



Proceedings of the workshop on coastal forest rehabilitation and management in Asian tsunami-affected countries

26 September 2006, Bangkok, Thailand



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Compiled and edited by Jeremy Broadhead and Robin Leslie

**FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
REGIONAL OFFICE FOR ASIA AND THE PACIFIC**

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Foreword

Twenty months after the 2006 Indian Ocean tsunami, the one-day workshop in Bangkok on “Coastal forest rehabilitation and management in Asian tsunami affected countries” served to exchange information on post-tsunami coastal forest rehabilitation and identify related long-term needs.

The workshop was organized by the FAO Regional Office for Asia and the Pacific under the Government of Finland funded “Forestry programme for early rehabilitation in Asian tsunami affected countries” and centred on presentations provided by representatives of national forestry agencies from India, Indonesia, Malaysia, Maldives, Myanmar and Sri Lanka. The presentations drew attention to:


- the pre-tsunami status of coastal trees and forest resources and impacts of the tsunami;
- the status of implementation of coastal forest rehabilitation and issues that have emerged;
- lessons learned, policies, legislation and institutional factors affecting management of coastal forests and trees; and
- key needs to support short- and long-term efforts in coastal forest rehabilitation and management.

Representatives of regional and international organizations, NGOs and donors also participated and presentations of programmes and activities in coastal forest rehabilitation were given by the IUCN on initiation of the Mangroves for the Future Initiative (MFF). The Green Coast/WWF Aceh project and the Coastal Greenbelt Initiative of the Global Environment Centre were also presented.

The meeting’s key message was that although the tsunami caused direct damage to forests in the worst hit areas of Indonesia, Sri Lanka and India, a more significant outcome has been a heightening of awareness of the degraded state and continuing loss of coastal trees and forests in the region. The social and environmental implications of these losses are varied but in general the repercussions of forest and tree removal are felt most acutely by poorer sections of society and associated environmental costs are seldom born by those reaping direct benefits.

The opportunity exists to improve the situation through reform of policy and management of coastal areas such that conservation and rehabilitation of coastal trees and forests are better facilitated. The direct activity of planting trees is an integral, but by no means the only, part of this effort as post-tsunami experience has shown – seedlings were often planted only to be subsequently removed or to die because of inadequate assessment of the prevailing policy, economic and physical environments.

The recommendations of the workshop reinforced the appropriateness of many of the activities undertaken by the FAO’s current regional forestry-tsunami programme and provided valuable inputs for future activities and forthcoming work such as that proposed under the Mangroves for the Future Initiative, due to begin in 2007.



He Changchui

Assistant Director-General and
Regional Representative for Asia and the Pacific
Food and Agriculture Organization of the United Nations

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1 Introduction

The impacts of the 2004 Indian Ocean tsunami on coastal areas in Asia drew attention to the role and status of coastal forests, green belts and buffer zones. In response the regional workshop “Rehabilitation of tsunami-affected forest ecosystems: strategies and new directions” was held at FAO’s Regional Office for Asia and the Pacific in March 2005 to exchange information on the impacts of the tsunami on forest resources and to discuss plans for forest-related rehabilitation and collaboration.

This workshop on “Coastal forest rehabilitation and management in Asian tsunami-affected countries” followed up on the March 2005 meeting in reviewing the status of forest rehabilitation and looking at needs for long-term support for coastal forest management 20 months after the tsunami. The overall objective of the workshop was to facilitate dialogue between countries on post-tsunami forest rehabilitation, coastal management and forest-related disaster management and to identify opportunities for collaboration among countries. The specific aims were to collate and share information from Asian tsunami-affected countries on:

1. The pre-tsunami status of coastal trees and forest resources and the forest-related impacts of the tsunami, if any.
2. Policies and legislation affecting coastal trees and forests.
3. The extent to which forestry is included in rehabilitation and disaster management plans.
4. The implementation status of coastal forest rehabilitation, issues that have emerged and lessons learned.
5. Key national needs (technical advice, capacity building, financial assistance) to support rehabilitation efforts.

Government representatives of India, Indonesia, Malaysia, the Maldives, Myanmar and Sri Lanka presented papers on their respective national situations and representatives of IUCN, WWF and the Global Environment Centre gave presentations on tsunami-related forestry initiatives.

