

# Trends in forestry education in Southeast Asia and Africa, 1993 to 2002: preliminary results of two surveys

*Surveys of forestry education institutions help prioritize regional forestry education needs.*



Reforestation course,  
Viet Nam

In 2002, FAO, in collaboration with two regional education networks, the Southeast Asian Network for Agroforestry Education (SEANAPE) and the African Network for Agroforestry Education (ANAFE), initiated regional surveys to establish trends in forestry education and training over the preceding ten years. The surveys were intended as a contribution to the prioritizing of regional forestry education needs. In addition to establishing trends in enrolment and graduation,

they also sought to identify changes in the roles of the forester and to relate them to curriculum developments; and to examine the funding situation over the same period.

The surveys were carried out by regional networks, with funding from FAO. Participating institutions responded to a questionnaire survey (see Box); the responses were supplemented by interviews and scrutiny of records and reports. The following articles summarize the results.

## Information requested in the surveys of forestry education

### *Number of forestry graduates in the past ten years*

Year of establishment of the forestry programme

Number of forestry graduates in the past ten years, separated by: certificate, diploma, first degree, masters, Ph.D. or equivalent; each of these categories separated by gender

Any other records considered important

### *Enrolment*

Has enrolment been increasing or decreasing, and why (by degree programme level)?

Any additional information that may be useful in interpreting the data

### *Employment*

Identify the ten most important organizations employing graduates in the country, briefly describing the type of work assigned to forestry graduates (by category, e.g. certificate, first degree, etc.)

Any comments on employment conditions

### *Roles of foresters*

List the changes in the roles of foresters in the country over the past ten years, and indicate whether or not curricula have changed accordingly. If so, how? If not, why not?

### *Comments on resources, facilities and funding for the institution (adequate/inadequate, comments)*

Comments requested on the following items: teaching staff; support staff; lecture rooms; library and teaching materials/books; current publications; laboratories and laboratory equipment; teaching aids (computers, projectors, etc.); field training sites; transport facilities for staff and students; financial support (national); donor support (please qualify); communication facilities (e-mail, phone, fax); other

### *Priority needs*

List and explain the five most important needs for the institution.

## Southeast Asia

*P.G. Rudebjer and I. Siregar*

In Southeast Asia, the survey covered 35 institutions in six countries: Indonesia, the Lao People's Democratic Republic (Lao PDR), Malaysia, the Philippines, Thailand and Viet Nam (see Table 1). The study was carried out during May and June 2003 by the Southeast Asian Network for Agroforestry Education (SEANAFE). In each country a national study was carried out by a national study coordinator identified through SEANAFE member institutions.

The six countries vary greatly in terms of size, population, forest cover, history, economic development, etc. These differences are reflected in forestry education. For example, over the ten-year study period, Lao PDR had only 222 bachelor's degree forestry graduates, while the Indonesian institutions had 8 490. Trends valid throughout the region were few. Rather, national trends sometimes moved in opposite directions. Regional averages may therefore be misleading. They were heavily influenced by the Philippines and Indonesia, which have many forestry institutions. Therefore this analysis includes specific national examples whenever relevant.

The 35 institutions surveyed offered among them 63 forestry programmes (professional and technical). Bachelor's degree programmes accounted for 39 percent of the programmes analysed, followed by certificate (23 percent), master's degree (18

percent), diploma (11 percent) and Ph.D. (8 percent) (Table 1).

The sample size per country varied. Indonesia and the Philippines had a larger offering of forestry education programmes than the other countries. In Lao PDR and Viet Nam, most of the important forestry institutions were included in the study. In Malaysia only three institutions were included, but the main university did not respond, which biases the results for that country. In Thailand, only one institution, Kasetsart University, offers formal forestry education.

### FORESTRY GRADUATES

A total of 31 325 graduates was reported in the period 1993 to 2002 from the 35 institutions surveyed. Among the sampled institutions, the certificate was not offered in Thailand or Viet Nam. The diploma was not offered in the institutions surveyed in Malaysia, the Philippines or Thailand, while the master's degree and Ph.D. were not offered in Lao PDR (Table 2).

The study indicated that graduation from lower levels – certificate and diploma – is decreasing, while the completion of bachelor's and master's degrees, and to some extent Ph.D.s, is increasing. An exception is Lao PDR, where a national policy to increase admissions to higher education has steeply increased graduation at the certificate and diploma levels. Only in the Philippines is graduation decreasing at all levels.

