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Green Reconstruction Policy Guidelines for Aceh

Preface by Acting Governor of Aceh

GOVERNOR
PROVINCE OF NANGGROE ACEH DARUSSALAM

PREFACE

A series of natural disasters that hit the Province of Nanggroe Aceh Darussalam (NAD) (from earthquakes, tsunami and floods to landslides, the decrease of the island surface and fires) teach us to be wiser and more cautious in conducting the reconstruction of Aceh, including making changes to the natural landscape. No matter how urgent the need is to use our land for various purposes, ecosystem health and nature conservation should be our main concern, especially in the rehabilitation and reconstruction of Aceh after the tsunami.

It is necessary to have guidelines for a policy that requires Aceh, as well as other regions in the world, to be managed in accordance with ecological principles known as “green reconstruction”.

We are grateful for WWF-Indonesia’s awareness of this, and for WWF-Indonesia’s initiative in formulating Green Reconstruction Policy Guidelines. This document will become the guidelines for Aceh’s sustainable reconstruction, both for the provincial government and the regency / city administration. Thus, on behalf of the government of NAD, I express my highest appreciation to WWF-Indonesia for its substantial initiative and efforts in formulating the Green Reconstruction Policy Guidelines in the framework of the sustainable rehabilitation and reconstruction of Aceh.

Serious efforts are needed to revive the spirit of the Acehnese and to rebuild Aceh after the earthquakes and tsunami that occurred on December 26, 2004. This means that we must make serious efforts not only to restore Aceh to its condition before the tsunami, but also to develop an ideal model of development that implements comprehensive concepts of sustainable development and thereby gives longer-term hope to the Acehnese.

It is expected that the Green Reconstruction Policy Guidelines will supplement the Indonesian Government’s Master Plan for Aceh’s Rehabilitation and Reconstruction. At the same time, they will be a reference for donors and development agencies so that their contribution to developing Aceh is undertaken in a manner that minimises the negative impacts of the reconstruction process on Aceh’s environment and natural resources. Therefore, this document plays as an important role for the Government of NAD in the realization of our commitment to make Aceh a green province.

At the same time as the Government of NAD supports the realisation of a green province for Aceh, the Government of NAD expects WWF-Indonesia to provide a valuable contribution through the development of models for sustainable development in the future.

Banda Aceh, April 25, 2005

Acting Governor
Province of Nanggroe Aceh Darussalam

Ir. H. AZWAR ABUBAKAR, MM

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Executive Summary

"Green reconstruction aims to improve the quality of life for communities and affected individuals whilst minimising the negative impacts of reconstruction on the environment and maintaining the long-term biological diversity and productivity of natural systems."

Post-tsunami reconstruction efforts face the challenge of meeting immediate humanitarian needs whilst balancing longer-term development and natural disaster mitigation. Across the Indian Ocean, where the greatest loss of life occurred, literally tens of thousands of families are left without homes, boats or fishing gears. Healthy ecosystems underpin healthy and safe communities and durable prosperous economies.

Those impacted by the tsunami will be looking to healthy marine ecosystems as a source of livelihoods and food security, and as a potential first line of defence against future natural disasters. There is a strong connection between the well being of many of the most vulnerable individuals in the post tsunami recovery process (women, children and those dependent on subsistence activities) and a well-managed environment. Therefore, it is important that the following principles are adopted as fundamental operational principles throughout the reconstruction process and across development activities in general:

- Sustainable development (socially acceptably, economically viable, and environmentally sound);
- Effective participation of local communities; and
- Strengthened and decentralized natural resource governance.

Within the context of a national recovery and restoration strategy, the following four sets of general cross-cutting policies are seen as being fundamental to successful implementation of any post-tsunami reconstruction activity, whether in the form of setting policy or carrying out activities on the ground. Together, these four principles provide for achieving sustainable development, through effective management of the natural resource base of social and economic development.

- **Mainstreaming environment**: Environmental concerns should be integrated into all aspects of reconstruction activities and strategies including through aiming to improve the quality of life for communities and affected individuals whilst minimising the negative impacts of reconstruction on the environment and maintaining the long-term biological diversity and productivity of natural systems.
- **Building strong legitimate local institutions**: Recovery from the socio-economic, cultural and livelihood impacts of the tsunami will be strengthened by building strong local institutions such as the Panglima Laot, and making them self-reliant in carrying out sustainable development programs to enhance their well-being and ensure environment sustainability.
- **Following a spatial plan**: An overall spatial plan should ensures that reconstruction efforts have minimum negative environmental impact and promote positive choices during the reconstruction process that optimize environmental goods and services as well as development and livelihood opportunities.
- **Building good governance**: The governance of the reconstruction process (including planning, implementation and evaluation) should be transparent, accountable and include the effective participation of local communities.

The Implementation section of these Green Reconstruction Policy Guidelines highlights areas of reconstruction that can have the most direct impact on natural resources. The aim of the Implementation section is to minimise any negative environmental impacts of reconstruction and promote positive choices that optimize environmental goods and services, development, and livelihood opportunities. The provision of targets, principles, guidelines and examples of “green” rehabilitation and reconstruction best practices will allow decision makers and policy makers to choose options that provide for long-term sustainable development, thereby ensuring that the end result of reconstruction is enduring and supported by local stakeholders.

The advice in these Green Reconstruction Policy Guidelines takes the form of strategies, actions and indicators of success, based on experience and current models of best practice. Priority areas include:

- Ensuring the use of sustainably sourced materials (including timber) in reconstruction.
- Rebuilding an energy sector that uses clean and renewable sources of energy.
- Rebuilding small-scale fisheries and aquaculture sectors that result in models of sustainable fisheries management under the new Indonesian Fisheries Law.
- Providing for the rehabilitation and restoration of coastal and marine ecosystems, and ensuring that reconstruction does not cause further negative impacts.
- Minimising the overall ecological footprint of reconstruction on the natural environment.

