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## **Lessons Learned in Recovery**

# **Post-Tsunami Relief and Reconstruction for Sustainable Coastal Development**

**Asian Institute of Technology Conference Center  
February 15-17, 2006**

**A Workshop Hosted by the USAID Post-Tsunami Sustainable Coastal  
Livelihoods Program**

**In Collaboration with the US Government Indian Ocean Tsunami Warning System  
Program (IOTWS)**

## **Proceedings Report**

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Learning Workshop Participants at the IOC/WESTPAC Conference, Phuket, Thailand

## Executive Summary

The first of two learning workshops on the post-tsunami transition from relief to rehabilitation and reconstruction was convened at the Asian Institute of Technology on February 15-17, 2006. Participants to the workshop were middle to high-level government professionals and post-tsunami program managers. The goal was to share experience between different tsunami impacted regions on responses and interventions to capture what worked, what did not, and why.

Working groups on five theme areas shared experience through discussions on key issues, lessons learned, good practices and guiding principles for post-tsunami rehabilitation and reconstruction. The five thematic areas were sustainable fisheries and aquaculture; microfinance and building diversified livelihood opportunities; community-based disaster preparedness; infrastructure reconstruction and coastal development; and co-management of marine parks and fisheries. For a diverse group of professionals coming together for the first time, the three-day workshop was highly productive and set the foundation for more in depth discussions at the second workshop scheduled for February 2007.

This proceedings report highlights the main findings from the workshop. Some of the common themes that repeatedly came up in working group and plenary discussion were:

- Coordination among donors, NGOs and government organizations
- Use of mechanisms for local participation and capacity building in recovery and reconstruction efforts
- Tailoring actions to site specific contexts, including decisions on coastal protection structures and recognition of local culture and indigenous knowledge
- Training and capacity building
- Use of natural barriers as a bioshield to protect people
- Adoption of ecosystem based management measures within an integrated coastal management framework

It is interesting to see the commonalities between the outputs of the learning workshop and the Cairo Guiding Principles for Post-tsunami Rehabilitation and Reconstruction.<sup>1</sup> The Cairo Principles were the outcome of an international conference held February 17, 2005 and have been put forward at numerous regional and international meetings as widely accepted guidelines for post-tsunami rehabilitation and reconstruction.

The same participants to the 2006 workshop will be invited to reconvene for the second learning workshop in February 2007. We anticipate that with additional time having passed since the disaster, one of the main goals of that workshop will be to spend more time in introspection and digging deeper into capturing experience on what works and does not with reference to the first workshop outputs and Cairo Guiding Principles.

The outputs of the first workshop will feed into the U.S. government Indian Ocean Tsunami Warning System Program's work on tsunami resilient communities. There were also be a number of ideas for maintaining a dialogue among workshop participants in the time before the second workshop, including creating an email listserver, sharing information and reports from participants' respective post-tsunami activities, and meeting at other conferences and regional events.

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<sup>1</sup> Cairo Conference, Annotated Guiding Principles for Post-tsunami Rehabilitation and Reconstruction, United Nations Environment Programme (UNEP-GPA), ([http://www.gdrc.org/oceans/tsunami\\_coastal-guidelines.html](http://www.gdrc.org/oceans/tsunami_coastal-guidelines.html))

## Introduction

The USAID Post-Tsunami Sustainable Coastal Livelihoods Program in partnership with the U.S. government Indian Ocean Tsunami Warning System Program (IOTWS) hosted the first of two linked regional learning workshops on post-tsunami relief and reconstruction for sustainable coastal development on February 15-17, 2006. These workshops are organized to learn from the relief and reconstruction experience of the December 26<sup>th</sup>, 2004 tsunami and to enhance good practices that minimize coastal vulnerability and impacts of future coastal disasters.

This first workshop focused on sharing experience between professionals and practitioners from different tsunami devastated countries. The goal was to review lessons learned and best practices for promoting sustainable coastal development that reduces vulnerability to natural hazards.

The three day event drew together participants from each of five tsunami affected countries (Indonesia, India, Maldives, Thailand and Sri Lanka) and Vietnam. In addition, other resource people and experts from Thailand, Malaysia and the United States participated in some or all of the workshop (see participant list in Annex 1).

Objectives of the workshop were to:

- Learn from success stories, assess failures, and generate new ideas to improve programs and to expedite the recovery process
- Exchange information and share experiences
- Identify guidelines and good practices in disaster relief and reconstruction
- Create a regional practitioner learning network

Five thematic areas for capturing experience and drawing lessons learned were identified in the workshop and these became the basis for working group and plenary discussions. The themes selected were:

1. Sustainable fisheries and aquaculture
2. Microfinance and building diversified livelihood opportunities
3. Community-based disaster preparedness
4. Infrastructure reconstruction and coastal development
5. Co-management of marine parks and fisheries

Workshop participants brainstormed and discussed key issues, lessons learned and good practices with respect to their country experience in these themes. For each of these themes, experts from around the region were asked to consider not only the immediate aftermath of the disaster, but also the longer-term transition from relief to reconstruction and sustainable coastal development.

