Environment Sector

Disaster Recovery Framework Guide

United Nations Development Programme

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ABBREVIATIONS

BBB	build back better
DRF	Disaster Recovery Framework
DRR	Disaster Risk Reduction
EU	European Union
GFDRR	Global Facility for Disaster Reduction and Recovery
PDNA	Post-Disaster Needs Assessment
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme

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The guide emphasizes that recovery programming focused on the environment can play a critical role in reducing poverty and meeting the Sustainable Development Goals, ensuring that affected people maintain their environment and health during and after disasters and build resilience over time. Mitigating risk exposure and strengthening the resilience of environment systems are the best ways to protect the most vulnerable, beat back poverty, and promote shared and sustained growth.

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Summary

In the aftermath of a disaster or conflict, countries must address the recovery needs of the affected economy, society and its environment at the earliest to minimize the deleterious effects on them. In order to assist countries in their endeavours, international organizations—Global Facility for Disaster Reduction and Recovery (GFDRR), the World Bank, the European Union and the United Nations Development Programme—have developed systematic guidelines on post-disaster needs assessment (PDNA) for the many socio-economic sectors and the cross-cutting sectors including the environment.

A critical follow-up to a PDNA is the elaboration of a more detailed Disaster Recovery Framework (DRF) for each sector identified in the PDNA. A DRF outlines the recovery policy, institutional arrangements and recovery cost estimates along with the project implementation

mechanisms. To that effect, the international organizations recently updated the Disaster Recovery Framework Guide in March 2020.

The current guidance document, the DRF–Environment Guide, is a companion document to the main DRF Guide, with emphasis on the environment sector.[1] The environment sector recovery framework and priorities follow the generic steps involved in the development of a DRF (similar to the ones outlined in the main DRF Guide) and cover the (a) development of a recovery policy; (b) creation of institutional arrangements; (c) identification of financial mechanisms and (d) establishment of implementation arrangements.

In the post-disaster scenario, those involved in DRF activities have to work under resource and time constraints. Therefore, this DRF–Environment Guide has been written with the DRF practitioners in mind. It is more detailed than the main DRF Guide and provides stepwise guidance on the various stages of the development of environmental recovery policies, the team structure, stakeholders, etc. and walks the reader through the process of establishing a comprehensive recovery framework. Throughout the document, many examples are provided on how similar or relevant activities have been conducted in the past. The DRF–Environment Guide also contains a number of useable templates on team formation, project planning, task management, project budgeting, etc., for the reader's consideration as a starting point in their DRF creation. At the end of this DRF–Environment Guide, a number of free online resources and tools have been provided on various informative topics of relevance to DRF–Environment and will be of use to practitioners.

1

Preamble

The confluence of disasters and conflicts is becoming more prominent in all the regions of the world and the catastrophic impact of these events on peoples' lives and their environment is often felt for many years after.

1.1 Post-Disaster Recovery

In the immediate aftermath of a disaster or conflict, the government of the affected area must address these issues responsibly so as to deliver net positive and long-term benefit to its peoples and the environment. This calls for a systematic approach to initially identify post-disaster needs.

In 2008, the United Nations (UN), the World Bank (WB) and the European Union (EU) created a common platform for post-crisis assessment and recovery planning. This tripartite partnership has generated dozens of joint processes, and its methodologies have achieved recognition as state-of-the-art tools for supporting national recovery efforts. One such methodology is the Post-Disaster Needs Assessment (PDNA), which comprises two volumes, A[2] and B[3], represents a harmonized and coordinated approach, providing for an objective, comprehensive and government-led assessment of the post-disaster damages, losses and recovery needs across sectors and paving the way for a consolidated recovery framework.

A key follow-up activity to the PDNA is the development of a more detailed Disaster Recovery Framework (DRF) for each sector identified in the PDNA. The DRF is a government-led and owned exercise, conducted in association with the stakeholders relevant for the recovery of the country and affected sectors, including but not limited to the civil society, the private sector and international partners.

A DRF outlines the recovery policy, institutional arrangements and recovery cost estimates, along with the project implementation mechanisms. The main DRF Guide[4] provides an understanding of the key steps that each sector should take to develop a recovery framework that will be included in the overall DRF for the country. The main DRF Guide emphasizes the importance of

Practical Considerations

The post-disaster activities of PDNA and DRF are often sequential, continuous and seamless, even if there are time gaps between the PDNA completion and the official requests for triggering and conducting the DRF.

To facilitate smooth transition from PDNA to DRF, it is recommended that the team involved in the PDNA also take on the task of completing the DRF. This is valid for all sector teams including the environmental sector. Government officials who are assigned to this task should be allocated sufficient time to specifically attend to this important work.

Figure 1: Timeline for initiating a Disaster Recovery Framework

Source: Adapted from UNDP, Training Material "From PDNA to Disaster Recovery Framework (DRF)", United Nations Development Programme.

disaster preparedness activities that put in place (or strengthen) institutional mechanisms to be triggered in the event of a disaster. It also identifies within the recovery process a chance to incorporate crucial principles of 'building back better (BBB)' and converting the adversity into an opportunity for prioritizing inclusive recovery of vulnerable groups. A typical timeline graphic is shown in Figure 1.

1.2 Context for Environment Sector in Post-Disaster Recovery

The environment affects all sectors of economic and social activity. That is especially relevant in a post-disaster recovery scenario, posing both risks and opportunities in the turmoil of the immediate aftermath. As governments work towards addressing the social and economic consequences of a disaster, the environmental issues run the risk of being neglected. However, the situation also provides an opportunity for working towards environmental rehabilitation in an inclusive and sustainable manner during the recovery process. For this reason, the PDNA and the DRF guides have identified 'environment' as an important cross-cutting sector.

1.3 The PDNA for the Environment

The PDNA–Environment Guide:[5]

(a) outlines the various environmental segments impacted by a disaster and the typical services they provide;

(b) identifies cross-sector linkages and cross-cutting issues;

(c) helps to identify key institutions at national and local levels that are involved in environmental governance; and

(d) provides guidance on the process of assessing environmental recovery needs as part of the overall PDNA.

1.4 Purpose of this Guide

In the context of post-disaster recovery efforts relevant to the environment sector, there are four distinct terms that are frequently referred to in this document:

(a) PDNA, with an associated guidance document referred to going forward as the PDNA Guide Volume A;[6]

(b) PDNA–Environment, with an associated guidance document referred to going forward as the PDNA–Environment Guide;[7]

(c) DRF, with an associated guidance document referred to going forward as the main DRF Guide;[8] and

(d) DRF–Environment, with an associated guidance document referred to going forward as the DRF–Environment Guide.

The current document is the DRF–Environment Guide. It is a companion guidance document to the main DRF Guide with emphasis on the recovery framework for the environment sector.[9]

During the post-disaster recovery framework process, the team dedicated to the environment sector will follow this

DRF–Environment Guide to develop the environmental recovery policy, identify the institutional arrangements, key partners and primary stakeholders that will help support the recovery framework, as well as work out the implementation details of such a framework. The team will also prepare cost estimates for addressing cross-cutting issues related to the environment so that the main DRF can incorporate the environmental components. The approach to disaster recovery using the revised version of the DRF is relatively new and therefore there is limited experience and lessons to draw from for the environmental sector. It is hoped that this DRF–Environment Guide will be updated with a greater number of specific environmental examples over time.

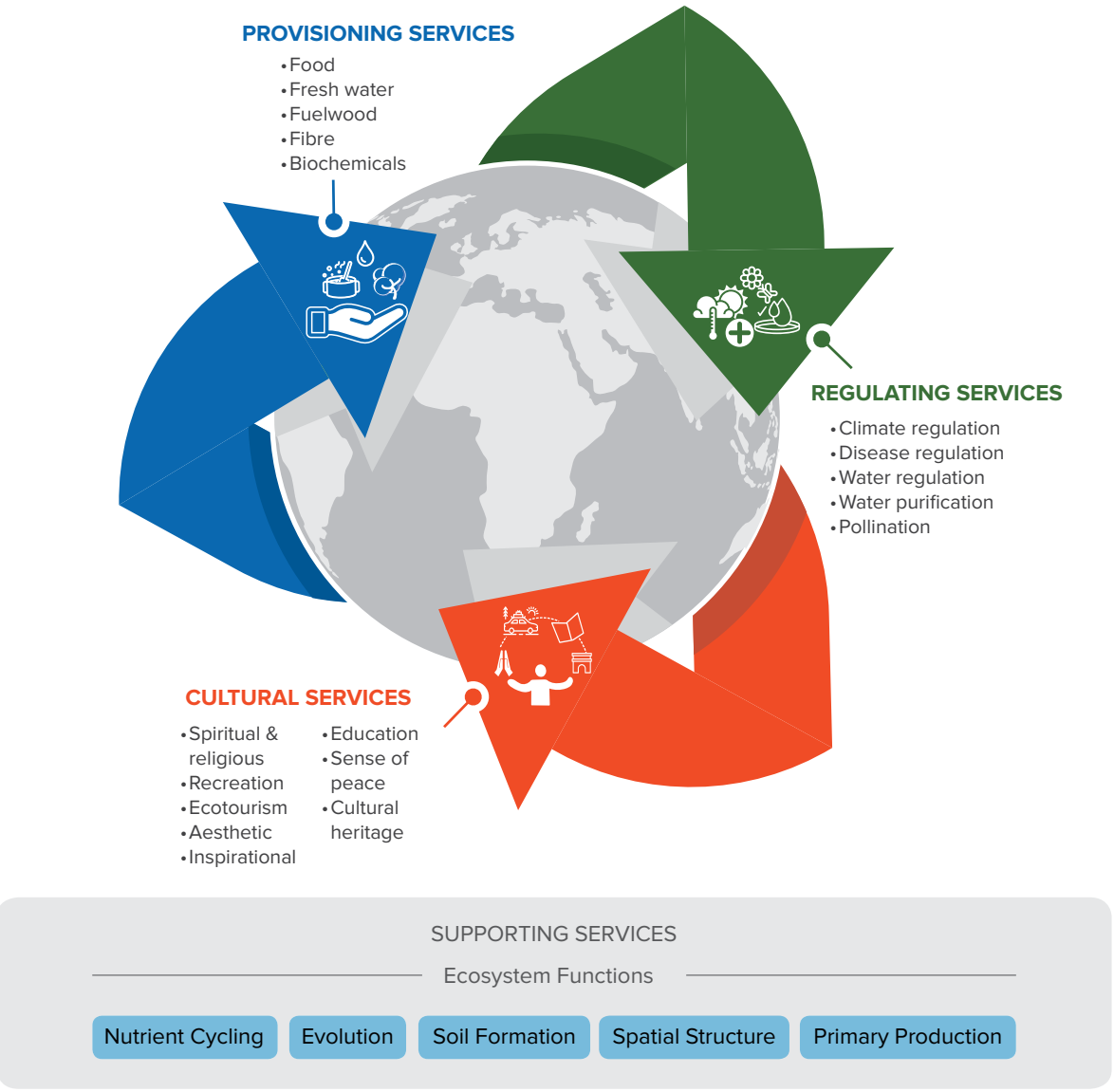
2

Post-Disaster Environmental Issues

Most disasters have both immediate and long-term implications for the environment, disrupting key ecosystem services in their wake (Figure 2). These must be appropriately addressed while preparing frameworks for post-disaster recovery.

Not all environmental systems offer every ecosystem service mentioned in Figure 2. However, in the event of a disaster, this framework needs to be applied to every damaged environmental segment to ensure that damage and loss are assessed not only in terms of the most obvious 'provisioning services' but should also be cognizant of regulating cultural and supporting services.

Figure 2: Ecosystem Services



Source: Adapted from Global Facility for Disaster Reduction and Recovery, 'Cross-Cutting Sector—Environment,' *Post Disaster Needs Assessments Guidelines: Volume B*, (GFDRR, World Bank Group, European Union, United Nations Development Group, 2017). https://www.preventionweb.net/publication/post-disaster-needs-assessments-guidelines-volume-b-environment. p. 8.

2.1 The Disaster–Environment Linkage

The environment, disaster-impact and recovery are deeply interlinked in multiple ways. A thorough understanding of these linkages must precede any PDNA or DRF exercise. Some of them are listed below.[10]

(a) Disasters have environmental and economic effects, which in turn affect people (see Example 2.1 which

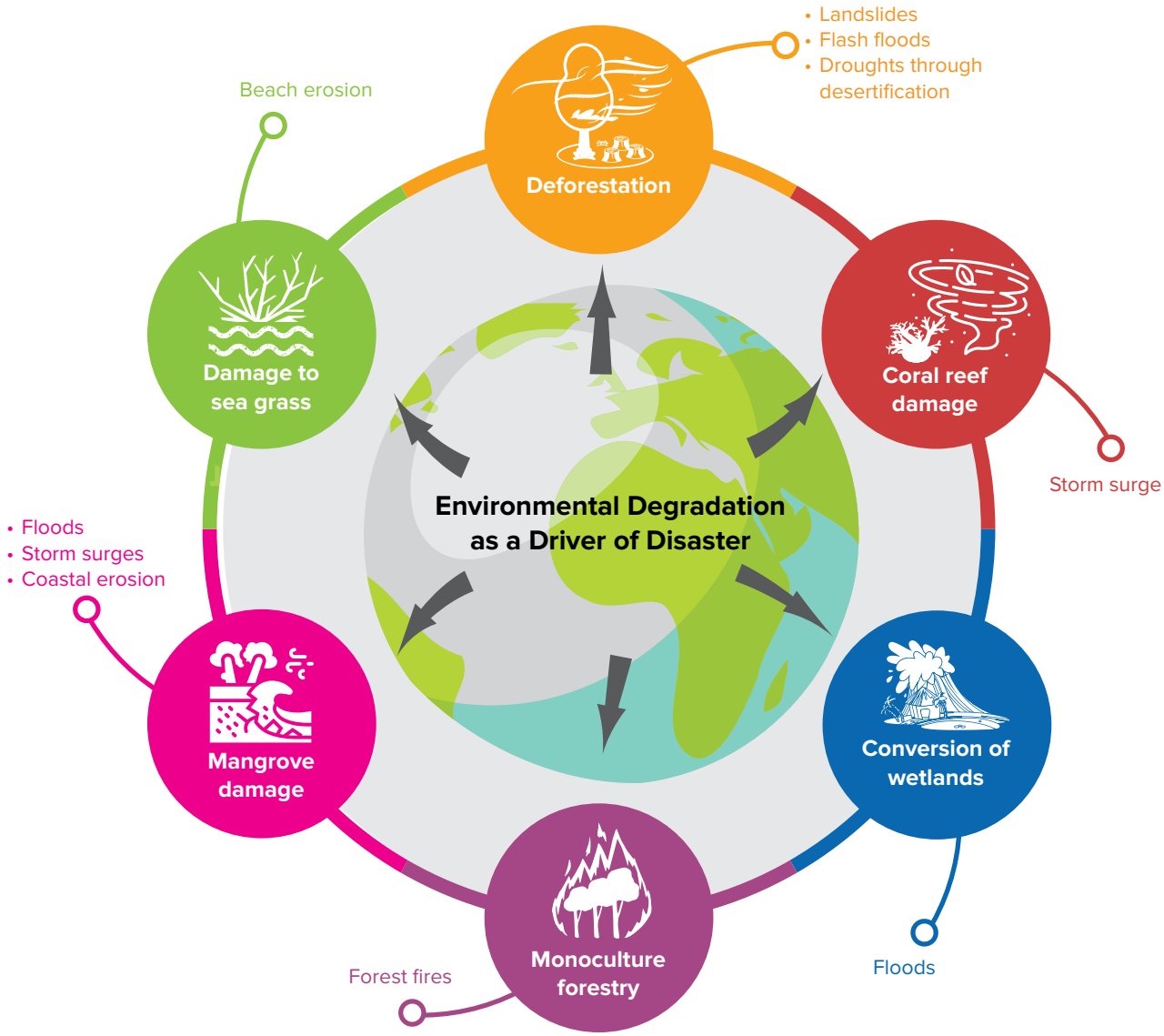
showcases the environmental impact of the COVID-19 pandemic).