Green Reconstruction Policy Guidelines
Prepared by WWF-Indonesia

1 Overview

"Green reconstruction aims to improve the quality of life for communities and affected individuals whilst minimising the negative impacts of reconstruction on the environment and maintaining the long-term biological diversity and productivity of natural systems."

1.1 Introduction

Post-tsunami reconstruction efforts face the challenge of meeting immediate humanitarian needs whilst balancing longer-term development and natural disaster mitigation. Healthy ecosystems underpin healthy and safe communities and durable prosperous economies.

The Indonesian Government's "Master Plan for the Reconstruction of Aceh" advocates that all facets of the reconstruction of Aceh be consistent with long-term environmental health and sustainable development. This approach is echoed in the "Notes on Reconstruction" and "Preliminary Loss and Damage Assessment" reports published by BAPPENAS and the World Bank, and is supported by numerous national and provincial politicians. WWF welcomes this approach and provides the following policy guidelines to elaborate on the work of the Indonesian Government to assist governments, agencies and NGOs involved in the green reconstruction and development of Aceh. WWF recognises that government agencies, international organisations and NGOs are currently addressing certain issues covered by these policy guidelines, and looks forward to working cooperatively with government agencies, international organisations and NGOs.

WWF is also producing implementation guidelines to expand on topics covered at a policy level in these guidelines. These implementation guidelines will offer practical advice for those involved in reconstruction. The first of these is the "Timber for Aceh Program Implementation Design", available at www.wwf.or.id. WWF's implementation guidelines are based on WWF's on-the-ground assessments in Aceh since 26 December 2004, more than forty years of operations in Indonesia, and extensive experience in working with local communities and governments to provide solutions to environmental problems in the context of ongoing sustainable development.

WWF stands ready and willing to provide further guidance, and to refine its advice by working with government agencies, organisations international organisations and NGOs involved in reconstruction.

1.2 Aim

It is clear that the reconstruction effort in Aceh must address environmental issues and ensure the effective participation of local communities. This is because of Aceh's environmental characteristics (eg, Aceh is flood prone in low-lying areas) and natural resource management regime (eg, natural resources are treated as effectively open access, leading to illegal activities including unregulated fishing by foreign vessels and bomb and cyanide fishing; and many of the local coastal communities are highly impoverished, with access to few means of self-improvement).

Therefore, the aim of these guidelines is to assist policy makers realise development and livelihood opportunities while minimising negative environmental impacts by:

- **Mainstreaming environment**: Environmental concerns should be integrated into all aspects of reconstruction activities and strategies including through aiming to improve the quality of life for communities and affected individuals whilst minimising the negative impacts of reconstruction on the environment and maintaining the long-term biological diversity and productivity of natural systems.
- **Building strong legitimate local institutions**: Recovery from the socio-economic, cultural and livelihood impacts of the tsunami will be strengthened by building strong local institutions such as the Panglima Laot, and making them self-reliant in carrying out sustainable development programs to enhance their well-being and ensure environment sustainability.
- **Following a spatial plan**: An overall spatial plan should ensures that reconstruction efforts have minimum negative environmental impact and promote positive choices during the reconstruction process that optimize environmental goods and services as well as development and livelihood opportunities.
- **Building good governance**: The governance of the reconstruction process (including planning, implementation and evaluation) should be transparent, accountable and include the effective participation of local communities.

1.3 Green Reconstruction Principles

WWF supports the following principles in the “Master Plan for the Reconstruction of Aceh”:

- Implement a people-centred and participative process, where the administration listens and understands the feelings and aspirations of the people of Aceh.
- Apply principles of sustainable development including choosing solutions that are economically viable, socially acceptable, and environmentally sound.
- Adopt a holistic approach: base rebuilding on a comprehensive strategy.
- Adopt effective coordination for consistency and effectiveness among sectors and regional programs at national and local levels.
- Incorporate fiscal transparency and accountability into programs.
- Incorporate effective monitoring and evaluations into the rehabilitation and reconstruction programs.
- Support the implementation of Law 18, 2001, and Law 44, 1999, regarding the province of Nanggroe Aceh Darusalam (NAD).
- Focus on those most vulnerable, including women, children, and those dependent on subsistence livelihoods.
- Focus on the areas impacted by the disaster as a priority for implementation of the reconstruction plan.

In addition, WWF stresses the importance of the following principles for reconstruction:

- Frame activities in a spatial plan.
- Ensure good governance.

- Build and empower legitimate local institutions.
- Implement transparent procedures and mechanisms available to deal with tenure issues.

1.4 Green Reconstruction Vision and Mission

WWF supports the following vision and mission for the reconstruction of Aceh, which are mirrored in the "Master Plan for the Reconstruction of Aceh":

- Restore people's lives and fulfil their needs.
- Restore the economy and provide work opportunities, markets and incentives.
- Rebuild communities and give them social stability.
- Restore the system of local governance that represents people's aspirations.
- Re-establish the province as politically stable, economically vibrant, and resilient and protected against new disasters.
- Minimise negative impacts of reconstruction on livelihoods and the natural environment.
- Ensure rehabilitation, reconstruction and future development of Aceh follow a sustainable path to make sustainable resource use a basis for rehabilitation and reconstruction.
- Ensure long-term improved quality of life.
- Ensure long-term human harmony with nature through increased consideration of environmental issues in development practice.