As expressed in the opening presentation by Richard Volk, “just as the sun will rise tomorrow, we can be sure that another natural disaster is on its way. Of course, we don’t know when, where, or how the disaster will strike. But somewhere in the deep reaches of the earth, or in the heat transfers between ocean and atmosphere, another massive release of energy awaits its turn.”

With that in mind, this series of two regional learning workshops aspires to capture practical experience that will help coastal communities and their governments prepare for natural disasters and make the difficult choices that will prevent or reduce the magnitude of lost lives and property when disaster strikes again.

## Sustainable Fisheries and Aquaculture

A major challenge following the tsunami disaster is an increase in fishing capacity and the potential for a return to a state of **overfishing**. Throughout the region, more small fishing boats are being replaced than were lost, swelling fishing fleets to a size greater than they were before the disaster. Replacing boats and infrastructure is easy, compared with remaking fisheries policy and changing age-old practices of communities to ensure sustainable livelihoods. One of the reasons for over capitalization of the fishing fleet is that reliable information is not available on boat owners prior to the tsunami (especially small boats), boat losses from the disaster, and boat replacements by government agencies and donors.

There is also a limited recognition and resistance to the commonly accepted reality that fisheries are in a state of decline with a decreasing catch per unit effort (CPUE). It now takes much longer and one must travel farther to catch the same amount of fish. The size of the fish caught are decreasing and we are “**fishing down the food web**,” meaning that the fish being caught are at lower trophic levels. Fish that were once considered undesirable are now being caught. Non acceptance of this reality seems to be wide spread, from the national level down to individual fishers. One reason is that while CPUE has decreased greatly, the total catch has decreased only slightly due to improvements in fishing technology, efficiency of gear, speed and power of boats and the total number of fishermen and boats. Also, the baseline situation of healthier fisheries of the past is being forgotten so that people cannot understand the relative changes.

The need for **education and training** for new fishers entering the fishing industry after the tsunami through the distribution of free boats is being recognized as a major gap. These fishers are learning about fishing through trial and error. This is not efficient or ecologically sound. Some are employing destructive fishing practices and lack traditional knowledge of fishing practices.

The working group panel on fisheries and aquaculture was encouraged by their experience that attitudes can be changed and that disasters can open a “window of opportunity” for change. For example, in India people have become more willing to work with the government following the tsunami and people are changing their long established and traditional attitudes when presented with reasonable, easy to understand and financially viable alternatives. Under the right conditions, attitudes can be changed and the level of fishing effort can be reduced.

*The tsunami can become a positive force for change and stimulate opportunities for co-management and better collaboration with government officials, local authorities, NGOS, and local fishers.*

Improved **fishing techniques**, gear and post-harvest technology is another issue. In Indonesia, it is estimated that 20 percent of the fish catch is wasted for lack of post-harvest technologies. Additionally, efficacy of fishing effort could be improved through better fish handling, transporting, processing, packaging, and marketing.

Issues of governance were identified by workshop participants. It was agreed that **integrated coastal management** (ICM) should be the over-riding framework within which all aspects of fisheries and other coastal resources management should be incorporated. However, in many of the tsunami affected countries ICM is in a relatively early stage of development and ICM frameworks and programs are weak. Institutions and enforcement of fishing rules are weak. Ecosystem-based management principles are generally lacking, as is co-management.

“Sharing a **common vision**” was considered by the working group panel to be of utmost importance to any successful fisheries management approach. National and local governments coupled with

fishers must agree on the importance, as well as the approach, to fisheries management. Unfortunately, at this juncture fishermen view the responsibility of managing fisheries as one that belongs to the government. This reflects the historical top-down approach of most governments as well with respect to fisheries management.

**Indigenous knowledge** is invaluable to the fisheries management process, but is often not well utilized. No one knows better about fish aggregation sites, spawning areas, and seasonal fisheries trends than the local fishermen. Yet, post-tsunami some of that knowledge is no longer applicable because the tsunami changed the shape of the sea floor (as in Aceh). What was once sandy bottom is now rocky, depths have changed and fish have changed their location. If true, this represents its own disaster. Nevertheless, fishers do adapt since they work and live in a dynamic coastal environment.

