

Integrating ecosystems in resilience practice:

Criteria for Ecosystem-Smart Disaster Risk Reduction and Climate Change Adaptation

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In practice: wetlands for disaster risk reduction

The integration of ecosystems and natural resource management in disaster risk reduction (DRR) has been largely overlooked to date. This document introduces a set of criteria, which can be used by policy makers and practitioners to better integrate the management of ecosystems and natural resources in their DRR work. The criteria describe the required steps to develop an 'ecosystem-smart' approach in the design, implementation and evaluation of risk reduction programmes. They provide guidance on the required capacities, partnerships, institutional set-up and planning needs.

The criteria were developed in the context of the Partners for Resilience alliance, which aims to reduce the impact of natural hazards on the livelihoods of around 400,000 vulnerable people worldwide. This alliance is one of the first large-scale efforts to bring together expertise from the humanitarian, development and environment sectors into a holistic risk reduction and climate change adaptation (CCA) programme. Following the criteria will help to integrate these disciplines, which will substantially increase the sustainability and effectiveness of risk reduction interventions. While this document focuses on disaster risk reduction, the criteria are equally applicable to guide the integration of environmental considerations into climate change adaptation planning processes.

Key messages

Criteria for Ecosystem-Smart DRR and CCA will assist users to:

1. Assess and understand the interrelationships between ecosystem functioning and disaster risk, and to appreciate how improved land, water and natural resource management can increase community resilience;
2. Mobilise interdisciplinary teams capable of designing and implementing more inclusive risk reduction programmes, including vulnerability assessments that combine interventions from the humanitarian, development and environment sectors;
3. Understand how risk is expressed at different spatial scales, and how human interventions related to land, water and natural resource use may affect the vulnerability of communities elsewhere (within a river basin, along coastlines, etc.);
4. Establish policy dialogues with a broad range of stakeholders to advocate the wise use of ecosystem services and highlight the adverse consequences of unsustainable practices regarding disaster risk and community vulnerability;
5. Consider the environmental root causes of disaster risk, convening the right actors at the appropriate scales and clearly identifying institutional responsibilities and stakeholders' roles.

The document does not provide specific guidance on the technicalities behind selected ecosystem and natural resource management interventions. These are typically highly site-specific and no generalisations can be made.

A new vision for community resilience

The *Partners for Resilience* alliance between CARE Netherlands, Cordaid, the Netherlands Red Cross, the Red Cross/Red Crescent Climate Centre and Wetlands International, developed a joint vision on how to achieve community resilience in a holistic manner. It identifies *building blocks* encouraging communities and other stakeholders to:

- anticipate the risks they face by building on existing capacities;
- respond when disaster strikes while maintaining basic structures and functions;
- adapt to changing risks, and to a changing location situation and its livelihoods options; and
- transform themselves to address the underlying factors and root causes of risk and to be active partners to governments in implementing DRR.

These *building blocks* apply on several levels, from households and the communities they form, up to the civil society and landscape in which they are situated and with which they interrelate. At all levels, policy dialogue is important to create an enabling environment.

These *building blocks* should be implemented through a variety of well-balanced measures related to land, water and natural resource management, humanitarian aid, and community development. The criteria outlined in this document provide guidance to achieving such integration.

Why Criteria for Ecosystem-Smart DRR and CCA?

Ecosystem-Smart DRR and CCA is not about prioritising nature over people or stopping development. It is about making optimal use, in a sustainable manner, of the services provided by ecosystems. *Provisioning services* are the products derived from nature, such as timber, fruits and fish, which provide people with important daily supplies and strengthen community resilience in times of crisis. *Regulating services* can reduce the impacts from hazards and sometimes even prevent them: marshes, for example, can store large quantities of water and help mitigate floods. Mangrove forests may serve as buffers against storms.

Ecosystem-Smart DRR and CCA aims to accomplish a paradigm shift towards an approach where the sustenance and restoration of ecosystem services and the maintenance of the natural dynamics that underpin ecosystem health are firmly embedded, alongside other risk reduction approaches.

