

Technical forestry education in Africa: the industry point of view

J.J. Landrot

An overview of the training needed for forest industries in Africa – in technician training schools and in service for those already employed in the sector – stressing the benefits of linkages between industry and technical schools.

In the 1960s (and even earlier), the opening of a forest concession in tropical humid Africa simply involved the implementation of a forest harvesting programme based on a topographical survey and a basic inventory. Forest harvesting entailed planning the selective extraction of a few sought-after species, observing a minimum harvesting diameter and then closing off the harvested plots to allow the forest to regenerate undisturbed for future harvests.

By the 1990s this simple approach had been modified because of growing environmental degradation resulting from rapidly increasing demographic pressure, industrial overexploitation of forest resources and conversion of forest lands to other uses in the effort to achieve rapid economic development. In 1990, members of the International Tropical Timber Organization made a commitment to the Year 2000 Objective, which aims at 100 percent sustainable production from tropical forests. Worldwide concern over the sustainability of the planet's forests, especially tropical forests, came to the fore at the United Nations Conference on Environment and Development (UNCED) in 1992. The forest industry, as well, began to recognize the need to consider forests not only as a source of wood, but also as a complex ecological system to be managed in a sustainable manner to satisfy the needs of present and future generations.

Three years after UNCED, the first African concessions began to introduce systematic forest management regimes involving long-term planning for harvesting of the forest resource. Yet more than ten years after UNCED, less than 1 percent of allocated tropical forest concessions in Africa (1.5 million hectares) have completed and are implementing long-term sustainable forest management plans – although this figure should increase rather significantly in the next few years

as more plans are being deposited with forestry authorities for approval.

The lack of a long-term management regime is extremely detrimental to the sustainability of African forests and to the continued availability of tropical timber for consumers who increasingly demand timber produced from sustainably managed forests. One of the reasons for the delay in achieving sustainability is the failure of professional training programmes to meet the changing needs of the private sector, governments and non-governmental organizations (NGOs). Another reason is that forest tax revenue is not channelled back into forest management or into education and training. Modern forest management for timber production requires specialist knowledge that has been hard or indeed impossible to obtain within logging companies. This article describes the training needed for forest industries in Africa, both at the technician training school level and for those already employed in the sector.

TRAINING NEEDS

Forest inventory

The number of commercial tree species to be identified and included in inventories has risen; for example, in the countries of the Congo Basin, where the forests are still extremely rich in species diversity, the number has risen from around ten to more than 100. Inventories must include not only mature trees for present harvesting, but also young trees of future harvests, i.e. those with diameter at breast height (DBH) of 10 cm and over. The bark and leaves of these young specimens are often different from those of adult trees, so additional knowledge is required for their identification. Furthermore, in recent years many forest inventories have started to require the inclusion of social aspects, non-wood forest products (NWFPs) and a wider range of forest flora and fauna.

J.J. Landrot is Secretary-General of the Interafrican Forest Industries Association (IFIA), Paris, France.

Satellite imagery, global positioning systems (GPS) and geographic information systems (GIS) have become important complements to the compass, surveyor's chain and inventory notebook.

Extraction

New reduced-impact logging (RIL) techniques begin with the planning and construction of low-impact road infrastructures that occupy as little space as necessary. New approaches are now also taken in the construction of main and secondary tracks and in the crossing of both small and large waterways.

Secondary species have an increasingly important role in forestry development in the region, and surveyors now require training in economics so that they can assess the market value of these species and recommend their commercialization on the basis of qualitative assessments of standing stock.

Forestry equipment has changed dramatically over the past few years and is constantly evolving. Many forestry machines are now partly or entirely computerized. Computers are also used in managing equipment stocks and spare parts.



The logging company workforce must have increasing technical competence in order to understand the dialogue involved in design and maintenance of equipment and facilities.

Advances that help increase industrial yields and improve protection of future harvestable trees, such as directional felling and the use of high-capacity chainsaws (which have replaced axes and cross-cut saws in felling operations), require new skills and knowledge.

More attention is now being paid to extraction itself, with the intention of minimizing the damage done to the residual stand, the soil and the logs extracted. There is also growing concern about the optimum use of machinery and skidding routes and the planning and construction of landings.

The simple concept of commercial yield that used to dictate how logs were cut in African forest logyards has now been replaced by a more complex concept of resource optimization, covering both the volume exportable in its unprocessed state and the volume that can be processed on site.

Processing and locally added value

In all wood industries (e.g. sawmilling, veneer manufacturing), modern processes require new skills and knowledge.

- Blades are sharpened with special steels, profiling tools, composite grindstones and electronic grinders.
- Primary processing equipment (e.g. sawmills, veneer slicers, rotary peelers) increasingly contains electronic components.
- Air drying, which used to require several months to reduce the moisture

content to 20 percent, has been replaced by closed kilns combining heat, forced dehumidification and even depression pumps, making it possible to obtain a moisture content as low as 10 percent in much less time.

- Veneer guillotines and handsaws are being replaced by blades guided by optical fibres. Cutting is optimized by computer programs that take account of species characteristics and desired products, through the use of lasers, etc.
- Sanders are now automatic and aspiration has become obligatory.
- Treatment products require special handling and chemical knowledge.

TECHNICAL EDUCATION

Three levels of technical education are currently available in Africa:

- ordinary technician: certificate following a two-year course;
- senior technician: certificate following a three-year course;
- engineer: certificate from a higher institution following a three-year course.

Candidates can choose between two specializations, one for those wishing to work in the forest and the other for those who aspire to work in processing industries.