Other fisheries and aquaculture issues identified by the expert panel include:

- Poor understanding of the linkages between wild fisheries and aquaculture. Low impact aquaculture can provide alternative and environmentally sustainable employment opportunities, but it is not a panacea for solving the problem of overfishing. It should not be considered a replacement for traditional fisheries management techniques
- Need for greater understanding of the differentiation between intensive and extensive aquaculture and their social and ecosystem impacts. Also, the need was noted for greater understanding of the difference between farming high value carnivorous species that are high on the food web as opposed to low trophic level fish. Carnivorous species such as grouper and sea bass require as much as 5 kgs of fish as feed to generate one kg of fish as food.
- Piracy on the high seas and roving fisherman

### ***Guiding Principles and Good Practices***

1. The “precautionary principle” should be used in setting targets for long term redevelopment
  - Assess conditions of fish stocks and aquaculture prior to and post disaster
  - Set targets for reconstruction/rehabilitation based on fisheries assessments and sound science
  - Assess damages with the help of a multidisciplinary team that integrates the military, financial institutions, national/local governments, academics, local communities
  - Preparation for disaster begins before the next disaster
  - Construct a comprehensive database with data on boat registration and information on fishery resources and update the database on a periodic basis. Special attention needs to be given to the boat database for small boats.
2. Examine the existing “enabling context” and find opportunities to connect with and strengthen enabling conditions
  - Conduct an assessment of the enabling context, e.g., laws, policies, institutions, and links to national and local development plans
3. Host governments must define priorities within which donors should work
  - National/local development plans (after a rapid assessment of their continued relevancy) should be used as basis for identifying and setting priorities
  - Commitment of resources (by host governments) to update the development plans after a disaster (with wide consultation for setting standards)

- Governments should create a clear coordination authority for setting priorities and coordinating donor investments
4. Donors and NGOs need to coordinate and build fisheries management around a common vision
    - Resource mapping of the capabilities of donors and NGOs (including financial and technical elements, and strategic advantage)
    - Coordinate with relevant national/local authorities to align their efforts to priorities
    - Donor and NGO coordination (meetings or networking)
  5. ICM should be the unifying framework for fisheries/aquaculture management using ecosystem-based and participatory planning and implementation approaches
    - Under normal circumstances (pre-disaster), all key stakeholders must invest time and financial resources to establish ICM programs to integrate fisheries and aquaculture programs
    - Encourage processes for multi-layer co-management including stakeholder participation, ownership, use of indigenous knowledge, development of ICM plans and programs
  6. Participation of all stakeholders at multiple levels and local ownership are necessary for success
    - Dialogue with appropriate stakeholders (national/local governments, communities) to create a shared vision for sustainability
    - Create mechanisms to hold regular meetings and make use of technology for dissemination of information and knowledge management
    - Seek commitments of financial resources for continued consultation and dialogue on a regular basis

### **Microfinance and Building Diversified Livelihood Opportunities**

Key issues in microfinance and building diversified livelihood opportunities highlighted by the working group on this theme included: **equity** in the selection of beneficiaries, the need to involve the private sector in program implementation, and the need for improved linkages among microfinance and enterprise initiatives, as well as greater coordination of donors. A village in India where there are some 400 donors was noted as an example of extreme post-tsunami coordination challenges and duplication of efforts. Periodic donor and stakeholder meetings are one way to share information and reduce overlap of efforts of projects. The Post-Tsunami Sustainable Coastal Livelihoods Program, for example, initiated monthly donor and stakeholder coordination meetings at the local government office near its field site.

Other issues identified by the Working Group included the importance of designing **sustainable** microfinance and microenterprise programs. In this context, it was felt that microenterprise development should be based on a careful community assessment of needs. In promoting reestablishment of livelihoods the first priority should be to rebuild enterprises that were damaged by the disaster. In expanding and diversifying livelihoods, care must be given to the creation of new enterprises. In most cases, new business development is more risky than supporting already tried and tested enterprises. However, there may be instances where new enterprises with likelihood of success can be identified and would

*There is a growing tendency for communities that have suffered from the disaster to depend upon aid. This needs to be addressed in long-term strategies for rebuilding the community under post-tsunami reconstruction. Aid may reduce resilience by diminishing self-help and self-reliance.*

have value for local business diversification. Successful microenterprise initiatives also need to combine loans with technical assistance, skill development and extension. An area of particular importance, especially in rural settings is technical assistance in **marketing**, including value added chains, product quality, packaging and linkages to larger markets outside of the immediate area. It was stressed that microenterprises need to have access to markets to make business growth and diversification work. Building on and strengthening existing financial systems is also important for long-term and successful microenterprise development.

The expert panel felt that post-tsunami programs that support livelihoods should start small and grow based on experience and lessons learned. Providing too much money, too fast, to microenterprises in small, rural communities can reduce the likelihood of success. **Monitoring and evaluation** of microenterprise development programs is important in order to identify what does or does not work and why. This information should then feed back to decisions on allocation of loans and determination of successful recipients. A final issue raised by participants is that the unit of microenterprise is the family in most rural contexts. Microfinance and microenterprise development initiatives need to recognize this and adopt mechanisms and objectives to meet the needs of small family operated businesses. The panel of experts agreed that there needs to be flexibility in the process of loan giving and in the use of the loan. The ultimate criteria, however, should be the success of the business activity for which the loan was approved.