This requires an integration of sectors, involving a multitude of stakeholders including communities, land-use planners and engineers. It also requires risk reduction measures to be implemented and deliver results across various spatial and temporal scales. These *Criteria for Ecosystem-Smart DRR and CCA* can be used for the design, implementation and monitoring of such an integrated disaster risk reduction approach. They provide guidance on technical aspects as well as on the institutional set-up that is required for a successful collaboration amongst stakeholders.

The *Criteria* also facilitate a much-needed linkage of DRR programmes to development planning processes, such as integrated coastal zone or water resources management.

Definitions

Ecosystem: A dynamic complex of plant, animal and microorganism communities and their non-living environment interacting as a functional unit. (MEA 2005; IUCN 2012a).

Ecosystem Approach: A strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. This approach considers the full range of species, their interactions, habitat, and the role of humans. (CBD decision V/6, 2000).

Ecosystem Services: The benefits of nature to people and households, communities and economies. (IAIA, 2012). Examples include the provisioning of clean water and food; the regulation of flood waters; soil protection and erosion control; climate regulation (carbon sequestration); and crop pollination. (MEA 2005).

Ecosystem Management: An approach to natural resource management that focuses on sustaining ecosystems to meet both ecological and human needs in the future. Ecosystem management is adaptive to changing needs and new information. It promotes a shared vision of a desired future by integrating social, environmental and economic perspectives to manage geographically defined natural ecological systems. (UNEP 2012).

Ecosystem Restoration (also ecological restoration or rehabilitation): The process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. (SER 2004).

Landscape approach: An approach which looks across large, connected geographic areas to more fully recognise natural resource conditions and trends, natural and human influences, and opportunities for resource conservation, restoration, and development. It seeks to identify important ecological values and patterns of environmental change that may not be evident when managing smaller, local land areas. (US Department of the Interior, Bureau of Land Management, 2012).

What is being addressed: understanding the role of ecosystems in DRR

Well-designed DRR programmes aim to reduce socio-economic vulnerabilities on-site, but also to address the hazards themselves as they emerge at a broader scale, for example within a watershed. This requires an approach that considers the management of ecosystems and natural resources alongside strengthened local community resilience, in addition to regional approaches that rely solely on infrastructure.

How exactly do ecosystems fit in this picture? Different ecosystems such as forests, floodplains, marshes and coastal wetlands, together with human settlements - small villages, but also big cities and the land that is used for food production - form interdependent socio-ecological systems that are connected across landscapes. The human settlements depend to a great extent on the natural environment. Nature supports livelihoods and economies by delivering a number of services in the form of fresh water supply, timber, fisheries products and soil protection, to name just a few. These provide an important resource base for vulnerable communities, allowing them to cope in times of crisis and to actively adapt to on-going global changes such as climate change.

Ecosystems may also play a key role in hazard mitigation. If sustainably managed, they can act as buffers against hazards - such as floodplains reducing floods downstream. Ecosystems can even prevent hazards from happening altogether: for instance, forested hill slopes within watersheds (mid and upper) can prevent landslides as well as ensure the provision of water resources downstream. In this context, ecosystems are considered as '*natural infrastructure*' preventing or reducing (the impact of) hazards.

The way people manage their surroundings largely determines the level of impact caused by different hazards. In certain circumstances, large-scale engineering works such as dams and dykes are needed to mitigate extremes that cannot be buffered by nature. In other cases, clever land-use planning may prevent people from being exposed to extreme events. However, unwise land-use decisions all too often result in a substantial increase in vulnerability. This is the

case when ecosystem services are lost as a result of environmental degradation. Deforestation and conversion of wetlands, for example, may cause massive erosion and increased exposure to storms and floods. Sometimes well-intended measures result in unintended adverse consequences and a net increase in vulnerability. This is the case, for instance, when water is diverted upstream to support agriculture or hydropower installations, leading to less water downstream, which in turn can lead to the loss of wetlands and their valuable services to downstream communities.

