

## Chapter 17

## Institutional collaboration in agroforestry: Networking and knowledge management

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### Abstract

As the focus of rural development has shifted from sector-based to integrated approaches, agroforestry has emerged as a key element of integrated natural resources management (INRM). Integrated approaches require effective links across the research, education and extension continuum. This chapter discusses weaknesses in this continuum that lead to the unsatisfactory impact of investment in agroforestry development, with emphasis on the education system. We describe the change from opportunistic agroforestry teaching – often initiated by alumni of the World Agroforestry Centre’s training courses – towards regional agroforestry education networks. The African Network for Agroforestry Education (ANAFE) was formed in 1993 and the Southeast Asian Network for Agroforestry Education (SEANAFE) in 1999 to improve the access to and quality of agroforestry education. Activities include curriculum development and review using participatory approaches, training of trainers, teaching materials support, graduate thesis research, information and policy advocacy.

### Introduction

A widespread traditional practice among farmers, agroforestry has emerged as a science only during the past 25 years. The education system has taken note and agroforestry courses are now offered widely in universities and technical colleges in Africa and Southeast Asia, as well as in Latin America and South Asia. Many universities in developed countries also teach the subject.

Agroforestry science initially focused on classification of agroforestry systems, intercropping research and the development of agroforestry technologies – approaches that were embraced by extension and education systems. But efforts to disseminate agroforestry as a technical package to increase food security and income and to protect the environment showed mixed

results. Meanwhile, many traditional agroforestry practices were overlooked. Today, agroforestry science has broadened its scope and now includes multidisciplinary research on landscape functions and the livelihoods of people. One obstacle to developing agroforestry in an integrated, participatory and innovative manner has been a lack of adequately trained agroforestry researchers, extension specialists and teachers.

Integrated natural resource management (INRM) is a new approach to agricultural research and development that has emerged to address these complex interactions. The INRM paradigm differs notably from the traditional crop improvement paradigm that was successful in bringing about the Green Revolution (Izac and Sanchez 2001). INRM reflects the broad

interactions required to simultaneously reduce poverty, increase food security and achieve environmental protection. It also recognizes ecological, social and economic interactions at different scales in time and space (CGIAR 2000). These trends influence development strategies in Africa and Southeast Asia too, as they evolve from sector-oriented towards integrated rural development. Agroforestry practices play an important role in such integrated approaches to natural resource management.

Complex problems require new organizational forms for their solution. Interorganizational networks among public, private and grassroots organizations have emerged to meet this need (Boje and Wolfe 1989). In the 1990s, regional networks were formed in Africa and Southeast Asia to improve the access to and quality of higher education in agroforestry. The two networks of universities and technical colleges contribute to educational change and to building the capacity of present and future agroforestry and natural resource management professionals. This chapter shows how institutional collaboration, in the form of networking, can be a powerful tool for managing knowledge about agroforestry, thus underpinning the complex processes of rural development.

### Missing links in the research–education–extension continuum

The starting point of our discussion is a model of the links between research, education and extension – a continuum that depends on, and interacts with, a range of other stakeholders and the policy framework (Figure 1). Rural

development efforts have often had weak or missing links in this continuum, which led to unsatisfactory or sub-optimal impact of investments in agroforestry development. The situation that is yet to be fully corrected, was characterized by:

- poor adoption and slow scaling up of agroforestry innovations;
- technology oriented research and extension and local knowledge not sufficiently recognized by research and education institutions;
- research results not effectively reaching or entering education programmes;
- poor capacity among graduates to use participatory approaches in developing rural areas; and
- government research, education and extension departments being located in separate units, resulting in poor links and a fragmented approach.