### ***Guiding Principles and Good Practices***

1. Conduct market analysis for new and expanding businesses and assess microfinance needs and capacity
  - Before giving loans for a new enterprise, conduct a market survey to determine demand and value added chain for the product, as well as a skills survey to be sure microfinance members are capable
  - Start small. Determine the magnitude of loans that can be successfully absorbed by communities before disbursing capital
  - Evaluate credit worthiness of loan members before giving a loan
  - Require that fund members deposit savings for at least 3 months (ideally 6 months) before they can apply for a loan.
2. Microfinance and microenterprises must have local ownership and be tailored to local context
  - Members of loan programs must see value in what they are doing, feel that they have ownership of the initiative and therefore be motivated to ensure its success
  - Respect and build on local knowledge and skills (for example, in Muslim areas interest cannot be charged, but other mechanisms, such as the payment of social contributions, can be used)
  - Make use of local materials and expertise (for example, in India, new seashell polishing businesses were developed that use local materials and local knowledge)
  - Promote local equity objectives, including empowering women and other vulnerable and marginalized groups
3. Build microfinance programs on long-term loan strategies
  - Develop long-term strategy for microfinance and microenterprise development
  - Monitor and evaluate how loans are how well programs meet their objectives
  - Donor projects should define a clear exit strategy to ensure sustainability of efforts. This is especially important in the context of tsunami relief that is typically short term. The time



frame of post-tsunami donor projects is generally not consistent with the time frame required for strategic microenterprise development.

4. Pool resources and promote coordination among donors, NGOs, and local organizations
  - Establish coordination mechanisms among donors and NGOs to prevent competition and duplication
  - Build linkages and partnerships among microenterprises in related industries (for example, between fishers and makers of fish nets)
  - Leverage resources from the government and private sectors to provide funds and markets for products

### Community-based Disaster Preparedness

One of the issues in community-based disaster preparedness common to many of the tsunami-affected countries is the availability and quality of **information** for disaster rehabilitation and planning, including information on transportation systems, communications, and escape routes in a natural disaster. Post-tsunami evacuation plans worked in some communities but failed in others.

*In the island of Simalu, Indonesia, there were traditional stories about Tsunamis which stated that if one sees the water recede to run to the hills. This traditional knowledge meant that there was little loss of life.*

The lack of **hazard risk insurance** and risk transfer in the region is a challenge that makes coastal communities more vulnerable. In Tamil Nadu, India, the government is introducing incentives for the introduction of an insurance policy for disaster management.

The tsunami disaster has created an awareness of the importance for locally based **disaster management planning**. Many coastal areas have protocols for storms and

flooding (such as Aceh), but do not have plans specifically for a tsunami incident. In India, government is taking initiatives to develop plans at every administrative level. In Tamil Nadu, for example, the government trained and developed a women's rescue group and undertook mock drills to prepare people. In Banda Aceh, government is developing guidelines for field level disaster management through a participatory process. Disaster management plans need to be tailored to a diversity of scenarios, cultures and development contexts.

The need to strengthen **communications** was noted as another important issue. In Sri Lanka, the tsunami disaster resulted in an overload and shutdown of the mobile communications system. A communications plan that is more robust and multi-tiered is required (i.e. VHF, Radio, RANET). In Bangladesh, VHF radio has proved to be a robust communication system during disasters. In Tamil Nadu, India, it has been found that television works very quickly to inform people. But television is backed up with other communications systems such as calls to village heads and use of local methods like temple bells and tom-toms.

Issues of **coordination** among donors, NGO's and local government partners is a challenge in all of the tsunami affected countries. In Sri Lanka, for example,

#### *Post-tsunami coordination mechanisms*

*The Maldives established a top level task force involving the Ministries of Planning, Housing, Hotels, Defense, Army and Media. This high-level task force meets regularly to coordinate with the president who can then quickly act.*

*The Indonesian government sends out one representative from the Ministry of Social Welfare to local government to coordinate and share responsibility.*

there are more than a thousand NGO's working on tsunami relief and rehabilitation and each has their own goals, strategies, and objectives. Dozens of donor groups may be working in the same set of villages at any time creating confusion among local people and putting excessive demands on their time.

A **lack of resources** for community-based disaster preparedness was noted as an issue in some of the countries. In Indonesia and India, for example, there were no funds allocated in the local government for disaster management, except on an ad hoc basis.