Acknowledging and understanding the deep interdependency between the use of land and ecosystems, human well-being and risk patterns, is at the core of resilience. In this light, measures to improve land use and sustain ecosystem health at the landscape level provide the basis for risk reduction practices in which more localised approaches are embedded. Failure to take such a *landscape approach* into account will mostly lead to short-term fixes and prevent the achievement of long-lasting, sustainable results. For this reason, addressing the *environmental root causes of disaster risk* is a must when truly aiming to strengthen community resilience.

occupation

speed of change
10 - 25 years

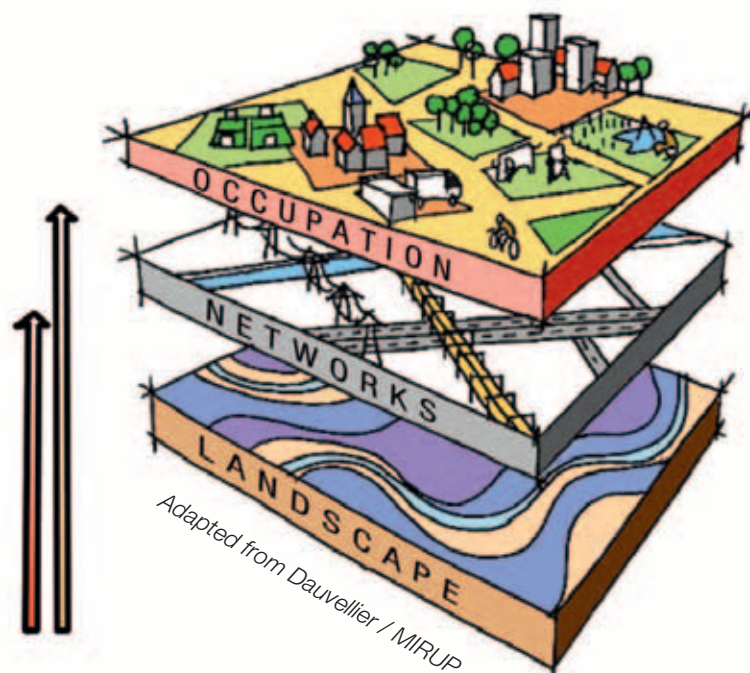
networks

speed of change
25 - 100 years

landscape

speed of change
50 - 500 years

enabling and constraining



private



public

CASE STUDY

The cluster approach to Risk Reduction: working across a landscape in India

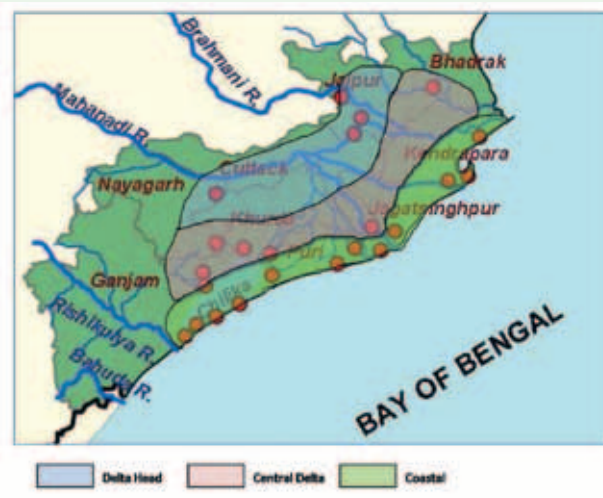
Partners for Resilience (PfR) works in India to improve resilience in 212 villages within 15 districts of the Mahanadi Delta and Kosi-Gandak floodplains in the states of Orissa and Bihar. Risk assessments are being conducted in each of these villages to gather data on which intervention plans can be based. However, this leads to significant compilation and monitoring challenges. If each village has an individual plan and the villages do not connect their plans, they will be unable to address risks that operate at higher scales, such as watersheds or delta segments.

