

Integrating natural resource education through national networks: experiences from Thailand and Indonesia

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Abstract

The tropical forests areas in Thailand and Indonesia are declining rapidly. The land use changes accompanying this decline are complex, reflecting the diverse biophysical, socio-economic and political environment in the two countries. Large areas that may be classified as forestland are de facto used by millions of small-scale farmers, resulting in a mosaic of land uses, including many agroforestry practices. These integrated landscapes serve multiple functions. They are a source of livelihood for their inhabitants and provide environmental services that concern watershed functions, biodiversity and climate change. New and integrated competencies are required to address and reverse current threats to rural livelihood and sustenance of the environment in Southeast Asia. University programmes in agriculture and forestry are considering these issues seriously. They are developing agroforestry education programmes that tackle natural resources management from an integrated perspective, and in closer collaboration with farmers and other stakeholders. With Indonesia and Thailand as examples, this paper examines how regional and national networks have addressed these issues through better integration among institutions and disciplines. The driving forces behind educational change are discussed in terms of policy-driven changes and changes initiated by universities themselves.

The Southeast Asian Network for Agroforestry Education (SEANAFE) was established in 1999 based on a status and needs assessment. National sub-networks were set up in 2001, first informally, then formally. These networks were better able to engage in the national policy dialogue and to take new opportunities following a de-regulation of higher education in Indonesia and Thailand. The national networks have contributed to increased integration in natural resources education through network-wide exchange of experiences and development of a joint strategy, better links among universities in planning and implementation, closer collaboration among faculties/ departments within a university, dialogue with policy makers, and increased participation with field-level stakeholders. Our experiences show that national university networks can have an impact on educational change. These efforts should continue, with particular attention to curriculum review, policy dialogue and links with the research system and the field.

Introduction

The tropical forest areas in Thailand and Indonesia are estimated at 14.7 and 105 million ha, respectively (FAO 2000). Thailand imposed a logging ban in 1989 to stem the rapid loss of their forests. Indonesia's wood processing industries need three to four times more wood than the forests can produce sustainably (IHT 2003). This contributes to con-

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tinued rapid loss of tropical forests. A parallel trend is the conversion of forestland to agriculture as a result of population increase and expansion of large-scale plantation crops such as oil palm. The forests continue to be reduced at rates of 0.7 % per year in Thailand and 1.2% per year in Indonesia (FAO 2000).

The trajectory of land use change is complex in both countries, and stakeholders' multiple interests sometimes lead to conflicts. The 1997 forest fires in Indonesia were partly triggered off by such conflicts. In Thailand the ethnic minorities in the uplands and the majority lowland communities might have different views on land use. In Indonesia indigenous people's rights need to be negotiated with a range of stakeholders, including transmigrants, forest and mining companies and commercial agriculture enterprises.

The classification of forestland is unclear in both countries. Areas classified as forestland in the upper and middle parts of watersheds are often used, *de facto*, for agriculture or are degraded or 'marginal'. Both countries have significant areas that are not tropical forests, rice paddies or intensive agriculture land; areas that often are managed by millions of small-scale farmers with or without secure land tenure. The resulting mosaic of land uses includes many agroforestry practices.

These integrated landscapes — with significant agroforestry elements — are important for both farmers' livelihood and sustaining environmental services. However, unsustainable land-use practices causing soil erosion and land degradation are common. There are considerable tradeoffs between local benefits and external environmental impacts regarding biodiversity, watershed functions and carbon sequestration at local, national and global scales. Given the right circumstances, small-scale farmers are reclaiming degraded areas by planting trees in more intensively managed agroforestry systems. Fruit trees and timber trees are often preferred. The trees outside the forest are increasing in importance.

This background leads to the main theme for this paper. While Southeast Asian landscapes and small-scale farmers' land management systems are highly integrated, tertiary education is often compartmentalised in disciplines such as forestry and agriculture. Furthermore, university education is frequently outdated, relying on top-down curricula and a didactic teacher-centred process as opposed to participatory and learner-centered approaches.