WWF sees the following issues as being key components of successful engagement with communities in tsunami-affected areas:

General

- **Do no further harm**: Evaluate all proposed actions for potential short and long-term social and environmental consequences, considering both direct and indirect impacts, and aim to find solutions that minimise negative impacts and maximise benefits.
- **Act locally**: Prioritise rehabilitation activities that allow individuals to rebuild their homes, livelihoods and communities, paying particular attention to those who are vulnerable, such as women and children and those engaged in subsistence activities.

Natural Resources and Environment

- **Respect local culture and values**: The coastal area impacted by the tsunami (including the offshore islands) is rich in culture and heritage. Take care to respect and preserve these values.
- **Do not exceed carrying capacity**: Understand and respect the carrying capacity of natural ecosystems and apply a precautionary approach to ensure that limits are not exceeded.
- **Prioritise health and sanitation issues**: Prioritise rebuilding infrastructure and capacity that ensures access to healthcare and sanitation.

- **Restore natural defence system**: Incorporate the rehabilitation of protective natural coastal ecosystems in the spatial planning framework.
- **Use sustainably sourced materials where possible**: Focus reconstruction on rebuilding local industries and, where possible, use sustainably sourced or recycled materials.

Implementation

- **Follow sustainable development principles**: Fully integrate environmental and social issues in all aspects of the reconstruction process, and work within a sustainable development framework that includes maximising environmental goods and services.
- **Frame activities in a clear spatial plan**: Frame reconstruction efforts within a clearly defined regional spatial plan, produced with effective participation of all relevant stakeholders.
- **Provide a process for resolving tenure issues**: Provide an effective process for resolving tenure issues, and take care to minimise the likelihood of conflict among natural resource users arising from disputes over tenure.
- **Implement a framework for disaster management**: Develop and implement an appropriate disaster management framework such as early warning, disaster training, and local, provincial, national and regional disaster response action plans.
- **Build strong local institutions**: Build effective local institutions in both the formal and informal sectors. Steps to ensure this include secondment of staff and expertise, technical support, training, cross-visits and targeted capacity building programs.
- **Empower local government**: Re-empower the people of Aceh and local Government by involving them in the regulation, funding and management of the reconstruction process.
- **Ensure effective participation**: Ensure effective participation and fair representation by all relevant groups in the governance and decision making process.
- **Communicate and coordinate effectively**: During the reconstruction there need to be effective mechanisms for coordination of all public, private and donor efforts.
- **Ensure transparency and accountability**: Ensure that all activities and funding of Government agencies and the informal sector are transparent, accountable and auditable.

2 Green Reconstruction Policy: General

2.1 Mainstreaming Environment

Goal

The reconstruction process integrates the reconstruction of infrastructure, rehabilitation of livelihoods, and rehabilitation of environmental goods and services. This includes integrating environmental concerns in all aspects of reconstruction activities and strategies, such as aiming to improve the quality of life for affected communities and individuals whilst minimising the negative impacts of reconstruction on the environment and maintaining the long-term biological diversity and productivity of the natural systems.

Reconstruction Strategy

- Ensure that environmental considerations, including the need to minimise environmental impacts, are fully incorporated in all aspects of the reconstruction strategy, and within general development practice;
- Undertake strategic environmental assessments (SEAs) and environmental impact assessments (EIAs) or at least a rapid response version in all sectors and for all actions, and ensure these are implemented as part of all rehabilitation and reconstruction efforts;
- Ensure that the decision making process supports actions that have minimum negative environmental impact and promote positive choices during the reconstruction process, including through the optimizing environmental goods and services;
- Put in place mechanisms and policies to prevent demand exceeding the carrying capacity of the environment, including providing sustainably sourced alternatives;
- Pay particular attention to infrastructure and transportation reconstruction as areas where direct and indirect environmental impacts need to be fully considered; and
- Use resource economics, best available scientific data and the results of EIAs and SEAs to identify reconstruction solutions that minimize impact on the environment and provide for long-term sustainable development.

Indicators of Success

- Policies are in place to prevent demand exceeding the carrying capacity of the environment;
- Infrastructure and transportation reconstruction is considered in a full and transparent framework that includes EIA and SEA considerations;
- Natural resource economics, EIAs and SEAs are carefully reviewed and reconstruction options are selected that minimize impact on the environment; and
- “Soft” environmental solutions that strengthen and utilize natural defence systems (eg, creating a mangrove buffer zone) are preferred over “hard” engineering solutions (eg, breakwaters).

2.2 Building Legitimate Local Institutions

Goal

The long-term recovery from the socio-economic, cultural and livelihood impacts of the tsunami is made more sustainable through building the capacity and effective participation of legitimate local institutions involved in natural resource management, such as the Panglima Laot, and making them self-reliant in carrying out sustainable development programs to enhance their well-being and ensure environment sustainability.

Reconstruction Strategy

- Engage and work with communities, local groups (including private companies), and local institutions in planning, implementation, monitoring and evaluation activities (including programs related to spatial planning aspects such as participatory mapping);
- Develop approaches to ensure economic sustainability of local institutions including increasing management and organizational skills by providing relevant trainings and cross visits;
- Develop the capacity of local institutions by providing technical assistance on relevant issues, including participatory assessment and monitoring processes and business plan development skills;
- Encourage the role of women in the local economy through micro credit financing schemes that provide soft loans to support daily activities such as trade, merchandise, and agriculture. This role will be strengthened through:
- Participatory management training and business planning;
- Basic conservation training and awareness raising; and
- The connection of micro-credit services to other community activities, such as organic fertilizer, trade, and even co-op groups.
- Conduct participatory processes to identify natural resources to protect within each community and to facilitate rehabilitation efforts (eg, a coastal community could initiate a “coral garden” near their village to grow soft coral recruits and breed fish stock to provide materials for the rehabilitation of damaged coral reef areas);
- Conduct participatory processes to monitor effectiveness and document drawbacks, constraints and success;
- Put mechanisms in place to ensure social equity; and
- Provide training and targeted human capacity building programs to ensure effective human capacity in formal and informal institutions, and conduct cross visits to share experiences and lessons on effective institutions.