A so-called *cluster approach* is therefore being adopted to enable the linking of local risk reduction plans for villages located in similar risk contexts. In the Mahanadi Delta, for example, the overall delta environment can be broadly divided into three areas:

- inland delta head (with dominant rivers);
- central deltaic region (active floodplains fragmented by hydraulic structures and subject to extensive water logging);
- coastal region (dominated by coastal processes).

The hazard patterns of the villages within any given cluster bear strong commonalities. For example, most of the coastal villages face hazards like tidal inundation, coastal storms, saline intrusion and coastal erosion. However, if the risk reduction plans are limited to village boundaries, the interventions often take the form of constructing small structures that, for a short time, reduce the intrusion of seawater or protect that individual village from cyclones.

In contrast, working together it is possible to plan for risk reduction measures at a larger and therefore more efficient and long-lasting scale. By working in a



Map 1: Clusters identified for risk reduction plans in the Mahanadi Delta region.

cluster, coastal villages can jointly invest in greening the coastline, maintaining a free flow of water to reduce water logging, better management of upstream hydraulic structures and several other options.

In this approach, piloted by PfR in India, the village-level DRR plans are still at the core of risk reduction practice, but the interventions are reviewed using ecosystem management and climate change adaptation criteria. Additionally, interventions are jointly planned with a cluster of villages to better enhance regional resilience. This regional approach to risk reduction practice will not be limited to physical activities, but will also connect planning to policy dialogues and efforts to strengthen the capacity of civil society groups.

How to use these Criteria for Ecosystem-Smart DRR and CCA

These *Criteria for Ecosystem-Smart DRR and CCA* are meant to be used along with tools for existing DRR project design, management and monitoring & evaluation (M&E). They complement and can be used jointly with the *Minimum Standards for local climate-smart Disaster Risk Reduction*, developed by the Red Cross/Red Crescent Climate Centre. Planners and practitioners can compare their project planning in all its phases against the criteria provided in the different sections of the table. Using the *Criteria* should not be difficult. However, it does require a willingness to acquire new knowledge, and most importantly to be open to a new way of thinking and working in order to accommodate all the criteria programmatically. It also requires discipline, ensuring timely and proper use of the criteria. Success is more likely if the criteria are integrated from the very start of project design and planning, and implemented all the way through the DRR project cycle.

The *Criteria for Ecosystem-Smart DRR and CCA* are organised in three sections, and can be used as follows:

The first section can be used to evaluate an organisation's own 'ecosystem awareness' and to make sure that staff is knowledgeable on the interrelations between ecosystems as natural infrastructure and risk reduction. It will also help practitioners to identify stakeholders, networks, opportunities and synergies to work with environment experts, as well as to advocate for ecosystem-aware policies at different levels (from communities up to higher government levels). This section also emphasises the need to strengthen the environmental awareness of communities and to consider ecosystems in standard risk assessment procedures.

The second section leads practitioners through the DRR project cycle. It guides practitioners through ecosystem-smart project implementation, from the project design and baseline study all the way to the M&E phase. The need to adopt a landscape approach that addresses the root causes of risk is stressed in this section, as well as the need to build in mechanisms that sustain project results in the long-term.

The third and final section leads practitioners through the monitoring and evaluation phase and helps them draw lessons from ecosystem-smart DRR initiatives.

Criteria for ecosystem-smart disaster risk reduction and climate change adaptation

This table presents criteria that should be followed in order for a disaster risk reduction initiative and its host organisation to be considered ‘ecosystem-smart’. As a tool for programme design and implementation, it helps organisations to appreciate how the management of ecosystems across wider landscapes is relevant in the context of their programmes. It also provides guidance for the development of practical measures related to the management of ecosystems and the services they provide. For ease of reference, the actions are divided by themes, with each theme representing different project phases. Activities related to each of the criteria must be SMART (Specific, Measurable, Attainable, Relevant and Time-bound) and will differ for each programme or project.