The workshop related closely to two other regional meetings organized by FAO on key issues highlighted by the 2004 tsunami:

1. “Coastal protection in the aftermath of the Indian Ocean tsunami: What role for forests and trees?” 28–31 August 2006, Khao Lak, Thailand.
2. “Coastal area planning and management in Asian tsunami-affected countries”, 27–29 September 2006, Bangkok, Thailand.

Information on all FAO’s tsunami/forestry-related workshops and activities can be accessed at: www.fao.org/forestry/site/tsunami/en

2 Welcome speech

Mr He Changchui, Assistant Director-General and Regional Representative for Asia and the Pacific

Distinguished participants, colleagues, ladies and gentlemen, it is my great pleasure to welcome you, on behalf of the Regional Office of the Food and Agriculture Organization of the United Nations, to this important regional workshop.

The impacts of the 2004 Indian Ocean tsunami on coastal areas in Asia have drawn attention to the roles of forests and trees in enhancing coastal livelihoods and ecosystems and in providing coastal protection. In March 2005, soon after the tsunami, FAO convened a regional workshop “Rehabilitation of tsunami-affected forest ecosystems: strategies and new directions”, at our regional office here in Bangkok. The purpose was to exchange information on forest-related tsunami impacts and associated rehabilitation plans and to discuss opportunities for collaboration. The workshop brought together over 50 representatives of affected countries, regional and international organizations, NGOs and donors.

The workshop today is a follow up to that first meeting. Several people who were at the first meeting have joined us again. A warm welcome to you and to the many new faces.

FAO has been able to convene this meeting thanks to the generous contribution of the Government of Finland, through the “Forestry Programme for Early Rehabilitation for Asian Tsunami Affected Countries”. We are honoured that the Ambassador of Finland to Thailand and the Forestry Advisor of Finland’s Ministry of Foreign Affairs are able to be with us here today.

The goal of the workshop is to increase understanding of coastal forest rehabilitation and management and to support improvements in livelihoods and the environment in areas affected by the 2004 tsunami. Now, almost two years after the tsunami, the affected countries are moving from emergency response into long-term rehabilitation and development. This is an opportune time to take stock of forest rehabilitation efforts carried out to date and to identify needs for long-term support for coastal forest management. We call on participants to identify actions to improve coastal forest rehabilitation and management for future development in the tsunami-affected countries.

We hope that the workshop findings will contribute to improved rehabilitation efforts in tsunami-affected countries. Further, we anticipate that lessons learned will be brought to bear on improved coastal area management in other areas.

The workshop outputs will also contribute to linking country priorities with the IUCN-led Mangroves for the Future Initiative, or MFF. Starting in 2007, this is a multi-agency, multi-country initiative that aims to strengthen livelihoods and reduce the vulnerability of coastal populations in South and Southeast Asia and the western Indian Ocean. FAO is supporting it and looks forward to collaboration with the other partners of MFF in its focal activities, including livelihood support, protected areas, ecosystem restoration and integrated coastal zone management and ecosystem valuation. We hope that this workshop will help to foster collaboration with MFF and other worthwhile initiatives in the region.

FAO, with funding from several donors, supports an active programme for tsunami rehabilitation in the forestry, agricultural and fisheries sectors through 75 projects, ongoing or completed, with a combined worth of US\$65 million. We are working hard to foster coordination across these sectors and to address cross-sectoral issues in tsunami rehabilitation efforts in the affected countries.

The workshop on “Coastal area planning and management in Asian tsunami affected countries”, which will be held here from tomorrow through Friday, will discuss key post-tsunami land-use issues that affected countries are grappling with. We are pleased that many of you will also be present. The outcomes of the meeting today will be certainly relevant to the agenda of the next few days and will help to put your discussions into a broader context.

I wish you a fruitful exchange of ideas and information today and successful workshop outcomes. I hereby declare the workshop open.

Thank you.