We describe a regional and national networking approach initiated in 1998 to improve quality and access to agroforestry education. Two countries, Indonesia and Thailand, are used to illustrate this process. The emphasis is put on analysing aspects of integration in both the networking process and in the outcome of networking efforts, through:

- A status and needs assessment in 1998 that pointed at insufficient integration as one of the weaknesses in agroforestry education.
- The establishment of the Southeast Asian Network for Agroforestry Education (SEANAFE) in 1999 as a regional mechanism for strengthening collaboration between countries, institutions and disciplines.
- The formation in 2001 of national sub-networks under SEANAFE, which increased the number of member universities and strengthened the integration and collaboration among disciplines and institutions.
- The resulting ability of national networks to better influence educational change through participation in national policy dialogue and by tapping new opportunities related to privatisation and autonomy of the university system in Indonesia and Thailand.

Status and needs assessment

In 1998 a status and needs assessment of agroforestry education was conducted in five countries in Southeast Asia (SEA). The study included 26 universities in Indonesia and 11 in Thailand (Rudebjer and Del Castillo 1999).

In Indonesia eight universities out of 26 taught agroforestry as a compulsory or elective course in BSc programmes. Most agroforestry courses were offered in faculties of forestry. In 1998 there was no full agroforestry degree programme in Indonesia, one reason being that the Ministry of Education did not recognise agroforestry as an official 'study programme' (Widianto 1999).

In Thailand 5 out of 11 universities offered agroforestry-related courses at BSc level, as a major, a core or an elective course. Two other universities offered MSc courses in agroforestry. Agroforestry was predominantly offered in agricultural programmes. As was the case in Indonesia no full agroforestry degree programme was offered (Vityakon et al. 1999).

Universities in both countries had by 1998 chosen to integrate agroforestry into existing natural resources programmes instead of offering separate degree programmes in agroforestry. Still many students in natural resources management programmes did not study agroforestry at all, because the subject was taught only in certain programmes or was offered as an elective. The study also identified a range of issues that confronted agroforestry education (Table 1), some of which related to the way agroforestry education is integrated at different levels:

- There is a great diversity in the content of agroforestry courses among universities of different disciplines, raising concerns about curriculum quality.
- Market demands for agroforestry graduates are not clear and the recognition of integrative competencies in the established career structure is unsatisfactory.
- Teaching staff has insufficient training in team teaching and interdisciplinary skills.
- Academic isolation among agroforestry teachers in different universities is common.
- There are insufficient links between universities and research and extension institutions.

Southeast Asian Network for Agroforestry Education

Objectives and activities

Based on the status and needs assessment, tertiary educational institutions in SEA decided to collaborate regionally to influence changes in agroforestry education. Thirty-three universities and colleges in five countries — Indonesia, Laos, Philippines, Thailand and Vietnam — established SEANAFE in 1999. The first general meeting of SEANAFE identified the following general objectives:

- Improve the quality, availability and accessibility of agroforestry education.
- Foster collaboration among disciplines in the educational system.
- Promote cooperation among stakeholders in agroforestry.
- Enhance exchange of information, staff, students and other resources among network members.
- Link agroforestry education to research, extension and practice in the field.
- Provide opportunities for human resources development in agroforestry education and training.
- Help create job opportunities for agroforestry graduates.

Table: Observations and recommendations on agroforestry education in Indonesia and Thailand

