

## MDF - JRF Knowledge Notes

### Lessons Learned from Post-Disaster Reconstruction in Indonesia



## Effective Post-Disaster Reconstruction of Infrastructure: Experiences from Aceh and Nias

Given the incredible scale and extensive nature of the damage resulting from the tsunami and earthquakes in Aceh and Nias, the reconstruction of large infrastructure was a critical priority of the Government of Indonesia. The Multi Donor Fund for Aceh and Nias (MDF) invested approximately \$285 million out of a total of \$655 million in grant funds towards the recovery of large infrastructure and transport.

The MDF's initial infrastructure investments focused on addressing logistics needs and restoring vital transport links to provide access to affected areas, thereby supporting urgent community recovery processes. Once these were established, the MDF

redirected attention to large scale infrastructure reconstruction. Investments in large infrastructure have critical quality and ownership requirements that may supersede speed considerations, and care needed to be taken to balance the cost of speed and the cost of delay. In its final phase, the focus expanded to include enhancing the capacity of agencies to manage the newly created assets. The experience in Aceh and Nias demonstrate that a sequenced approach to infrastructure investments, and, indeed, to overall reconstruction, based on balancing the need for urgency with the need for quality and ownership can be highly effective in managing short-term expectations while delivering long lasting results.

## The MDF Infrastructure Portfolio

MDF implemented its infrastructure program through several Partner Agencies—the World Bank, International Labour Organization, World Food Programme and United Nations Development Programme—building on the comparative advantages and core competencies of each. The Partner Agencies worked with various Implementing Agencies, including the line ministries of the Government of Indonesia and non-governmental organizations to implement activities on the ground. The MDF funded physical investments in roads, transport logistics, ports, drainage and flood control, solid waste management, urban water supply, and coastal protection, complemented by a strong focus on safeguards and capacity building.

### Infrastructure Reconstruction Achievements:

- 620 km of national and provincial roads constructed
- 240 km of district roads and trails constructed or rehabilitated, including 1,200 m of bridges and river crossings
- 11 water systems (clean water, reservoirs, etc) constructed
- 2 temporary wharves constructed
- 5 ports reconstructed
- 3 pumping stations for flood control constructed
- 150 km of drainage completed, constructed and rehabilitated
- 13 landfills with 26 ha of waste cells rehabilitated and constructed

### MDF Infrastructure Portfolio

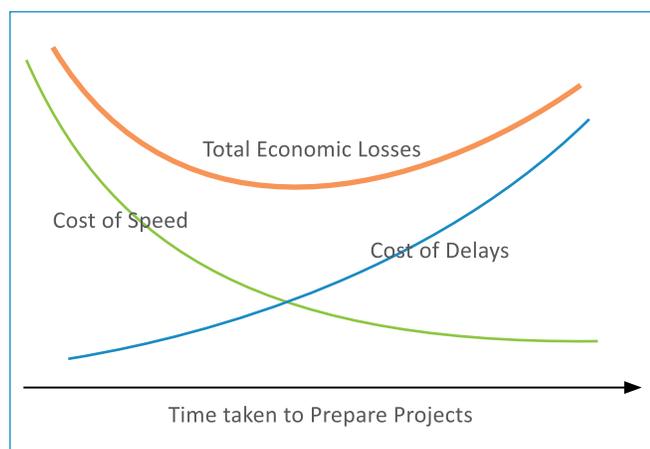
|  |
|--|
| <p><b>Tsunami Recovery Waste Management Programme (TRWMP) – \$39.4 million</b><br/>Clearing of tsunami rubble and waste; improved municipal solid waste management system</p>  |
| <p><b>Sea Delivery and Logistics Programme (SDLP) – \$25.0 million</b><br/>Shipping services and other logistical support; capacity building for port and logistics management</p>   |
| <p><b>Lamno-Calang Road Maintenance Project (LCRMP) – \$1.5 million</b><br/>Maintenance of a temporary road link along the west coast of Aceh</p>  |
| <p><b>Tsunami Recovery Port Redevelopment Programme (TRPRP) – \$3.8 million</b><br/>Basic planning for and redesign of various affected ports</p>  |
| <p><b>Infrastructure Reconstruction Enabling Program (IREP) – \$42.0 million</b><br/>Technical assistance for preparation and implementation management of infrastructure projects</p>   |
| <p><b>Infrastructure Reconstruction Financing Facility (IRFF and IRFF-AF) – \$136.7 million; Government of Indonesia counterpart funds: \$107.0 million</b><br/>An open-menu facility providing funding for infrastructure reconstruction projects</p> |
| <p><b>Banda Aceh Flood Mitigation Project (BAFMP) – \$6.5 million</b><br/>Installation of drainage and flood protection systems in Banda Aceh City</p>   |
| <p><b>Capacity Building for Local Resource-based Rural Roads (CBLR3) – \$13.9 million</b><br/>Capacity building and local labor based construction and maintenance of rural roads and river crossings in Aceh</p>                                      |
| <p><b>Nias Island Rural Access and Capacity Building Project (RACBP) – \$16.0 million</b><br/>Capacity Building and local labor based construction and maintenance of rural roads and river crossings in Nias</p>                                      |