**TABLE 1. Number of institutions and sample size for the study by programme**

Country	Number of institutions	Sample size of programmes				
		Certificate	Diploma	Bachelor	Master	Ph.D.
Indonesia	11	2	5	7	2	1
Lao PDR	5	4	1	1	0	0
Malaysia	3	3	0	1	1	1
Philippines	10	6	0	9	4	1
Thailand	1	0	0	1	1	1
Viet Nam	5	0	1	5	2	1
<b>Total</b>	<b>35</b>	<b>15</b>	<b>7</b>	<b>24</b>	<b>10</b>	<b>5</b>

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TABLE 2. Forestry graduates 1993-2002 by country, educational level and gender

Level	Indonesia (n=11)		Lao PDR (n=5)		Malaysia (n=3)		Philippines (n=10)		Thailand (n=1)		Viet Nam (n=5)		Total (n=35)		
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M+F
Certificate	713	53	1 409	269	500	27	696	810	0	0	0	0	3 318	1 159	4 477
Diploma	2 520	894	1 346	192	0	0	0	0	0	0	35	5	3 901	1 091	4 992
B.Sc.	6 085	2 405	191	31	207	218	1 394	1 226	890	500	5 847	1 365	14 614	5 745	20 359
M.Sc.	248	104	0	0	16	0	148	58	372	131	223	52	1 007	345	1 352
Ph.D.	11	1	0	0	4	0	66	18	16	10	15	4	112	33	145
<b>Total</b>	<b>9 577</b>	<b>3 457</b>	<b>2 946</b>	<b>492</b>	<b>727</b>	<b>245</b>	<b>2 304</b>	<b>2 112</b>	<b>1 278</b>	<b>641</b>	<b>6 120</b>	<b>1 426</b>	<b>22 952</b>	<b>8 373</b>	<b>31 325</b>

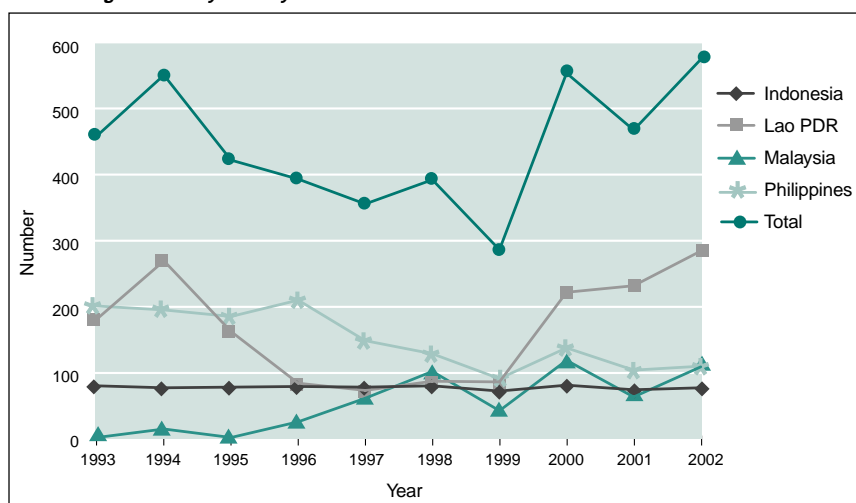
### Trends by degree programme

**Certificate.** In the Philippines, graduation decreased substantially between 1993 and 2002 (Figure 1). Graduation in Indonesia remained stable. In Lao PDR, graduation fluctuated greatly over the past ten years, with a sharp increase in the past three years. Certificate graduation in Malaysia increased with the opening of new forestry programmes. However, the educational level of a certificate in forestry differs among countries, and they cannot be directly compared.

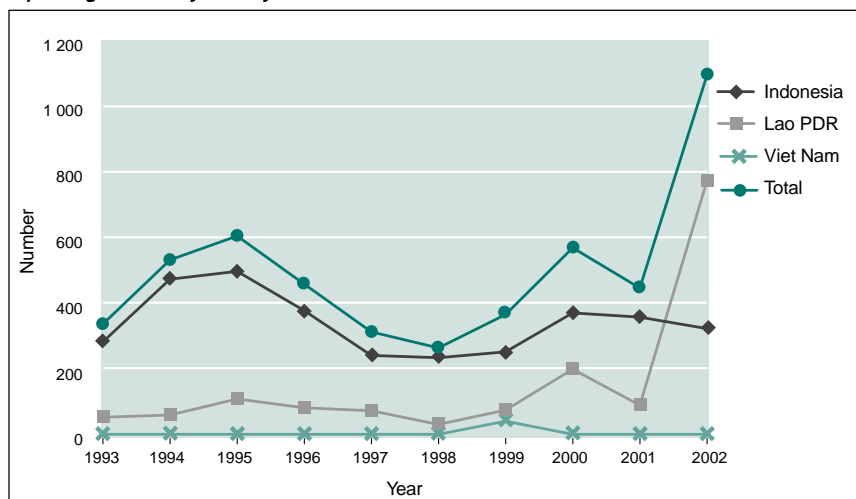
**Diploma.** After a peak in 1995, the total number of diploma graduates decreased sharply because of a reduction in the number of graduates in Indonesia (Figure 2). An increase was again observed from 1998. The high figure for 2002 is explained by a huge increase in graduates from one single institution, the National University of the Lao People's Democratic Republic.

**Bachelor's degree.** Overall, the number of B.Sc. graduates doubled from 1993 to 2002, but trends differed among countries (Figure 3). The Philippines and Thailand had a fairly stable output of graduates over the ten-year period. Graduation increased in Indonesia, Viet Nam and Lao PDR. In Viet Nam, a sharp increase in the output of B.Sc. graduates was observed after 1999. In Lao PDR, the first batch of B.Sc. students in forestry graduated as late as 2000.