(b) Recovery efforts after a disaster may also leave an environmental footprint.

(c) Environmental degradation increases disaster risk (Figure 3).

(d) Disasters disrupt access to environmental goods and services.

Figure 3: Environmental Degradation as Driver of Disaster



Source: Adapted from Global Facility for Disaster Reduction and Recovery, 'Cross-Cutting Sector—Environment,' *Post Disaster Needs Assessments Guidelines: Volume B*, (GFDRR, World Bank Group, European Union, United Nations Development Group, 2017). https://www.preventionweb.net/publication/post-disaster-needs-assessments-guidelines-volume-b-environment. p. 11.

(e) Disasters increase strain on environmental governance.

(f) Healthy ecosystems can play an important role in disaster risk reduction (DRR) and hence could be part of future strategies for DRR in the country.

In any post-disaster situation, the various incidences of damage across the affected area may need to be qualitatively classified based on severity. For instance, we may consider the classification system elaborated by the UN Economic Commission for Latin America and the Caribbean as a useful model.[11]

> "In general, a qualitative analysis based on some sort of scale that will make it possible to differentiate between categories and degrees of damage will need to be undertaken before any of the various direct and indirect economic estimation techniques can be applied. The use of a qualitative scale offers two advantages: first, it provides a way to describe the force, intensity and duration of a disaster; and, second, it makes it possible to assign quantitative values to the wind velocity or force of a hurricane, the force or intensity of an earthquake, the area covered by a forest fire, the amount of land flooded by torrential rains or overflowing rivers, the amount of erosion caused by prolonged heavy rains on steep terrain, the consequences of strong winds that sweep over areas with light-textured soils, ocean swells or large waves that destroy coral reefs, etc. The recommended qualitative scale includes the following categories:
>
> i. *Nil*. [Where there is] barely perceptible or very slight impact, the environment can recover quickly. If it is necessary to take action to facilitate or expedite that recovery, the cost of the programs that will be called for will be almost negligible.
>
> ii. *Minor or minimal impact*. This kind of impact will be easily quantifiable and will not destabilize the ecosystem. The environment will recover within a short period of time and, as the environmental changes that have been caused will not be significant, the recovery costs will also be low.
>
> iii. *Moderate impact*. The environment will be able to recover from this kind of impact in the short term. The environmental disturbances may be significant, but if they are confined to a fairly small area, their consequences will be moderate, and their mitigation will therefore not be very costly.
>
> iv. *Severe impact*. Obvious environmental disruptions will be found over a fairly large area. It may be possible for the environment to recover from these disturbances in the short or medium term if appropriate mitigation measures are used to counteract the problems caused by the disaster.
>
> v. *Very severe impact*. The large-scale consequences of this kind of impact are very serious and spread out over a large area, which may encompass more than

one region within the country concerned. There is a possibility that a partial recovery can be made over the medium or long term, but it will be very costly and the chances that the affected resource will be usable in the future are small.

vi. *Total impact*. The ecosystem will not be able to recover from the damage caused and the chances of future use of the area are nil. In this kind of situation, natural resources will take a long time (25 years or more) to recover."

2.2 Sectoral Overlap of Environmental Issues

Many of the environmental issues may also be categorized under other sectors (Figure 4). Therefore, it is crucial for the team undertaking the environmental PDNA or DRF preparation to collaborate and coordinate with the other sector teams to avoid duplication of efforts and to ensure that important environmental issues are not overlooked.

Further details are provided in the PDNA–Environment Guide on the various environmental issues, cross-cutting linkages and the secondary environmental concerns that should be addressed in a DRF.

Practical Considerations

The extent of impact and the response to a disaster will vary depending upon several factors, such as the type of disaster, the geographical location, the country where it occurred, data availability, the experience and expertise of the disaster response team members on the ground, as well as their access to and availability of external expertise to support the response team.

Therefore, the DRF activities should be conducted keeping these factors in mind. It is recommended that the environmental response team coordinate with the other sectoral teams and map out a mutually agreed upon approach to DRF.

Example 1: The COVID-19 Pandemic–Environment Linkage[12]

From an environmental and a socio-environmental standpoint, countries in the post-pandemic recovery period continue to face several challenges. The adverse impacts of the COVID-19 crisis on human and planetary health have come from many sources. Some (and by no means all) direct and indirect linkages between the COVID-19 pandemic and the environment are outlined below.

1. **Healthcare waste management:** The pandemic led to a spike in hazardous waste, such as personal protective equipment, electronics and pharmaceuticals, millions of litres of wastewater and massive use of detergents, disinfectants, and antimicrobial solutions. The most immediate challenge facing national and local authorities was: how to manage and dispose of the waste produced by hospitals and healthcare facilities handling COVID-19 patients as well as by infected persons in home-based care. Any waste that has been in contact

Figure 4: Sectoral Overlap of Environmental Issues

Source: Adapted from Global Facility for Disaster Reduction and Recovery, 'Cross-Cutting Sector—Environment,' *Post Disaster Needs Assessments Guidelines: Volume B*, (GFDRR, World Bank Group, European Union, United Nations Development Group, 2017). https://www.preventionweb.net/publication/post-disaster-needs-assessments-guidelines-volume-b-environment. p. 15.

with an infected individual should be considered as hazardous and treated as infectious waste.

2. **Impact on routine waste management and sanitation services in urban settings:** The quality of urban services, including routine waste management and sanitation, saw a decline in many middle-income and low-income countries due to changes in the nature, location and quantum of waste flows and a potential reduction in revenue for municipal authorities.
3. **Impact on industrial pollution control:** The enforcement of environmental regulations is often an early casualty of post-crisis economic recovery. This occurs when standards are loosened, or regulations not enforced, as part of governmental efforts to kick-start the economy through industry and manufacturing. Increased air, water and land pollution will naturally follow.
4. **Impact on land use:** The lockdown of international and national borders triggered calls for increased self-sufficiency in food production in a number of countries. Enacting such a policy would likely require the conversion of land for agricultural production that currently has other uses, such as national parks, forests and wetlands. In addition, such 'emergency agriculture' may be more intensive (with the increased use of fertilizers and pesticides) but less productive (due to the use of marginal land and/or lack of scale), worsening the environmental damage linked to such efforts. Furthermore, as household incomes decline or income sources are no longer available, vulnerable populations may increasingly rely on natural resources as a source of income, for subsistence or for fuel. This can potentially result in overexploitation of local natural resources, causing localized deforestation and consequentially increasing risks of fires and floods.
5. **Impact on the management of biosphere reserves and national parks:** Many national parks around the world depend primarily on income derived from tourism to pay for their staff and maintenance. International tourism has dropped drastically in the context of the COVID-19 pandemic travel restrictions. Efforts to limit the spread of COVID-19, such as lockdowns, may have led to less patrolling of national parks, potentially leading to an increase in the incidence of poaching, which will impact both wildlife and tourism long-term. In addition, reduced national budgets and international development assistance flows will also impact the operating budget of protected areas.
6. **Impact of urban-to-rural and rural-to-urban migration:** Both urban-to-rural migration (due to loss of jobs) and rural-to-urban migration (due to poverty, lack of healthcare facilities) were experienced in the initial 12 months, resulting in greater pressure on destination resources including environmental resources.
7. **Impact of humanitarian response:** Providing humanitarian assistance for

COVID-19 outbreaks in humanitarian hotspots, including refugee camps and settlements for internally displaced persons, resulted in significant environmental challenges. Such settlements, often characterized by severe environmental degradation and rudimentary infrastructure, presented challenges related to safe disposal of medical waste, risks linked to sanitation and the tendency of the affected population to hurtle towards environmentally unsustainable solutions for accessing energy or restoring livelihoods.

8. **Negative impact on enforcement of environmental standards and its long-term impacts on climate change action and sustainable development efforts:** The drastic reduction in economic activity during the pandemic temporarily reduced CO2 emissions and pollution in many areas. It was inevitable for such improvements to be short-lived, however, unless countries delivered on their commitment to sustainable development once the crisis was over. Equally inevitable was the laxity in enforcement of environmental standards, as countries implemented emergency measures to kick-start their economies. Furthermore, substantial political capital and limited financial resources were absorbed by the response, especially in developing countries experiencing sizable capital outflows. This may have resulted in the diversion of such resources away from the implementation of the Nationally Determined Contributions for the Paris Agreement, for example. The same applies to the environmental targets of the Sustainable Development Goals (SDGs). It is therefore vital that in their response to the crisis, countries keep the SDGs and Paris Agreement commitments in focus to hold on to past gains and, in their recovery phase, make investments that will propel them towards a more inclusive, sustainable and resilient future.

3

Initial Preparatory Activities

DRF for Environment Sector

According to the main DRF Guide, generic steps involved in the development of a DRF include the[13]

(a) development of a recovery policy;

(b) establishment of institutional arrangements;

(c) identification of financial mechanisms and

(d) establishment of implementation arrangements.

In a typical post-disaster recovery scenario, after due consideration for the safety and welfare of the affected population, the following macro actions usually take place:

(a) Member State requests assistance from the international community.

(b) International agencies that are part of the Tripartite Agreement on Post Disaster Needs Assessment including the UN, the World Bank and the European Union, step in to carry out PDNA in collaboration with the country's national government, which identifies the recovery needs and associated cost estimates.

(c) A donor conference is held to bring together international donor agencies and the Member State to discuss the potential funding mechanisms based on the PDNA and to obtain pledges of funding and technical assistance.

(d) The Member State proceeds to start the planning and implementation of the recovery process over the short, medium and long terms. International expertise provides advice and support for the recovery activities.

Therefore, the recovery framework would logically follow the needs assessment wherein the different steps required to develop effective planning, vision, policies and strategies for recovery are identified. This applies to the sectoral recovery framework activities as well.

The environment sector recovery framework and recovery priorities will follow the above methodology while ensuring that it is in line with the overarching recovery policy and in collaboration with the other sectors' needs and priorities.

Therefore, the DRF team for the environment sector should carry out the following activities in preparation for developing the recovery framework:

Practical Considerations

In many cases, DRF activity will not be an exercise that starts afresh. The PDNA report would have already identified

- a recovery vision and strategy, including the application of guiding principles;
- a cost estimate for the overall recovery process; and
- the lead agency/agencies and the teams responsible for the overall and sectoral recovery activities.

It is important to keep this information handy at the outset.

(a) Review the overall PDNA Report as well as the specific PDNA–Environment Report.

(b) Understand the overarching recovery strategy and environmental priorities identified in the PDNA.

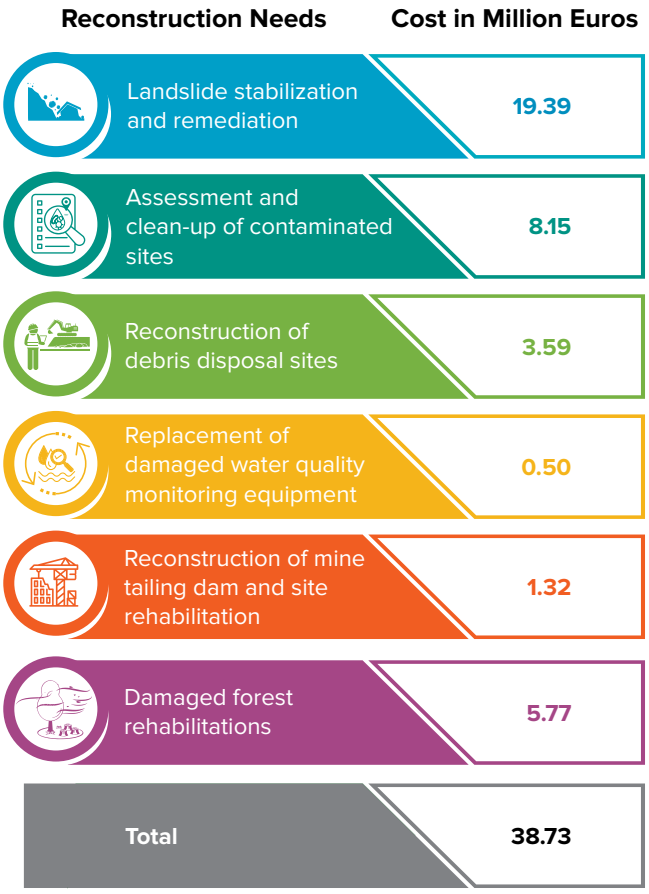
(c) For BBB and enhancing resilience, identify priority areas that are directly related to the disaster (or conflict) impact and reconstruction plans.

(d) Drawing upon the PDNA, estimate costs for the reconstruction needs in the environment (for instance, see Figure 5).

(e) Identify the teams (lead agency, team lead, line ministries for environment and counterparts) involved in the development of the PDNA.

(f) Identify the key partners and primary stakeholders involved in the PDNA–Environment Sector.