3 Abstracts

Coastal forest rehabilitation and management in Bangladesh¹

Md. Mozaharul Islam, Deputy Conservator of Forests, Divisional Forest Officer, Sundarbans West Forest Division, Khulna, Bangladesh

The Bangladesh coastline is approximately 710 kilometres long and the densely populated coastal zone covers around 2.85 million hectares. Agriculture is the main activity in the coastal zone, although fishing and salt production are also widespread. Additionally, gas, minerals and aquaculture make significant economic contributions. The coastal zone is particularly susceptible to tropical storms and tidal surges which are a great hindrance to development. For this reason, mangrove shelterbelts are considered to be very important for the country. Coastal afforestation was initiated in the 1960s to protect life and property from cyclones and tidal surges. Over the last four decades the Forest Department has established some 148 000 hectares of mangrove plantation.

The coast of Bangladesh was not affected significantly by the tsunami of 2004. However, degradation of mangrove habitats is evident in Bangladesh, as in many other countries in the region. Causes include changes in the physical environment, overexploitation and conversion to shrimp ponds. A green (tree) belt establishment programme was completed in 2002 and several other programmes are currently underway to rehabilitate coastal forests. Success of past programmes has, however, been highly variable and generally unsuccessful as a result of inadequate knowledge of mangrove ecology.

The main responsibility for forest-related policy implementation in Bangladesh lies with the Forest Department and protection of the country against natural disasters is the main objective of the 1992 National Environment Policy which emphasizes maintenance of ecological balance and sustainable development. To support coastal forest rehabilitation, priorities include developing ecological knowledge and information, building capacity, accessing technical advice and financial assistance and improving cooperation and collaboration.

Coastal forest rehabilitation and management in India

Sanjay Kumar, Deputy Inspector-General — Forests, Ministry of Environment and Forests (MoEF), India

The narrow continental shelf and higher poverty levels amplified tsunami destruction along the east coast of India in 2004. Rapid assessment of the damage revealed that the damage became less severe towards the north along the east coast. Extensive damage to coral reefs and mangroves was reported, with the most severe damage in the Andaman and Nicobar Islands which house the most diverse mangroves in the subcontinent. In a few of the islands, mangrove loss was total. Noticeable changes in coastal landforms and wetlands with heavy mineral deposits impacted heavily on coastal and marine life forms.

The significance of coastal shelterbelts in mitigating the risks of natural disasters was recognized quite early on by Indian policy-makers who made them regular components of central, state and externally-assisted developmental programmes. In addition, the lessons learned in coastal plantation and mangrove rehabilitation under the National Cyclone Risk Mitigation Project following the super cyclone of 1999 helped to underscore and fine-tune the bioshield establishment component of the integrated post-2004 Tsunami Reconstruction Programme of India coordinated by the National Planning Commission.

A number of central and state government ministries, *inter alia* Environment and Forests, Agriculture, Defence, Tourism, Mining, Home and Commerce are responsible for various aspects of regulation and development in coastal areas, but the Coastal Regulation Zone notification under the Environment (Protection) Act, 1986 has an overarching mandate for the Integrated Coastal Zone Management Plan.

¹ This paper was not presented during the meeting.

Strengthening of village-level institutions, an enabling environment for private plantations in coastal areas, capacity building among frontline staff and better coordination amongst various line ministries are the key areas identified for continued support by the government. The framework for such focused action is already provided under the newly promulgated National Environmental Policy, 2006.

Coastal forest rehabilitation and management in Indonesia

Adi Triswanto, Head, Mangrove Forest Utilization Section, Mangrove Forest Management Division, Directorate of Land and Forest Rehabilitation, Ministry of Forestry, Indonesia

Indonesia is one of the wealthiest countries in the world in terms of biodiversity. Mangrove forests are an important component of the coastal forest ecosystem. The tsunami disaster heightened public awareness of the important role of the forest in Indonesia. Indonesia has about 9.3 million hectares of mangrove forest, of which more than half is currently degraded, a situation that prevailed before the tsunami struck. Therefore, the Government of Indonesia is attempting to restore these areas through a mangrove and coastal forest rehabilitation programme. To support the initiative the government has also prepared policies, legislation and other administrative tools.