1. Getting started		
Theme	✓ Criteria	Comments
Institutional capacity of the implementing organisation	☐ 1. Staff members at all levels (headquarters, regional offices) are able to explain what ecosystems are, what services ecosystems deliver and how changes in ecosystems affect vulnerability/resilience.	Consider in what ways ecosystem functions and services are relevant to sectors (agriculture, forestry, water and sanitation, health and safety, etc.) and community livelihoods in target areas and identify implications of these interrelations for disaster risk reduction work.
	☐ 2. Staff members at all levels are aware of trends and projections with regards to the condition of ecosystems and their services in their region. They are able to explain root causes of ecosystem degradation and are aware of related implications for disaster risk at the landscape and community levels.	Consider status of/changes in: land and resource use, water flow regimes, natural vegetation cover, occurrence of key plants and animals, demography, livelihood strategies, pollution, etc.
	☐ 3. Staff at all levels understand how ecosystems are connected across landscapes and what implications these connections have for disaster risk.	Consider how (changes in) ecosystem services may have implications at broad spatial scales (upstream-downstream linkages, connections along coastlines, etc.).
	☐ 4. The management of the organisation understands key ecosystem functions and knows how people benefit from ecosystem services. They appreciate how these insights are relevant to the organisation’s mission, vision and aims.	This is important for project outreach and policy dialogue and to ensure institutional support for ecosystem-smart initiatives.
	☐ 5. The organisation is able to establish, facilitate and coordinate the multidisciplinary partnerships that are required for the development and implementation of an integrated risk reduction programme; it is able to establish and nurture appropriate stakeholder networks. Partnerships and networks engage stakeholders involved in the management of natural resources, alongside other sectors.	Explore lessons learned from involvement in other multi-sectoral partnerships. Much can be learned from well-established cross sectoral planning initiatives such as integrated water resources management (IWRM) or integrated coastal zone management (ICZM). Make sure that technical experts, policy makers and stakeholders are involved along with communities and private sector representatives.

Theme	✓ Criteria	Comments
	☐ 6. The organisation incorporates an introduction to ecosystems and their values in orientations for new staff.	Orientations may cover the elements cited above as well as include practical experiences on options to incorporate ecosystem and natural resource management into DRR planning and activities.
Creating an enabling environment (during all project phases)	☐ 7. The organisation engages in awareness-raising on the importance of ecosystems in DRR.	Consider: national days for action, forums, conferences, schools, community meetings.
	☐ 8. The organisation identifies and establishes relationships with relevant stakeholders in land use and development planning at the local, provincial and national levels and cooperates with them.	Consider: knowledge centres such as universities, government ministries, river basin authorities, NGOs, major land users, donors and private sector organisations.
	☐ 9. The organisation can explain policies and plans on DRR and identify if these are ecosystem-smart. It is aware of how (non DRR-specific) environmental, land use and development policies and plans may have implications for disaster risk. It follows key policy developments and is involved in relevant stakeholder platforms and policy dialogues.	Policy reviews and position papers may be developed for internal guidance about priorities and needs.
	☐ 10. The organisation designs advocacy strategies to address ecosystem issues related to DRR and defines a modus operandi to deal with sensitive issues such as logging, mining and aquaculture that could be influencing disaster risk.	Improved management of ecosystems and natural resources is largely dependent on the development and implementation of sound policies. This means that integrated risk reduction programmes should include a substantial policy component. This also requires sensitive issues to be addressed. Advocacy measures should focus on both DRR and non-DRR policies. This can be done by the organisation itself, or through other organisations.
	☐ 11. The organisation supports the mainstreaming of ecosystem service considerations into government and corporate policies, particularly those on DRR, climate change and land-use and development planning.	Example: sharing experiences of ecosystem-based DRR approaches; ensuring inclusion of environmental safeguards in land use and development policies (e.g. in relation to agriculture/forestry/fisheries/infrastructure development) thereby preventing increases in disaster risk through ecosystem degradation.
Community capacities	☐ 12. Communities are able to explain what ecosystems are, what services ecosystems deliver and how changes in ecosystems affect vulnerability/resilience of their lives and livelihoods.	Help communities to explore in what ways ecosystem functions and services are relevant to sectors (agriculture, forestry, water and sanitation, health and safety, etc.) and community livelihoods in the target areas and identify implications of these interrelations for disaster risk reduction work.