Figure 5: Cost Estimates for Environmental Recovery from Floods in Serbia in 2014



Source: United Nations Serbia, European Union, and World Bank, *Serbia Floods 2014*, (Belgrade, 2014). https://www.ilo.org/wcmsp5/groups/public/---ed_emp/documents/publication/wcms_397685.pdf.

4

Developing a Recovery Policy for the Environment

4.1 Building Back Better

A sector-specific post-disaster recovery policy lies at the foundation of any sectoral DRF. In drawing up a recovery policy for the environment, both primary and cross-cutting issues have to be considered within recovery programming and across the relevant relief and recovery clusters without losing sight of inclusive priorities such as the guiding principles of Sustainable Developmental Goals (SDGs), Building Back Better (BBB), green technologies and climate adaptation, integrating sustainable environmental practices and natural resource management.

The PDNA–Environment Guide indicates what reconstruction and recovery practices along the lines of BBB look like. It recognizes that post-disaster geographical and political settings offer opportunities to build back greener by

(a) utilizing greener building materials and energy sources for reconstruction;

(b) shifting to cleaner production technologies in damaged industries;

(c) establishing better urban services, such as landfills and sewage collection and treatment systems;

(d) incorporating modern institutional governance practices through equipment, personnel training and capacity building activities; and

(e) promoting ecosystem-based approaches to DRR.

The application of new technologies, advanced environmental practices and stronger coordination and technical capacities can turn post-disaster recovery into a unique opportunity. Sustainable natural resource management can be promoted as a DRR strategy. Building healthy and diverse ecosystems can increase resilience to hazards. For example, reforestation can create shelterbelts and windbreaks and protect against landslides and floods, and trees can stabilize riverbanks and mitigate soil erosion. Restoration of wetlands can serve to store water, provide storm protection and enable flood mitigation and erosion control. Proactively using ecosystems as a disaster reduction measure through improved land use planning should also be considered.

4.2 Formulating Environmental Recovery Policy

The main DRF Guide lays down the following steps for formulating the environmental recovery policy (Figure 6):

Step 1: Develop a recovery vision for the environment sector in line with the overall central recovery vision of the post-disaster recovery framework.

Step 2: Identify key partners and stakeholders for engagement with all levels of government, and outside.

Step 3: Identify a government-led or authorized programme under which the recovery policy will be implemented.

Step 4: Apply guiding principles to the recovery policy and include costing for BBB.

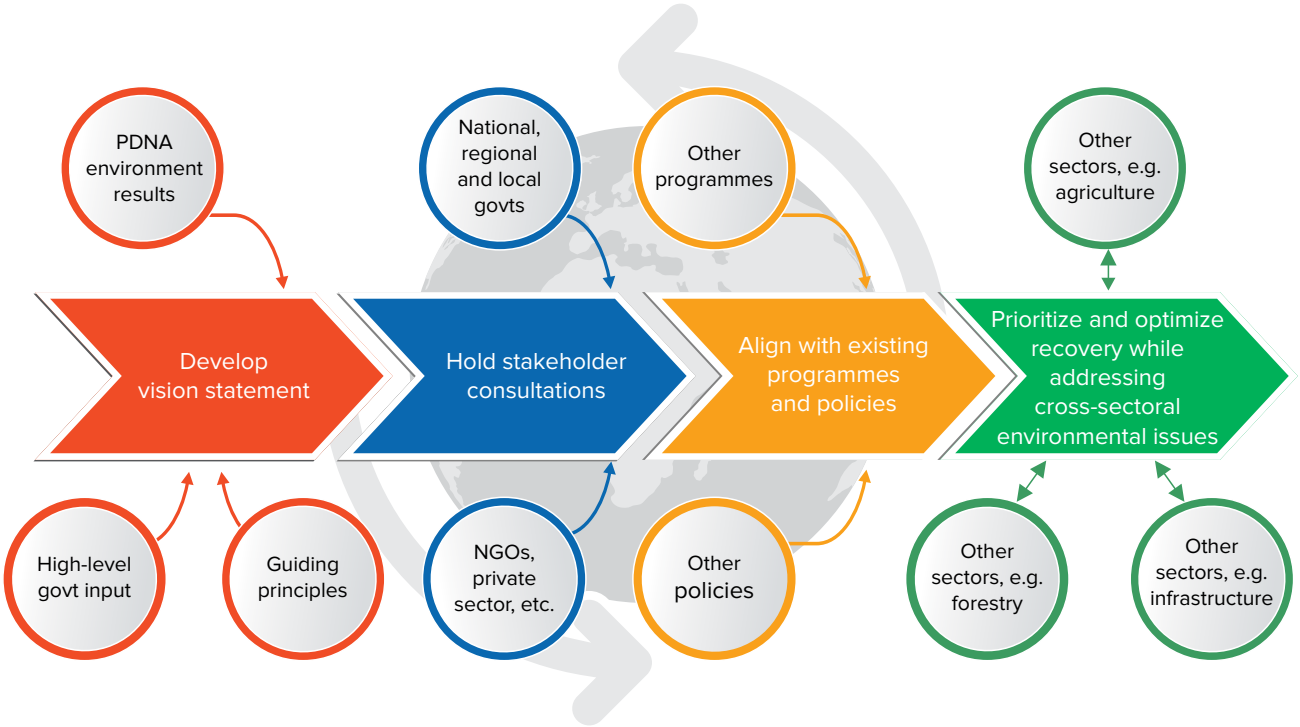
Step 5: Identify alignment with other programmes and policies within the government and environmental linkages with overlapping sectors.

Step 6: Prioritize and optimize recovery actions.

These steps have been further adapted for this DRF–Environment Guide and elaborated upon below.

Step 1: Develop a recovery vision for the environment sector in line with the overall central recovery vision of the post-disaster recovery framework. The questions to be considered during this step are:

Figure 6: Formulating the Environmental Recovery Policy and Framework



Abbreviations: Govt., government; NGO, non-governmental organization; PDNA, post-disaster needs assessment.

Source: Team analysis.

- Is the environmental recovery vision in alignment with the overarching vision for the post-disaster recovery?
- Is it inclusive of resilience and BBB concepts?
- Is it people-focused?
- What are the high-priority environmental linkages to be considered during this exercise? How do we identify them and focus on them?
- What are the overlapping linkages with other sectors?

Step 2: Identify key partners and stakeholders for engagement with all levels of government, and outside. The questions to be considered during this step are:

- Who are the key partners and primary stakeholders in this exercise at the national, regional and local levels of governments? Do they adequately cover the above environmental linkages?
- Which of these key partners have overlapping environmental linkages identified above?
- Are the designated contact persons at sufficiently high levels so as to make decisions on the behalf of the department they represent?

- Are they able to dedicate sufficient time and resources for the recovery framework consultation process?

Practical Considerations

At the beginning of a post-disaster recovery framework development, it is often tempting to include many development/rebuilding plans that are not necessarily related to the disaster being addressed. However, it should be noted that the DRF is meant to focus on the recovery from the disaster and not meant to include the full country development plan. It is why the recovery measures should be closely linked to the PDNA findings related to disaster effects and impacts.

Step 3: Identify a government-led or -authorized programme under which the recovery policy will be implemented, that is, develop a programmatic approach to recovery. Through this exercise, identify the programme and agency under which the environmental recovery will be planned and implemented as part of the post-disaster recovery framework activity. The questions to be considered during this step are:

- Is there a disaster management (DM) agency currently in existence? If not, should we create one?
- Does the DM agency have an environmental protection mandate?
- Does the current post-disaster recovery effort for the environment sector fall within the mandate of the DM agency? Should the mandate of the DMA be amended in light of the disaster?
- Does the agency have a strong management system with programme oversight, monitoring and reporting structures in place?
- Is there adequate legislative authorization along with funding mechanisms in place for the DM agency? If not, do we need to do a gap analysis of the regulatory oversight for disaster management?
- What are the multilateral and international environmental obligations of our country that we have to comply with during this process?
- What other government departments and agencies at the national and local levels exist that we will have to collaborate with in the current recovery framework process?
- What non-governmental organizations are actively involved in disaster management and recovery ecosystem in the country?

Example 2: Environment Ministry Leads Post-Flood Recovery in Sri Lanka, 2017

In May 2017, Sri Lanka witnessed severe floods and landslides across 15 districts. Though the extent was less than that of the previous year when 24 districts had been impacted, higher incidence of landslides and fatalities in 2017 made the situation extremely challenging.

In the post-disaster planning and implementation,[14] the environment sector came under the purview of the Sri Lankan Ministry of Mahaweli Development and

Environment (MMDE) in 2017.[15] The MMDE took the leadership in collecting damage and loss data from across departments and agencies both within it (Department of Forest, Department of Wildlife, Central Environmental Authority, and Biodiversity Secretariat) and beyond (Department of Irrigation, National Building Research Organisation, Local Authorities, and District/ Divisional Secretariats). The MMDE supported the validation of findings by key sectoral stakeholders with the Disaster Management Center (DMC), Ministry of Disaster Management and the Department of National

Planning, Ministry of National Policies and Economic Affairs being in charge of overall coordination. The MMDE also coordinated the formulation of the environmental recovery plan and maintained oversight over implementation by relevant government entities.

During the recovery planning in 2017, the MMDE acknowledged weak recovery from the floods and landslides of the previous year. To overcome the challenges, it was decided that post-disaster environmental recovery in 2017 would be based on the coordination mechanism set up for the National Climate Adaptation Plan (NAP) including the formulation and implementation of National Determined Contributions (NDCs)/SDGs. The coordination mechanism for NAP/NDC/SDG included representation of agencies working in vulnerable sectors such as food security and water, biodiversity and coastal resources, health, human settlements and infrastructure, tourism, energy, industry and infrastructure and export agriculture, the National Working Group for Cross-cutting National Adaptation Needs, and a civil society organizations (CSO) forum.

In addition, the MMDE also decided to implement few strategic actions to support disaster recovery based on BBB. These included the

(a) revision of the National Environmental Policy of Sri Lanka, including PDNA and post-disaster recovery, to facilitate post-disaster environment recovery;

(b) revision of land use plan to promote environmentally sound land use planning and sustainable land management;

(c) implementation of data and information collection and documentation pledges in coordination with DMC which is responsible for the Sendai Framework for Disaster Risk Reduction (SFDRR) implementation; and

(d) monitoring waste management (since a large garbage dump collapse in Colombo in mid-April 2017 prior to the floods aggravated disaster impacts, especially pollution challenges).

Step 4: Apply guiding principles to the recovery policy and include costing for BBB. The questions to be considered during this step are:

- What are the opportunities in the current context to incorporate new approaches to environmental protection? Can we incorporate community awareness campaigns, for example, as part of the new approach?
- How can we incorporate BBB by using more resilient restoration measures? Can we examine climate adaptation technologies and ecosystem-based infrastructure to reduce future risks, or apply alternate livelihood options to increase resilience of communities?
- How do we deliberately prioritize the inclusion of vulnerable groups, such as women, in our recovery framework? Can we consider capacity building activities exclusively for women in order to overcome cultural inhibitions?

Example 3: Environmental Clean-up of the Niger Delta Region

The Federal Government of Nigeria has set up a dedicated project office, Hydrocarbon Pollution Remediation Project (HYPREP), for the environmental clean-up of the Niger Delta region in the southern coast of the country. The United Nations Environment Programme (UNEP) has been providing technical and project management expertise to HYPREP. As part of that project, modern water supply facilities are being built for the Ogoni people so that future health risks from hydrocarbon contaminated groundwater and surface waters are mitigated.[16] For more information, see the HYPREP website.[17]

Step 5: Identify alignment with other programmes and policies within the government and environmental linkages with overlapping sectors. The questions to be considered during this step are:

- What are the important environmental issues identified during the PDNA process? What were the overlapping sectors identified?
- Are there other environmental linkages that were not considered in the PDNA but should be considered in the recovery framework exercise?
- Is there any known duplication of efforts across other programmes/policies or sectors in considering the environmental linkages?

Example 4: Remediation of the Environmental Consequences of the Chernobyl Nuclear Accident

Disaster or conflict may lead to the destruction of physical infrastructure with far reaching environmental fallout. Such infrastructure could be related to the management of solid and liquid waste

such as sewers and incinerators or be the kind that releases hazardous waste into the surrounding area upon destruction, as in the case of the Chernobyl disaster in Ukraine, which cast radioactive dust far beyond the immediate vicinity. Therefore, the repair and re-construction using scientific methods in such circumstances are not only high priority but also time sensitive. The International Atomic Energy Agency (IAEA) has published a comprehensive report on the Chernobyl nuclear accident and its environmental consequences.[18]

Step 6: Prioritize and optimize recovery actions.

Step 6.1: Establish environment sector recovery programmes for priority areas. Consider the following questions during this step:

- What are the priority environmental areas to be included in the recovery programme?
- What are the objectives of the environmental recovery programme? List them.
- What relevant data was collected for the environment sector during the PDNA process?
- What should we include in the scope of work for the integrated environmental assessment for the planned recovery programmes?
- How much time do we have to complete additional data gathering and the environmental assessment? What expertise do we need to complete them? Who can help us with such expertise?
- Who are the stakeholders and key partners that we need to consult during the environmental assessment process and for the sector recovery programme development?
- What are the well-known and modern communication tools we could use for effective stakeholder consultations during this process?

Example 5: Enhancing Post-Disaster Community Resilience: A Priority

A key element of sustainable disaster recovery is to build resilience of the population reliant on the surrounding environmental resources. Therefore, long-term disaster recovery projects incorporate programmes that reinforce the resilience of target communities. For instance, the river catchment management programme in Uganda focuses on multi-stakeholder engagement to reduce and prevent flood, drought and soil loss in order to tackle food insecurity. Upscaling community resilience through ecosystem-based disaster risk reduction (Eco-DRR) is a multi-year project funded by the European Union (EU-DEVCO). It is being implemented by UNEP and the Partners for Resilience (PfR) consortium, which in Uganda includes of CARE International, CORDAID and Wetlands International.[19] The 28-month project started in June 2019 and is scheduled to end in 2022. It is being implemented in the Aswa Catchment, specifically in the districts of Otuke, Agago, Alebtong, Abim and Kotido in Northern Uganda. The consortium members

pursued an Integrated Risk Management (IRM) approach involving ecosystem management and restoration, climate change adaptation and mitigation, and DRR, while mainstreaming gender in all its activities. The overall objective was to achieve greater resilience to disasters (including climate risk-related disasters) of 160,000 vulnerable women and men in the districts mentioned above.