Indicators of Success

- Local institutions participate in management programs, training and cross visits to build capacity in key areas;
- The staff of local institutions display improved knowledge, skills and capacity;

- Local institutions receive targeted technical assistance and infrastructure and resources to build capacity in key areas;
- Local, provincial and national policies on disaster mitigation recognise the role of community empowerment and multi-stakeholder participation;
- Communities have raised awareness regarding the functions and benefits of coastal and marine ecosystems; and
- There is voluntary management and setting aside of coastal and marine areas to promote recovery.

2.3 Spatial Plan

Goal

The overall spatial plan ensures that reconstruction efforts have minimum negative environmental impact and promote positive choices during the reconstruction process. This includes optimizing the provision of environmental goods and services as well as development and livelihood opportunities for impacted communities.

Reconstruction Strategy

- Identify the full range of needs and uses to be incorporated in the spatial plan, and identify the full range of environmental considerations, including disaster risk, and environmental goods and services;
- Promote flexible, adaptive, planning approaches to be responsive to short-, medium- and long-term spatial planning needs;
- Establish mechanisms to deal with critical issues such as displacement and tenure resolution, and ensure effective and equitable resolution of jurisdictional overlaps and other claims;
- Establish mechanisms to coordinate all rehabilitation and reconstruction activities across sectors and across government agencies, international organisations and NGOs; and
- Conduct a spatial planning process that takes place at all levels (eg, local community, district, provincial and regional), and which involves the participation of communities and representatives of civil society such as NGOs.

Indicators of Success

- Sensitive facilities are located away from high risk areas;
- Infrastructure and transportation reconstruction is considered in a full and transparent framework that includes EIA and SEA considerations;
- Natural resource economics approaches and EIAs are carefully reviewed and appropriate options selected.
- Infrastructure reconstruction is carefully monitored to prevent the creation of excessive capacity;
- Integrated coastal management is adopted as the planning framework for coastal areas;

- Natural resource exploitation (including forestry, agriculture and water use) is consistent with the long-term health of surrounding and down-stream environments and economic activities;
- The spatial plan is endorsed by all relevant stakeholder groups; and
- Transparent procedures and mechanism are established to deal with conflict resolution.

2.4 Building Good Governance

Goal

The governance of the reconstruction process (including planning, implementation and evaluation) is transparent, accountable and includes the effective participation of local communities.

Reconstruction Strategy

- Create clear lines of communication between and within formal and informal sectors and put in place mechanisms to ensure effective consultation and input as part of the reconstruction process;
- Ensure transparency mechanisms in all reporting and management frameworks (government, NGO and private sectors operations) and ensure accountability mechanisms are in place to guide effective use of resources and funds;
- Provide an “open room” for consultation and empowerment and ensure that local communities, local resource owners and users, and other relevant key stakeholders can engage effectively in decisions regarding reconstruction; and
- Build the capacity of NGOs and other groups representing the voice of civil society, particularly in the area of natural resource governance.

Indicators of Success

- Reporting and management frameworks are fully transparent;
- All aspects of planning, implementation, and management are fully accountable;
- All rehabilitation and reconstruction activities are effectively coordinated across all sectors and across all government agencies, international organisations and NGOs; and
- Communities and local stakeholders participate effectively in decision-making process and in the governance of the reconstruction process.

3 Green Reconstruction Policy: Implementation

3.1 Coastal and Marine Natural Resources

3.1.1 Rebuilding well managed small-scale coastal fisheries

Goal

A small-scale fisheries sector is re-established that is sustainably managed, equipped with appropriate gears, does not exceed carrying capacity, and promotes poverty reduction through incentives for best practices.

Reconstruction Strategy

- Develop a sustainable fisheries reconstruction plan that focuses on creating an over-arching sustainable fisheries management framework, sustaining target fish populations, conserving sites critical for replenishment, rebuilding boats, gears, supporting infrastructure and markets, strengthening local institutions involved in small-scale fisheries, and strengthening small scale fisheries governance;
- Where possible, promote community led reconstruction efforts, including investing in local industries and local capacity for rebuilding boats and infrastructure, taking care to ensure that capacity limits are not exceeded;
- Where possible, promote the use of recycled or sustainably sourced materials in the rebuilding of boats and supporting infrastructure, and re-equip with appropriate gears according to national and local management frameworks, working within an overarching sustainable fisheries management plan;
- Avoid the introduction of inappropriate technologies (eg, steel boats), and critically evaluate donor or national government driven initiatives to provide substantially different boats or gears; and
- Invest in the reconstruction of strong local formal and informal institutions and human capacity for management, including monitoring and enforcement, coupled with efforts to rebuild infrastructure.

Indicators of Success

- There is a reduction in the use of unsustainable and destructive fishing gears, and a reduction in illegal fishing activities;
- The marine trophic structure of target ecosystems is maintained or improves, and there are positive trends in population indicators such as size / frequency distribution of indicator species, and abundance and population structure of target species;
- Management frameworks integrate traditional fisheries knowledge and management mechanisms, including the maintenance of traditional fishing grounds, and access rights,
- Management frameworks support the effective participation of local institutions representing fisher communities in the governance process;
- Product sold to markets meets best practice criteria; and
- Fishing households engage in enterprise schemes.