Theme	✓ Criteria	Comments
	☐ 13. Communities are aware of how the ecosystems in which they live are connected through the landscape. They understand how changes in ecosystems elsewhere can have implications for their vulnerability, and how modification of their environment can change disaster risk elsewhere.	Provide examples of these spatial dimensions: e.g. upstream-downstream linkages, connections along coastlines, etc.
	☐ 14. Communities can explain the root causes of ecosystem degradation around them and can relate this to their own vulnerability to disasters.	Consider the status of/changes in: land and resource-use, water flow regimes, natural vegetation cover, occurrence of key plants and animals, demography, livelihood strategies, pollution, etc. Example: logging and mining cause soil erosion that affects crop production and causes siltation, which may cause flooding, or other hazardous events such as landslides.
	☐ 15. Community perceptions of ecosystem degradation and implications for disaster risk, as well as current and traditional coping methods, are documented and used during a community-based risk assessment, compared with technical/scientific data, and used in development and DRR action plans.	Questions include: have there been changes in land use, natural vegetation cover, occurrence of key plants and animals, human population, types of livelihoods, pollution, etc.? Are these changes interrelated? If yes, in what way? Are the disasters that the village faces related to ecosystem degradation? What actions are recommended? Are there ways of restoring ecosystems and their services?
	☐ 16. Communities can identify the need for and take action to manage or restore ecosystems efficiently. They are able to advocate for sustainable land use policies and practices as a strategy to reduce disaster risk.	This presumes the community has the capacity to: 1) implement site-based measures within their area of influence, 2) engage in dialogues with other communities, government units and organisations within the same landscape, and 3) seek expert advice from specialised organisations and institutions working on environmental issues.

2. Project planning and implementation

Theme	✓ Criteria	Comments
Assembling a project team	☐ 17. DRR project teams are multidisciplinary and include experts from both humanitarian/development and environment fields, along with other relevant disciplines (economics, land-use planning, hydrology, engineering, etc.). These experts act as full members of the project team (incl. participation in field trips, assessments and meetings) in all phases.	Bringing together the right capacities usually requires a partnership approach. Most partnerships include representatives from: government, NGOs, communities and knowledge institutes. Sometimes involvement of the private sector is also required.
Phase 1: Assessment and analysis	☐ 18. Community-level vulnerability assessments and baseline studies assess and quantify the environmental root causes of risk and identify opportunities/needs for improved ecosystem and natural resource management.	Consider using at least the following tools for community risk assessment in each village: 1) transect walk, 2) natural resource and risk map, 3) seasonal calendar, 4) historical profile. To facilitate the creation of an enabling environment, it is also wise to map relevant stakeholders, for example by using a Venn diagram. Focus on the changes that have occurred in the last 30 years within the community and the surrounding area and their possible (even if indirect) relatedness with livelihood vulnerability as well as disaster risk. Use a good topographic map of the village and its surrounding landscape (catchment area) during the workshops.
	☐ 19. Regional dimensions and root causes of risk and vulnerability are captured through landscape or catchment level assessments. This includes identifying linkages between ecosystem and land use changes and risk patterns.	Make use of satellite imagery, GIS assessments and existing monitoring data to identify if changes in land use, ecosystem functioning and/or water flows have affected risk at a broader landscape/catchment level. This information might be readily available, yet in most cases additional assessment and data gathering will be required.
	☐ 20. The results of the community risk assessments are complemented and validated with secondary data and advice from knowledge institutes and government agencies.	See comments for criterion 19.