Step 6.2: Develop environmental recovery policies for priority areas. Consider the following questions during this step:

- Have we included the specific aspects discussed in the previous steps above?
- Have we collaborated with other sector teams involved in the recovery framework process to identify overlapping areas of environmental cross-cutting issues?
- Have we coordinated and aligned with the overarching recovery policy?
- Have we identified the key partners at the national and local levels within the government who can support and help implement the inclusive recovery policies?
- Do we have a programme infrastructure that follows international best practices in oversight and transparency, grievance redress mechanisms, and which also focuses on people?
- Does the recovery policy consider the promotion of environmental cross-cutting issues such as longer-term disaster risk reduction and climate change adaptation?

Example 6: Environmental Recovery Framework in the Context of a Pandemic

In the context of the COVID-19 (and other) pandemic, it is necessary to plan for two types of approaches in developing an effective environmental recovery framework:

First, the direct part of the recovery is to develop and cost a list of recommendations to address the environmental issues identified during the needs assessment. Taking waste management as an example, one should plan for long-term adequate waste management—

collection, source separation, treatment and disposal—for improvements in policy, institutions and delivery of services for a sustainable recovery. This may include:

(a) increase of and/or upgrading of existing infrastructure such as waste treatment facilities and landfill capacity for treated waste disposal;

(b) awareness of waste pickers on health and safety in the informal sector;

(c) provision of personal protective equipment to formal and informal waste management workers; and

(d) establishment of sustainable environmental policies for future implementation.

However, there are issues beyond the immediate environmental needs. Hence, a second approach is also required in developing a recovery framework. Countries are pumping massive amount of cash into their economies to boost economic activity. This is both an opportunity and a challenge. The potential availability of billions of dollars for investment should be reviewed and leveraged in such a way that (a) some of the funding is used directly for improving environmental quality and (b) no investment leads to serious environmental damage.

Step 7: Ensure lasting success to recovery through smart land-use planning and commitment. Consider the following during this step.

- Do we have the appropriate local government representation and buy-in for the recovery framework activities?
- Have we considered land-use planning process and timeline requirements during the environmental assessment process as part of the recovery framework?
- Have we ensured that appropriate stakeholder consultation has occurred regarding the integrated land-use plans?
- Does the land use plan cover the broad range of land uses that are relevant to the environmental sector: settlements, residential areas, commercial areas and productive infrastructure, public infrastructure, forestry, farmland, animal husbandry and fisheries?
- Does smart land use consider energy efficiency and green development strategies?
- Do we have the requisite legislation and regulations to allow for the smart land-use during the recovery process?
- Do we consider conducting a Strategic Environmental Assessment of the overall recovery framework? This helps direct recovery activities to the most suitable locations and pre-empt potentially adverse effects and support the development of higher-quality plans.

Example 7: Addressing Chennai's Water Crisis

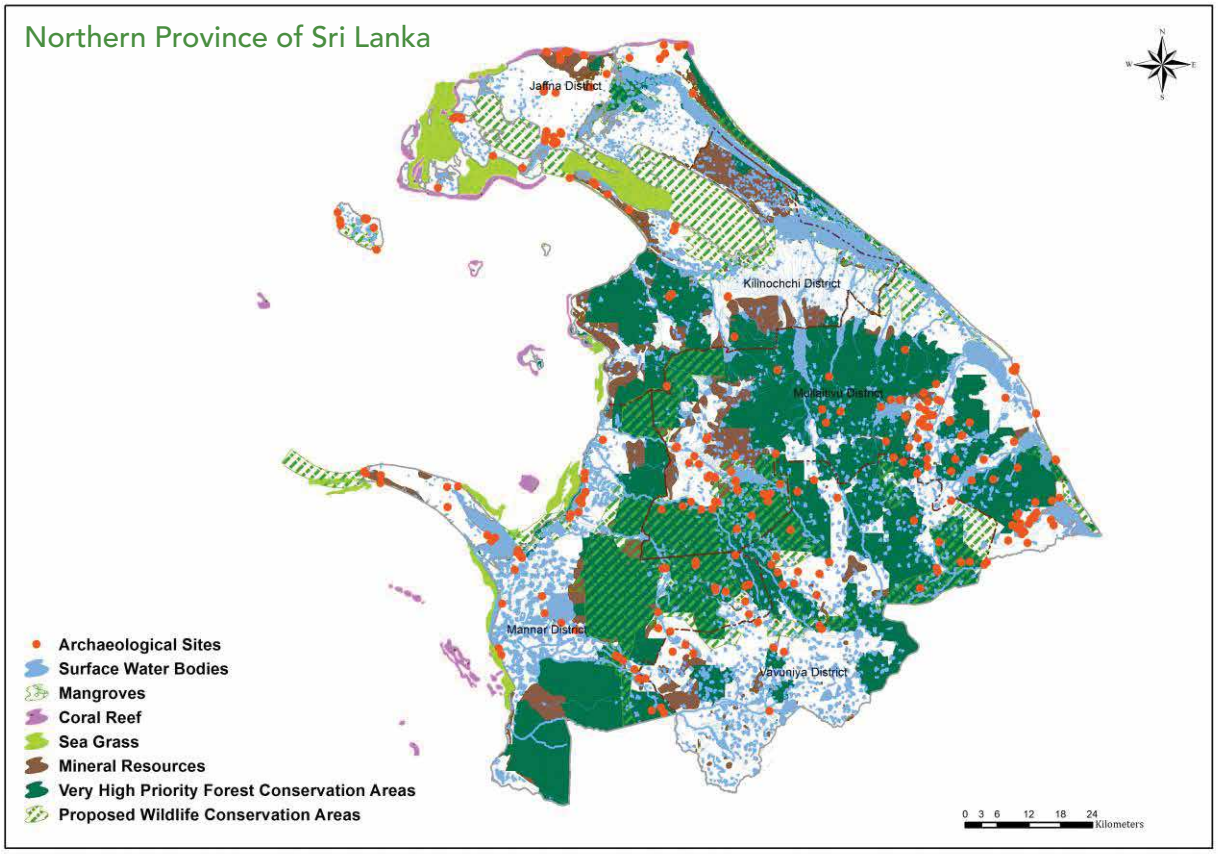
The flooding event in 2015 and drought in 2022 have brought international attention to Chennai, India. Once known as the 'city of a thousand tanks', Chennai is now famous for having the lowest per capita availability of water among the major metropolitan areas of India. Currently, trains of water are

being brought in to cater to the citizens, for Chennai's water infrastructure has run dry.

Two multidisciplinary design teams, 'City of 1,000 Tanks' and 'Rise Chennai', comprising local and international experts in architecture, sociology, economics, hydrology, engineering, ecology and disaster risk reduction have been working over nine months on developing solutions for Chennai's water and climate change-related problems. The stakeholder process was facilitated through local workshops and the design concepts were signed off by the Water as Leverage Advisory Board during two regional workshops in Singapore. For Chennai, they came up with some very interesting and promising solutions, which are currently being developed further to acquire funding from agencies such as the Asian Infrastructure Investment Bank and FMO (the Dutch entrepreneurial development bank), amongst others.[20]

Example 8: Integrated Strategic Environment Assessment for the Northern Province of Sri Lanka

Integration of environmental sustainability and disaster resilience, including climate concerns, is an important and challenging aspect in post-conflict or post-disaster development and reconstruction towards BBB. Such opportunities also provide governments and development partners with options to adopt systematic multi-sector and multi-stakeholder inclusive approaches based on informed planning tools to ensure the protection of natural, cultural and heritage resources during the reconstruction phase.



In parallel, such approaches can be used to incorporate climate and disaster risk considerations more effectively. This was the post-conflict and post-disaster challenge faced by the Government of Sri Lanka at the end of a 30-year-long protracted armed conflict that devastated the Northern Province of Sri Lanka. Over 330,000 displaced people had to be resettled. The coastal belt of the Northern Province had also been heavily impacted previously by the 2004 Indian Ocean Tsunami. The UNDP and the UNEP joined forces with several government ministries/agencies to develop a framework for the sustainable and resilient reconstruction of the Northern Province. This approach was named the 'Integrated Strategic Environment Assessment for the Northern Province of Sri Lanka (ISEA-North)'.[21]

5

Institutional Arrangements

5.1 Lead Recovery Agency

Module 4 of the main DRF Guide (revised March 2020) provides a detailed set of instructions on the establishment of the overall institutional arrangements to respond to, recover and rebuild from a disaster.[22] The module includes:

(a) the importance of selecting effective lead agency to manage the recovery, and

(b) the three options for lead agency structure:

  (i) strengthening an existing institution;

  (ii) creating a new institution or

  (iii) employing a hybrid institutional model.

The hybrid institutional model is being increasingly used by governments wherein an existing institution is being strengthened by a single unit, section or department dedicated to recovery.

5.2 Lead Agency for the Environmental Sector

Post-disaster recovery in the environmental sector typically occurs in two distinct ways. First, where the recovery actions target the main productive sectors such as forestry, agriculture, housing, along with the cross-cutting environmental components that require expertise to address. The second area of environmental recovery deals with specific environmental challenges such as clean-up of environmental hotspots and restoration of environmental infrastructure. Consequently, the institutional arrangements for environmental recovery will depend upon whether the disaster is primarily environmental in terms of impact (such as an oil spill) or one where the environmental impact is one of many other issues (e.g. an earthquake or cyclone or war).

Therefore, the agency responsible for the recovery of environmental sector will have to involve both government and non-government actors. The main purpose of the environmental lead agency is to ensure that (a) cross-cutting environmental recovery issues are coordinated with the other productive sectors and (b) environmental challenges are dealt with adequately and effectively.

Typically, the national government's environment ministry would be the default lead agency responsible for the recovery of environmental sector, including the cross-cutting issues straddling other sectors – if they have the technical and human resources capability to handle the matter. Alternatively, the lead environmental recovery agency could be created under the mandate and accountability of the national Environmental Ministry. This lead agency could also take the shape of a dedicated Project Management Unit (PMU) within the environmental department created specifically to handle the liaison and implementation of the environmental recovery plan.

The lead environmental recovery agency should consider the following in its formation and implementation:

(a) clearly define its role and mandate vis-à-vis the overall lead recovery agency and those of other sectors;

(b) identify the cross-cutting environmental issues and the overlapping recovery sectors with whom coordination is needed to ensure they are considered adequately;

(c) identify participation of environmental team in the dedicated agency/institution established to coordinate recovery;

(d) incorporate environmental issues in the specific and clear guidelines and milestones for transitioning from disaster recovery and reconstruction to post-disaster development; the guiding principles of recovery framework (converting adversity into opportunity, BBB and prioritizing inclusive recovery of vulnerable groups) should be considered;

(e) identify key partners, stakeholders and implementing institutions at national, regional and local levels where recovery is needed—in both public sector and private sector—that will be involved in environmental recovery activities;

(f) identify the codification of functions and authorities of implementing institutions so that there is clarity on their mandates, scopes, end-date, funding mechanisms and their legal authority; and

(g) identify and communicate environmental recovery needs in post-disaster land use and physical planning.

As noted in earlier sections, it is desirable for institutional arrangements and legal clarity on roles and responsibilities for recovery activities to be established in advance by governments before a disaster strikes.

Practical Considerations

Given the nature and scale of disasters, the post-disaster recovery activities are conducted under time and funding pressures. The reality is that no recovery has adequate funding and that leads to prioritization of recovery activities. Under such suboptimal circumstances, environmental recovery activities may be seen as less urgent, even though under-investment in environmental sector may lead to accumulation of disaster risk.

Therefore, the key challenge of the environmental sector is to advocate to the stakeholders the importance of longer-term perspectives while dealing with the desire for immediate recovery.

5.3 Establishment of Environmental Recovery Teams

The environmental recovery framework includes implementation activities that span multiple sectors and involve a broad array of expertise. The nature of the disaster also has important implications on team structure and size. Therefore, it is necessary for the environmental lead agency to establish teams and working groups that cover topics from major environmental policy making to the implementation of environmental recovery projects. On the other hand, in some cases, there may only be two or three persons from the environment sector. Some examples of teams are:

(a) High-Level Environmental Recovery Decision-Making Team

  (i) A team that makes decisions on recovery project implementation that has major and cross-sectoral consequences and is answerable to the national government and the designated agency leading recovery

  (ii) Comprises high-level officials from the lead agency responsible for environmental recovery

  (iii) Member of the overall high-level recovery team that has decision-making responsibility

- Has access to high-level counterparts in lead agencies for other sectors
- Has access to funding and staffing for environmental sector recovery implementation

- Has the authority to define and implement recovery activities in the environmental sector
- Might include all or some of the working group team leads
- Reports progress and decisions on a regular basis to the overall lead agency team
- Has the ability to coordinate with international agencies and development partners interested in being implementing partners in the environmental recovery efforts

(b) Working Groups

(i) Thematic teams established to focus on specific recovery needs (for example: coastal erosion mitigation in the hurricane-affected region of a country, or recovery of forest cover in areas devastated by forest fires, recovery of protected areas including national parks, Ramsar sites, biodiversity hotspots, etc.) within the environmental sector

(ii) May comprise several distinct teams with assigned leads and staff with expertise tailored to the relevant recovery needs (Table 1)

(iii) Generally, consists of (or has access to) team members that are experts in policy, planning, legal, technical, communication and public health

(iv) Might include members from government and non-governmental organizations

(v) Reports progress and recommendations on a regular basis to the environmental decision-making team

(c) Expert Roster for Support Tasks

(i) Specific individuals or groups of experts to support the working

Table 1: Illustration of Team Assignments

Team	*Team lead*	*Team members*	*Cross-cutting sector*	*Liaison for cross-cutting sector*
Lead Environmental Recovery Team				
Working Group 1: Healthcare Waste Management				
Working Group 2: Environmental Stressors from Internal Migration of Displaced Peoples				
Working Group 3: Environmental Impacts of Loss of Agriculture and Livelihood Resources				
Working Group 4, etc.				

groups in planning, design or implementation of recovery activities

(ii) Involvement primarily from the private sector supplying goods and services through competitive procurement processes

Practical Considerations

In many cases, the recovery planning and/or implementation team comprises officials seconded from line ministries. However, these staff members are asked to step in on short notice and take on the additional task of participating in the recovery teams while also being responsible for their ongoing commitments in their regular jobs. This leads to staff overwork and burnouts.

It is important that when the environmental recovery teams, working groups and support expertise members are identified, arrangements are made to accord them adequate time and resources to focus on the assigned recovery activities.

The teams should be inclusive in nature, and it should be made clear that the teams work with a consultative approach.