### *Guiding Principles and Good Practices*

1. Assess quickly, efficiently, and comprehensively after the disaster
  - Involve people in the village in post-disaster assessment
  - Make information on victims accessible and transparent
  - Issue identify cards to affected people and families as a quick means of cataloging damages and creating list of people affected
2. Create systems to transfer risks from natural disaster
  - Organize awareness programs to promote a culture of risk transfer
  - Create incentive based systems of risk transfer as well as mandatory risk transfer avenues
  - Create incentives for insurers
3. Build local capacity for disaster risk management and assist communities in the development of disaster management plans
  - Form disaster reduction and management committees
  - Identify and train local level response teams
  - Conduct routine drills
  - Incorporate principles of equity in response
  - Stress strengthening of social capital in disaster management
  - Establish education and awareness programs
  - Train villages in rescue and first aid skills
  - Strengthen bio-shields, such as mangroves, beaches, and coral reefs
4. Formulate evacuation plans
  - Plan road networks in coincidence with evacuation plans and strengthen transportation linkages
  - Identify alternative modes of transport
  - Establish emergency centers and identify other critical facilities
5. Strengthen communication systems
  - Identify robust communication tools and build in redundancy of communications systems (e.g. use of ham radios, cellular communications, and VHF)
  - Develop quick and effective warning dissemination mechanisms
  - Ensure that communications systems are linked across geographic scales
  - Enhance peak usage capacity of communication systems
  - Use already available communications tools
  - Utilize siren and loudspeakers (PA) more effectively in disaster warning systems

6. Improve coordination among donors, NGOs and government organizations and clarify roles and responsibilities
  - Clearly articulate who is doing what and introduce mechanisms (e.g. coordination meetings) to find opportunities of convergence and to avoid duplication and institutional overlap
  - Clearly define roles of different recovery initiatives
7. Strengthen human and institutional resources
  - Conduct capacity needs assessment, prepare an inventory of human and institutional resources and develop plans for training
  - In addition to human resource training, strengthen community institutions and social capital
  - Ensure institutional commitment and strengthening of laws that reduce vulnerability
8. Design public infrastructure to reduce vulnerability to coastal hazards and promote sustainable coastal development
  - Undertake participatory and strategic development planning
  - Move beyond mere physical plans
  - Prepare land use plans, road and transportation networks
  - Strengthen and enforce building regulations
9. Promote the ‘WE’ feeling, local ownership and integrating mechanisms that build social capital
  - Hold frequent community meetings in public buildings to build awareness on community preparedness and sense of a community support network
  - Create and distribute booklets with key village and government contact information
  - Build local ownership for “self activating” disaster management

### **Infrastructure Reconstruction and Coastal Development**

Lack of proper, pre-selected **evacuation** sites, evacuation routes and other infrastructure facilities were identified by the expert panel as a critical issue during the relief stage in some countries, such as Sri Lanka. Evacuation sites had not been properly evaluated for their suitability, resulting in the lack of basic amenities such as power, proper sanitation facilities, and access to water. In addition, some sites were improperly located in ecologically sensitive areas such as elephant corridors. In Tamil Nadu, India, the situation was somewhat better because this area has a history of natural disasters, cyclone shelters and other public buildings (e.g. schools) were already identified and properly set up for use in evacuation and relief efforts. One of the lessons learned from India, is that where community-based disaster risk management training programs were in place the loss of life was minimal.

Food supplies and equity in distribution, transportation, and the challenges of rapid mobilization of human and material resources were critical issues in the relief stage in most of the tsunami affected countries (especially Maldives and Indonesia). In the Maldives, boats are the primary mode of transportation. They were largely destroyed by the tsunami. The speed of relief was also identified as an issue. In some cases, recovery activities were too slow. Assessment and planning must be conducted rapidly after the disaster to quickly identify sites for housing and other infrastructure.

In the relief stage, the expert panel noted that infrastructure issues need to include not only relief housing but also other social infrastructure like harbors. In some cases repairs to structures like harbors made early on can avoid the need to totally rebuild the structures at a later time. For example, in the Maldives, structures like harbors that had small cracks were not repaired with the

cracks increasing over the relief period. This means that the structures now have to be torn down and completely rebuilt.

Issues in the reconstruction and rehabilitation stage include land acquisition for resettlement, transportation, supplies of reconstruction materials, and **water drainage**. In Sri Lanka, for example, large buffer zones were established that limited land for resettlement. In some tsunami affected areas water is not draining after the destruction of the tsunami, creating water bodies and marshes that create risks of diseases from malaria and dengue. In Aceh, Indonesia, the actual landscape shifted. The tectonic shift caused the land to drop creating a new permanent marshland, which would not drain.

Cleaning wells for **drinking water** and carrying away debris were major issues in all affected areas. It was noted that India is creating artificial sand dunes with natural debris. In Sri Lanka, most of the drinking water wells were damaged. The solution proposed was to pump the wells. But pumping of wells only brought in more dirty water due to the new marshlands created. The lesson in this case is that to clean the water, new water must be brought in and then disinfected.

In Aceh and in other regions there was an immediate growth in the construction of **sea walls** and other man made barriers for protection following the tsunami. In many cases these are not well planned and will have negative and unexpected long-term effects. In India, it was observed that settlements are built so close to the beach that there is no space to build sand dunes. They therefore had to go into the sea to erect the structures.