3.1.2 Rebuilding a well managed commercial fisheries sector

Goal

The commercial fisheries sector is sustainably managed, operates according to best practices within a precautionary framework, uses appropriate gears and capacity, is supported by efficient post-harvesting technology and infrastructure, and does not compromise subsistence and small-scale fisheries.

Reconstruction Strategy

- Develop a sustainable fisheries reconstruction plan, focusing on creating an over-arching sustainable fisheries management framework, building capacity for effective management, sustaining target fish populations, and conserving sites critical for replenishment;
- Develop a sustainable fisheries infrastructure reconstruction plan, involving rebuilding boats, gears, supporting infrastructure and markets, and strengthening local institutions involved in small scale fisheries, and strengthening fisheries governance;
- Ensure effective surveillance, enforcement and compliance mechanisms are in place to prevent over-exploitation of fish populations and other targeted components of the ecosystems, and to prevent other activities from having a significantly damaging impact on the health of the ecosystems; and
- Provide incentives and access to markets for product of a certification standard to encourage best practice, and if appropriate, develop infrastructure and trade networks and seek markets to support such ventures.

Indicators of Success

- There is a reduction in the use of unsustainable and destructive fishing gears, and a reduction in the incidence of illegal fishing activities;
- The marine trophic structure of target ecosystems is maintained or improves, and there are positive trends in population indicators such as size / frequency distribution of indicator species, and abundance and population structure of target species; and
- Fisheries management plan are developed under an ecosystem based management framework with clear catch limits, and are supported by local stakeholders.

3.1.3 Rebuilding a sustainably managed aquaculture sector

Goal

The aquaculture sector is sustainably managed, operates according to best practices, within a coastal zone management framework, with minimum negative impacts on marine and coastal ecosystems, and promotes poverty reduction through incentives for best practices.

Reconstruction Strategy

- As far as possible, provide alternative livelihoods and compensation whilst the aquaculture sector is reviewed for environmental and economic sustainability, infrastructure needs assessed and a sector specific reconstruction plan developed;

- Ensure that reconstruction is framed within a larger coastal zone management and spatial planning framework, and that there is effective participation of local communities in issues of land tenure, reclamation and zoning;
- Ensure that reconstruction follows best practice guidelines for aquaculture, including minimising impact on other ecosystems, and provision of incentives and access to markets for product of a certification standard; and
- Use the reconstruction of the aquaculture sector as a means of promoting local level enterprise opportunities, coupled to the implementation of best practice, such as providing individuals with equity in a larger enterprise.

Indicators of Success

- Aquaculture operations meet best practice standards;
- Water quality in adjacent rivers and watersheds is maintained or improved;
- Aquaculture operations are in compliance with integrated coastal management recommendations for location and type of operation;
- The sourcing of broodstock for shrimp aquaculture has no negative impact on the environment;
- Product sold to markets meets best practice criteria; and
- Aquaculture households engage in enterprise schemes.

3.1.4 Rehabilitation and recovery of coral reefs and sea grass beds

Goal

Tsunami damaged coral reefs and sea grass beds fully recovered with optimum health to contribute to fisheries, coastal defence, and tourism potential and to be resilient against future impacts such as climate change.

Reconstruction Strategy

- Prioritise the removal of any external threats to the reef system, including bomb and cyanide fishing, and seek to minimise land-based threats such as pollution and destructive fishing, in order to maximise recovery;
- If active rehabilitation is deemed necessary, choose a methodology appropriate to the type and scale of damage;
- Initiate a broad education and outreach program targeting communities and policy makers, to highlight the need to urgently remove external threats and illegal activities, to help ensure rapid recovery;
- Prioritise sites of importance for ecological processes, such as those providing new recruits to fish populations and those identified as having long-term resilience, and ensure they receive high levels of protection as insurance against future natural impacts; and
- Ensure that any proposed structure or activity with direct or indirect impacts on coral reefs and seagrass beds is subject to a full environmental impact assessment and that the results are fully integrated in the decision making process in a transparent manner.

Indicators of Success

- Reef and seagrass habitats that were damaged by tsunami undergo full recovery;
- Areas of reef and seagrass are designated for high forms of protection;
- The marine trophic structure of target ecosystems is maintained or improves, and there are positive trends in population indicators such as size / frequency distribution of indicator species, and abundance and population structure of target species;
- The incidence of illegal activities impacting coral reef and sea grass ecosystems is reduced; and
- There is no further damage to coral reefs and seagrass beds from reconstruction activities.

3.1.5 Rehabilitation of mangroves and coastal wetlands

Goal

Mangroves and coastal wetlands are rehabilitated and restored to provide a coastal defence function, support sustainable livelihoods and maximise environmental goods and services to fisheries.

Reconstruction Strategy

- Assess damage to mangrove ecosystems;
- Review historical data and assess coastline changes to establish area potentially able to support mangroves;
- Document examples of mangroves providing a coastal buffer protecting communities from storm wave inundation and disseminate to policy makers and local groups;
- Adopt integrated coastal management and spatial planning processes as frameworks for rehabilitation of damaged mangroves and establishment of new mangroves;
- Ensure all discussion of mangrove rehabilitation and establishment respects local and customary management, and includes effective participation of local communities and affected individuals;
- Ensure effective mechanisms are in place to resolve tenure issues;
- Recognise that planting mangrove seedlings offers an opportunity for a “food for work”, or “tools for work” program; and
- Link rehabilitation and protection efforts to the spatial planning process to ensure that identified areas are included in the spatial plan.