5.4 Identification of Key Partners and Stakeholders

The environmental recovery framework encompasses a broad range of topics—some that are linked to other sectors and others that are exclusively environmental in nature. Environmental recovery planning and implementation of activities also vary widely and require a wide array of expertise within and outside the public sector. Therefore, it is important to identify key partners and stakeholders that need to be involved in the various steps during recovery activities, for example, consultation, data gathering, technical and economic inputs, and implementation planning. A typical list of key partners and stakeholders in the environmental field is given below.

5.4.1 For Recovery Vision and Policy Development

(a) Ministers of the environment, natural resources, forestry, fisheries, infrastructure (and their respective departmental heads) at national and sub-national levels

(b) Environmental policy development experts within these organizations

(c) Environmental law experts within departments of justice

(d) Environmental economics experts

5.4.2 For Recovery Implementation

(a) Government ministries of the environment, etc., at the national, sub-national and local levels (delegated officials identified for recovery activities project planning and implementation)

(b) National and sub-national agencies for disaster management

(c) Governmental (most likely at sub-national and local levels) land use planning

(d) Non-governmental organizations at national and local levels involved in environmental project implementation

(e) Private sector environmental practitioners and academic research centres for

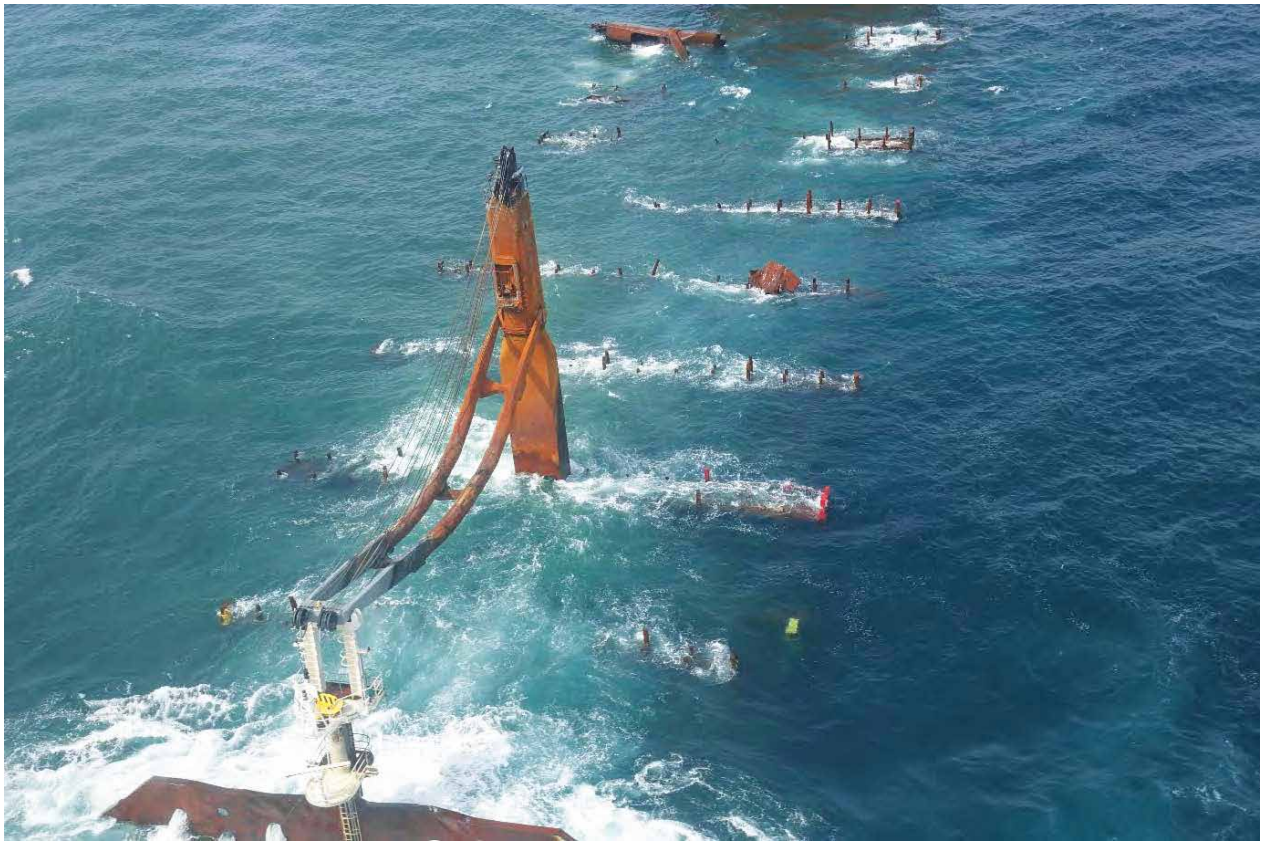
designing and conducting environmental assessments, project management, environmental remediation of soil, water and air pollution, waste management, and other cross-cutting topics of relevance.

(f) Environmental project procurement experts within public and private sectors

Example 9: The X-Press Pearl Disaster on the Sri Lankan Coast, 2021

In May 2021, the X-Press Pearl caught fire off the coast of Colombo, Sri Lanka, and after burning for 12 days, it sank as it was being towed to deeper waters. The incident was deemed the worst marine ecological disaster in Sri Lankan history for the chemical products that spilled with significant impact on Sri Lanka's sensitive coastal environment, local communities and the economy. Along with uncertainties of cascading environmental damage, the incident's complexity stems from the range of pollutants involved—oil, hazardous chemicals and plastics—and the lack of clarity regarding the nature and status of a substantial part of the vessel's cargo. Moreover, the growing geographic extent of the plastic spills—the largest on record—is expected to have transboundary impacts, further compounding the problem.

The Sri Lankan Marine Environmental Protection Agency (MEPA) activated the national oil spill contingency plan, and the Ministry of Foreign Affairs requested



UNEP to help with the environmental assessment and mitigation efforts.[23] A four-member team was deployed for an environmental emergency mission by the UNEP/United Nations Office for the Coordination of Humanitarian Affairs (OCHA) Joint Environment Unit in order to advise MEPA on steps to prevent, respond to and mitigate risks from the spill, to recommend measures to strengthen institutional capacity on national preparedness and to brief the government on the evolving situation and on the needs for longer-term recovery, among other things. The mission members included two oil/chemical and marine litter experts from the Centre of Documentation, Research and Experimentation on Accidental Water Pollution (CEDRE) in France and a marine environment expert from the Italian National Institute for Environmental Protection and Research (ISPRA). The experts were mobilized through the European Commission's Directorate General for European Civil Protection and Humanitarian Aid Operations/ Emergency Response Coordination Centre (DG ECHO/ERCC). The team was led by an environmental assessment specialist from the UNEP Resilience to Disasters and Conflicts Branch.

As part of the mission's efforts to understand the facts of the disaster, the team of international experts consulted with many stakeholders. They examined the country's environmental assessment process, including their sampling programme methodologies. They tried to identify the root cause of the incident and examined the environmental impacts, such as chemicals and oil spillage, resulting air pollution, impacts on water and seashore, biodiversity, and aquatic resources. They also assessed the socio-economic impacts, such as damage assessment and economic valuation and impact on tourism. These stakeholders were from several Sri Lankan organizations, including the International Union for Conservation of Nature, National Building Research Organisation, Sri Lanka Tourism Development Authority, University of Ruhuna, Ministry of Environment, Wayamba University of Sri Lanka, University of Sri Jayawardanapura, Central Environmental Authority (CEA), The Pearl Protectors and the UNEP Country Team.

6

Financial Mechanisms

Module 5 of the main DRF Guide on financial mechanisms for post-disaster recovery identifies five major financing challenges that policy-makers have to address.[24] These include the need to

(a) quickly quantify the economic costs of the disaster;

(b) develop recovery budgets;

(c) identify the sources of financing as well as financing gaps;

(d) coordinate and allocate financial resources; and

(e) set up the mechanisms to manage and track funds.

These are generally led by or overseen by the lead agency and the team dealing with the post-disaster DRF. The sector teams need to participate in resolving some of the challenges mentioned above, such as the quantification of economic costs and the budgetary estimates for the sector recovery. However, the lead agency and recovery team might be managing the consolidation of these details from various sectors and then might take responsibility for the rest of the steps. Based on identified recovery needs and depending upon whether the recovery budgets are managed centrally or by each ministry, the ministry of environment might have to decide on (a) budget reallocation of existing lines and corresponding programmes and (b) use of contingency funds for the sector, if they exist.

6.1 Post-Disaster Economic Costs and Recovery Budgets for the Environment

The economic costs of a disaster for the environmental sector have been estimated in the Post-Disaster Needs Assessment (PDNA) in a systematic manner and coordinated with the other sectors so that cross-cutting issues are neither left out nor counted twice. The following text from the main DRF Guide (revised March 2020) is reproduce verbatim for emphasis as it is quite relevant to the environmental sector.[25]

> "During an assessment process after a disaster, the damages to physical assets are valued, first, in physical terms (number, extension of area or surface, as applicable). Second, damages are assigned monetary value, expressed as the replacement costs, according to the market prices prevailing just before and after the disaster. These costs are the baseline cost. The reason is that the calculation of recovery costs would have to account for additional costs. They are post-disaster price alterations, improvements associated with risk reduction, and the concept of build back better introduced by the recovery framework. Additional economic losses calculated refer to changes in economic flows arising from the disaster. Changes in flows continue until the achievement of full economic recovery, in some cases requiring several years, up to a decade or more."

The PDNA–Environment Guide also addresses the costing for environmental recovery, albeit at a macro level. For each of the environmental effects identified, the need for remedial action must be specified and the costs of these remedial actions have to be estimated. Given that there are multiple environmental effects caused by each event, a chosen remedial action may adequately cover and resolve more than one environmental effect.

While the cost estimation of environmental recovery activities is carried out within the PDNA, the budgetary calculations at the DRF phase tend to be much more detailed and granular compared to the PDNA as they are geared towards providing for the implementation of specific recovery programmes or projects. Furthermore, financial recovery measures related to the

environment may be inter-sectoral, and each sector may have to include, in their recovery budgets, measures linked to environmental recovery. Therefore, the sector teams must have effective mechanisms for dialogue and the environment team of a DRF may act as a convening force for it. The environment sector team may also develop its own environment recovery budget depending on the impact of disaster on the environment.

Therefore, the team in charge of calculating the post-disaster economic recovery costs for the environmental sector should consider the following during their estimation exercise:

(a) Identify the specific environmental effects of the disaster and identify cross-cutting elements (recognized during the PDNA phase).

(b) Calculate/re-calculate/validate the economic assessment of damage and value of change in economic flows.

(c) Calculate/re-calculate/validate the cost of rebuilding and restoration while incorporating the guiding principles of recovery (converting adversity into opportunity, BBB and prioritizing inclusive recovery of vulnerable groups).

(d) Coordinate with teams in charge of other sector recovery budgeting to ensure that cross-cutting issues are neither left out, nor not counted twice.

The Sector Recovery Strategy section on page 16 of the PDNA–Environment Guide outlines various types of disasters and what it means to address the recovery strategy in terms of restoring access to environmental goods, environmental services, environmental resources that support livelihood systems, and governance mechanisms, and reducing environmental risks and vulnerabilities.

Practical Considerations

The PDNA process, which is carried out first, will have already identified the key sectors and cross-cutting sectors of the disaster, along with a high-level estimate of the recovery costs. This may act as a limitation on the DRF budget estimation process. It can largely be mitigated by having the same team of experts for both the PDNA and the DRF processes and by following the same systematic process for cost calculations.

Furthermore, it is essential that the environmental sector team involved in the recovery budget calculations includes an environmental economist familiar with the evaluation of environmental damage cost estimation.

PDNA–Environment Guide illustrates the principle of calculating the economic loss and the restoration costs of a disaster. It provides guidance on the final tabulation of cost of recovery. A revised version of that table has been adapted as Table 2.

The UN Economic Commission for Latin America and the Caribbean (ECLAC) has published a number of documents related to disaster assessments.[26] ECLAC (2014) examines in detail the environmental effects and impact assessment of a disaster.[27] It includes separate appraisal techniques of disaster impact on goods that have market

Table 2: Revised and Updated Guidance on the Final Tabulation of Cost of Recovery

Effect	*Value of change in economic flows (A)*	*Restoration costs (include BBB)*	*Net costs*	*Associated recovery project budgeting*
Destruction of vegetation cover	Value of short-term revenue lost (until restoration) A1 Value of long-term revenue lost (in the event of no restoration) A2	Restoration costs (B1)	A1+B1 or A1+A2, whichever is less	Detailed activities to address damage and losses identified and corresponding costs
Mudslides	Value of short-term losses (until restoration) A3	Restoration costs (B2)	A3+B2	
Saltwater intrusion to freshwater reservoirs	Value of short-term revenue losses + higher operational costs (until restoration) A4 OR Value of long-term revenue lost (in the event of no restoration) A5	Restoration costs B3	A4+B3 or A4+A5 whichever is less	
Damage to offshore coral reefs and natural coastal defence mechanisms	Value of losses (until restoration) A6	Cost for allowing the natural habitat to regenerate B4	A6+B4	
Waste (some of which may be hazardous) and debris accumulation	Higher cost to cope with waste until its removal A7	Removal cost B5	A7+B5	
Impact on wildlife habitat	Value of short-term losses (until restoration) A8 Or Value of long-term losses (in the event of no restoration) A9	Restoration costs B6	A8+B6 or A8+A9 whichever is less	

Effect	*Value of change in economic flows (A)*	*Restoration costs (include BBB)*	*Net costs*	*Associated recovery project budgeting*
Increased soil erosion	Value of short-term revenue losses + higher operational costs (until restoration) A10	Implementation of erosion control mechanisms (B7)	A10+B7	
Soil contamination from saline water	Value of short-term revenue losses + higher operational costs (until restoration) A11 OR Value of long-term revenue losses + higher operational costs (if there is no clean-up) A12	Clean-up costs B8	A11+B8 or A11+A12 whichever is less	
Secondary impacts by temporarily displaced people	Value of short-term losses associated with relocation (until restoration) A13 OR Value of long-term costs associated with relocation (in the event of no restoration) A14	Restoration costs B9	A13+B9 OR A13+A14 whichever is less	
Access to fishing grounds/loss of fish stocks	Cost of providing access (A15) or value of lost revenue due to unavailability of access/stock until it is rebuilt naturally (A16)	Cost of allowing it to regenerate naturally B10	A15 OR A16+B10 whichever is less	
Access to Freshwater	Cost of provision of freshwater until access is rebuilt (A17)	Cost of rebuilding access/system B11	A17+B11	
Rebuilding institutions		Costs of (re) building the institution and its renewed enforcement (B12)	B12	

Effect	*Value of change in economic flows (A)*	*Restoration costs (include BBB)*	*Net costs*	*Associated recovery project budgeting*
Norms/rules regulating access to fishing grounds		Costs of (re) building the institution and its renewed enforcement B13	B13	
Norms regulating access to other common property resources		Costs of (re) building the institution and its renewed enforcement B14	B14	
Coastal zone regulations		Cost of making and enforcing coastal zone regulations (including the capacity building) (B15)	B15	
Reduction in future risks		Cost of monitoring and planning to meet future risks B16	B16	

Abbreviation: BBB, building back better.