Area	Indonesia	Thailand
Curricula and policy	<ul style="list-style-type: none"> • Many interpretations of agroforestry and a diversity of content in agroforestry courses. • Urgent need to standardise the content of agroforestry courses in Indonesia. 	<ul style="list-style-type: none"> • Need for awareness by administrators of the significance of agroforestry education. • Need to develop agroforestry curricula and agree on 'minimum standards' for agroforestry courses and curricula to secure quality. • Need for a full programme in agroforestry and compulsory courses for all agriculture, forestry, natural resources and environment students.
Job opportunities	<ul style="list-style-type: none"> • Market demand for agroforestry specialists is not clear. • A study is needed on job opportunities. 	
Teaching staff	<ul style="list-style-type: none"> • Teaching staff need further training in all aspects of agroforestry. 	<ul style="list-style-type: none"> • Teaching staff should be trained in team teaching and interdisciplinary skills.
Collaboration	<ul style="list-style-type: none"> • Inter-university exchange of staff and students is recommended. 	<ul style="list-style-type: none"> • Establish a national network on agroforestry education.
Teaching materials	<ul style="list-style-type: none"> • The supply of books, journals and other teaching materials on agroforestry is inadequate. • Agroforestry demonstration plots are needed. 	<ul style="list-style-type: none"> • The access to textbooks in Thai language needs to be improved. • Teaching materials for 'self-learning' should be developed.
Research and extension	<ul style="list-style-type: none"> • Research results need to be packaged into manuals and field guides for agroforestry training. 	<ul style="list-style-type: none"> • Research on various aspects of existing agroforestry systems and practices should be conducted. • More effective links between universities; research and extension institutions should be established.

Source: Rudebjer and Del Castillo (1999).

To meet these objectives, SEANAFE carried out the following key activities:

- Providing technical assistance and administrative support.
- Curriculum development.
- Teaching materials supply, development and translation.
- Conducting multidisciplinary workshops.
- Conducting short courses and staff development.
- Supporting students' thesis research and teachers' field projects.

Management

The SEANAFE board, elected by the general meeting, manages the network. At the national level elected committees lead the work in each country. The SEA regional office of the World Agroforestry Centre (ICRAF) provides technical assistance and financial support to the network via a grant from the Swedish International Development Cooperation Agency (Sida).

How integration was supported

SEANAFE addressed the need for increased integration in agroforestry education via three key activities:

- Participatory curriculum development.
- Training of trainers.
- Creation of informal national teams among institutions, which jointly implement network activities.

The work was initiated at the regional level and progressed towards the national and finally institutional levels. For example, curriculum development started with the regional development of *A guide to learning agroforestry* (Rudebjer et al. 2001). The guide was then validated, adapted and translated in a series of national curriculum development workshops. Institutions subsequently used the national versions of the guide to review their curricula. Training followed a similar pattern with a regional training-of-trainers course, followed by national courses organised by a group of lecturers from different universities and colleges. Figure 1 illustrates the integration process at different levels, resulting in products with enhanced integrated content.

This dialogue among universities subsequently led to the formation of national agroforestry education networks. The informal networks then evolved into formal ones, triggered by the need to better address national issues in a setting of great cultural, political and historical diversity among SE Asian countries.

National networks in Indonesia and Thailand

Management

SEANAFE decentralised at the Second General Meeting in May 2001 to form five national networks that were fully operational the following year. The Indonesia Network for Agroforestry Education (IndoNAFE) and the Thai Network for Agroforestry Education (ThaiNAFE) were formally established in 2002. A national agroforestry education committee (NAFEC) was elected to lead each network, from among nominated candidates during a country general meeting. The NAFEC chair is also a member of the regional SEANAFE board, providing a mechanism for regional-level exchange. The day-to-day activities are coordinated by the NAFEC chair, but can take place at any of the member institutions.

Network activities

After one year of operation the national networks in Indonesia and Thailand have attracted more members (growing from 6 to 20 in Indonesia and 7 to 11 in Thailand). They have significantly increased the number and scope of activities and have attracted national policy support. The two networks conduct a similar range of collaborative activities in order to strengthen agroforestry education:

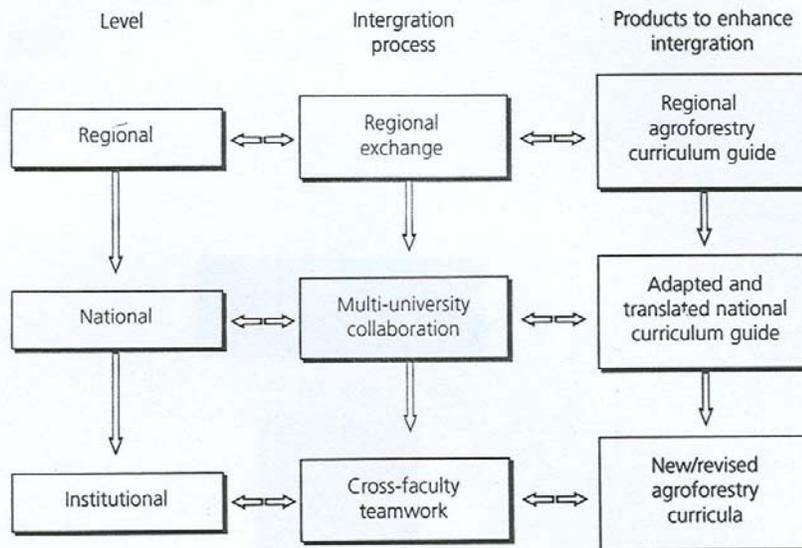


Figure 1: Integration in process and products.

- National network management, including organising meetings, administration and developing and network information.
- National workshops on agroforestry curriculum development that include policy makers and other key stakeholders.
- Training of trainers in priority agroforestry topics, e.g., on-farm experimentation in Thailand, and agroforestry entrepreneurship in Indonesia. Resource persons from different universities within the country organise these training courses.
- Development and translation of teaching materials by a team from various member institutions.
- Participation of farmers and communities in the teaching-learning process, through agroforestry demonstration farms, agroforestry research on farm and production of farmer-oriented information materials.
- Support to students' thesis research.
- Information and communication targeting a broader audience through promotion materials, newsletters and websites.

There are also approaches specific to each country:

- In Indonesia a teaching manual is being developed that matches the national agroforestry curriculum framework for a BSc level course in agroforestry.
- In Thailand agroforestry research projects at member institutions are supported through the network.

National policies and educational change

Changes in natural resources policies

A main reason for establishing national networks was the need for and opportunity to influence educational change, both by capturing policy changes in the natural resources

sector and by influencing national and institutional educational policies. Significant policy changes have been issued in both Thailand and Indonesia in recent years, many of which are recognising the need for better integration between sectors.

In Thailand the decentralisation of natural resources management is expressed in:

- The 1992 Tambon Administration Act under which sub-district government units are responsible for managing all natural resources within their boundaries.
- The new Thai Constitution of 1997, which states that local people and organisations should be involved in managing their natural resources.

Other important policies and initiatives in Thailand with a bearing on natural resources management include:

- The increase of national parks from 16 in 1979 to 81 in 1996.
- The development of a Community Forestry Bill, initiated in 1991 to involve local communities in managing communal forest areas (not yet approved).
- The Reforestation Act of 1992, promoting tree farming on private lands.
- Forest land use zonation. This implies reclassification of forest land into three land-use zones: conservation forest, economic forest and agricultural land reform.
- A 1994 five-year public reforestation campaign in commemoration of the Royal Golden Jubilee, promoting tree planting in degraded watershed areas, national parks, wildlife sanctuaries, roadsides, riversides and urban areas.
- Promotion of ecotourism by the Royal Forestry Department.
- A major Thai Government restructuring in October 2002, increasing the number of ministries from 14 to 20. The Ministry of Natural Resources and the Environment (MNRE) is among the new ministries. The Royal Forestry Department (RFD) has been divided into three departments: the Department of National Parks, Wildlife and Plants and the Department of Marine and Coastal Resources, both under MNRE, and the 'new' RFD under the Ministry of Agriculture and Cooperatives (MOAC).

Several recent policy decrees on natural resources management have also been issued in Indonesia, as noted by Colchester et al. (2003):

- The Agrarian Reform and Natural Resource Management, a decree passed by the Indonesian National Assembly in September 2001. The decree is one of the first pieces of law to acknowledge that agrarian and natural resources in Indonesia are being used unsustainably and that existing laws on land and natural resources overlap and contradict each other.
- The Regional Autonomy Act of 1999, which devolved much administrative and managerial authority to districts and townships, including over key sectors such as land, forestry, plantations and environment. Authority to issue framework legislation, and conservation remain at the centre.
- An amendment to the constitution that recognises the rights of customary communities.

