



# Entry Points for Mainstreaming Ecosystem-based Adaptation

The Case of Peru

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# Table of Contents

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<b>ACRONYMS</b>	4
<b>EXECUTIVE SUMMARY</b>	5
<b>I.</b> Introduction	7
<b>II.</b> Climate change adaptation in Peru: Context and Governance	8
Climate Risk and Vulnerability	8
Governance of climate change adaptation	9
Environmental governance	10
<b>III.</b> Ecosystem-based adaptation in Peru	12
<b>IV.</b> Entry points for EbA mainstreaming	13
<b>STRATEGIC PLANNING CYCLE</b>	13
Phase 1: Integral knowledge of the setting	14
Phase 2: The desired future	15
Phase 3: Coordinated policies and plans	15
Phase 4: Monitoring and evaluation for continuous improvement	21
<b>BUDGETING AND RESOURCE ALLOCATION PROCESS</b>	21
<b>V.</b> Case Studies	23
Overview of selected EbA case studies	23
Governance models of mainstreaming EbA	24
Local level governance	25
Regional level governance	27
National level and shared governance	29
Private governance	31
<b>VI.</b> Enabling and hindering factors for EbA mainstreaming	33
<b>VII.</b> Lessons learned and the way forward	34
Lessons learned	34
The way forward: Recommendations	35
<b>REFERENCES</b>	37

## Acronyms

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<b>ANA</b>	National Water Authority (Autoridad Nacional de Agua)
<b>ANP</b>	Nature Protected Areas (Áreas Naturales Protegidas)
<b>CCA</b>	Climate change adaptation
<b>CEPLAN</b>	National Centre for Strategic Planning (Centro Nacional de Planeamiento Estratégico)
<b>CNCC</b>	National Commission on Climate Change (Comisión Nacional para el Cambio Climático)
<b>DRM</b>	Disaster risk management
<b>DRR</b>	Disaster risk reduction
<b>EbA</b>	Ecosystem-based adaptation
<b>ECA</b>	Representative Unit of Community Reserves (Ejecutor de Contrato de Administración)
<b>ENCC</b>	National Strategy on Climate Change (Estrategia Nacional para el Cambio Climático)
<b>ERCC</b>	Regional Strategy on Climate Change (Estrategia Regional para el Cambio Climático)
<b>INVIERTE.PE</b>	National System of Multiannual Programming and Investment Management (Sistema Nacional de Programación Multianual y Gestión de Inversiones)
<b>IWRM</b>	Integrated Water Resource Management
<b>MINAM</b>	Ministry of Environment (Ministerio de Medio Ambiente)
<b>MEF</b>	Ministry of Economy and Finance (Ministerio de Economía y Finanzas)
<b>MINAGRI</b>	Ministry of Agriculture and Irrigation (Ministerio de Agricultura y Riego)
<b>NAP</b>	National Adaptation Plan
<b>NDC</b>	Nationally Determined Contributions
<b>NPA</b>	National Protected Areas
<b>PES</b>	Payments for Ecosystem Services
<b>PIP</b>	Investment Projects (Proyectos de Inversión)
<b>PLANGRACC-A</b>	National Plan for Risk Management and Adaptation to Climate Change in the Agricultural Sector
<b>SERNANP</b>	National Service of Natural Protected Areas (Servicio Nacional de Áreas Naturales Protegidas)
<b>UNEP</b>	United Nations Environment Programme
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change

## Executive Summary

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Peru is highly vulnerable to climate impacts and exposed to a wide range of extreme events as the Southern Oscillation - ENSO (El Niño and La Niña), resulting in severe social, economic and environmental impacts. Given these characteristics, combined with the high levels of poverty and inequality, especially in rural areas, climate change must be recognized as a priority issue and incorporated into the development agenda in a cross-cutting manner. An urgent issue is water availability, which is further jeopardized by climate variability that affects rural and urban livelihoods in a range of ways. It is therefore pivotal to take adaptation actions to respond to current and potential climate risks. Ecosystem-based adaptation (EbA) is a promising approach to provide plausible solutions and enhance the resilience of communities and ecosystems.

The country has an overarching national development plan and climate change policy, both of which acknowledge the importance of ecosystems for human well-being and adaptation. These are supportive frameworks for planning and implementing EbA measures at all governance levels (i.e., national, regional and local). The National Climate Change Strategy includes an ecosystem-based approach and identifies critical ecosystem goods and services, from which sectoral or regional plans can select and prioritize in their planning. In 2015, the Peruvian State presented its Nationally Determined Contributions (NDCs) by incorporating the vision of the National Climate Change Strategy. At present, The Ministry of Environment is designing the roadmap for the formulation of the National Adaptation Plan (NAP), which is tightly linked to the objectives of the NDCs on adaptation and will become the instrument for compliance of the indicators.