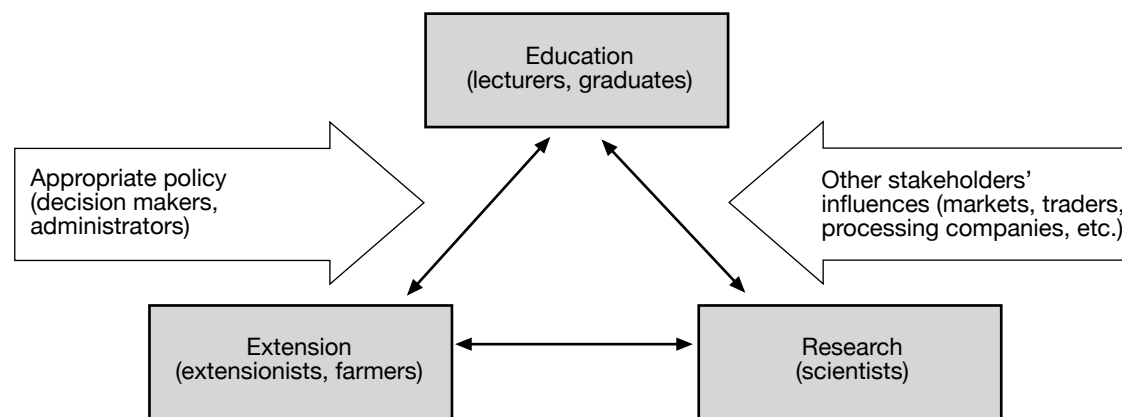
### Underlying causes

To understand the reasons for the missing links, we need to look at each of the three components in our model: education, research and extension.

**Education** was often not geared towards development – this was supposed to be

taken care of by the extension system alone. Similarly, universities in Africa and Southeast Asia often have weak research programmes (due to, for example, low salaries and poor facilities). Thus, education programmes often have limited research or extension content (although there are exceptions). Theoretical bias is common: programmes are too academic and do not have practical learning methods, making it difficult for graduates to face reality when they enter the job market. At the same time, lecturers tend to lack field-level skills. Too many curricula have been developed in a top-down, programme-based manner, as opposed to participatory and needs-based approaches. Finally, there is a lack of integration between university and ministry structures (hampering interdisciplinary education), and between researchers and educators.

The **research system** generally shows weak links with education and extension. This is because: i) research and extension in most countries are handled by separate institutions; ii) the research agenda is too narrow (i.e. not systems-oriented) and farmers do not participate sufficiently in identification of research topics, the conduct of research or feedback on results;



**Figure 1.** The research–education–extension continuum.

and iii) there is a lack of interdisciplinary team work, leading to sub-optimal use of existing human resources and a lack of synergy. Research results are therefore not disseminated effectively.

The **extension system** also has several bottlenecks that hamper the free flow of information with research and educational organizations. These include: i) a hierarchical extension approach, using one-way communication for spreading national policies and tending to overlook local knowledge and practices; ii) a focus on technologies that do not consider socio-economic or cultural aspects; iii) weak institutional support systems (e.g. resources, facilities, human resources, knowledge and skills) hamper the acquiring and sharing of knowledge; and iv) limited experience and lack of capacity in using participatory methods. In addition, cross-cutting policy and institutional factors influence the links between research, extension and education. Policy makers are often not sufficiently involved in the development process at a local level. Institutional structures do not help either; there are often several different ministries involved, which may or may not collaborate.

As a result of these bottlenecks and missing links, educational institutions face difficulties in teaching subjects that require interdisciplinary skills and a good grasp of current research and extension paradigms. Examples of such complex areas are the livelihoods in the ethnically diverse uplands of Southeast Asia, the links between local land use and environmental services, or farmers' postharvest processing and marketing.

Given the increasing interest in agroforestry education at tertiary level, how can individual institutions tackle the kind of issues

discussed above? They cannot change such a complex situation alone. To have a strong voice, they need to unite. Networking among universities and colleges has been found to be an effective tool.

### Development of regional networks

Several universities and colleges in Africa and Southeast Asia began to take an interest in agroforestry education during the mid-1970s. This was triggered by population increase, rapid changes in land use (including extensive deforestation) and issues raised by the global society about sustainable development and the environment, such as widespread soil erosion and land degradation. Educational institutions were also influenced by external factors, such as advances in international agroforestry research and development. The process of strengthening capacity for agroforestry education and training evolved through the following steps:

1. International training courses, such as the World Agroforestry Centre's 'Introduction to agroforestry research and development' in the 1970s and 1980s, exposed educators and researchers to agroforestry principles and practices.
2. Alumni tried to introduce agroforestry courses into their home institutions in Africa, Asia and Latin America, with varying degrees of success. This was done opportunistically.
3. A broader interest emerged in universities and colleges to incorporate agroforestry into education programmes, particularly in faculties of forestry.
4. Some institutions developed degree programmes (B.Sc. and M.Sc.) in agroforestry.
5. In time, many institutions began teaching agroforestry courses or programmes at technical, B.Sc. and M.Sc. levels, but there

were few mechanisms for institutional collaboration nationally or regionally (compared to forestry and agriculture).