## The Economics of Having to Act Fast

There was huge pressure on all actors involved in the reconstruction process to get projects implemented quickly. Acting too fast could result in economic losses due to poorly targeted, prepared, and/or designed projects, with consequent dilution of quality which is

particularly detrimental to major infrastructure – this is referred to as the “Cost of Speed.” On the other hand, long preparation periods prolong human suffering, exacerbate economic losses, and hinder reconstruction progress. This is referred to as the “Cost of Delays.” The objective of project design and management should be to minimize their sum.

## Minimizing Total Economic Losses



In post-disaster situations, local stakeholders may not be closely involved in the identification and scoping of projects, availability of data may be limited, and data gathering and analysis are often challenging. Addressing these constraints requires time, and this has to be seen against the background of the cost of delays and the need to manage expectations.

The MDF, constantly mindful of the need to balance the cost of speed against the cost of delays, adopted a phased approach to the reconstruction, and employed relatively simple and straightforward rules to the identification and selection of projects. In an emergency situation there is little time for thorough studies and advance preparation of projects, therefore requiring flexibility to respond to unexpected challenges arising on site during implementation. Procurement procedures for large infrastructure construction do lead to unavoidable start up time, but the quality standards and value for money that these procedures ensure cannot be compromised. Despite the various challenges faced, the MDF financed physical infrastructure of a high standard, and total economic losses were kept acceptably low.

Aceh presented a complex post-disaster situation embedded in a post-conflict context, and as a result there were factors other than pure economic benefits that had to be considered in selecting investments. Lessons from the MDF's experience in the reconstruction of large infrastructure show that priorities, strategic decision making, and expectations of results have to be context specific. This is especially

true in situations involving conflict, isolation and low capacity – factors common in post-disaster reconstruction settings across the world.

## Land Acquisition

Land acquisition was handled in accordance with World Bank procedures, taking into account required safeguards, necessary community consultations and with agreed-upon compensation. Where land needs were identified during the construction stage, land acquisition and compensation were carried out in parallel with construction. In addition to land acquisition, compensation was also given where livelihoods were affected and where this was deemed appropriate. Immediately after the disaster, it was often difficult to establish land rights and determine the market value of land. Many property owners had died, markers were untraceable, both private documents and official records were lost, and there were limited regular land transactions. In general, establishing realistic land values and compensation is likely to be a challenge for any



*A district road in Aceh Besar District before (top) and after (bottom) reconstruction. The project scope included better protection against coastal abrasion. Photos: Kris Hedi*



*Various types of bridges across Aceh and Nias were constructed by the MDF infrastructure projects. These two pictures illustrate trail and pedestrian bridges that were constructed under two projects implemented by ILO using a local resource-based approach. Photos: Gottfried Roelcke*

reconstruction program, but must be addressed in spite of any delays this may cause in the short run.