**Institutional leadership for policy change promotes EbA in various sectors and across governance levels.** The institutional structure shaping the EbA governance in Peru is notably led by two national actors – Ministry of Environment and Ministry of Economy and Finance.

**Natural infrastructure is an integral part of national budgeting processes in Peru.** A key advance is the experience in mainstreaming EbA into the national system for public investment projects by promoting green infrastructure for water resource management. It demonstrates that there are appropriate legal frameworks and financial resources that are supporting the promotion and implementation of EbA across scales and sectors.

**To strengthen EbA, it is essential to understand obstacles and opportunities for its replicating and scaling up.** Currently, despite the advances in integrating EbA in various national and regional processes, limited information is available to strategically identify policy entry points for systematically

integrating EbA into planning and decision-making processes in the country. To contribute to these efforts, this analysis examines the policy cycle stages (national agenda setting, sector policy formulation, resource allocation and implementation) and main actors involved in EbA mainstreaming. It aims to provide an in-depth understanding of the effective entry points at sector and political level considering the driving factors, processes and roles of actors in the presence of barriers and enabling factors.

**Results of the assessment show that there are a number of entry points for EbA mainstreaming across the four policy cycle stages, which can contribute to effective EbA scaling-up.** Given that the National Adaptation Plan (NAP) will be the implementation mechanism of the NDC on adaptation, it is crucial that the EbA approach is integrated as a cross-cutting element. As the National Adaptation Plan is currently in a formulation phase, there is a potential for the integration of EbA across the process. Additionally, examples show that Regional Climate Change Strategies are a principal policy instrument for EbA mainstreaming and articulation with regional and local development strategies. Critical sectors and areas with high potential for EbA mainstreaming include agriculture, forestry, water and sanitation, protected area management and disaster risk reduction. A potential entry point is the mining sector, which will need further research to identify better whether it is feasible.

The study analyses the enabling and hindering factors with regards to the institutional setting, policy and legal framework as well as capacity and awareness, and shares lessons learned on EbA mainstreaming in Peru.

**Institutional framework:** the Peruvian experience demonstrates that delivering policy change for EbA requires collaboration across governance scales and procedures, both with a top-down and bottom-up approach. It also concludes that the firm articulation of national agencies with existing local structures and policies enables EbA ownership and sustainability on the long run.

**Policy and legal processes:** integrating EbA into national investment processes enables its mainstreaming across sectors and at multiple scales, from local to regional and national budgets. The case studies illustrated that another financing opportunity for EbA comes from the potential of the mechanisms for compensation for ecosystem services.

**Awareness and capacity building:** it illustrates that effective communication has the potential to mobilize capacity and resources for EbA, while technical capacity building is vital to strengthen the role of local actors to plan and implement EbA measures.

To unlock the potentials of EbA, it is vital to foster interventions in policy-making and planning across scales. It is also essential to provide incentives for EbA implementation on the ground, promote enabling framework conditions at the national level and support global common agendas. The formulation of an EbA roadmap as an integral part of the National Adaptation Plan process and NDCs in Peru presents the potential to become a central component of climate adaptation efforts. In addition, the need for innovative financing mechanisms in collaboration with the private sector is critical for EbA and will provide an incentive for mainstreaming. Planning and implementing EbA works best at a landscape or ecosystem scale, which means that making the case for scaling up EbA at the regional level is especially relevant for the Amazon and the Andean regions. Peru can share experiences, technology, and lessons learned at a regional scale.

# I. Introduction

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Ecosystem-based Adaptation (EbA) is a promising approach to address climate risks and reduce vulnerability of ecosystems and communities. Currently, very little consolidated experience and few suitable methodological approaches and guidelines on policy entry points for systematically integrating EbA into planning and decision-making processes exist at international, regional and national levels. To strengthen EbA, it is essential to understand obstacles to its up-scaling and broad-scaling. To contribute to these efforts, this analysis on entry point for mainstreaming EbA into policy decision-making and planning processes presents a case study from Peru. The country has an overarching national development plan and climate change policy, which acknowledge the importance of ecosystems for human well-being and adaptation and provide supportive frameworks for planning and implementing EbA measures nationally. It presents an emblematic experience on mainstreaming EbA into public investment to promote green infrastructure for water resource management, considering processes related to the elaboration of the National Adaptation Plan and Nationally Determined Contributions. Key sectors and areas are, among others, water and sanitation, agriculture, forestry, disaster risk reduction and protected areas.