A massive influx of donors and NGOs in reconstruction and rehabilitation, each operating largely in isolation from one another, has resulted in issues of **coordination** as well as inappropriate technology transfer and infrastructure mistakes in some instances due to lack of **local knowledge** and experience. In Sri Lanka, for example, water pumps were put at the end of a road but the path to the pumps went through ground that did not have sanitized water facilities, resulting in the pumping of unsanitary water. In another example, in the Maldives, one major donor is having problems in its tendering programs because it ignored advice from the local government on the local process.

Experience in the use of low cost and locally available materials to speed reconstruction was mentioned by expert panel participants. **Low cost housing materials** using earth blocks were applied in Milrissa, Sri Lanka. This was also successful in Indonesia. In India, low cost drainage systems were put in place using bamboo and palm leaves.

The need for fast and flexible **procurement procedures** with pre-qualified suppliers was identified as an important issue by the panel. However, increasing speed and flexibility must be done carefully to avoid misuse of the system and potentially corruption. In the Maldives, the Ministry of Public Works announced work tenders in the morning and received bids the same day. In this way people know the bid at night and can begin work the next day. Also, there are no custom duty taxes for any materials brought in for tsunami relief. Indonesian customs duties are also waived.

Other issues raised by the expert panel in the reconstruction and rehabilitation stage include the need for

- Standardization of codes for sanitation and building
- Local participation and capacity building in recovery and reconstruction efforts
- Proper disposal sites or reuse procedures for cleared debris

An example of good waste management practice is Banda Aceh where 7,000 cubic meters of debris was reduced to 4,000 cubic meters by a UNDP program to separate and reuse materials. Another example is the Maldives where coral was extracted from buildings and infrastructure destroyed in the tsunami and reused again in new building materials.

### ***Good Practices***

#### *Relief stage*

- Identify pre-selected evacuation sites, evacuation routes and other infrastructure facilities through proper technical studies
- Consult with fishers about location of rebuilt homes for compatibility with fishing occupation
- Carry out rapid planning and rapid assessment to identify sites for housing and other infrastructure
- Encourage rapid mobilization of human and material resources

#### *Recovery and reconstruction stage*

- Identify and promote rapid infrastructure recovery with locally available materials and through participatory approaches
- Promote recovery efforts through technology transfer. For example, the Maldives imported ‘design and build’ tender technology (ICTAD) from Sri Lanka
- Develop monitoring mechanisms to recovery activities through stakeholder participation
- Promote faster procurement procedures with pre-qualified suppliers
- Expedite environmental restoration with ecological balance
- Promote site-specific coastal protection structures with special reference to natural barriers (for example, planting mangroves and landscape greening to reduce coastal hazards, or creating artificial sand dunes with natural debris)
- Develop mechanisms for local and regional participation and capacity building in recovery and reconstruction efforts
- Ensure proper disposal sites for debris clearance or reuse in an environmentally acceptable manner

## **Co-management of Marine Parks and Fisheries**

The co-management panel found many similar issues as the fisheries and aquaculture panel, for example, **over capitalization of the fishing sector** as a result of poor coordination of boat replacement efforts leading to a situation where there are more boats, engines and gear after the tsunami than before. The panel noted that in most cases there is no reliable source of information with details of the different donor agencies working in a particular area. Developing an integrated database that is accessible to the public and that shows the records of all the donors in a specific area, their consolidated budget, and activities they are taking on, is important for efficient use of the donor money, and will promote transparency in the reconstruction process.

Many issues raised by the panel dealt with legal and institutional frameworks for the **governance** of marine parks. Among these is the inappropriateness of many laws and weak law enforcement. For example, unconditional no use laws in areas where local residents are primarily dependent on fishery resources can not be enforced and are not realistic. Regulations are more effective that allow

small-scale fishers in communities residing in marine parks to earn a livelihood using sustainable fisheries practices. The best way to implement the sustainable use of the natural resources is to involve all the stakeholders right from the beginning in the decision making process. The panel discussed the use of restricted fishing seasons in marine national parks as an alternative conservation strategy to total fishing bans.

In the case of Thailand, it was observed that the **community-based model**, which is being used to manage coastal fisheries outside of marine parks, could be applied to manage national marine parks. Under the model, coastal fisheries are managed by the local fishing community in areas defined by the communities. Only small boats are allowed to fish inside the managed area and trawlers are strictly prohibited to fish in this area. The fishing community also manages the coral reef and in some cases undertakes activities such mangrove planting, waste management, and resource enhancement by releasing fish fry within the area.

The panel felt that it is essential to develop **indicators** (e.g. catch size, species composition, and total catch) in marine parks and fishing activities should be regulated accordingly to make the practice sustainable. Similarly, aquaculture is often completely excluded from marine parks. However, allowing some forms of low impact aquaculture (e.g. cage culture) may reduce fishing pressure and also diversify the livelihood of the community residing in the Park.