Source: Table 7, p. 22. of PDNA–Environment Guide adapted by Dr. V. Santhakumar, Environmental Economist, Azim Premji University, Bengaluru, India.

Global Facility for Disaster Reduction and Recovery, 'Cross-Cutting Sector—Environment,' *Post Disaster Needs Assessments Guidelines: Volume B*, (GFDRR, World Bank Group, European Union, United Nations Development Group, 2017). https://www.undp.org/sites/g/files/zskgke326/files/publications/PDNA_Environment_FINAL.pdf.

prices (such as loss to timber due to a forest fire), damage to soil, water and air, and environmental services.

In order to appraise environmental damage and losses as efficiently as possible, the assessment team should try to gain access to:

(a) publications on biomes and habitats in the disaster area, including compendiums dealing with the flora and fauna in that zone;

(b) surveys of the natural capital or biological stock existing in the affected zone or the usable output of the relevant ecosystems;

(c) publications containing baseline studies or assessments of the status and trends of local and regional biological resources; and

(d) prior studies on the ecosystems that have been affected by the disaster, including any economic appraisals

of environmental goods and services produced by those ecosystems which are of local or national importance.

Example 10: Appraisal of Environmental Services Provided by Coral Reef Ecosystems[28]

Coral reefs are solid structures that develop in tropical waters where wave action and ocean currents provide a constant flow of nutrients for both the coral and the algae that live in symbiosis with the coral. These structures are highly prized habitats for a wide range of aquatic species. Due to their strategic position between the coastline and the open sea, coral reefs serve as solid barriers that protect mangrove swamps and seagrass meadows from the waves. By the same token, mangrove swamps and marine grasses protect the reefs from the damage that would be caused by sedimentation and are excellent spawning and nursery areas for many aquatic species that live in coral reef ecosystems.

The main environmental services provided by coral reefs are: opportunities for tourism and recreation, habitats for fish and protection of fish species, maintenance of biodiversity and sources for the extraction of sand to restore beaches and dunes. In addition, coral absorbs the carbon dioxide in the water and thereby helps to regulate the climate. The pharmaceutical industry has also become interested in gaining access to certain raw materials that can be obtained from coral reefs.

Following a natural disaster (particularly in the case of hurricanes and tropical storms), if there are signs that coral reefs may have been affected, a submarine inspection will need to be conducted by professional divers. Their findings can be supplemented by interviewing fishermen and other people whose specialized knowledge can help the assessment team to ascertain the size of the affected area, the severity of the damage and the scale of losses. Economic appraisals of coral reefs in Australia, Aruba and Jamaica have assigned monetary values to damaged reefs of between US$ 7,500 and US$ 500,000 per hectare, depending on the reef's location and the role it plays in the coastal ecosystem concerned.

In a hypothetical case that serves to illustrate an approach to the environmental assessment of an area in the vicinity of a coral reef, it was posited that the present per-hectare value of the reef ranged from US$ 90,000 to US$ 320,000. It was then determined that an area measuring 7,000 linear metres in length and 75 metres in width had been irreversibly damaged or could be restored only in the very long term. The coral surface was appraised at US$205,000 per hectare (the simple average of its estimated present value). Since its total area was calculated to be 52.5 hectares, its total value came to US$10,762,500.

Once the value had been assessed, the next step was to develop a detailed budget and corresponding activities to lead to the replacement of damaged assets or to addressing the economic losses.

6.2 Identifying and Mobilizing Sources of Funding

The lead agency and team for preparing the DRF are usually in charge of the consolidation of the overall recovery cost estimation and budgeting responsibilities. They have to be ready for discussions and pledges at the donor conference or within the country's own legislative system. The environmental sector team may not be part of that effort.

The budget planning during the DRF process is more detailed than the PDNA's recovery needs estimates because they are based on the recovery programmes and projects envisaged. Typically, the funding sources for these targeted programmes and projects are government budget allocations or reallocations, donor pledges and commitments, emergency contingency funds, and loans and grants. They might be allocated to these programmes and projects through departmental budget plans or through extra-budgetary allocations specifically meant for disaster recovery.

Practical Considerations

A donor conference is one of the options for identifying DRF funding sources, but it is not always necessary. Countries sometimes conclude that their national legislative mechanisms are adequate for responding to the financial needs of a DRF.

Even though the environmental sector team may not directly be involved in identifying funding mechanisms for their sector recovery budgets, there is a possibility that the team members are aware of internal and external donors, and specific funding sources that might have an interest in participating in the environmental recovery component of the country's DRF. Such parallel funding opportunities and approaches might be of additional benefit to the environmental team.

6.3 Development of Recovery Budgets

American Planning Association (2014) outlines approaches to and thought processes that must precede recovery budgeting.[29] A successful recovery implementation strategy would integrate (a) the community's needs, including total damage and economic impacts; (b) the known recovery resources such as federal and state assistance, insurance, local reserves and other resources; and (c) the potential gaps in funding. This applies to environmental sector recovery activities as well. At the same time, it is an opportunity to explore cost-cutting by eliminating non-essential actions. Some of the past activities or practices might have to be discarded because they may no longer be relevant. In some instances, such as the revegetation of forest cover, there may be a case to abandon such an effort as the benefits are not substantive enough.

Once such macro-analysis is done, the environment ministry would have to match available technical, financial and human resources to the proposed recovery programmes and projects. As noted elsewhere in the report, the environment ministry might have to look for funding from

sources beyond the lead disaster recovery agency. This requires significant knowledge about the different sources of funding—which sources to use for particular projects and needs; when and how each source becomes available; and what eligibility criteria, project conditions and matches are required. For example, the process of financing the repair of infrastructure and public facilities may start with an assessment of damages and determination of whether the repairs will be covered by insurance, etc.

Therefore, it becomes clear that the disaster recovery budgeting process is complex and varies depending upon the nature of disaster, the nature and extent of funding, the country-specific financial management mechanisms, the country's priorities, the departmental needs and capabilities, and much more.

Despite these variables influencing the budgeting process, there are some fundamental costing principles that can be applied at a programme or project level. A systematic approach to cost estimation for various components of a project or a programme related to environmental recovery will help in the overall estimation of costs related to DRF for the environmental sector. Complex, multi-year programmes or projects would require a more detailed spreadsheet that can track expenditures based on various outcomes and outputs. Appendix A of this document provides an example of such a spreadsheet. It also includes a high-level budget table from the Post-Disaster Recovery Plan for Sri Lanka's Floods and Landslides.[30] For smaller-scale projects, Tools4Dev.org has developed a simpler budget template.[31]

6.4 Management and Tracking of Funds

The management and tracking of funds dedicated to environmental recovery project budgets and expenditure are typically subject to the overall financial accountability processes established by the country and the departments under which the activities are carried out. The financial and reporting accountability will also have to follow the terms and conditions imposed by the donor agency for any loans, contributions or grants. These mechanisms are country- and project-specific.

7

Implementation Arrangements

The implementation of environmental recovery in a post-disaster scenario follows the approach recommended for other recovery sectors. In many instances, the cross-cutting environmental recovery activities will be integrated with the recovery activities of the main sectors. Furthermore, standard implementation procedures and best practices are followed, as outlined in Module 6 of the main DRF Guide. The key elements of the standard approach are:

(a) project planning, project approval and change management processes, procurement systems, staffing, project monitoring and evaluation and reporting processes that are simplified but effective to achieve recovery implementation;

(b) effective and timely public communication and consultation approaches to ensure community participation;

(c) effective public grievance redress mechanisms; and

(d) clear reconstruction standards that incorporate the key planning principles of

  (i) converting adversity into opportunity,

  (ii) building back better (BBB), and

  (iii) prioritizing inclusiveness of vulnerable groups.

7.1 Action Plan Development

Environmental recovery programmes will need to be developed in a systematic manner using the best practices of programme management. With this systematic approach, a realistic and practical road map from the current status to the stated goal can be drawn with the support of and participation from various key stakeholders. Note that the road map might have more than one activity, and they could either be linked or could be realized in parallel.

Action plans are simple lists of all the tasks that you need to finish to meet an objective. They differ from 'To-do lists' in that they focus on the achievement of a single goal. Action plans set out more precisely what needs to be done in a project, by whom, when and at what cost. They are organized along the strategic objectives, outcomes and outputs which will be achieved. They include a budget, a financing plan and a monitoring and evaluation (M&E) process.

Action plans are useful because they give a framework for thinking about how teams will complete a project efficiently. They help teams finish activities in a sensible order and ensure that one doesn't miss any key steps. Also, since each task is laid out clearly, team leads can quickly decide which tasks would be delegated or outsourced, and which tasks might be pushed further down the priority list.

In the context of environmental recovery project implementation, there might be several outputs, each of which can be considered as a goal. There should be many clearly defined deliverables established under each output, with specific dates by which they need to be completed. Therefore, an Action Plan needs to be developed for each output, with the specific timelines respected.

Practical Considerations

Well prepared action plans will allow teams to be realistic. However, extremely detailed action plans are a heavy burden in the preparation process. In order not to discourage the preparation team, it is recommended that a precise action plan be prepared for the first implementation year of the project. For the remaining years, estimations of the time framework and of the costs of the outputs can be less precise (to be subsequently revised as the project progresses).

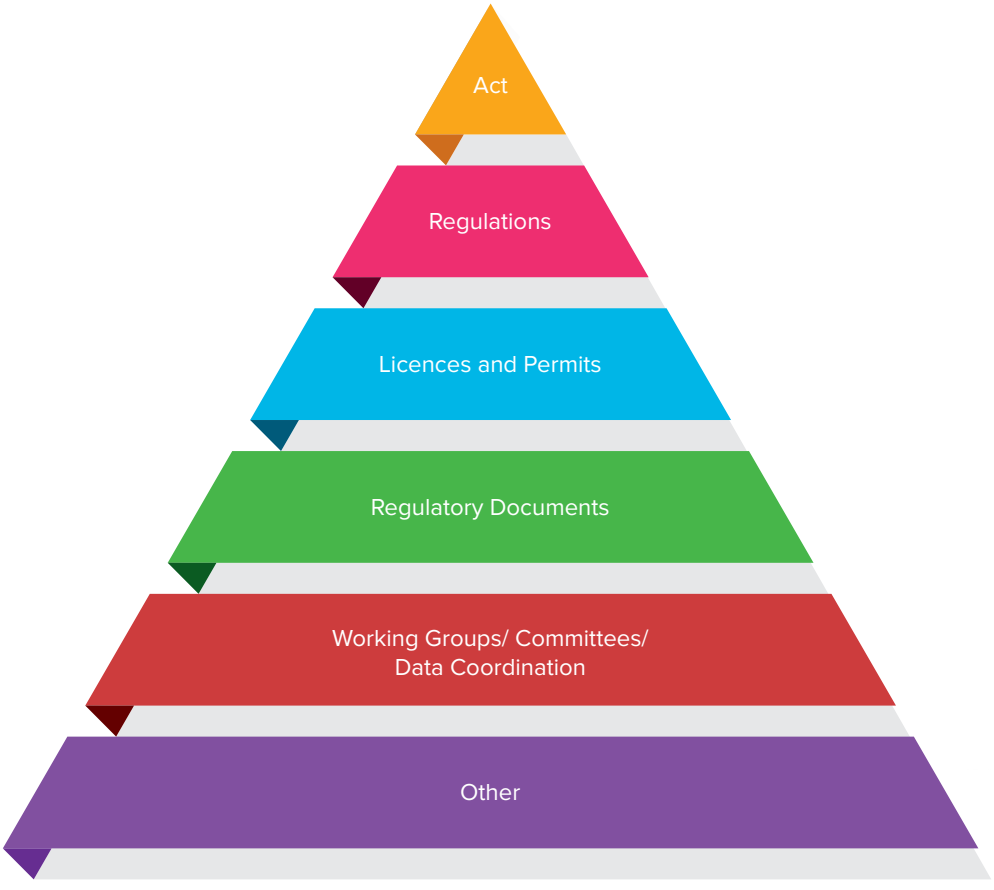
Example 11: Action Plan for the Government Stakeholders

During post-disaster recovery activities related to institutional capacity building incorporating BBB, approaches to building community resilience through ecosystem-based risk reduction measures are very useful.

The EU-funded project 'Up-Scaling Community Resilience through Ecosystem-based Disaster Risk Reduction (Eco-DRR)' is managed and implemented by the UNEP's Disasters and Conflicts Branch in collaboration with the non-governmental Partners for Resilience (PfR).[32] The PfR is a global network of about 50 civil society organizations and their networks, working in hazard prone areas to strengthen people's resilience in the face of rising disaster risks. The main objective of this multi-country project is to establish models that demonstrate various types of ecosystem-based measures and uptake of knowledge and capacities to undertake such measures for DRR and adaptation.

There are four general categories of outputs that lead to the outcome of the project. They are related to (a) the communities and households; (b) the national and local government stakeholders; (c) the civil society organizations (CSOs) and (d) the development of knowledge products, establishment of

Figure 7: Entry Points for Introducing Eco-DRR Phase II Project



Source: Author's analysis.

baselines and proper tracking of project implementation. Many of these activities can take place simultaneously (such as engaging communities and various government departments), while some activities may depend upon the progress of other activities (for example, the preparation of knowledge products may have to be done after the initial engagement of community or government departments).

One of the project outputs outlines the activities and deliverables for the relevant national and local government stakeholders to incorporate Eco-DRR measures in development plans and programmes in the project countries. This includes an assessment of existing knowledge levels and capacities to implement Eco-DRR, a strategy for increasing capacities, identification of Eco-DRR entry points for policy and practice uptake in development plans and programmes, and a strategy to address capacity gaps and entry points. Therefore, there are many entry points in the regulatory framework for PfR partners to introduce the Eco-DRR Phase 2 project in each country (Figure 7).