1  
Certificate graduates by country



2  
Diploma graduates by country



**Master's degree.** The largest increase in graduation occurred at the M.Sc. level; graduation almost tripled from 1997 to 2002 (Figure 4). With the exception of the Philippines, all countries offering the degree increased their output of M.Sc. graduates. Again the variation among countries was significant, with Kasetsart University, Thailand accounting for a large proportion of the total increase – having increased from around 20 to 120 M.Sc. graduates per year. The responding institutions in Viet Nam bestowed their first M.Sc. degrees in forestry in 1995.

Considering the large number of B.Sc. graduates in Indonesia and the Philippines, the number of M.Sc. graduates in these two countries was fairly small. In 2002, for example, the Philippines granted 213 bachelor's degrees in forestry versus 17 masters. Indonesia had 947 B.Sc. and 55 M.Sc. graduates.

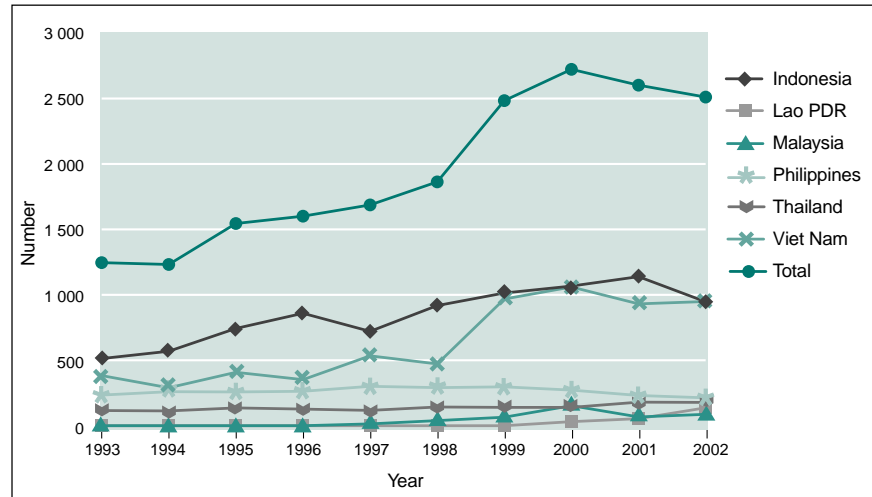
**Ph.D.** The five institutions granting Ph.D.s (one institution per country, Lao PDR excepted) had a combined total output of 145 graduates during the ten-year period (Figure 5). Some 60 percent of them graduated in the Philippines. Notably, only 12 Ph.D.s graduated in Indonesia during the ten-year period. Overall, the number of Ph.D.s increased, but there were large fluctuations from year to year. Only in Thailand could a clear upward trend be seen. The survey did not cover the many Ph.D.s obtained abroad, so Figure 5 is not an accurate indicator of the availability of Ph.D.-level personnel in the region.

### Gender

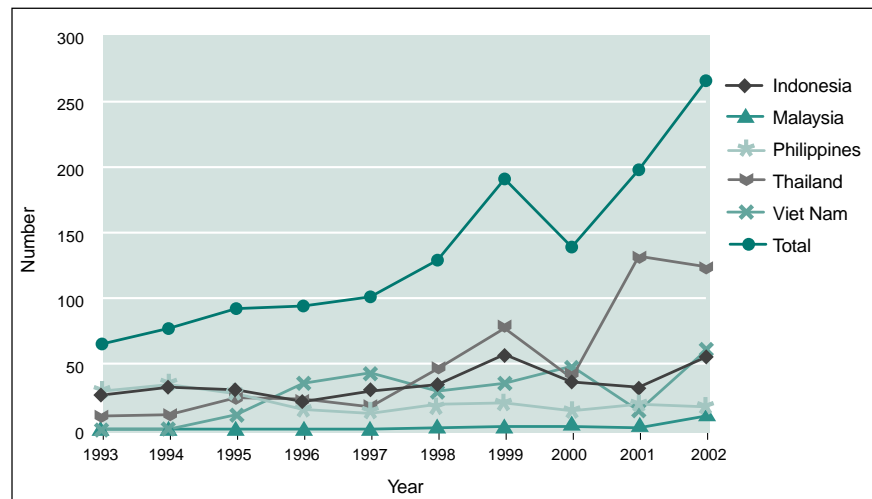
The male/female ratio of graduates varied little among the levels of education, and changed little over the ten-year period. Regionally the study showed roughly between 20 and 30 percent female graduates at the various levels (Table 3).

However, the variation between countries was very significant. The high ratio of fe-

**3**  
**Bachelor's degree graduates by country**



**4**  
**Master's degree graduates by country**



male graduates in the Philippines biased the regional average. The Philippines had an almost 50/50 ratio of male and female graduates at the certificate and bachelor's degree levels. Malaysia also had a fairly balanced number of male and female bachelor's degree graduates. Lao PDR and Viet Nam had less than 20 percent female graduates in all their programmes. At the M.Sc. and Ph.D. levels there was less difference among countries, Malaysia being the exception with no female M.Sc. graduates.