Other policy initiatives and trends in Indonesia include:

- Harmonising forestland use zoning and provincial land zoning.
- Decisions to follow a social forestry approach, which implies more opportunities to practice agroforestry.
- A forest concession restructuring plan, especially to phase out current concessions, leading to the development of smaller concessions of up to 50,000 ha per unit.
- The government 'moratorium policy' to stop the conversion of natural forests to plan-

tation estates (however, forest concessions may plant estate crops such as rubber and tung-oil trees as their main tree species instead).

- The decentralisation in Indonesia gives more responsibility to local governments to manage their forest resources. Some activities are still under the central government control, such as ensuring proper management of forest management units that extend beyond regency or provincial borders. In managing their natural resources, the local governments tend to merge forestry, agriculture, veterinary, fishery and other agriculture activities into one integrated institution.
- Five policy priorities of the Ministry of Forestry in addressing existing forestry problems are elimination of illegal logging, prevention of forest fires, restructuring of the forestry sector, forest resources rehabilitation and conservation, and strengthening of forestry decentralisation.

De-regulation of higher education

In Thailand, a new National Education Act was passed in 1999. A student-centred teaching process is considered a key component for educational improvement. However, many schools still lack experience in such methods. A further major change is the privatisation of all public universities from 1 October 2002. The objective is to improve the efficiency of the universities, especially the decision-making process. The university council becomes the highest decision-making body instead of the ministry. A constraint is that the government cannot increase future budgets for salaries and investments. Universities seem to be forced to become self-reliant and to initiate income-generating activities. The process of privatisation is still going on.

In Indonesia a decree on autonomy for universities was issued in 2002. In its initial pilot stage this decree comprised four key universities, including two SEANAFE member institutions. Other universities will follow. Under the new policy the procedure for developing new study programmes, such as degree programmes in agroforestry, is simpler than before. The constraint is only market considerations.

University-initiated educational change

While operating under the national natural resources and educational policy framework described above, universities review their education programmes to match perceived needs of society. The on-going de-regulation of higher education in both Indonesia and Thailand gives universities more freedom to review old programmes and to introduce new ones.

SEANAFE has applied a participatory curriculum development approach to develop and review agroforestry curricula. A situation analysis was the starting point, based on training needs analysis, including task/skill/ job analysis; research results; field experiences and policy analysis.

A regional stakeholder workshop was organised to write a regional agroforestry curriculum framework. Teachers and institutional leaders, as well as employers, students, former graduates, non-governmental organisations, policy makers and others participated. After testing, reviewing and editing, *A guide to learning agroforestry* was published (Rudebjer et al. 2001).

In a second step the networks in Thailand and Indonesia held national workshops to draft curricula adapted to the respective situation analysis, educational environment and policy

context. The national curricula were written in the local languages. The universities progressively implement the new curricula as deemed suitable by each institution. New courses were included in existing programmes or entirely new programmes were developed.

Results

The need to rehabilitate and conserve SEA landscapes opens employment opportunities for new expertise in broader and integrative agricultural knowledge. At present such agroforestry-related jobs are still held by foresters or agriculturists with little experience in agroforestry. SEANAFE, established in 1999, and its national sub-networks in Indonesia and Thailand, initiated in 2001, have succeeded in bringing together people and institutions interested in developing agroforestry education. They have helped harmonise national efforts to change natural resources education towards more integrated curricula. National networks are better positioned than regional ones to capture national opportunities and participate in national forums.

The national networks in Indonesia and Thailand encourage integration as a mechanism for collaboration via:

- National network ownership in management, planning and implementation and through a national agroforestry education committee.
- Multi-university participation in many network activities.
- More intra-university collaboration in team teaching and multifaculty or departmental units, e.g., the agroforestry unit at Mulawarman University or the Agro-complex Cooperation System at Gadjah Mada University, both in Indonesia.
- Enhanced links between education and research through agroforestry research projects and thesis research.
- Strengthened links with the field through on-farm training and demonstrations.
- More frequent dialogue between the national network and policy makers.