If baseline data reveals that a country's national government has an existing environmental law that encompasses DRR strategy, but not Eco-DRR, and therefore, lacks the appropriate regulations and policies, the PfR partners could engage with the relevant departments and assist them in drawing up the regulatory language for Eco-DRR and prepare knowledge products such as procedures and guidance documents associated with those regulations.

The design of an action plan is presented in Appendix B (adapted from "Action Plans – Small Scale Planning" by MindTools.com).

7.2 Programme Monitoring and Evaluation

Annex 2 of the Disaster Recovery Framework Guide (Revised Version March 2020) provides the Integrated Results Framework for Recovery Planning, a tool that aggregates and encapsulates the key results and outputs by each aspect of a recovery framework.[33] It is a useful tool for monitoring the process of recovery planning in a sequential or thematic manner, as well as to monitor the progression of the various components of the programme.

The environmental sector recovery programmes should be incorporated into and aligned with the main monitoring tool so that all the outcomes, relevant outputs and deliverables are streamlined and coordinated under the overall recovery framework. However, the environmental sector's recovery activities may be complex enough that they warrant their own monitoring and evaluation systems. Tables 3 to 6 provide guidance on project monitoring and evaluation under environmental recovery programmes.

7.2.1 Sample List of Elements in Project Monitoring

Table 3 provides a list of elements that could be included in the project monitoring and evaluation system, methods, tools/forms and planning. The degree to which these elements are employed depends upon the complexity of a project. Therefore, this list should be considered as indicative, and not prescriptive.

Table 3: Project Monitoring and Evaluation, Elements and Purpose

No.	*Element*	*Purpose*
1.	Environmental recovery project logical framework	Overview of programme logic; aligned with the overarching recovery framework
2.	Narrative reporting	Monitoring of output and outcome results at country level
3.	Key performance indicator sheet	Align targets and indicators with cross-cutting sector log frame Guides the: • narrative reporting (quantify) • tracking of programme indicators
4.	Financial reporting	Monitoring of output and outcome expenditures/ burn rate Financial accountability
5.	Information flow (between implementing partners including other sectors)	Verification of data and consolidation of narrative reports and indicator sheets at country level by thematic lead
6.	Baseline study at relevant national and sub-national levels	Perform data availability scan and use national census data, vital statistics, civil registration systems, etc.
7.	Field implementation plan/work plan	Planning of field activities
8.	Midterm review	
9.	End-line final (external) evaluation	Possible impact studies/case studies
10.	Timeline	
11.	Budget	Realistic project monitoring and evaluation budget in line with the available resources

7.2.2 Key Performance Indicators

In large and complex disaster recovery programmes, key performance indicators (KPIs) can be wide-ranging and can cover a broad spectrum and multiple stages of a given project. It is therefore not feasible to provide a comprehensive list of KPIs that suit all aspects of environmental recovery.

However, Table 4 lists just a few relevant KPIs that can measure the success of disaster recovery in the environmental sector. The reader is urged to follow the principles of KPIs and use the template provided in Appendix C to develop KPIs that are practical in nature and manageable in numbers for a given project.

Table 4: Examples of Key Performance Indicators

Topic	*Sample Key Performance Indicators*	*Baseline*	*Target*
Restoration of water quality	• The turbidity in rivers and lakes has reduced to drinking water quality standards		
	• Aquatic biota native to the rivers and lakes (fish, molluscs, etc.) have returned to pre-disaster levels		
	• Influent contaminants sources (such as pesticides) have been eliminated		
Regeneration of vegetation cover	• Area of vegetation cover has increased to pre-disaster levels		
	• Destruction of trees for fuel is reduced		
Environmentally friendly infrastructure development	• Number of green infrastructure projects have been implemented		
	• Ratio of ecosystem-based infrastructure projects to traditional infrastructure projects has increased		
Waste management	• Volume of uncontrolled disaster-related waste has reduced		
	• Number of engineered waste disposal facilities have increased		
	• Waste collection and recycling practices have been restored to pre-disaster levels		

Table 5 shows an example of the consolidated tracking table for KPIs for a multi-year project.

7.2.3 Review of Lessons Learned

Table 6 can be used by project implementers as well as project managers to capture on-going lessons learned on a routine basis, which will also benefit subsequent project phases as well as future projects.

7.3 Communications Strategy

Module 6 of the main DRF Guide (revised version, March 2020) explains the importance of having a communication strategy. It states that throughout the recovery process, it is in the government's best interest to maintain ongoing dialogue and share information with all other stakeholders and partners in the recovery. A well-defined internal and

Table 5: Consolidated Tracking Table for Key Performance Indicators

Project Title								
RESULTS LEVEL:	*KEY PERFORMANCE INDICATORS (KPIs)*							
RESULT	*KPI 1*		*Baseline*	*Annual target 1 (Year)*	*Annual target 2 (Year)*	*Annual target 3 (Year)*	*Annual target 4 (Year)*	*Final project target (Year)*
		Planned						
		Achieved	N/A	a)	a)	a)	a)	a)
				b)	b)	b)	b)	b)
	KPI 2		Baseline					
		Planned						
		Achieved	N/A	a)	a)	a)	a)	a)
				b)	b)	b)	b)	b)
	KPI 3		Baseline					
		Planned						
		Achieved	N/A					
	KPI 4		Baseline					
		Planned						
		Achieved	N/A					
	KPI 5		Baseline					
		Planned						
		Achieved	N/A	a)	a)	a)	a)	a)
				b)	b)	b)	b)	b)
	KPI 6		Baseline					
		Planned						
		Achieved	N/A					
	KPI 7		Baseline					
		Planned						
		Achieved	N/A					
	KPI 8		Baseline					
		Planned						
		Achieved	N/A					
	KPI 9		Baseline					
		Planned						
		Achieved	N/A					
	KPI 10		Baseline					
		Planned						
		Achieved	N/A					

Table 6: Review of Lessons Learned

Planned task/ activity/ practice/ approach	*What worked*	*What didn't go according to plan or your expectation*	*Conclusion*	*What would you change if you started this activity again?*	*Remark*

public communications strategy recognizes the different types of stakeholders and identifies the most effective means of communicating with them.

The communications strategy for the environmental portion of the DRF should also follow the same approach and should have three principal goals:

(a) Establishment of effective internal communication among recovery partners

(b) Establishment of an effective public communication programme

(c) Promotion of transparency and accountability in recovery

It is important that the relevant environmental cross-cutting issues are identified and explicitly discussed on a regular basis in both internal communication avenues as well as in the public communication methods. Modern communication tools such as social media should be effectively deployed to reach various demographics of the population and also to increase the speed of information transmission.

Effectiveness of these instruments can be measured as part of the sector's monitoring and evaluation process through appropriate KPIs.

Example 12: Communication Framework for the Hydrocarbon Pollution and Remediation Project of the Niger Delta Region of Ogoniland

The Ministry of Environment of the Federal Government of Nigeria fulfilled one of its commitments towards the environmental clean-up of the Niger Delta region of Ogoniland in the southern coast of the country with the establishment of the Hydrocarbon Pollution and Remediation Project (HYPREP). UNEP has been providing technical and project management expertise to HYPREP on the project.

One of HYPREP's mandates is to strengthen governance, transparency and accountability in its activities in the region. Through UNEP's assistance, HYPREP has developed a communications framework to help structure HYPREP's external and internal communications plans and to highlight and deal with current needs and gaps and future challenges that may arise in the course of implementing the UNEP recommendations of 2011. HYPREP has identified a number of internal and external stakeholders. It has also identified the core stakeholder engagement activities as (a) strengthening community relations at the local government and grassroots level and (b) strengthening existing collaborations with non-governmental organizations, community-based organizations, political, traditional and academic institutions, and the private sector.

HYPREP's core communication activities include:

(a) maintaining quality, consistency and adherence to HYPREP communication policy and standards in disseminating information shared internally and in the public domain with all stakeholders;

(b) maintaining internal communications and maximizing opportunities for engagement and feedback;

(c) establishing information centres in the four local government areas;

(d) strengthening the existing ties with traditional, digital and new media institutions and news outlets and keeping them constantly informed of HYPREP's activities in the region;

(e) enhancing the visibility of HYPREP's activities by communicating results, on-going projects and messages through media interviews, press releases, opinion-editorials (op-eds), articles, website stories and informative videos, among others; and

(f) utilizing social media channels to further expand HYPREP's communication outreach and to disseminate messages, results and activities with a feedback monitoring mechanism in place.

As part of this strategy, the Ministry of Environment created the Central Representative Advisory Committee (CRAC) in 2019. The CRAC was formally established by embedding it in the HYPREP Gazette. The committee is expected to serve as an all-inclusive and multifaceted approach to the Ogoniland clean-up, with a clear mandate to act as a bridge between stakeholders, communities, groups and HYPREP on all issues relating to successful project execution.

The ten-member committee is made up of the HYPREP Project Coordinator who is

also the Chair, with representatives of the Government of Rivers State, international oil companies, CSOs, traditional rulers and UNEP. The government considers CRAC as an important national duty and made clear that CRAC's mandate was to mediate, counsel, advise, reconcile and recommend appropriate actions where applicable with the impacted communities, stakeholders and the Government of Rivers State as targets so as to ensure a hitch-free clean-up exercise and for the timely restoration of aquatic and environmental life in Ogoniland, keeping in mind the urgency of the assignment.

7.4 Some useful resources and tools on project management, monitoring and evaluation

- https://www.unep.org/evaluation-office
- https://tools4dev.org/
- https://www.ifrc.org/document/projectprogramme-monitoring-and-evaluation-guide
- https://www.thecompassforsbc.org/how-to-guides/how-develop-indicators
- https://www.measureevaluation.org/resources/training.html
- https://www.measureevaluation.org/resources/publications/ms-07-20-en.html
- https://www.advancingnutrition.org/resources/monitoring-evaluation-courses
- https://www.theguardian.com/global-development-professionals-network/2015/aug/17/how-to-write-a-logframe-a-beginners-guide
- https://documents.worldbank.org/en/publication/documents-reports/documentdetail/783001468134383368/the-logframe-handbook-a-logical-framework-approach-to-project-cycle-management
- https://www.mindtools.com/pages/main/newMN_PPM.htm
- https://www.uvic.ca/communicationsmarketing/assets/docs/briefing-note-template.doc
- https://www.bobpikegroup.com/trainer-blog/top-ten-slide-tips-by-garr-reynolds

APPENDIX A

Environment DRF Budget Template Spreadsheets

A.1 Budget Template for a Complex Multi-Year Project

This example shows budgeting details for the first year of the project. Additional columns for subsequent project years can be added and customized.

Project title:

Project executing department:

Project implementation period:

Departmental budget line			*Budget*	*Year 1* *Expenditures*		*Reporting period balance*
10	Budget Code	PERSONNEL COMPONENT		Actual	Committed	
		Project personnel				
		Environment sector DRF coordinator				
		Sub-total				
		Consultants				
		Sub-total				
		Administrative support				
		Administrative assistant				
		Sub-total				
		Component total				
20		SUB-CONTRACT COMPONENT				
		Sub-contracts (MOUs/LOAs for supporting organizations)				
		Sub-total				
		Sub-contracts (for commercial purposes), e.g., printing of outreach materials				
		Sub-total				
		Component Total				
30	TRAINING / WORKSHOP COMPONENT					
		Group meetings				
		Travel related to training/ workshops (meeting participants)				
		Sub-total				
		Meetings/Conferences				
		Meetings for monitoring project progress				
		Conduct end-of-project review workshop				
		Sub-total				
		Component total				
40	EQUIPMENTS & PREMISES COMPONENT (PROCUREMENT)					
		Non-expendable equipment				
		Project office expenses				
		Utilities				

Departmental budget line			*Year 1* *Budget*		*Expenditures*	*Reporting period balance*
		Sub-total				
		Component total				
50	Travel of personnel					
		Travel (international, domestic, per diems)				
60	MISCELLANEOUS COMPONENT					
		Operation and maintenance of equipment				
		Vehicle costs (maintenance and fuel)				
		Sub-total				
		Reporting cost				
		Compilation, production and publication costs				
		Sub-total				
		Sundry				
		Internet and communication costs—internet, telecoms and courier				
		Sub-total				
		Monitoring and evaluation/ Financial audits				
		Monitoring and evaluation				
		Financial audits				
		Component total				
	SUB-TOTAL (US$)					
		Project support costs (X %)				
	GRAND TOTAL (US$)					

A.2 Activity Budget Template

This table shows an example of project budget tracking based on the project outcomes and outputs. Project outputs are the results of programme/intervention activities in the form of deliverables. Project outcomes are short-term and medium-term effects of an intervention's outputs, such as change in knowledge, attitudes, beliefs and behaviours.