It was also discussed in the panel that overlapping and conflicting agency mandates and **inappropriate laws** are primary limitations to better management of marine parks. For example, in Thailand managing marine parks and natural resource conservation are the responsibility of the Department of Royal Forestry and Department of Natural Resources within the Ministry of Natural Resources and Environment. But fisheries conservation and management falls under the Department of Fisheries (DOF) within the Ministry of Agriculture and Cooperatives. Therefore, for co-management of fisheries and marine parks to work effectively these departments must integrate efforts and work cooperatively.

One of the challenges of co-management was identified as the willingness and ability of stakeholder groups at different levels to work together. In many cases there is little experience among different stakeholders to come together to discuss policies and procedure to manage marine national parks. Different agencies and stakeholder groups may not **trust** each other. For example, in Thailand it was noted that people in communities residing in the marine park do not trust the officers of the National Park and they generally have the tendency to disobey the rules set by the authorities. At the same time, the tsunami disaster has created a window of opportunity for co-management and collaboration with government officials.

Demonstrating local **benefits** of marine conservation to community stakeholders was another issue raised by the panel. In Thailand, for example, revenues from marine national parks go to the Central Government. Local communities would feel that they are direct beneficiaries of the Park if a percentage of the total income of the Park were earmarked for the local community.

Education and **awareness** raising to influence attitudes and perceptions is another issue. The panel identified the need to bring change in the general perception of residents toward marine parks and the sustainable use of its natural resources. In some cases, people residing within marine parks have developed the feeling that it is legitimate to use the resources with the marine park any way they like. It is essential to convince them to use natural resources in sustainable ways. A lesson learned from experience is that attitudes can be changed and that disasters can open a “window of opportunity” for change. One participant also noted that marine parks can be used to enhance

awareness and education on tsunamis. It was suggested that marine parks should keep destroyed and beached boats and other disaster exhibits in post-tsunami condition as monuments.

As with the other four themes addressed by expert panels in the learning workshop, issues of donor and host government **coordination** were highlighted. Across the region different agencies (donors, government agencies, NGOs) and individuals rushed to help the effected communities after the tsunami, but in most cases there was no coordinated effort among the different players involved in the rescue and recovery.

### *Guiding Principles and Good Practices*

1. The “precautionary principle” should be used in setting targets for reconstruction
  - Assess conditions of fish stocks and aquaculture prior to and post disaster
  - Conduct ongoing ecological, social, and economic research and monitoring that can have feed back for evaluating and improving action plans
2. Examine the existing “enabling context” and find opportunity to connect with and strengthen
  - Provide training to local people and agency Park staff to build human resource capacity (on the job training and mentoring, study tours, seminars, participatory research and mapping, periodic meetings)
3. Host governments should identify priorities within which donors should work and donors and host governments should coordinate efforts closely
  - Develop mechanism for different government agencies (national and local) to work together on planning, legislation, ICM frameworks, policy, etc.
  - Donors and NGOs should define their strategic advantage or niche in reconstruction
  - Longer-term rehabilitation issues can be taken up by the larger donors
4. ICM should be the unifying framework for fisheries and aquaculture management using ecosystem-based and participatory approaches that include management of marine parks
  - Develop or strengthen national level ICM policy and guidelines in relation to local needs
5. Participation, local ownership, and use of indigenous knowledge in co-management processes are essential
  - Identify all key stakeholders (village leadership, local authorities and government agencies, NGOs, academic institutions, national level ministries)
  - Develop a co-management action plan with stakeholders
  - Conduct research with the participation of local people
  - Promote alternate livelihood opportunities to reduce vulnerability and improve quality of life (e.g. tourist guide services, handy crafts, other services)

## Annex 1

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**LESSONS LEARNED IN RECOVERY:  
POST-TSUNAMI RELIEF AND RECONSTRUCTION FOR  
SUSTAINABLE COASTAL DEVELOPMENT**

**Asian Institute of Technology Conference Center  
February 15-17, 2006**

**A Workshop Organized by the USAID Post-Tsunami Sustainable Coastal  
Livelihoods Program**

**Agenda**

**Workshop Objectives**

- Review key issues in tsunami rehabilitation
- Share country experience in relief and long-term recovery
- Discuss lessons learned in recovery and Best Practices in rehabilitation
- Develop ideas for structure of second learning workshop and promote learning network among participants from the tsunami affection region

**Workshop Outputs:**

- Workshop proceedings highlighting lessons learned, recommendations, key issues and Best Practices for sustainable coastal development in tsunami affected countries

**Tuesday, February 14<sup>th</sup>**

Afternoon      Arrival and check-in

19:00            Welcome dinner

**Wednesday, February 15<sup>th</sup>**

**Session One: Introduction and Overview**

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9:00-9:45      Welcome  
Prof. Said Irandoust, President, Asian Institute of Technology  
Timothy Beans, Director, USAID RDM/A

