.com

Cancelled
IUFRO Small Scale Forestry Conference
Kilkenny, Ireland
Contact: https://iufrossf.ucd.ie

Postponed—new dates to be determined
25th Session of the FAO Committee on Forestry
Rome, Italy
Contact: COFO-2020@fao.org

Postponed—new dates to be determined
Gabon Wood Show
Libreville, Gabon
www.woodshowglobal.com

14–18 September 2020
Biological Invasions in Forests: Trade, Ecology and Management
Prague, Czech Republic
Contact: https://iufro.v2.czu.cz/en/

15–17 September 2020
The 8th World Sustainability Forum
Geneva, Switzerland
Contact: https://wsf-8.sciforum.net

21–23 September 2020
International Woodfiber Resource and Trade Conference
Lisbon, Portugal
Contact: https://events.risiinfo.com/wood-fiber

21–25 September 2020
7th IUFRO International Workshop on the Genetics of Tree-Parasite Interactions in Forestry
Pontevedra, Spain
Contact: www.efi.int/events/7th-iufro-international-workshop-genetics-tree-parasite-interactions-forestry-2020-09-21

22–24 September 2020
3rd IUFRO Acacia Conference 2020: Embracing Transformation for Sustainable Management of Industrial Forest Plantations
Bintulu, Sarawak, Malaysia
Contact: https://iufro.sarawakforest.com/wp

29 September–1 October 2020
6th International Climate Change Adaptation Conference—Adaptation Futures 2020
New Delhi, Delhi, India
Contact: http://adaptationfutures2020.in

5–7 October 2020
5th European Agroforestry Conference
Nuoro, Sardinia, Italy
Contact: www.euraf2020.eu

Postponed—new dates to be determined
15th Meeting of the Conference of the Parties to the Convention on Biological Diversity
Kunming, China
Contact: www.cbd.int/cop

6–9 October 2020
26th Session of The International Commission on Poplars and Other Fast-Growing Trees Sustaining People and the Environment
Rome, Italy
Contact: www.fao.org/forestry/ipc/en

9–14 November 2020
56th Session of the International Tropical Timber Council and Sessions of the Associated Committees
Yokohama, Japan
Contact: www.itto.int/events

Postponed—new dates to be determined
2020 UN Climate Change Conference (UNFCCC COP 26)
Glasgow, Scotland, UK
Contact: secretariat@unfccc.int; https://unfccc.int/calendar

Postponed—new dates to be determined
GLF Glasgow 2020
Glasgow, Scotland, UK
Contact: https://events.globallandscapesforum.org/glasgow-2020

7–9 December 2020
New dates!
International Forest Business Conference 2020
Kistowo, Poland
Contact: http://fba-events.com/index.php/2017/09/03/international-forest-business-conference-2018

7–15 January 2021
New dates!
IUCN World Conservation Congress
Marseille, France
Contact: www.iucncongress2020.org

11–14 January 2021
New dates!
World Conference on Timber Engineering 2020
Santiago, Chile
Contact: https://wcte2020.com

3–5 February 2021
New dates!
Carrefour International du Bois Nantes, France
Contact: www.timbershow.com

5–8 May 2021 *New dates!*
Forestry: Bridge to the Future Sofia, Bulgaria
Contact: https://conf2020.forestry-ideas.info

30 June–1 July 2021
New dates!
Treescapes2020
Birmingham, UK
Contact: www.birmingham.ac.uk/facilities/mds-cpd/conferences/forest/index.aspx

23–26 August 2021
New dates!
4th World Teak Conference 2020
Accra, Ghana
Contact: www.worldteakconference2020.com

10–13 November 2021
New dates!
AUSTIMBER 2020
Victoria, Australia
Contact: www.afca.asn.au/www-austimber-org-au

Note that the above-listed meetings are all subject to date changes and cancellation in light of the COVID-19 pandemic. Some meetings are yet to indicate decisions on postponement or cancellation, or have not yet rescheduled; please check the contact addresses for the latest information.