### ENROLMENT

The survey indicated variation in enrolment trends at the different levels and among countries. Forestry education enrolment was decreasing at all educational levels in the Philippines, while it was increasing in Lao PDR, Viet Nam, Thailand and Indonesia. The sample for Malaysia may have been too small to draw conclusions about enrolment. In Lao PDR and Viet Nam, the increases were linked to government education policies. The recent

dramatic increase in the number of students in Lao PDR is putting great pressure on the limited resources of the country's educational institutions.

The survey showed a trend towards increased enrolment at bachelor's and master's levels and a trend towards decreasing enrolment at the lower levels. Enrolment data per programme indicated the following trends:

- certificate level: sharply decreasing in the Philippines but increasing in Lao PDR;
- diploma: increasing in Indonesia and Lao PDR, decreasing in Viet Nam;
- B.Sc.: decreasing in the Philippines, increasing in all other countries except Indonesia;

- M.Sc.: decreasing in the Philippines, increasing in all other countries;
- Ph.D.: decreasing in the Philippines and Viet Nam, stagnant in Malaysia, increasing in Indonesia and Thailand.

#### EMPLOYMENT

The survey indicated that forestry employment in Southeast Asia is largely dominated by the public sector. Although the structure of the job market varies among countries, graduates in the subregion generally find employment in various government agencies at the central, district or provincial level. Especially in Lao PDR and Viet Nam, the public sector is the predominant employer. Traditional forestry jobs dominate, such as positions in forest

departments, forest enterprises, research and education. Non-traditional jobs in the public sector – dealing, for example, with environmental issues, national parks, community development, agroforestry – are also available to foresters, and seem to be increasing in importance. In the Philippines, forestry graduates frequently find jobs as “community organizers” under a people-centred development model used in the Philippine extension system.

The private sector is still a small employer of forestry graduates, especially in countries with a relatively low level of economic development. Private-sector employment in forest industries and enterprises is most important in Indonesia, Thailand and Malaysia. Non-governmental organizations (NGOs) were reported to be important employers of foresters in the Philippines and Viet Nam. Self-employment was only reported in the Philippines.

The education level was seen to be important for employability. For example, it was reported that diploma graduates in Lao PDR had difficulties obtaining jobs because employers preferred graduates with higher education.

Although the survey did not quantify employment, anecdotal evidence suggests that unemployment and underemployment in the forestry sector may be high and that many graduates may enter a non-forestry segment of the labour market.

#### ROLES OF FORESTERS

The roles of foresters were reported to have changed substantially in Southeast Asia over the ten-year period. All countries reported an ongoing shift from traditional forestry towards social and community forestry, agroforestry and environmental conservation. These changes demand competence among foresters in dealing with human aspects of forestry and multidisciplinary and participatory approaches. Most of the responses

5  
Ph.D. degree graduates by country

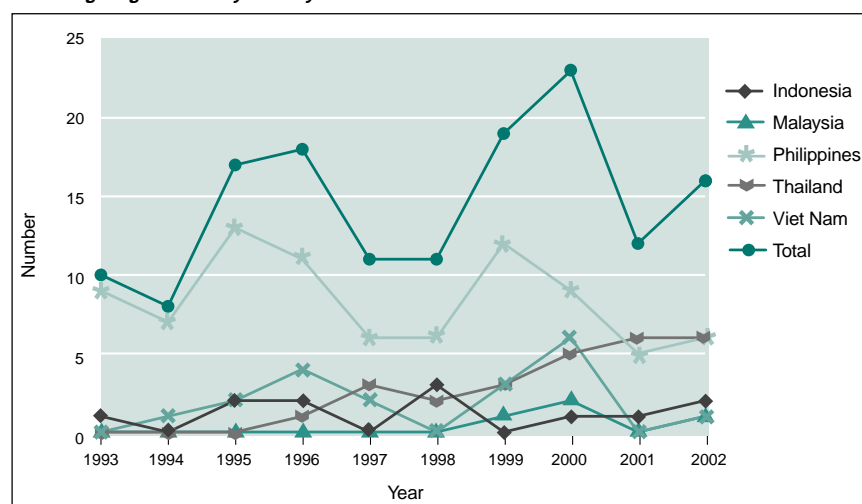


TABLE 3. Graduates by gender, 1993-2002

Level	Number of graduates	Male (%)	Female (%)
Certificate	4 477	74.1	25.9
Diploma	4 992	78.1	21.9
B.Sc.	20 359	71.8	28.2
M.Sc.	1 352	74.5	25.5
Ph.D.	145	77.2	22.8



indicated that these changing roles are being included in curricula, both through new courses and programmes and through the revision of existing ones. New directions reported in forestry education include economics, entrepreneurship, wood technology and ecotourism. Indeed, forestry education was found to be in a stage of change throughout the region. Further qualitative studies of curricula and of graduates' competence would be needed to confirm how thoroughly and effectively these changes are being implemented.

#### RESOURCES, FACILITIES AND FUNDING

The availability of resources, facilities and funding was found to vary a great deal among countries and among institutions. Malaysia reported adequate resources in most areas of the teaching infrastructure. In contrast, Lao institutions reported inadequate resources, facilities and funding in almost every aspect of forestry education.