Theme	✓ Criteria	Comments
	☐ 21. Information at both the local and landscape scales is incorporated in the Risk Assessment (RA) report, including an analysis of the (environmental) root causes of disaster risk and livelihood vulnerability.	Next to providing anecdotal accounts and site-specific facts and figures, also consider to include maps and GIS databases. These are powerful decision support tools as they communicate complex interactions across spatial scales.
	☐ 22. The draft Risk Assessment report is discussed among communities, government agencies and other stakeholders to ensure their ownership and for a joint approach to DRR options.	Ensure inclusion of new perspectives and information. An external review panel, including environmental specialists may be requested to validate the risk assessment report.
Phase 2: Planning and implementing	☐ 23. The institutional and political context in which the project operates (for instance stakeholders, landownership, other projects, major political developments, etc.) is analysed.	This could be done through stakeholder interviews, review of policy documents, etc.
	☐ 24. Risk reduction plans include measures that address environmental root causes for disaster risk, including the management and restoration of ecosystems and their services.	This typically means that the project team decides to have multiple intervention strategies, both for short-term disaster preparedness and longer-term disaster impact reduction, involving policy dialogue, community-based measures, awareness raising, etc. Be flexible in project set-up: the most effective strategy might require addressing root causes and broadening the geographical scope of the programme.
	☐ 25. Risk reduction scenarios are identified on the basis of a cost-benefit analysis, considering: 1) Effectiveness (how much impact will the project have on what number of beneficiaries?); 2) Priority setting (which risks are considered the most important to address?); 3) Environmental sustainability.	Ensure that cost-benefit analyses quantify the values of gained or lost ecosystem services. Be aware that it may take time for a certain intervention to positively or negatively impact on the ecosystem services provisioned.
	☐ 26. DRR Interventions are planned locally (at community and household level in the 'private' domain) and regionally (at a landscape or catchment level in the 'public' domain).	Questions include: who are the relevant local/ regional/national stakeholders? What other activities and interests relate to the project? How can they influence the project outcome? What can be done to reduce institutional obstacles and create or improve an enabling environment?

Theme	✓ Criteria	Comments
	☐ 27. When possible the project links/ collaborates with other DRR and development initiatives in the region (by governments, NGOs, etc.) to improve outreach and impact.	High conservation value areas should be identified and must not be affected negatively by project interventions. Examples: • Project implementation takes into account the protection of wells or the buffer functions of forests and marshes. • Ensure that interventions do not cause fragmentation of landscapes or water flows. • Flora and fauna that are globally threatened with extinction are preserved (see IUCN Red List).
	☐ 28. Project interventions do not negatively impact vital ecosystem services and biodiversity.	Next to introducing ecosystem-based approaches as vital components of risk reduction, DRR measures should avoid unintended environmental impacts.
	☐ 29. Risk reduction plans adopt a systemic approach: the development and timing of risk reduction interventions take place on the basis of a sound understanding of ecological, geological and socio-economic processes across the wider landscape.	Example: does the project planning take into consideration wet and dry periods?
	☐ 30. An Environmental Impact Assessment, in which the community has participated, is conducted for all structural interventions. Sometimes alternative locations and designs for structural interventions must be considered if they can minimise impacts on ecosystems and their services.	Make sure that an Environmental Impact Assessment considers 'invisible' impacts. Implications of ecosystem degradation are often feasible elsewhere (e.g. downstream) or may take time (sometimes years) to emerge.
Phase 3: Sustaining the impact	☐ 31. Risk reduction plans are regularly reviewed and updated in the course of project implementation, in terms of their environmental sustainability and contribution to long-term livelihood security and diversification, aiming to respond to on-going changes.	Gaining an in-depth understanding of the functioning of the natural environment may take years. Hence, ensure that programmes continue to deliver new insights and ensure that these are accommodated under the programme.