## Environmental Safeguards

The MDF followed stringent environmental safeguards for all projects. Good environmental management during reconstruction does not differ from regular development projects, and must be addressed during identification, preparation and implementation of projects. However, finding the correct balance between quality and time taken to navigate bureaucratic processes is critical in an emergency situation. The Infrastructure Reconstruction Financing Facility (IRFF) project included an innovative approach to create better acceptance and ownership of the environmental management process by contractors. Contractors were required to include proper environmental management plans as part of the bidding process; those plans were then included in the contracts. This successful approach has become known as the Contractor's Environmental Action Plan (CEAP) and has been replicated in other projects.

## Enabling Good Governance

Substantial challenges exist in minimizing corruption, collusion, and mismanagement in any complex reconstruction context. The Agency for Rehabilitation and Reconstruction of Aceh and Nias (BRR) was committed to enabling good governance across the reconstruction effort. The majority of the MDF's large infrastructure projects were

implemented in conjunction with the BRR, and later with the Department of Public Works after the BRR completed its mandate in 2009. The BRR management designed a strong system of checks and balances, with mechanisms to enhance transparency, correctness, accountability, and fairness in all its actions and transactions and to involve the wider public in its efforts. Negative practices were greatly reduced by these mechanisms. The MDF also upheld the highest standards of combating corruption, collusion, fraud, and mismanagement.

## Sustainability Beyond Reconstruction

Ensuring the long-term sustainability of the assets created is an important objective for a reconstruction program. This requires a clear framework for transferring ownership of physical infrastructure created and the allocation of sufficient resources for the continued operation and maintenance of the assets after the program ends. Working in partnership with the appropriate levels of local government during the reconstruction process helps to create a strong sense of ownership over the assets generated, thus facilitating the smooth transfer of assets to the relevant government authorities and allocation of local government budgets for operations and maintenance.

## Building Back Better

The Government of Indonesia and the donor community agreed that the reconstruction should contribute to the region's further development by creating new assets that are better than those that had existed before the disaster. "Build Back Better" became the motto of the overall reconstruction in Aceh. But the implications of "Building Back Better" need to be carefully considered before being implemented for all investments. This can lead to overdesign of investments that do not match demand on the ground. In addition, substantially upgraded facilities bring with them the need for significantly increased resources and capacity for proper operations and maintenance, and a local authority may be reluctant or unable to take on the responsibility. A more nuanced approach to improve facilities based on economic viability and sustainability can lead to more robust outcomes.

## Lessons Learned in the Reconstruction of Infrastructure

- **Strong coordination and working relationship with the government is a critical success factor.** Coordination depends on clearly defined roles of the government and reconstruction partners. The infrastructure portfolio was designed in close coordination with the government and the majority of funds allocated were channeled through the government's budget. Close communication between all parties is central to a well-coordinated reconstruction program.
- **A phased approach balances speed of response with quality of investment.** A phased approach allows the opportunity to balance the costs of speed and delays. Approaching the reconstruction through a phased approach allowed the MDF more time to prepare more technically complex work (such as large infrastructure design) while immediate response needs such as community recovery and logistics support were being addressed.
- **Extensive infrastructure needs can be addressed faster by combining different partners' expertise.** Funds can be quickly disbursed to a variety of needs by using existing mechanisms and/ or partners that have the comparative advantage and core competencies to provide specific support in specific conditions.
- **Flexibility in project planning and implementation enables an effective and efficient response.** The IRFF project was approved as a financing facility and funds were made available for infrastructure reconstruction. As needs were identified, project activities were prepared and approved, allowing a flexible response to evolving demands on the ground. A strong presence on site and a high degree of devolution of decision-making authority are essential in this context.
- **Involving all levels of government in project planning and implementation enhances their capacity and increases ownership.** National and local governments learn from these processes, which empower officials to develop, manage and maintain the investments. Such close involvement creates a strong sense of ownership. Channeling funds through the national budget of the government also facilitates the sense of ownership as well as asset transfer on completion. A strong focus on capacity building allows the necessary skills to be transferred for the proper operations and maintenance.
- **Investments are likely to be more sustainable when matched to the local ability or willingness to finance operations and maintenance.** Reconstruction should not result in assets that may exceed local financial and technical capacity, as local authorities may be reluctant or unable to take on the responsibility of increased operations and maintenance costs.