Institutions in Thailand, Malaysia and Indonesia reported adequate teaching aids. All countries except Malaysia reported needs for library and teaching materials, current publications, laboratory facilities and equipment, transport facilities for staff and students, and financial resources. Only institutions in Viet Nam reported sufficient donor support. All countries except Lao PDR reported adequate support staff, lecture rooms and field sites; all except Lao PDR and Viet Nam reported adequate teaching staff and communication facilities.

#### PRIORITY NEEDS

The priority needs most frequently reported were:

- curriculum development;
- improvement of teaching and support staff;
- improvement of facilities;
- budget improvement.



*Dialogue with farmers: the shift from traditional forestry towards social and community forestry, agroforestry and environmental conservation demands competence in dealing with human aspects of forestry and multidisciplinary and participatory approaches*

*Forestry or agriculture? Roles of foresters are changing as boundaries blur*



#### CONCLUSIONS

At a time when the forest cover in South-east Asia continues to decrease, enrolment is increasing in most forestry education programmes in most countries except for the Philippines, particularly at the bachelor's and master's degree levels. This raises questions about job opportunities for forestry graduates in a job market strongly dominated by the public sector. Universi-

ties and education policy-makers need to carry out further studies on job markets in order to adapt both the extent and content of forestry education to prevailing and future needs.

Especially noticeable increases in graduation were reported in Lao PDR (certificate and diploma), Viet Nam (bachelor's degree) and Thailand (master's degree). In Lao PDR, this increase



*Non-traditional jobs in the public sector – for example, positions as community organizers in the Philippines – seem to be increasing in importance for forestry graduates*

is putting great pressure on the limited resources of its educational institutions, raising serious concerns about education quality as well as employment opportunities for graduates. International development cooperation agencies should take note and assist the educational development in the country.

Employment of foresters in Southeast Asia is largely in the public sector, in line with most governments' policies to keep forests and forest land within the State's domain. However, non-traditional jobs, still mostly in the public sector, are growing in importance in a context of dwindling forest resources, increased attention to environmental services and increased importance of trees outside forests in various agroforestry and community forestry arrangements. Other alternative jobs are also appearing in such fields as wood processing, ecotourism, economics and marketing. However, there seems to be an untapped potential to increase the presence of foresters in other private-sector job niches – including non-traditional ones – where competence in natural resource management is an asset.

The roles of foresters are changing in all countries in the region, and these changes are being incorporated in curricula. Yet curriculum development remains the highest priority for forestry education institutions and demands further support from governments, donors and education specialists.

Forestry education institutions in Southeast Asia, and in particular in Lao PDR, suffer from an insufficiency of teaching materials and resources which impairs the quality of education. Government and donor support as well as national, regional and international collaboration could help mitigate these problems. ♦

## Africa south of the Sahara

*A.B. Temu*

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The African survey was carried out in November and December 2002 by the African Network for Agroforestry Education (ANAFE). Altogether 20 institutions responded to the questionnaire (see Table). Supplementary data were gathered from records available with ANAFE and through telephone interviews.

### GRADUATION OVER THE PERIOD 1993-2002

#### Forestry technicians (certificate and diploma)

The graduation of forestry technicians has dropped drastically (Figure 1), especially since 1996, mainly because of low enrolment. The drop appears to be linked to the adoption of structural adjustment pro-

grammes in many countries, which discouraged government support for the training of technicians in forestry and agriculture. In some cases governments closed technician training programmes; in others the number of students supported by government was dramatically reduced. The impact is seen directly in the quality and amount of technical services provided in managing forests, especially plantations. Many forest plantations are poorly maintained, especially in terms of pruning, thinning and quality harvesting. In many government-managed forests the number of technicians has dropped drastically. This is also having an adverse impact on forestry extension services. Non-governmental organizations (NGOs) and private enterprise did not rise

### Institutions that participated in the forestry education survey

Institution	Programmes	Country
Ecole Nationale des Eaux et des Forêts (ENEF)	Diploma	Burkina Faso
Institut du Développement Rural (IDR)	M.Sc.	Burkina Faso
Unité de Formation et de Recherche Sciences de la Vie et de la Terre (UFR/SVT), University of Ouagadougou	M.Sc., Ph.D.	Burkina Faso
Department of Forestry, Moi University	B.Sc., M.Sc., Ph.D.	Kenya
Kenya Forestry College, Londiani	Certificate, Diploma	Kenya
Centre de Formation Pratique Forestier (CFPF)	Diploma	Mali
Institut Polytechnique Rural (IPR)	B.Sc., M.Sc.	Mali
Department of Forest Resources Management, University of Ibadan	B.Sc., M.Sc., Ph.D.	Nigeria
University of Agriculture, Abeokuta	B.Sc., M.Sc.	Nigeria
Department of Forest Science, University of Stellenbosch	B.Sc., M.Sc., Ph.D.	South Africa
Forestry Programme, University of Natal	Diploma, B.Sc., M.Sc.	South Africa
College of Forestry and Range Science, Sudan University of Science and Technology	Diploma, B.Sc., M.Sc., Ph.D.	Sudan
College of Natural Resources and Environmental Studies	B.Sc., M.Sc.	Sudan
Faculty of Forestry, University of Khartoum	B.Sc., M.Sc., Ph.D. A new diploma programme to start soon	Sudan
Faculty of Forestry and Range Science, Upper Nile University	B.Sc.	Sudan
Faculty of Natural Resources and Environmental Studies, University of Kordofan	B.Sc. since 1995, M.Sc. started in 2002 with 6 students	Sudan
Faculty of Forestry and Nature Conservation, Sokoine University of Agriculture	B.Sc., M.Sc., Ph.D.	Tanzania
Forest Training Institute, Olmotonyi	Certificate, Diploma	Tanzania
Faculty of Forestry and Nature Conservation, Makerere University	B.Sc., M.Sc., Ph.D.	Uganda
Zimbabwe Forestry College	Certificate, Diploma	Zimbabwe