Coastal forest rehabilitation and management in Malaysia

Mohd Ridza bin Awang, Forestry Department of Peninsular Malaysia HQ., Ministry of Agriculture, Malaysia

Malaysia is for the most part a maritime country with over 4 800 kilometres of coastline. Peninsular Malaysia's coastline extends for 1 792 kilometres and 30 percent of this is covered by mangroves. In 2005, there were approximately 566 856 hectares of mangroves, mainly located along the west coast of Peninsular Malaysia, northeast of Sabah and in the deltas of Rejang and the Terusan–Lawas rivers in Sarawak. Recognizing the crucial role that mangrove forests played in mitigating loss of life and damage to property by the December 2004 tsunami, Malaysia embarked on a tree-planting programme along its coastline. A national taskforce committee for the "Tree Planting Programme along the Coastline", headed by the Secretary-General of the Ministry of Natural Resources and Environment was formed; it is supported by the planning and implementation technical committee and the research and development technical committee. Committee members comprise representatives from related government agencies at federal and state levels, the private sector and NGOs. A total of 5 998 hectares along the coastline (including tsunami-affected areas) will be planted over a five-year period under the Ninth Malaysia Plan (2006–2010) with government funding. Selected areas have been allocated to one of three categories: Category 1 (coastal area with severe erosion and unstable land condition); Category 2 (coastal area with moderate erosion and less stable land condition); and Category 3 (coastal area with little or no erosion and stable land condition). The committee has adopted several approaches for implementing the tree-planting programme. By the end of June 2006, about 170 hectares of coastal area (Category 3) had been planted by the Forestry Department Peninsular Malaysia with approximately 480 000 mangrove seedlings and seedlings of other trees species.

Coastal forest rehabilitation and management in the Maldives

Faisal Hussain, Agriculture and Forestry Service, Ministry of Fisheries, Agriculture and Marine Resources (MFAR), the Maldives

A limited number of species are present in the coastal vegetation of the Maldives. Being an island nation surrounded by sea, coastal vegetation plays an important role in protecting the islands from salt spray and monsoon winds and has multiple functions with regard to economic, social, educational, conservation and heritage values.

The 2004 tsunami had a severe effect on coastal vegetation as some islands were completely “over-washed” and there was considerable accumulation of debris. Directly after the tsunami the Ministry of Environment conducted a joint survey with UNEP and the UN Office for the Coordination of Humanitarian Affairs (OCHA). An interministerial task force was formed to oversee activities.

Since the tsunami, communities have become more aware of the environmental importance of coastal vegetation and activities such as planting of trees and research are being carried out.

There is still need for a thorough assessment of forest and tree resources and the potential for this is closely linked to the capacity of authorities involved. Thus more capacity-building opportunities and short- and long-term funded projects are needed to conserve and sustainably utilize the resource.

Coastal forest rehabilitation and management in Myanmar

U Tin Tun, Deputy Director, Nature and Wildlife Conservation Division, Forest Department, Myanmar

Myanmar has a coastline exceeding 2 000 kilometres along the Bay of Bengal and has several areas where mangroves are common. Due to expansion of agricultural land and excessive cutting of fuelwood, the area of mangroves in Myanmar decreased by approximately 50 percent between the early 1990s and 2002. Despite efforts by the Forest Department, a gradual conversion of mangroves for agriculture, aquaculture and dwelling purposes has occurred.

Myanmar suffered little damage as a result of the 2004 tsunami although there was some loss of life. Mangrove forests of the Ayeyarwady Delta are now being rehabilitated and conserved and protected areas comprising extensive areas of mangrove forests are being proposed. To encourage natural regeneration and stand improvement, improved felling techniques to fulfill rehabilitation needs are also being carried out in degraded mangrove forests.

The Forest Department is the main agency responsible for conservation, protection and management of forests in Myanmar. Other departments, however, do control use of certain categories of land and land tenure and customary rights have significant impact on forests and trees. The 1995 Myanmar Forest Policy formalizes the commitment and intent of the government to ensure the sustainable development of forest resources for social, environmental and economic purposes. The 1992 Forest Law encourages stakeholder participation in forest management and private sector involvement in forestry sector development.

Key needs relating to coastal forest rehabilitation and management include: alleviation of pressure on coastal forest; collection of information on resource use and distribution; implementation of land-use planning and demarcation; settling of land tenure and water-related disputes; legal, administrative and institutional execution of coastal resource management policy and matters concerning natural resource concessions; and monitoring and safeguarding of indigenous rights.