	☐ 32. Involvement, commitment and (feeling of) ownership of the target communities, relevant government agencies and NGOs/CBOs is ensured in all phases of the project by capacity building and informed participation in decision making.	Agreements are made with: - Communities on how the results will be maintained. - Local, regional and/or river basin authorities and organisations in charge of development and investment planning on how results will be embedded in land use and investment policies, how results will be maintained and/or how the programme will be continued beyond the project's timeframe. - Partner NGOs/CBOs on how they will be involved during and after the project's timeframe to continue activities and sustain results.
3. Taking stock: monitoring, evaluation and knowledge exchange		
Theme	✓ Criteria	Comments
Monitoring and evaluation	☐ 33. These criteria are considered in baseline, monitoring and evaluation processes so that impacts and changes can be measured over time.	Quantify target values for each of the activities and identify relevant process and performance indicators.
	☐ 34. Review meetings are held regularly to evaluate the success of ecosystem-based natural resource management interventions and to review the environmental sustainability of other DRR measures, and to spread the lessons learned to other DRR projects.	Meetings and follow up plans should be programmed and budgeted for, including the costs of getting advice from environment and DRR experts.
	☐ 35. The budget includes funds to monitor the impact of the project on disaster risk and the related ecosystem services for at least five years after the intervention has taken place.	Ideally, project impact is monitored at one, two, five and ten years after the intervention has taken place, acknowledging that it might take several years for the results of environmental measures to become visible. Lessons are used for future programme development. Long-term project monitoring may be arranged by agreements with locally-rooted knowledge centres, government agencies and NGOs.
Linking and learning	☐ 36. Capacity-building sessions are organised for relevant government and non-government stakeholders who have influence on local and regional risk reduction planning.	Consider designing capacity-building sessions on DRR and ecosystem services for DRR professionals and experts dealing with natural resources and water management, forestry, agriculture and community development. Also, reach out to high-level elected officials such as mayors and governors. Departments for development planning and finance, and stakeholders involved in the energy and infrastructure sectors could also benefit from concise capacity-building sessions and experience sharing.

Theme	✓ Criteria	Comments
	☐ 37. The organisation nominates an ' <i>ecosystem focal point</i> ' who ensures that experiences and lessons learned are captured and shared inside and outside the project/programme.	The focal point may, for instance, coordinate community exchange visits, development of targeted outreach materials, participation in forums and conferences and engagement in stakeholder planning meetings.
	☐ 38. The organisation identifies high-level ' <i>ambassadors</i> ' who are able to explain and promote integrated ecosystem-smart risk reduction approaches across society.	High-level government representatives, philanthropists, celebrities, journalists, etc., may play a key role in ensuring acknowledgement of the need to develop integrated ecosystem-inclusive risk reduction approaches.
	☐ 39. The organisation has an active, two-way relationship with environmental expert centres. These can include river basin authorities, ecologists and environmental NGOs. Together they advise policy makers and development initiatives at the local and surrounding catchment levels.	Through this relationship, the organisation can request information on GIS-mapping, water flows, ecosystem services and research on the links between ecosystem degradation and disaster risks. The experts could also review past events and projects. A joint workshop can be held to learn about interpreting ecosystem functioning and ecosystem services, and to share needs with the environmental experts and discuss actions to be taken under various scenarios.

Further reading:

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The way forward

Wetlands International has developed these criteria to provide DRR practitioners and policy makers with an easy reference - complementary to other tools and resources - that helps them to better integrate ecosystems and natural resource management in their DRR work. It is not intended to cover all of the technical solutions that could be considered. For this we refer to the tools and approaches that are available online and in scientific literature. Some key references are provided at the end of this document.

The criteria will be regularly updated based upon lessons from the field and emerging insights. Readers are encouraged to work with us towards integrated risk reduction approaches. We invite you to submit your commentary, feedback and experiences when using these criteria to:

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