6. The need for joint curriculum standards and sharing of resources was recognized.
7. Regional workshops were held, culminating in decisions by educational institutions to establish regional networks. This process was jointly facilitated by the Centre's African and Southeast Asian offices and key universities in the two regions.

Status and needs assessments and institutional visits to universities and colleges (conducted in the early 1990s in Africa and in 1997/8 in Southeast Asia) revealed a series of constraints to agroforestry education (Hansson 1992; Temu and Zulberti 1994; Rudebjer and del Castillo 1999):

- agroforestry was not recognized as specialization or discipline;
- agroforestry curricula were inadequate: they were often incomplete and lacked a common standard;
- training materials were in short supply: they were too few, too specialized, or in the wrong language, and even when materials were available, the libraries could not afford them;
- there was limited research capacity among staff and graduates;
- lecturers needed training in all aspects of agroforestry because agroforestry science had developed so fast that there were few trained teachers; and
- there were inadequate links with field practices.

At the same time, opportunities for networking were appearing. Agroforestry programmes were offered within many educational institutions. Stronger institutions wanted to take the lead while the 'weaker' ones wanted to learn from others. There was recognition of the challenges related to land sub-division and intensification of

land use. Agroforestry practices seemed to provide viable solutions. Governments, non-governmental organizations (NGOs) and multilateral organizations also took an increasing interest in agroforestry development. Support from the policy level increased, but human capacity was needed to implement such programmes. Partnerships with like-minded projects and organizations emerged, including links with social and community forestry efforts and sustainable agriculture.

Agroforestry network development took a major step forward when the Swedish Agency for International Development Cooperation (Sida) offered its support and, in 1993, the African Network for Agroforestry Education (ANAFE) was established. This network now has 123 member colleges and universities in 34 African countries and is organized into four regional sub-networks, some of which include national sub-networks. The Southeast Asian Network for Agroforestry Education (SEANAFE) was established in 1999. There are 76 member colleges and universities in five national sub-networks (Indonesia, Lao People's Democratic Republic [PDR], the Philippines, Thailand and Vietnam).

Latin American countries are also following suit and a planning workshop for a Latin American agroforestry network was held in 2002.

### **Membership, management and activities**

The networks link institutions rather than individuals. Membership is free. In Africa, any relevant institution may apply for membership. In Southeast Asia, given the potentially very large number of institutions in some countries, membership is based on invitation as advised by the National

Agroforestry Education Committee in each country.

Ownership by the members is secured through elected network leadership at regional, sub-regional (Africa) and national (Southeast Asia) levels. The members show commitment through sharing the costs of network administration and meetings. The medium- to long-term direction and strategies are discussed at regular meetings. The network coordination/facilitation units are located at the World Agroforestry Centre offices in Nairobi (Kenya) and Bogor (Indonesia), where they benefit from the latest advances in agroforestry research.

The networks conduct similar types of activities, with variations depending on national and sub-regional needs. The key activities are:

- curriculum review (using participatory approaches) and publication of guidelines for such reviews (e.g. Temu et al. 1995; Rudebjer et al. 2001);
- training-of-trainers in agroforestry theory and teaching methods;
- preparing, developing, translating and adapting teaching materials;
- supporting graduate thesis research in agroforestry;
- linking the networks to the regional agroforestry research agenda;
- pooling of resources and exchange of staff and experiences between institutions in the networks (where 'stronger' institutions assist 'weaker' ones);
- providing information on network outputs and activities through publications, newsletters and websites; and
- inviting policy makers to key events.

### **Achievements**

SEANAFE and ANAFE have already become powerful mechanisms for managing knowl-

edge and communicating and sharing experiences in agroforestry among educational institutions through their publications, newsletters, websites and databases. They are the largest working networks of educators in Africa and Southeast Asia and are recognized internationally – being regional hubs for the International Partnership on Forestry Education (IPFE), an initiative launched at the World Forestry Congress in 2003. IPFE, with initial support from the World Bank, aims to strengthen university-level education about forests and forestry worldwide, by facilitating and supporting collaboration.