Coastal forest rehabilitation and management in Sri Lanka

Amara Liyanaarachchi, Senior Deputy Conservator of Forests, Forest Department

Ministry of Environment and Natural Resources, Sri Lanka

A pre-tsunami forest cover survey in 1999 estimated a total of 9 530 hectares of mangroves in Sri Lanka. The mangrove ecosystems in Sri Lanka occupy thin coastal strips and comprise 23 mangrove species and 14 mangrove-associate species. The largest areas of mangrove forest are in Trincomalee and Batticaloa districts. Other coastal forest resources include *Casuarina* plantations established by the Forest Department, which form part of the 3 400-hectare green belt, the largest expanse of which is in Trincomalee. There are also shrub forests, protected areas and trees in home gardens including coconut, pandanus, neem, teak and *Terminalia catalpa*.

Frontline mangroves were damaged in Batticaloa and Ampara districts as a result of the tsunami but provided protection and also prevented erosion. In Batticaloa District, many *Casuarina* and coconut trees were damaged but there was little or no damage in other areas. In Jaffna, extensive areas of palmyra were broken, uprooted and defoliated by soil salinization but no significant protection was provided. Coastal forest rehabilitation has included rehabilitation of damaged mangroves, establishment of coastal forest and planting of shelterbelts.

The main government agencies responsible for coastal areas are the Coast Conservation Department (CCD), the Forest Department and the Wildlife Conservation Department. The main policies include the Coast Conservation Act and Policy, the Forest Ordinance and Policy and the Fauna and Flora Protection Act and Policy. The CCD management plans focus less on forests for coastal protection and more on hard structures and there has therefore been less emphasis on conservation of coastal forests. The forest and wildlife departments, for their part, prioritize inland forests but there is no specific agency that focuses on coastal vegetation.

Institutions with sufficient capacity and experience in participatory techniques and community mobilization should be supported and ecosystem managers recognized as sources of technical support for the propagation and management of coastal forests. Donor assistance is required to support these activities as the government does not have sufficient funding available.

Mangroves for the Future: Investing in coastal ecosystems as development infrastructure

Kent Jingfors (IUCN Asia)

Mangroves for the Future (MFF) aims to promote investment in coastal ecosystem conservation as development “infrastructure”. The initiative, running from 2007 to 2011 with a total funding target of US\$62 million, provides a long-term response to address the critical state of ecosystems, livelihoods and coastal management in Indian Ocean countries. MFF builds a collaborative platform for different countries, sectors and agencies to work together towards a common goal: To conserve and restore coastal ecosystems as key assets which support human well-being and security. It seeks to match funding and other resources to the locations, actions and agencies where they are needed most.

MFF targets countries that are recovering from the Indian Ocean tsunami. Its “focal countries” are some of the worst-affected nations: India, Indonesia, the Maldives, the Seychelles, Sri Lanka and Thailand. The initiative will also initiate a dialogue and sharing of information and experiences with other tsunami-affected countries in the region that face critical ecosystems and livelihood issues, including Bangladesh, Kenya, Malaysia and Tanzania. Additional countries within the Indian Ocean region will also at a later stage be brought into these dialogues, such as Cambodia, China, Pakistan, the Philippines and Viet Nam. An ocean-wide approach will be promoted to coastal management.

Green Coast experiences of coastal forest rehabilitation towards ecosystem and livelihood sustainability

Marie-José Vervest (Green Coast/WWF Aceh)

Four international environment organizations: Wetlands International, WWF, IUCN and Both ENDS, initiated the Green Coast project to restore and manage coastal ecosystems to increase livelihood security for coastal communities in tsunami-hit regions.

Assessments of tsunami impacts on ecosystems and livelihoods were conducted by Green Coast partners in India, Thailand, Malaysia, Indonesia and Sri Lanka. These were built on the rapid assessments done by governments and NGOs in cooperation with UN agencies, and took full advantage of the surveys, satellite imagery and syntheses available.

Green Coast partners work within local communities, disbursing funds through NGOs and community-based organizations to work on ecosystem restoration. Forestry rehabilitation, including mangroves, and multiple species-based shelterbelt plantations in demonstration plots provide protection to households as an alternative to the conventional *Casuarina*/palm tree shelterbelt.