to meet the demand for extension and associated training as governments expected when they withdrew from this area.

A large variation in graduation was observed among institutions; this is symptomatic of inconsistencies in policies and funding of forestry technician training. Some of the colleges even close down periodically to minimize expenses, and reopen when funds become available.

Another disturbing observation is the drop in the number of female students taking up forestry technician training. The female enrolment seemed to take an upward trend

starting in 1994 but suffered a serious fall from 1998 and has not recovered. This is particularly bad news as greater participation of women is being encouraged in development activities, and especially in on-farm tree planting.

The clear conclusion from this analysis is that the twenty-first century is beginning with less technical capacity in forestry and reduced female capacity. The continent's ambitions for scaled-up tree planting will be undermined by low investment in technician training.

It is also interesting to study the certifi-

cate and diploma graduations separately (Figure 2). Since 1998, the number of certificate holders trained has been negligible. Interviews with some colleges revealed that in some cases, certificate holders are registering for diploma courses to upgrade their skills, but no further recruitments are being made at the certificate level. The long-term consequence of this will be an abnormal staff structure, with more professionals than technicians. This trend is very likely to worsen, given the slight rise in undergraduate enrolment depicted in Figure 3.

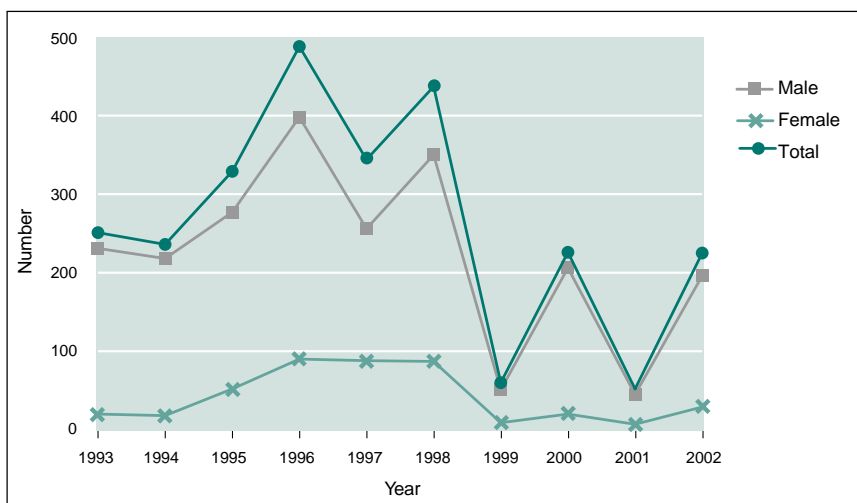
Governments should review their support for training technicians in forestry, and should consider the subject in tandem with technician training in agriculture, so as to develop broader strategies for natural resources management on farm and in forestry areas.

### Professional education (B.Sc. in forestry)

The number of professional degree programmes has increased, and along with that the number of graduates. However, in all countries surveyed except the Sudan and Nigeria, the increases are marginal in relation to the total needs expressed by respondents based on a perceived lack of personnel with the necessary skills in forestry institutions.

Respondents from many countries indicated that while the number of forestry graduates is small, government employment opportunities have been diminishing. Some graduates are able to find employment in private institutions and NGOs, but most are eventually employed outside forestry. The Sudan and Nigeria have recently established several forestry schools even though they too face a very serious problem of employment for forestry graduates. A strategic plan is needed to make better use of forestry training capacity already available in some countries. Rather than rushing to have national schools of for-

1  
Forestry technicians in Africa, by gender



*The closure of some technician training programmes and drop in enrolment in others has had a direct impact on the technical services provided in managing forests, especially plantations; as a result many forest plantations are poorly maintained*

estry, it would be better to substitute a regional and subregional approach to forestry education, whereby institutions in different countries would develop excellence in only one or two specific regionally relevant areas and students would be free to choose among them. Such specialization would lower costs and improve regional integration.

The professional programmes are poorly managed, lacking procedures for identifying needs and for meeting them through properly planned curricula. The teaching institutions operate according to the resources they are able to obtain. Thus the overall slightly upward trend shown in Figure 3 is more random than planned. Major annual variations in student enrolment have an adverse impact on the planning and implementation of programmes. Considering that the capital investments (staff, classrooms, laboratories, equipment, field training facilities, etc.) have already been made, there is a problem of poor utilization of capacity and facilities as well. Most institutions have access to a training forest or similar field training facility, but lack funds for transportation and field expenses for staff and students. Some schools of forestry (colleges as well as universities) are closed part of the year and only run when resources become available.