## Conclusions:

### Rebuilding Infrastructure and Maintaining It for Future Development

The MDF's experience demonstrates that it is critical to balance the competing demands of speed, quality and ownership in infrastructure investments, and a phased approach allows a possible solution to this need for balance. Long-term sustainability is a direct result of quality of construction and ownership by local authorities, and is enhanced through capacity building at all levels of government

to take on their operations and maintenance beyond reconstruction. The MDF's experience in implementing its large-scale infrastructure reconstruction program, in partnership with the Government of Indonesia and other development partners, offers many lessons for future reconstruction efforts in similar contexts, including post-conflict situations.



## About the Disasters

Between 2004 and 2010 Indonesia experienced a series of devastating natural disasters:

- **December 26, 2004:** A massive earthquake measuring 9.1 on the Richter scale hit Aceh and parts of North Sumatra, followed by the deadliest tsunami in history. In Aceh, 221,000 people were killed or missing. Over 500,000 were left homeless. The scale of physical devastation and human suffering was enormous.
- **March 28, 2005:** Another massive earthquake struck the Nias Islands and parts of Aceh, killing about 1,000 people and leaving thousands homeless. It caused severe damage, destroying about 30 percent of all buildings on the island of Nias.
- **May 27, 2006:** An earthquake in Yogyakarta Special Region and Central Java claimed more than 5,700 lives. Over 280,000 homes were destroyed and the local economy was severely affected, especially the large number of home-based industries.
- **July 17, 2006:** An earthquake triggered a tsunami causing widespread damage along the south coast of West Java. About 650 people died, and over 28,000 were displaced.
- **October 26 to November 11, 2010:** Mount Merapi, an active volcano located between Yogyakarta and Central Java, erupted repeatedly, causing serious damage to housing and infrastructure. About 750 people were injured or killed, and about 367,000 displaced.

## About the MDF

The Multi Donor Fund for Aceh and Nias (MDF) was established in April 2005, in response to the Government of Indonesia's request to coordinate donor support for the reconstruction and rehabilitation of affected areas following the December 2004 earthquake and tsunami, and the subsequent March 2005 earthquake. The MDF pooled US\$655 million in contributions from 15 donors: the European Union, the Netherlands, the United Kingdom, the World Bank, Sweden, Denmark, Norway, Germany, Canada, the Asian Development Bank, the United States of America, Belgium, Finland, New Zealand and Ireland. The World Bank serves as Trustee of the MDF. Under the MDF portfolio, 23 projects were financed in six outcome areas: (1) Recovery of Communities, (2) Reconstruction and Rehabilitation of Large Infrastructure and Transport, (3) Strengthening Governance and Capacity Building, (4) Sustaining the Environment, (5) Enhancing the Recovery Process, and (6) Economic Development and Livelihoods.

## About the JRF

Following a request from the Government of Indonesia, the Java Reconstruction Fund (JRF) was established to respond to the May 2006 earthquake which struck near Yogyakarta, and the tsunami that hit the southern coast of West Java province in July 2006. Seven donors supported the JRF, with contributions totaling US\$94.1 million. The donors are: the European Union, the Asian Development Bank and the Governments of the Netherlands, United Kingdom, Canada, Finland and Denmark. The World Bank serves as Trustee of the JRF. Following government's priorities, the JRF supports the recovery of communities and livelihoods and increasing disaster preparedness.

Cover Photo: Kuala Bubon Bridge under construction on Aceh's west coast. Credit: Kris Hedi



THE WORLD BANK



[www.worldbank.org](http://www.worldbank.org)

[www.multidonorfund.org](http://www.multidonorfund.org)

[www.javareconstructionfund.org](http://www.javareconstructionfund.org)

Published by:  
**MDF - JRF Secretariat**  
 The World Bank Office  
 Indonesia Stock Exchange Building  
 Tower II, 12th Floor  
 Jl. Jendral Sudirman kav. 52-53  
 Jakarta 12190, Indonesia  
 Tel : (+6221) 5299-3000  
 Fax : (+6221) 5299-3111