The paper presents the results of the forestry rehabilitation experience gained by the Green Coast project partners over 12 months of implementation. The lessons learnt are useful in formulation of coastal forest rehabilitation strategies that enhance overall ecosystem resilience and connectivity of forests with regard to their habitat service functions including fisheries and coastal protection, and production of products such as fuelwood, nuts, fruits, or fibre.

Coastal Greenbelt Initiative: Development of green belts to protect coastal communities and resources

Faizal Parish (Global Environment Centre)

Not available

4 Recommendations

Three working groups were given the task of identifying recommendations for national and regional/international level action to promote improved management of coastal forests and trees focusing on (i) India, Sri Lanka and the Maldives; (ii) Indonesia, Malaysia and Myanmar; and (iii) regional issues. Possible categories of recommendations were suggested and are listed hereunder.

1. Information collection/coordination.
2. Policy, legislation and institutions.
3. Capacity building, technical assistance.

The output from each of the working groups is given in Appendix 4. The recommendations below were consolidated on the basis of those provided by the three working groups. They were subsequently endorsed during a final plenary session.

AGREED RECOMMENDATIONS

The workshop participants identified the following recommendations and encouraged national, regional and international level organizations to support their implementation:

1. Information collection/coordination

- 1.1. Ensure that information collection is accurate and independent and in accordance with existing formats.
- 1.2. Make full use of locally available knowledge of different stakeholders in addition to government information collection efforts.
- 1.3. Synthesize information from the local level for distribution at regional and national levels.
- 1.4. Make information available in local languages.
- 1.5. Provide support for collection of data on distribution, types, trends and status of mangroves and other coastal forest, for example through the FAO Forest Resources Assessment.
- 1.6. Collect and share lessons learned on rehabilitation, establishment and management of coastal forests — both tsunami related and more generally (such as practised by Green Coast Partners and the Coastal Green Belt Initiative).
- 1.7. Implement long-term monitoring of coastal forest rehabilitation pilot sites.
- 1.8. Collect and disseminate information on the effects of climate change on coastal forests and the role of coastal forests in mitigating the adverse effects of climate change
- 1.9. Prepare and disseminate:
 - Guidelines on good practices in coastal forest protection and management.
 - Technical materials for training and extension in relation to coastal forest rehabilitation.
 - Generic information, awareness raising and technical materials for country-level adaptation.

2. Policy, legislation and institutions

- 2.1. Assess existing policies and regulations to ensure they support the sustainable management of coastal forests.
- 2.2. Bridge gaps between existing policies and legislation, and implementation, such as through development of regulations or facilitation of existing regulations.

- 2.2. Promote participatory and consultative mechanisms for the development of forest rehabilitation-related plans and policies.
- 2.3. Establish coordination forums at local, provincial and national levels to facilitate coordination and avert policy conflict and overlap.
- 2.4. Assess the level of incorporation of forests into coastal area planning and management.
- 2.5. Share experience in relation to clarifying jurisdiction over coastal forest areas (including land tenure, access rights, customary law and the responsibility of different agencies).
- 2.6. Develop guidelines on incorporating forestry into coastal disaster management strategies and plans; regional or international organizations or partnership responsible.
- 2.7. Document and promote best practices in collaborative coastal forest protection and management.
- 2.8. Strengthen information exchange and coordination between international, regional and bilateral agencies supporting coastal forest management and rehabilitation.
- 2.9. Support Mangroves for the Future as a strategic and collaborative initiative to promote investment and action in ecosystem conservation for sustainable coastal development and livelihood improvement.

3. Capacity building and technical assistance

- 3.1. Build capacity to implement multistakeholder, participatory processes and consultation in developing and implementing plans and projects in relation to coastal forest rehabilitation.
- 3.2. Implement technical training, and also communication and policy-related training, for government and non-government organizations and local communities working in coastal forest rehabilitation.
- 3.3. Promote partnership in forest rehabilitation efforts (e.g. public–private–community partnerships).
- 3.4. Strengthen links with research and education institutions, especially with respect to technical matters concerning coastal forest management.
- 3.5. Use and strengthen existing organizations and social capital to promote coastal forest rehabilitation.
- 3.6. Develop general training modules that could be adapted for national and local use.
- 3.7. Provide increased support (including financial resources) for South–South cooperation and exchange.
- 3.8. Support capacity building in national level institutions through strengthened regional networking.