The efficiency and relevance of the networks is enhanced by their regional and national sub-networks, which encourage local solutions to local problems. The networks form a platform for multidisciplinary dialogue among educators, researchers and development workers – effectively encouraging greater integration and synergy. Colleges and universities are realizing that, to be effective, they need to work more closely with farmers and to capture their experiences into teaching programmes. New and revised educational programmes emerge every year, all addressing various aspects of agroforestry and INRM. Due to changes in education policies, agroforestry and INRM are being accepted as important components of college and university education; institutions now consider agroforestry as a suitable platform for launching broader natural resource management programmes, such as watershed management or environmental conservation. At the national level, the networks have developed agroforestry teaching manuals for B.Sc. courses in local languages and institutions have established practical field sites for training, research and outreach activities. In addition, the Centre supports thesis research, staff exchange and attachments at their own research sites throughout the regions.

In conclusion, the institutional networks have proven valuable in terms of:

- changing attitudes among educators: there is now greater understanding of the need for local context in rural development;
- providing leadership for, and analysis of, agroforestry education within countries and regions;
- sharing experiences and enhancing programmes;
- bringing integrated approaches to natural resource management into education systems; and
- facilitating interaction between academics, researchers, policy makers, extension workers and farmers.

## Challenges

Although member institutions of ANAFE and SEANAFE have responded strongly to the need for curricula reform, there is still much to do, since the science of agroforestry is developing rapidly. For example, the emerging broad landscape view of agroforestry is still not widely covered. There is still a need to incorporate such knowledge into education programmes and develop methods for field-based learning with farmers.

ANAFE and SEANAFE also need to address the challenge of growing demand for participation and membership in the networks. The establishment of new, more decentralized sub-networks brings issues of sustaining leadership and communication at the regional level. Regional meetings are expensive to organize and mobilizing resources to support the growing networks will not be easy. It is easier to find resources for specific activities, such as training and teaching material development, than for network management. Furthermore, as demand grows it will be difficult to

develop and distribute sufficient academic materials to meet the growing need, particularly where countries use local languages of instruction (e.g. Lao PDR and Vietnam).

Finally, there is still a lack of policy-level recognition of agroforestry as a field of study and a career path. It is generally felt that there is need for agroforestry competence but a shortage of specific agroforestry jobs.

## Future opportunities

The two networks are very well placed to address weakness in the education system for natural resources management and to capture opportunities for educational change. The networks have brought individuals and institutions into long-term partnerships. They have come to know each other, which also opens opportunities for partnerships beyond agroforestry.

### Box 1. On-campus field laboratory in the Philippines

The Misamis Oriental State College of Agriculture and Technology (MOSCAT) in the Philippines began offering agroforestry education in 1995. Two programmes were offered: a diploma and a bachelor degree. Both required practical experience, but the lack of a convenient field site proved problematic. So, in 1998 25 hectares on campus were designated as an agroforestry field laboratory. The college itself had extremely limited financial resources, so the development of the field laboratory was based on forming partnerships with local agencies, international research centres, NGOs and the private sector. The bulk of the financial support was provided by SEANAFE.

Initially a simple banana and coffee plantation, the site now has a woodlot, windbreaks, a multistorey system with free-range chickens, silvipasture with free-range goats and sheep, alley cropping with improved natural vegetative strips, a nursery and a fishpond. Farm income (from production of maize, lanzones, rambutan, sweet potato, jackfruit, 'marang', chayote, cassava and chickens) increased from US\$117 in 2000 to US\$425 in 2003. The centre also has goats, sheep, and cattle. Networking with other stakeholders has promoted a multisectoral approach to agroforestry development at the local level.

Future plans include:

- domesticating indigenous tree species;
- producing seedlings through macro-propagation;
- collecting non-timber forest products;
- enhancing existing agroforestry systems for improved production;
- developing an agro/eco-tourism village; and
- strengthening links with national government agencies, NGOs and people's organizations through collaborative research and development.

The network approach can be applied in a broader context. For example, ANAFE is not strictly about agroforestry only. It is about natural resources management, integrated beyond forestry, beyond agriculture. There is a change of attitude among educators towards putting education into context in rural development. Experiential learning methods and tools are emerging and the teaching and learning environment is changing to include farmers' participation. Agroforestry programmes can thus serve as vehicles for broader rural development.

The networks also reach out to regions and countries outside their core area (e.g. Latin America and South Asia) to influence change. This role can be further strengthened, for example through IPFE.

Finally, while the networks in some cases are being institutionalized (i.e. their programmes are becoming part and parcel of the institutions' regular work), the implementation of many good ideas will depend on resource mobilization activities that attract donors. Better funding will ensure the networks can play an important role in reducing poverty and conserving the environment in Africa and Southeast Asia.

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