Environment Sector Activity Budget-summary of all projects	*Year 1*			
OUTCOME 1	Budget	Expenditures		Balance at end of reporting period
Output 1.1		Actual spent	Committed/ obligations	
1.1.1				
1.1.2				
1.1.3				
Output 1.2				
1.2.1				
1.2.2				
OUTCOME 2, etc. (Follow same logic as for Outcome 1, for all other Outcomes identified and corresponding Outputs)				
5. REPORTING COSTS (see examples below)				
5.1 Translation costs				
5.2 Printing costs				
6. PROJECT MANAGEMENT COSTS				
6.1				
6.2				
6.3, etc.				
7. MONITORING AND EVALUATION/FINANCIAL AUDITS/PROJECT SUPPORT COSTS				
7.1 Monitoring and evaluation				
7.2 Financial audits				
7.3, etc.				
Total (US$)				

A.3 Recovery Plan Matrix—Environment Sector, Sri Lanka Post Disaster Recovery Plan

Table A.1: Recovery Plan Matrix—Environment Sector

Environment programme	*Annual target*	*Annual budget (LKR million)*				*Funding source*			*Goverment lead*		
		2017	*2018*	*2019*	*Total*	*Government*	*Donor*	*Unmet*	*Lead agencies*	*Support agencies*	*Potential partner support*
Environment											
Biodiversity											
Establish national list of species and ecosystem types with annual updating, research	Establishing expert teams on taxonomy, awareness raising and research	5.00	10.50	10.50	26.00	CF			BDS		
Environmental protection and conservation	Capacity building programmes, advisory groups Provincial biodiversity profiles published	1.48	2.95	3.50	7.93	CF			BDS		
Provide seed grants for research on identified sites, taxa and eco-system services	Research papers, identified sites, research papers evaluated	0.50	30.00	15.00	45.50						
Initiate research and monitoring programmes on disasters impacts on biodiversity	Most vulnerable areas to natural hazards identified	0.10	60.00	30.00	90.10						

Environment programme	Annual target	Annual budget (LKR million)				Funding source			Goverment lead		
		2017	2018	2019	Total	Government	Donor	Unmet	Lead agencies	Support agencies	Potential partner support
Conduct strategic environment assessments for all nine provinces and identify the best possible pathway to achieve national development goals with the least amount of habitat loss and fragmentation	Conduct awareness workshops, selecting specialized groups	10.00	80.00	40.00	130.00						
Implement the national ecosystem conservation plan by integrating it with provincial and local development plans as well as ensuring private sector participation	Ecosystem conservation plan established	30.00	10.00	5.00	45.00						
Mainstreaming agro-biodiversity conservation use in Sri Lankan agro-ecosystems for livelihoods and adaptation to climate change	Biodiversity fairs; training programmes; awareness, learning and sharing programmes; community biodiversity register in each site	29.00	31.50	10.00	70.50		GEF		BDS	UNEP	Agriculture Department

Environment programme	*Annual target*	*Annual budget (LKR million)*				*Funding source*			*Goverment lead*		
		2017	*2018*	*2019*	*Total*	*Government*	*Donor*	*Unmet*	*Lead agencies*	*Support agencies*	*Potential partner support*
Mainstreaming agro-biodiversity conservation and use in Sri Lankan agro-ecosystems for livelihoods and adaptation to climate change	Activities according to the action plan: (i) number of meetings conducted (ii) Coordination unit established (iii) increased number and types of relevant programmes and (iv) mobilizing biodiversity for food and nutrition	18.90	25.56	10.00	54.46		GEF		BDS	UNEP	Agriculture Department
Conduct a national-level awareness campaign on invasive alien species (IAS) and their impacts on natural habitats	Improved regulatory framework for IAS policy, strategy and action plan mechanism is established. Training programmes, publication, 9 provincial profiles, 3 research studies, 1 symposium held	16.00	0.00	0.00	16.00		GEF		BDS	UNDP	

Abbreviations: GEF, Global Environmental Fund; LKR, Sri Lankan Rupee; UNDP, United Nations Development Programme; UNEP, United Nations Environment Programme.

Source: Government of Sri Lanka, Ministry of National Policies and Economic Affairs, Ministry of Disaster Management, *Post Disaster Recovery Plan, Sri Lanka Floods and Landslides*, (Government of Sri Lanka, Global Facility for Disaster Reduction and Recovery, World Bank Group, European Union, United Nations Sri Lanka, May 2017). https://www.gfdrr.org/sites/default/files/publication/Sri%20lanka%20Recovery%20plan.pdf.
The ministry has since been restructured and renamed Ministry of Environment.

APPENDIX B

Design of an Action Plan

As described earlier,[34] the identification of activities itself doesn't make the action plan. It needs to be more than the enumeration of activities that the team needs to carry out. Besides the enumeration, an action plan or work programme should include: an assessment of the issue to be tackled and/or an opportunity to be seized (what?) (as outlined during a mapping exercise, for example); a time frame (when?); an evaluation of the existing capacities in order to identify missing capacities (how?); a cost evaluation (how much?); the identification of the actors (who?); appropriate mechanisms for monitoring and assessing progress (what for?).

An action plan includes:

- **What is the issue** to be tackled and/or what are the opportunities to be seized with regard to promoting environmental recovery in each project (from the mapping exercise);

- **Who** is going to do what—assigning the responsibilities and setting targets;
- **When**—estimating the schedule and duration of activity;
- **In what order**—determining the sequence and dependence of activities;
- **How**—defining human, technical and financial resources needed;
- **What for**—identifying and selecting indicators that can be used to track progress and monitor the performance of the action.

Steps to Develop an Action Plan

One way to develop an effective action plan for each output is to follow a systematic stepwise process.

Step 1. Identify tasks

Start by brainstorming all of the tasks that one needs to complete to accomplish the outputs. It is helpful to start this process at the very beginning. What's the very first action the team needs to take? Once that task is complete, what comes next? Are there any steps that should be prioritized to meet specific deadlines, or because of limits on other people's abilities and availability?

Brainstorming is an exercise that is effective when the team lead brings together all the team members to discuss various ideas without judgment or hierarchy. No idea is not worth noting down in such sessions, and the team uses 'appreciative enquiry' to probe those ideas. In fact, often the ideas are most robust when the team is diverse in terms of work experience, gender, life experiences, positions, etc.

Step 2. Analyse and delegate tasks

Now that you can see the entire project from beginning to end, look at each task in greater detail. Are there any steps that you could drop but still meet your objective? Which tasks could you delegate to someone else on your team or a freelancer? Are there any deadlines for specific steps? Do you need to arrange additional resources?

Step 3. Double-check with SCHEMES

One of the techniques to double-check the plan for its robustness is by using a mnemonic called SCHEMES. It stands for:

Space; Coordination; Helpers/People; Equipment; Materials; Expertise; Systems

Step 4. Identify Follow-Up Actions

Based on the tasks the team has identified and prioritized, determine the follow-up actions needed once the task is implemented. This follow-up action may last a long time and may require human and financial resources. They need to be considered to the extent possible at this planning stage.

Step 5. Put a Monitoring and Evaluation Plan in Place

This step is crucial to ensure that the implementation of the recovery team's action plan is on track till the end of the project. Establish a monitoring and evaluation (M&E) plan that tracks and documents progress of each activity in the action plan. More information on M&E is provided later in this module.

Therefore, for each of the relevant outputs and deliverables defined in the environmental recovery programme, identify the following:

(a) Who are the stakeholders? List names of relevant government ministries and departments at national and local levels, external organizations, groups, civil society organizations, etc.

(b) What are the key activities needed for this output? List the step-by-step tasks from start to finish, with estimated timelines and resources needed. Then prioritize the list in line with the expected commitments on each output deliverables.

(c) What are the key issues to be dealt with for that output? Do you have baseline data, or do you need to collect them? What are the challenges such as accessibility, security, cultural sensitivity, gender issues, seasonal demands on the communities—such as harvest season? Here, you can group the issues into your team needs, community matters, logistics, financial, etc.

(d) Identify the task progress tracking mechanism you want to put in place, and how you will go about it.

Based on the above-noted systematic approach, create an action plan for each output of the project using the attached template.

Process Mapping and Action Plan Template
(Add pages, columns and rows as needed)

Action Plan Reference Number:

Part I – General information

Project title: _____

Project reference no. _____

Partner organization: _____

Other partner organizations involved (if relevant): _____

Country: _____

Contact person: _____

Email address:

Phone number:

Part 2 – Output and deliverables for this action plan:

Output x.x _____

_____

_____

_____

_____

Deliverables:

No.	*Deliverable*	*Timeline*

List of stakeholders involved

(a) Government agencies

(b) Among nongovernmental organizations (NGOs) and civil society organizations (CSOs)

(c) International (for example, UNEP, UNDP experts)

List of activities to be accomplished to achieve output deliverables (for national and local governments)

Activity 1: (For example, obtain baseline data)

Task 1.1

Task 1.2

Task 1.3

Activity 2: (For example, conduct gap analysis)

Task 2.1

Task 2.2

Task 2.3

Activity 3: (For example, establish action plan for protection measures)

Task 3.1

Task 3.2

Task 3.3

Activity 4: (For example, undertake capacity building)

Activity x: (For example, develop M&E mechanisms)

Logistics

5.1 Infrastructure

5.2 Cost Estimation and Funding

5.3 Staff Resources

List of issues/challenges and mitigation methods

Internal

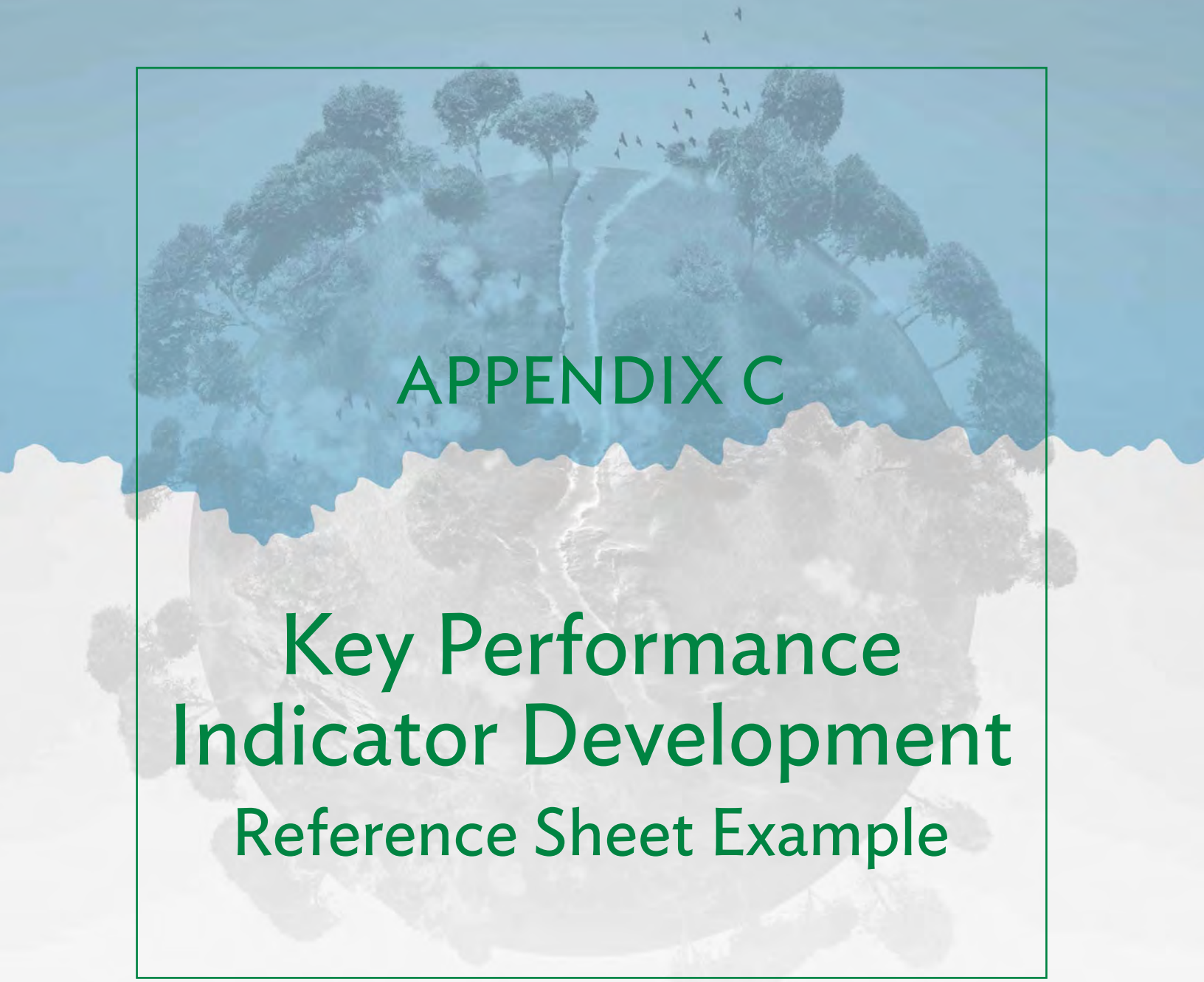
(For example, team readiness—including security clearances, sufficient staff complement, personnel qualification and training, orientation and onboarding, personal protective equipment, standard operating procedures)

Community

(For example, security situation, community availability, cultural issues, gender issues, corruption, etc.)

Stakeholders (NGOs, CSOs and government agencies)

(For example, availability and interest, accessibility, work ethic, readiness, orientation and onboarding, documentation and record keeping, etc.)



APPENDIX C

Key Performance Indicator Development

Reference Sheet Example

Indicator	"Theoretical knowledge of ecosystem restoration and protection management/ eco-disaster risk reduction (DRR) and climate change adaptation (CCA)"
Definition	At the individual level, it refers to the capacity to understand reasoning, techniques and theory of knowledge of ecosystem restoration and protection management/eco-DRR and CCA
Purpose	To demonstrate increased resilience at the individual level through two components: a) ecosystem restoration and protection management and b) eco-DRR and CCA
Baseline	0 person

Target	25 persons per workshop
Data collection	Designing an appropriate set of questions for collecting and measuring the reasoning, techniques and theory of knowledge of ecosystem restoration and protection management/eco-DRR and CCA
Tool	Post-workshop survey/test demonstrating that students have individual knowledge on the topics mentioned above. The test comprises 21 questions that measure theoretical knowledge, of which 15 measure reasoning capacity and 6 are based on theory.
Frequency	Once before and once after the training
Responsible	Training of trainers (ToT) Coordinator—UNEP
Reporting	Part of a narrative report, used to determine the success of the target
Quality control	Test questions are peer reviewed by internal UNEP specialists.
Associated project output milestones	Project Output 3.4

NOTES

1. Similar to the companion guidance that exists for conducting a PDNA for the environment sector.
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3. Volume B of the PDNA (https://www.gfdrr.org/en/pdna-volume-b) contains chapters that offer guidance for sector-specific needs assessments, as following:
   - Social sectors: housing and settlements; education; health; culture; and nutrition;
   - Productive sectors: agriculture, livestock, fisheries and forestry; industry; commerce; trade and tourism;
   - Infrastructure sectors: water, sanitation and hygiene; community infrastructure; energy and electricity; transport and telecommunications; and
   - Cross-cutting sectors/themes: employment and livelihoods; disaster risk reduction; governance; environment; gender; HIV/AIDS and ageing.
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9. This is similar to the PDNA–Environment Guide, which is a companion guidance document to PDNA Guide Volume A.
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11. UNECLAC, Handbook for Disaster Assessment, (United Nations Economic Commission for Latin America and the Caribbean, 2014).

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14. Government of Sri Lanka, Ministry of National Policies and Economic Affairs, Ministry of Disaster Management, *Post Disaster Recovery Plan, Sri Lanka Floods and Landslides*, (Government of Sri Lanka, Global Facility for Disaster Reduction and Recovery, World Bank Group, European Union, United Nations Sri Lanka, May 2017). https://reliefweb.int/report/sri-lanka/sri-lanka-floods-and-landslides-post-disaster-recovery-plan-may-2017.
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17. https://hyprep.gov.ng/.
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Environment Sector

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