The national multi-university teams have delivered a range of outputs that enhance agroforestry education. Specifically, they have:

- Produced national agroforestry curriculum frameworks in the national language, which harmonises the views of forestry and agricultural institutions.
- Held national training-of-trainers courses organised by a team from different universities in the country.
- Developed, translated and adapted teaching materials via multi-university projects.

The national networks have also been able to link with the broader policy framework in both countries:

- The Council of Deans of Agricultural Sciences in Thailand is now a dialogue partner of the Thai Network for Agroforestry Education. The council, which includes 16 deans from 14 universities, was set up in 1994 to be a forum for exchange of knowledge and educational development ideas among deans of agriculture, forestry and fisheries faculties.
- The Indonesian Network for Agroforestry Education has helped establish the broader focused Indonesian Agroforestry Society (Masyarakat Agroforestry Indonesia, MAFI). During its first congress held on November 2002 in Jogjakarta, MAFI invited the director general of forest rehabilitation and social forestry and the director general of estate crops. In their keynote papers, these directors discussed the integrated work between the departments of forestry and agriculture. Both policy makers confirmed

their departments' interest in agroforestry development programmes, either on forest or non-forest land (Sabarnurdin 2002).

Being in their early stage of formation, the national networks also face important challenges:

Indonesia

- The Indonesian network is attempting to find additional national funds. It would face funding constraints if the SEANAFE project stops too early, jeopardising its sustainability. Additional resource mobilisation is going on via MAFI.
- The exchange of students and lecturers among universities is important but is hampered by funding handicaps.
- The upgrading of libraries needs attention. Collaborative writing should be encouraged.

Thailand

- Networking is still a new thing in inter-university collaboration. Universities need to keep working and learning together.
- There are few teachers working in the field of agroforestry.

Conclusions and recommendations

SEA is in a stage of very rapid changes in land use and in natural resources policy. There is a large 'gray zone' in the landscapes — areas that are neither for forestry nor for traditional agriculture. Integrating the management of these landscapes calls for closer links and collaboration among traditionally rather separate disciplines. These needs are being addressed by universities in the region through SEANAFE since 1999 and through national networks since 2001.

In Indonesia and Thailand the national networks have contributed to increased integration in natural resources education, through:

- Network-wide activities to exchange experiences and jointly develop a strategy for strengthening agroforestry education in SEA, first regionally, then nationally.
- Better integration and collaboration between universities within the country through national network leadership and joint educational activities, such as curriculum development, training of trainers and teaching materials development.
- Closer integration between faculties/departments within a university.
- Including policy makers as participants in national meetings and curriculum development workshops.
- Increased participation with field-level stakeholders through on-farm experimentation, field visits and demonstration plots.

Both Indonesia and Thailand are decentralising the administration of natural resources management and the higher education system through autonomy (Indonesia) or privatisation (Thailand). Universities in both countries are now free to set up educational programmes according to their own needs assessment, as opposed to being directed by the government's central education authority. SEANAFE's national networks are well positioned to capture the opportunities that arise from this decentralisation. They especially should:

- Continue and further strengthen the national dialogue with policy makers.
- Mobilise additional national resources for network activities.

- Influence member universities to revise or develop new and more integrated education programmes in agroforestry and natural resources management, while paying attention to the job market.
- Strengthen the competence in designing integrated educational programmes.
- Jointly develop, translate and adapt teaching materials that convey a broader integrated view on agroforestry.
- Continue organising national training-of-trainers courses on topics of relevance to integrated natural resources management.
- Develop learner-based teaching methods that recognise the importance of field-based education, integrated production systems and participation of farmers.

Our experiences in Indonesia and Thailand show that national university networks can help integrate disciplines and create more effective links among institutions and as a result influence educational change. Much remains to be done, however, and these efforts need to continue. The national networks should continue developing and revising the curricula. They should deepen the policy dialogue that has been initiated. They should further strengthen their links with the research system and the field level.

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