- 9:45-10:15 Workshop Agenda and Objectives (Dr. Amrit Bart)
- 10:15-10:45 Introductions and Workshop Expectations (Lee Milstein, facilitator)
- 10:45-11:00 *Break*

### **Session Two: Plenary Presentations on Key Themes**

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Four speakers will provide thought provoking overviews of tsunami issues. Each speaker will be followed by time for questions and comments

- 11:00-11:30 Principles of environmentally sound coastal rehabilitation (Richard Volk, US Agency for International Development)
- 11:30-12:00 Community based disaster management (Earl Kessler, Asian Disaster Preparedness Center)
- 12:00-12:30 Sustainable Fisheries (Dr. Lens Garces, WorldFish Center)
- 12:30-13:00 Disaster mitigation and sustainable coastal development: Lessons from the Philippines (Alan White, Indian Ocean Tsunami Warning System Program)
- 13:00-14:00 *Lunch*
- 14:00-14:30 Participants will form working groups based on interest and expertise on key themes such as:
- Sustainable fisheries and aquaculture
  - Microfinance and building diversified livelihood opportunities
  - Community-based disaster preparedness
  - Infrastructure reconstruction and coastal development
  - Co-management of marine parks and fisheries

### **Session Three: Thematic Working Group Session 1**

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- 14:30-16:00 Working Groups Session 1

In the context of the particular theme, participants will brainstorm and discuss key issues and lessons learned with respect to their country experience

## **Thursday, February 16<sup>th</sup>**

- 9:00-9:15 **Recap previous day and introduction to goals of Day 3**

### **Session Four: Plenary Report Out of Working Group Findings**

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- 9:15-9:45 Working groups finalize their summary of findings
- 9:45-12:00 Report out on findings and group discussion

12:00-13:00 *Lunch*

**Session Five: Thematic Working Group Session 2**

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13:00-16:00 Participants will again break into thematic working groups formed the previous day and discuss best practices and recommendations for the way forward in the context of the key issues identified in previous working group session.

**Friday, February 17<sup>th</sup>**

9:00-9:15 **Recap previous day and introduction to goals of Day 3**

**Session Six: Disaster Resilient Communities**

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9:15-10:15 Discussion of assessment tool on resilient communities

**Session Seven: Plenary report Out of Working Group Findings**

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10:15-12:30 Report out on findings and group discussion

12:30-13:30 *Lunch*

13:30-14:30 Plenary exercise: Identification of priority actions and best practices in tsunami rehabilitation

**Session Eight: Next Steps**

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14:30-15:30 Discussion of networking opportunities among participants and content of the next regional workshop in February 2007

15:30-16:00 Discussion of field trip and UNESCO-IOC/WESTPAC Conference, 20-24 October 2005, Phuket

**Closing**





## **Field Site Visit Schedule and UNESCO-IOC/WESTPAC Conference February 18-23, 2006**

### **Saturday, February 18, 2006**

2:30pm Arrive Ranong Airport-picked-up by vans arranged by field site  
3:30pm Check in at Royal Princess Hotel  
5:00pm Greeting by Governor of Ranong at Provincial Office

Overnight at Royal Princes Hotel, Ranong

### **Sunday, February 19, 2006**

8:00 Depart Ranong for site-rented vans  
9:15 Orientation to Field Site Office  
10:00 Visit to the site of the Kampuan Community Learning Center  
10:30 Visit to Catfish Hatchery Site  
11:00 Revolving Fund Activities- Village #7  
  
12:00 Lunch  
  
1:15 View USAID donated fishing vessels-Village #2  
2:00 Debrief at Field Site Office  
2:30 Depart for Phuket in rented vans

### **Monday-Thursday, February 20-23, 2006**

UNESCO-IOC/WESTPAC Conference on “Post-Disaster Assessment & Monitoring of Changes in Coastal, Ocean & Human Systems in the Indian Ocean & Asian Waters”, Phuket

## Annex 3

### Background Materials

“Aceh and Nias One Year After the Tsunami: The Recovery Effort and Way Forward,” A Joint Report of The BRR and International Partners, December 2005, 205 pp. (<http://e-aceh-nias.org/oneyear/oneyearReport.pdf>)

“Aceh Emergency Response and Transitional Recovery Programme,” Tsunami one year commemoration project, December 2005, 52 pp. (<http://www.undp.org/bcpr/disred/tsunami/seatsunami.htm>)

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“Tsunami - One Year After. The Maldives,” December 2005, 39 pp. (<http://www.undp.org/bcpr/disred/tsunami/seatsunami.htm>)

“Tsunami Thailand: One Year Later,” December 2005, 122 pp. (<http://www.undp.org/bcpr/disred/tsunami/seatsunami.htm>)

“Tsunami - One Year After. India,” December 2005, 44 pp. (<http://www.undp.org/bcpr/disred/tsunami/seatsunami.htm>)