Indicators of Success

- Mangrove and coastal wetlands damaged by tsunami undergo full recovery;
- Community and local stakeholders support rehabilitation and establishment of mangroves in areas identified as important for disaster mitigation;
- The incidence of illegal activities impacting mangroves and coastal wetlands is reduced (eg, unregulated conversion, and harvesting for charcoal); and

- Non-destructive traditional use of mangroves is maintained and traditional access to beach landing sites for small-scale fishers is preserved.

3.1.6 Rehabilitation of coastal and marine ecosystems

Goal

Coastal and nearshore marine ecosystems are restored to a natural, intact state, supporting healthy associated fish and invertebrate communities, and contribute to sustainable livelihoods and well managed fisheries.

Reconstruction Strategy

- Recognise that changes in elevation associated with the earthquake will lead to permanent natural changes in the coastline, and that a process of adjustment of natural coastal habitats needs to take place, especially for beaches and inter-tidal habitats;
- Review lessons from other regions on the long-term costs and benefits of a range of environmental solutions to rehabilitation and reconstruction of coastal and marine ecosystems, in particular looking at breakwaters and beach replenishment and impacts on coastal fisheries and habitats;
- Focus on supporting natural processes of readjustment and stabilization of a new coastal geography: the reconstruction of the coastline and coastal ecosystems may be best left to nature;
- Prefer “soft” environmental solutions (eg, using natural vegetation to stabilize supra-tidal habitats) over “hard” engineering solutions (eg, beach replenishment and breakwater construction): exceptions include rebuilding jetties and similar protection for ports, boat access and landing points;
- Adopt integrated coastal management as a framework for all proposed coastal engineering works, including requiring an assessment of the full range of costs and impacts on other sectors and ecosystems;
- Ensure that reconstruction efforts focus on reducing illegal activities impacting coastal and marine ecosystems before the tsunami and respecting and preserving traditional and cultural uses; and
- Link rehabilitation and protection efforts to the spatial planning process to ensure that identified areas are included in the spatial plan.

Indicators of Success

- There is no further degradation or loss of intactness of nearshore and coastal habitats;
- The health of nearshore and coastal ecosystems is maintained or improves, resulting in positive trends in trophic structure, population size / frequency, and abundance of indicator species, including those targeted by commercial and subsistence fisheries;
- Water quality in coastal and nearshore environments is maintained or improved; and
- Traditional fishing grounds are maintained, including traditional access to beach landing sites.

3.1.7 Safeguarding marine and coastal sites for natural and cultural values

Goal

Marine and coastal sites of particular importance for cultural or traditional values, or containing important biodiversity or that help sustain fisheries, are afforded enhanced management and protection to ensure long-term persistence of values.

Reconstruction Strategy

- Protect and effectively manage all known important fisheries spawning and recruitment sites, using appropriate traditional, local and national management mechanisms (including time-area closures, and marine protected areas);
- Protect and effectively manage all known important life history sites for endangered or vulnerable species (eg, turtle nesting beaches), using appropriate traditional, local and national management mechanisms;
- Protect sites of importance for cultural, historical or traditional values, and maintain access to such sites;
- Identify and promote the protection of sites that have high value for “natural defence” due to their integrity and resilience;
- Adopt integrated coastal management as a framework for protecting marine and coastal sites of high natural and cultural value; and
- Link rehabilitation and protection efforts to the spatial planning process to ensure that identified areas are included in the spatial plan.

Indicators of Success

- Marine and coastal areas are designated for protection of habitat or ecosystems;
- Marine and coastal areas are designated for protection of endangered or vulnerable species; and
- Marine and coastal areas are designated for protection of critical fisheries sites, such as spawning grounds and nursery grounds.

3.2 Land, Forests and Freshwater Resources

3.2.1 Rebuilding a sustainable agriculture sector

Goal

A sustainable agriculture sector is re-established under an integrated river basin management scheme and integrated coastal zone management framework, including through rehabilitation of impacted lands, incentives for adopting best practice methods, and provision of alternative livelihoods focused on reducing poverty.

Reconstruction Strategy

- Provide alternative livelihood options for those displaced or unable to use impacted lands, prioritising those most in need; and
- Frame reconstruction efforts within a coastal zone management and spatial planning framework that includes sector specific reconstruction plans, and rehabilitation strategies for lands suffering salt water intrusion.

Indicators of Success

- Crops are produced according to standards of sustainability or in accordance with best practice guidelines;
- Agriculture practices have minimum negative impacts on water quality in adjacent river basins; and
- Agriculture households engage in enterprise schemes.

3.2.2 Rehabilitation, recovery and expansion of coastal forests

Goal

Coastal forests (including mangroves) are restored to a natural state with healthy associated ecosystems, managed in an integrated framework, able to provide for sustainable timber harvesting, agriculture and other uses and able to minimise down-stream impacts from unsustainable practices including clearing and conversion. Coastal forest and mangroves are expanded within their natural range to provide natural defence barriers against further natural disasters.

Reconstruction Strategy

- Assess damage to coastal forest and mangroves;
- Repair damage to coastal forest and mangroves in a manner consistent with healthy associated ecosystems; and
- Assess benefits of extending coverage of coastal forests and mangroves to provide natural defence barriers in the context of existing economic uses of the relevant land and marine environment, and extend the coverage by planting coastal forests and mangroves as appropriate.

Indicators of Success

- Coastal forests and mangroves have established themselves in a healthy state at least in their pre-tsunami range.

3.2.3 Rehabilitation and recovery of rivers, estuaries, and river basins

Goal

Rivers and estuaries are restored to a natural state, with healthy associated ecosystems, contained within rehabilitated watersheds that are managed in an integrated river basin management framework, able to provide for agriculture and other uses and able to minimise downstream impacts from watershed, agriculture and urban pollution sources.