The number of institutions and available courses needs to be increased to meet the growing needs for professional training in the region. The number of schools, students and specialized courses offered and whether the schools should be national or subregional must be decided on the basis of needs analysis. However, it can be estimated that each country needs several schools for ordinary and senior technicians for both forest and processing specializations. At a higher level, a single training institution in each country with a capacity of around 30 entering engineering students

Training in reduced-impact directional felling techniques that help protect the environment and increase industrial yields



Operators of forestry harvesting and processing machinery are some of the candidates for in-service training to update skills and knowledge

per year would probably meet the requirements of the government, companies and NGOs. A single college at the subregional level, possibly run in partnership with colleges in industrialized countries, would probably be all that is needed for the best students to continue their studies.

Improvements are also needed in materials, instructor recruitment and teaching methods. Because of the rapidly evolving nature of the profession, there is a constant need to update materials and to retrain instructors in new methods.

Governments and donor institutions need to ensure that support to forestry education lasts for an adequate duration and that a view towards long-term sustainability is adopted. Their support to training institutions should of course be backed up by the profession, both financially and technically.

EDUCATION FOR THOSE ALREADY EMPLOYED IN THE SECTOR

Needs for in-service training and education have expanded greatly with the growth in the number of logging and

processing companies and the greater sophistication of skills required.

There are many categories of candidate for in-service training:

- forest operations: surveyors, managers, operators of forestry and public works machinery (bulldozers, skidders, graders, scrapers, forklifts, etc.), loggers, mechanics;
- processing industries: saw doctors (responsible for maintenance of cutting tools), sawmill and veneer slicer operators, electricians;
- trade and management: stock clerks in forests, factories and ports, sales clerks (at local and subregional levels) and secretarial, administrative and accounting staff.

The Table gives a simplified estimate of the number of companies in each country's formal sector that require trained staff (based on the membership of national industry federations). A rough calculation suggests that if each of the approximately 300 logging companies identified needs to train an average of ten workers for the sectors listed, and if each of the approximately 200 processing companies needs to train an average of five people, then immediate training would be required for a total of about 3 000 forest workers and about 1 000 processing workers. If the needs of governments and NGOs are added to these private-sector

Simplified estimate of the number of companies in each country's formal sector that could be involved in forestry training

Country	Logging companies	Processing companies
Cameroon	100	50
Central African Republic	10	10
Congo	50	30
Côte d'Ivoire	30	30
Democratic Republic of the Congo	20	20
Gabon	50	20
Ghana	50	50
Total	310	210

needs, the figures of 3 500 in the forestry sector and 1 200 in the industrial sector seem reasonable minimums. Further training needs would depend on the rate of turnover, staff development and working methods, but could be roughly estimated at about half of the immediate needs, i.e. 1 750 in the forestry sector and 600 in the industrial sector, annually.

The few in-service courses given at present in Africa take place mostly in large companies and are run by European consultants and supported financially by donor institutions. Such donor funding is not sustainable, however, as there is no long-term assurance that it can be re-

peated for many years. The support of donor institutions to training courses therefore needs to be gradually supplemented and eventually replaced by funding from government and from industry itself to be truly sustainable.

The logistics of large companies and the often higher number of staff to be trained per company make it relatively easy to provide a training course for a single company; at most, the staff of two or three large companies can be combined. The European Union's Centre for the Development of Enterprise (CDE) and other donors have partially funded training programmes for large companies on such subjects as sustainable forest management, RIL and grinding and drying techniques. Similarly, the Worldwide Fund for Nature (WWF) has so far concentrated solely on large companies in its European Union-financed support to sustainable forest management. However, the lack of coordination and economy of scale has undoubtedly biased these programmes.

Providing training for staff of small companies is more difficult as they lack the necessary facilities and concentration of candidates. Support from specialized schools is therefore needed.

Indeed, it appears most desirable to rely on the school network for all in-service training, since this would make it possi-

ble to develop an overall strategy covering all needs. Other advantages include:

- the opportunity to use school facilities;
- reinforcement of the teaching system in schools;
- optimization of financial resources provided by donors for professional training;
- strengthening of bonds between schools and the private sector.

FORGING BONDS BETWEEN INDUSTRY AND TECHNICAL SCHOOLS

Private companies, especially those in remote areas, have traditionally provided their own training courses. Companies have supported not only basic primary school education, but also internal professional training. However, it is more difficult for the private sector to develop sophisticated training programmes for modern technologies than to provide a basic education in traditional methods.

In the author's view, mutual benefit could be obtained by forging bonds between schools and companies. Such bonds could be developed on five levels:

- formal industry participation on school boards of governors, which would allow future employers to have an active, upstream role in school decisions concerning such matters as the

levels of courses, teaching approaches and numbers of students;

- participation of company staff in teaching, at both the practical and theoretical levels – with each professional dedicating perhaps a dozen half-days to teaching per year;
- company hosting of trainees during both school terms and holidays;
- hiring of graduates when they finish their studies;
- admission of company staff for training by schools.

CONCLUSION

The above discussion suggests several pointers for decision-makers in African government and donor institutions.

An up-to-date inventory of training institutions and professional training needs should be made for each country and for the subregions (both English-speaking and French-speaking), divided by fields of study (forest harvesting, processing technology, engineering, commerce).

Coordination is needed among States, donor institutions and the private sector to establish a forestry education and professional training policy. This policy should then be implemented according to both the needs and preferences of each stakeholder. For example, one donor may be interested in supporting a forestry college, while another may wish to support technical development. The private sector should be mobilized to support and fund the implementation of this policy.

Training regarding forest and wood industries is also needed for government and NGO staff if industry is to be encouraged and supervised effectively.

The Interafrican Forest Industries Association (IFIA) and its member associations, as the main beneficiaries, can have a vital role in forestry education, through involvement in gathering information on needs, helping to run schools and assisting in professional training programmes. ♦



Students in an in-service course learning about the maintenance of new equipment