There is thus a need to improve forestry education planning through dialogue among forestry authorities, the private sector and schools of forestry, with assistance also from international institutions such as FAO, the Center for International Forestry Research (CIFOR), the World Agroforestry Centre (ICRAF), the United Nations Environment Programme (UNEP) and the International Union of Forestry Research Organizations (IUFRO).

**Postgraduate education in forestry**

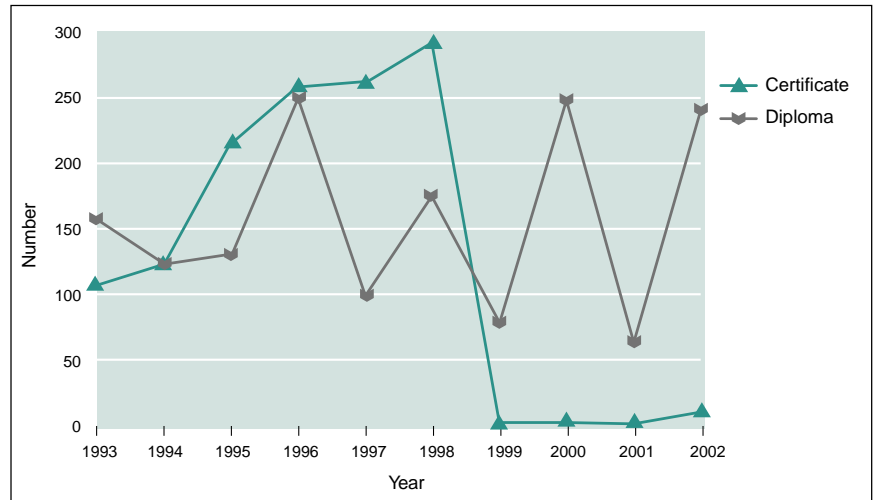
Only a few universities have the capacity to deliver postgraduate education in forestry, and most of them can only take in

*Female enrolment in forestry technician training programmes has been dropping since 1998, at the same time that greater participation of women is being encouraged in development activities and especially in on-farm tree planting*

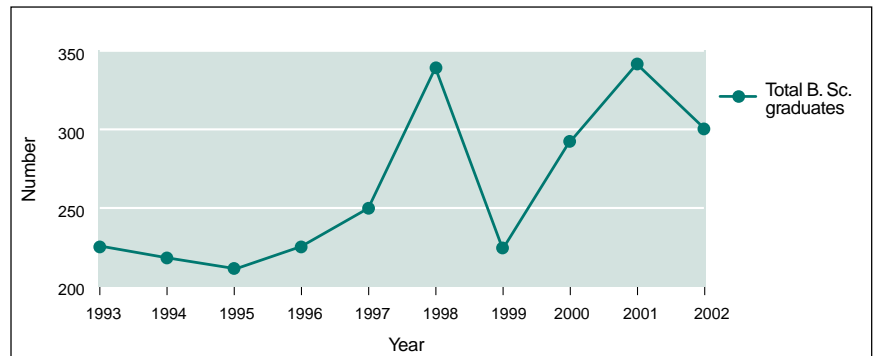


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**2**  
**Forestry technician graduates in Africa (certificate and diploma)**



**3**  
**Total B.Sc. forestry graduates**



small numbers of students at a time. There is a need to help build up this capacity. African countries have opportunities to send their students to foreign universities for this type of education, but scholarships to fund such programmes are increasingly limited. Moreover, the foreign programmes may have limited relevance to Africa's needs, especially if thesis research is not done in an African environment.

As might be expected, the number of M.Sc. graduates exceeds that of Ph.D.s (Figure 4). The percentage of women post-graduates is higher than the general proportion of women in the forestry sector. The relatively high number of women in post-graduate education may be a result of two strategies adopted by governments and donors:

- the introduction of more social science into forestry, which has resulted in many more thesis research projects in the areas of social forestry, community forestry, gender aspects, etc., many of them by women students;
- affirmative action in the awarding of scholarships and increasing implementation of gender-balancing policies by many institutions.

The overall trend in postgraduate education clearly shows a dive since 1998. This is a very disturbing trend, given the increase in the number of institutions teaching forestry and the emergence of research needs. No wonder forestry research output in Africa is weak.

There is a need to establish postgraduate training needs, especially the requirements of research institutes, universities and colleges, the private sector, NGOs and policy-making bodies. From this it would be possible to develop a strategy for meeting the needs from both regional and extraregional resources.

#### HOW HAS EDUCATION ADAPTED TO CHANGE?

Over the past ten years, there have been major changes in policies and attitudes related to forestry as a whole and foresters in particular. Although a cause-effect relationship is hard to establish, it is apparent that these changes have influenced investment in forestry and subsequently in forestry education.