Reconstruction Strategy

- Assess damage to rivers, estuaries and river basins (including groundwater systems);
- Repair damage to river basins in a manner consistent with healthy downstream river, estuary and marine ecosystems;
- Prefer “soft” environmental solutions (eg, re-vegetating unstable river banks with native vegetation) over “hard” engineering options (eg, concreting river banks);

- Ensure that rebuilt industries do not use more water than is sustainably available in the long term; and
- Ensure that effective systems are in place to prevent pollution and contamination of water systems from all human activities (eg, agriculture, aquaculture, heavy and light industry, urban and rural waste, run-off, infrastructure development).

Indicators of Success

- Rivers, estuaries and river basins (including groundwater systems) are healthy in the medium to long term; and
- Upstream activities do not negatively impact either downstream river, estuary and marine ecosystem health or downstream economic activities.

3.3 Planning, Mitigation and Reconstruction

3.3.1 Natural disaster mitigation and response strategies

Goal

Future human and economic impacts of natural disasters (including tsunamis, floods and storm waves) are minimised through measures such as spatial planning that locates industry and settlements away from high risk areas, enhancement of natural mitigation factors as part of coastal zone planning, and education, awareness, and early warning systems that ensure individuals are able to react in an appropriate manner.

Reconstruction Strategy

- Incorporate disaster mitigation and tsunami response strategies into spatial plans and integrated coastal management plans, using modified strategic environmental assessment (SEA) and environmental impact assessment (EIA) tools to help assess risk;
- Prefer “soft” environmental solutions that strengthen and utilize natural defence systems (eg, creating a mangrove buffer zone) over “hard” engineering solutions (eg breakwaters), using modified strategic environmental assessment (SEA) and environmental impact assessment (EIA) tools to support the decision making process;
- Establish an early warning system and communication system for Indonesia, and link to larger Pacific and Indian Ocean networks;
- Ensure that education and awareness programs are carried out at local, provincial and national levels, and that communities and individuals can act promptly and immediately to minimise loss of life; and
- Disseminate and adapt lessons and response strategies from other countries, including advice on evacuation routes, community preparedness, and location of sensitive facilities.

Indicators of Success

- Areas of natural habitat are identified as performing a natural defence function, and protected for that function;
- Spatial plans and integrated coastal management plans include areas set aside as disaster mitigation zones;

- Individuals are aware of the symptoms of natural disasters, and are trained to respond appropriately; and
- There is a recognized lead agency for natural disaster mitigation with resources and capacity to respond to the scale of potential disasters, and local, national and regional disaster response strategies and individual action plans are in place across all areas considered at risk.

3.3.2 Integrated coastal management

Goal

Integrated coastal management improves the quality of life of communities that depend on coastal resources whilst maintaining the biological diversity and productivity of those resources. Stakeholders are involved in preparation and implementation of an integrated coastal management plan for the protection and sustainable development of coastal ecosystems and resources that respects and embraces the social and economic values, and includes natural disaster mitigation.

Reconstruction Strategy

- Develop an open, participatory and democratic process that includes government and communities, science and management, sectoral and public interest, and which allows early identification and prioritization of uses, needs and concerns;
- Utilize the best available information for planning and decision making;
- Ensure that the integrated coastal management process has key political and community support, and that appropriate coordination and governance arrangements are in place, including linkages between local and national agencies;
- Ensure that the integrated coastal management process is managed to nurture an enabling environmental policy, operates with transparency and accountability, and is conducted by agencies that have the appropriate legal authority;
- Ensure that the agencies charged with conducting the integrated coastal management process have adequate, dedicated resources, including staff with appropriate skills, capacity and commitment;
- Promote the equitable allocation of resources and a flow of benefits to the majority; and
- Create many incomes and chains of enterprise, and build indigenous institutions that involve and empower the citizen.

Indicators of Success

- The incidence of conflicting uses of the coastal zone between stakeholders is reduced;
- There is greater transparency and accountability in the governance process in the coastal zone;
- There are positive trends in the intactness of coastal habitats, water quality, and ecological structure of coastal ecosystems;
- The diversity of economic sectors dependent on coastal natural resources increases; and

- The productivity and sustainability of economic sectors dependent on natural resources in the coastal zone improves.

3.3.3 Construction materials

Goal

Reconstruction is sensitive to local traditions and cultures, supports local businesses, builds local capacity and minimises impact on local natural resources through using recycled or sustainably sourced materials wherever possible (particularly avoiding unsustainable forestry practices that add pressure to already-stressed forest ecosystems).

Reconstruction Strategy

- Assess damage to infrastructure (houses, hospitals, schools, roads, bridges, airports, ports etc) and determine most appropriate reconstruction method;
- Assess quantity and type of materials required for reconstruction;
- Assess quantity of required materials available from recycled sources (eg, from debris) or other sustainable sources in affected country;
- If insufficient material is available from recycled or other sustainable sources in-country, assess feasibility of importing materials from sustainable sources;
- Where possible, promote the use of recycled or sustainably sourced materials;
- Aim to minimise the use of toxic materials in reconstruction, and where unavoidable, promote the application of the Material Safety Data Sheet system, including following specifications for storing, handling, and dumping waste;
- Pay particular attention to avoid exacerbating existing pressures on local natural resources (eg, avoid timber supply from stressed forest systems, avoid aggregate supply from stressed coastal and coral reef systems etc);
- Use materials suited to local conditions (eg, durable in local climate);
- As far as possible, involve local processing industries (eg, sawmills) in customising (eg, cutting to size), treatment (eg, against termites) and distribution of construction materials; and
- As far as possible, do not create new (or expand existing) processing industries beyond the long-term capacity of the relevant natural resource to supply them.

Indicators of Success

- Local natural resources are used in reconstruction in a sustainable manner; and
- Natural resources are imported from sustainable sources to fill any shortfall in local availability.

3.3.4 Sanitation and waste disposal

Goal

Effective and comprehensive sanitation and waste disposal infrastructure is rebuilt quickly to ensure that human-generated waste (organic and non-organic, solid and liquid) does not impact adversely on land, freshwater and marine systems.

Reconstruction Strategy

- Assess capability of existing infrastructure to cope with anticipated medium- to long-term sanitation and waste disposal requirements;
- Repair existing sanitation and waste disposal infrastructure where possible;
- Build additional required sanitation and waste disposal infrastructure according to world best standards (without over-engineering or providing more capacity than is required in the medium to long term);
- Place sanitation and waste disposal infrastructure within an overall spatial plan to maximise utility and efficiency;
- Find secondary uses for waste (eg, treated sewerage and grey water used for agriculture, solid waste recycled wherever possible);
- Promote “reduce, re-use, recycle” approach;
- Ensure that rebuilt industries (including agriculture and aquaculture) tie into the sanitation and waste disposal infrastructure, and comply with pollution and contamination regulations;
- Avoid disposing of untreated waste into land, freshwater or marine systems; and
- Ensure strong enforcement of sanitation and waste disposal regulations.

Indicators of Success

- Communities understand that untreated waste is a potential threat to the environment and public health; and
- Waste is either put to a secondary use or disposed of in an inert state.
- Sanitation and waste disposal regulations are implemented and enforced.

3.3.5 Debris removal

Goal

Debris removal focuses on minimising the risk of contamination from toxic wastes, sorting and disaggregating debris to provide recycled materials for reconstruction efforts and removal or disposal in a manner that will not lead to disruption or impact on coastal, estuarine or nearshore ecosystems, or later re-erosion.

Reconstruction Strategy

- Assess quantity and type of debris;
- Assess contamination threats to land, water and marine systems from undisturbed debris and from handling debris;
- Assess health risks from handling debris;
- Assess scope to recycle debris for use in the reconstruction effort (eg, timber for housing, rubble for road construction etc);
- Identify suitable methods and locations for sorting, storing and disposing of debris; and
- Where possible, promote the use of recycled materials in reconstruction.

Indicators of Success

- Debris are adequately sorted and recycled as far as possible; and
- Debris storage and disposal does not adversely impact on land, water or marine systems.

3.3.6 Sustainable energy

Goal

The reconstruction of the energy sector (including infrastructure to generate energy supply for rural and remote communities) focuses on clean and renewable energy sources that minimize emissions and are made available at a competitive price.

Reconstruction Strategy

- Assess the energy needs for reconstruction of urban and rural communities and associated infrastructure;
- Assess the current, and potential availability of clean and renewable energy sources, paying particular attention to opportunities for local sourcing of raw materials;
- Promote the use of natural gas from local reserves to generate electricity in urban areas;
- Promote the use of biomass, solar, and wind to generate energy for rural and remote areas, for both community and individual basis;
- Incorporate clean and renewable energy in the medium and long-term planning for the energy sector;
- Provide incentives for the use of clean and renewable energy options in the reconstruction of infrastructure for communities in rural and remote areas; and
- Ensuring that power plant and its facilitation will be constructed in low-risk area.

Indicators of Success

- Sustainable energy is considered in medium-term (5-10 years) and long-term (10-15 years) energy strategies;
- Energy infrastructure is available to communities in rural and remote areas;
- Electricity is available to an increasing number of households; and
- Renewable energy increases as an overall proportion of the energy supply.

3.4 Ecological Footprint

Goal

Reconstruction efforts provide for economic opportunities for development and improved quality of life whilst minimising the overall ecological impact on ecosystems and environment. Efforts to restore industry, infrastructure, utilities and public services aim to maximise efficiency, minimise environmental impact and do not create excessive capacity for consumption of natural resources.

Reconstruction Strategy

- Ensure that all aspects of reconstruction take measures to minimize their impact on the environment, adopt environmental best practices and incorporate environmental impact assessments and strategic environmental assessments in their operations;
- Pay particular attention to ensuring that donor and Government of Indonesia reconstruction efforts are well coordinated and are not duplicative;
- Where possible, ensure that donor and Government of Indonesia reconstruction efforts do not create excessive capacity, in particular in rebuilding major infrastructure for public works and for industries dependent on natural resources such as forestry;
- Promote decision-making based on the best available scientific data and promote the use of natural resource economics and modelling in the reconstruction process; and
- Evaluate reconstruction efforts against green reconstruction targets and adapt reconstruction strategies based on the results of monitoring results. Engage stakeholders in target-setting and in monitoring, and provide a feedback process for dissemination of results.

Indicators of Success

- Consumptive capacity of reconstructed infrastructure in sectors dependent on natural resources does not exceed sustainable production capacity (eg, fisheries, forestry, infrastructure);
- Public utilities and works reconstruction (eg, power production, water filtration, telecommunications, and industry rejuvenation) complies with environmental standards, meets local needs, does not exceed demand, and minimises environmental impacts; and
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WWF-Indonesia's **vision** is "Conservation of Indonesia biodiversity for the well-being of present and future generations". Our **mission** is to conserve biodiversity and reducing human impact through:

1. Promoting strong conservation ethics, awareness and action in Indonesia society.
2. Facilitating multi-stakeholders efforts to preserve biodiversity & ecological processes on ecoregional scales
3. Advocating for policies, laws and law enforcement that support conservation.
4. Promoting conservation for the well-being of people, through sustainable use of natural resources.

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