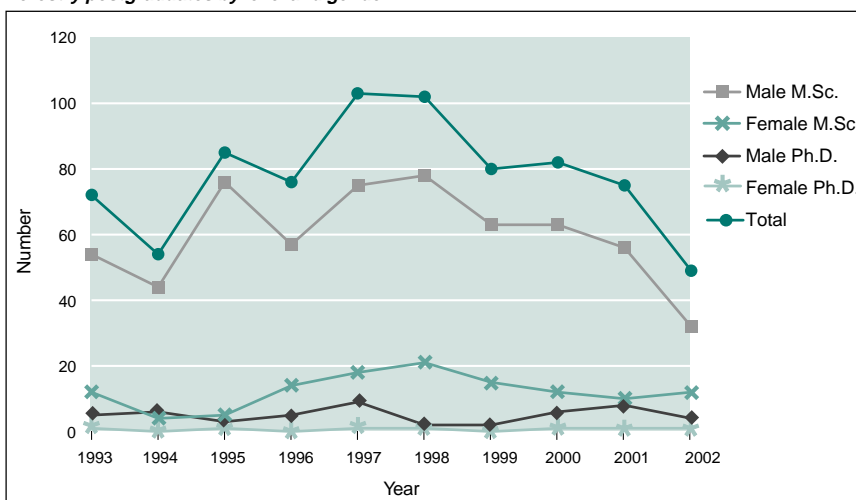
- A renewed emphasis on livelihoods and agricultural production, necessitated by declining food and nutritional security, has caught foresters un-

awares; they are unprepared to demonstrate how forestry is related to, and in fact part of, the food production chain.

- The emphasis on tree planting has moved strongly from establishment of forest plantations to integration of trees on farmland, through outgrower schemes and other means. This concept is relatively new to foresters, whose mandate traditionally stopped at the forest margin. They now have to learn to facilitate tree planting on farmers' fields.
- Faced with new forest policies that put greater emphasis on the roles of communities in forest resource management, foresters feared loss of control over forests instead of developing their skills to assist the local communities. Foresters' inertia in research and education in this area has cost them dearly at the professional level.
- Several global fora have produced resolutions that redefine the role of the forester from custodian of forest resources to facilitator of natural resource management by stakeholders. In many of these fora, African foresters have been poorly represented, at best. Many curricula, therefore, do not reflect the new approaches, and serving foresters have not been retrained to understand the implications of such resolutions in their work. Mechanisms should be sought to increase the participation of African foresters, and indeed forestry academicians, in global and regional fora on agriculture, forestry and environment.
- Investment in forest industries has slackened, reducing the demand for both logging expertise (in the traditional sense) and wood technology experts.

Many curricula are outdated and wanting in terms of relatively new topics such

4  
Forestry postgraduates by level and gender



as community forestry, biodiversity conservation, integrated natural resources management, communication and agroforestry.

African countries have also been unable to embrace fully advances in information and communication technologies. Because of their generally remote location, forestry institutions are particularly left behind.

These changes have resulted in declining employment opportunities in government, reduced government investment in forestry teaching and research capital (staff, facilities, equipment, books, etc.) and subsequently declining enrolment in forestry programmes. The result is brain drain: able educators and researchers find greener pastures outside forestry or in other countries. Some NGOs and private-sector employers have absorbed foresters in jobs that are peripheral to mainstream forestry.

All college curricula should be reviewed and lecturers trained to understand and apply modern thinking and modern information and communication technologies to forestry. Standardization of forestry curricula, and possibly an accreditation system establishing minimum teaching and learning standards, may be needed to alleviate the tremendous variation in the content and depth of coverage among the schools.

It is also necessary to monitor the content and quality of postgraduate education in Africa, with a view to improving the capacity to deliver it and opportunities for regional collaboration. Serving foresters need retraining to develop skills and attitudes suitable for working with local communities and on farm.

Libraries need special attention. With the recent proliferation of digital products, forestry libraries in Africa are at a loss, as many institutions lack digital capacity and the regular sources of electrical power needed to make use of electronic products. These libraries need forestry books and especially locally relevant materials.



*Investment in forest industries has slackened, reducing the demand for logging expertise in the traditional sense*

*Retraining is needed to help serving foresters develop new skills for interaction with a variety of stakeholders*



#### **FUNDING**

All institutions included in the survey indicated that funding was intermittent, declining and largely from national resources. Donor funds are unpredictable, often depending on politics, among other factors.

#### **CONCLUSION**

Forestry education in Africa is declining in terms of both relevance and quality. The impact of this decline is becoming visible in research, teaching, extension and practice on the ground. The long-term effects are hard to predict, but they are likely to be adverse in the areas of agricultural sustainability, biodiversity and environmental conservation, and availability and affordability of wood and tree products –

all of which have wider implications for livelihoods and the economic development of Africa.

The results of this survey are intended to provide a foundation for regional or subregional discussions among all stakeholders, and especially policy-makers, to produce a future agenda for forestry education in Africa. Participatory discussions should provide feedback to national institutions and other stakeholders; recognize opportunities for change and potential repercussions if remedial actions are not taken; and identify sources of support for forestry education. Many factors external to forestry have not been captured in the survey, and these also need to be considered in the setting of priorities. ♦