The objective of the study is to provide an in-depth understanding of promising policy entry points for mainstreaming EbA in Peru, considering the driving factors, processes and actors, as well as barriers and enabling conditions. The study will provide recommendations of what should be the direction of the interventions when aiming at mainstreaming EbA, and learning points on the processes that have taken place in Peru in order to inform processes in other countries and demonstrate best practices.

The study is based on a review of official documents (e.g., policies and legislation) and a series of semi-structured interviews with key experts from different governmental and non-governmental institutions at the national and subnational levels. Based on such information, some suitable entry points in the planning, policy, and budgeting processes were identified, along with potential champions of the mainstreaming effort.

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## II. Climate change adaptation in Peru: Context and Governance

### CLIMATE RISK AND VULNERABILITY

Peru presents seven of the nine vulnerability characteristics recognized by the UNFCCC: (i) low coastal areas; (ii) arid and semi-arid zones; (iii) areas exposed to floods, droughts and desertification; (iv) fragile mountain ecosystems (v) areas prone to disasters; (vi) areas with high urban air pollution; (vii) Economies that depend to a large extent on the income generated by the production and use of fossil fuels (MINAM, 2015). In addition, the country is exposed to a wide range of extreme events as the Southern Oscillation - ENSO (El Niño and La Niña).

Peru's vulnerability to climate impacts, in combination with high levels of poverty and inequality, underscore the importance of prioritizing climate change in Peru's development agenda. Communities who live in low socio-economic conditions and whose livelihoods depend entirely on natural resources are among the most vulnerable to climate risks. 46% of the national territory is considered to be highly vulnerable and 36% of the national population (almost 10 million inhabitants) occupies this territory (MINAM, 2015). Table 1 summarizes the impacts that will likely be experienced as a result of different climate hazards, by region.

Water availability is jeopardized by climate change, affecting human livelihoods and ecosystems. The increase in global

temperature is triggering the withdrawal and loss of glaciers, impacting the regime of rivers, especially the communities in the High Andes. In addition, changes in evapotranspiration and precipitation in the different regions of the country affect the reliability of water supply for urban areas in the coastal zone.

Agriculture and fisheries are key to national food security and highly influenced by climate variability. Considering that 55% of the population living in poverty works in these sectors, a large portion of the population is highly vulnerable to climate change (INEI, 2015). Extreme events such as heat waves, droughts and floods, in addition to ecosystem degradation and water insecurity affect the ability of food production and thus threaten food security.

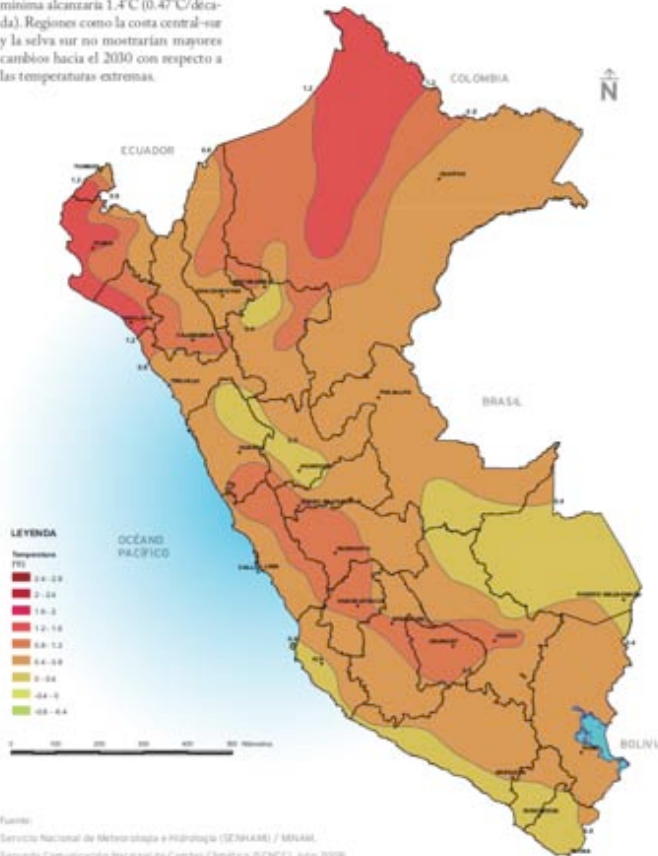
Moreover, climate change is expected to exacerbate ecosystem degradation and cause substantial alterations to the structure and function of ecosystems. In turn, these changes will affect the ecosystem services they provide, such as fresh water provision, and coastal protection of coasts for flood and erosion control. Furthermore, the degradation of ecosystems tends to lead to more disasters and reduces the ability of nature and the human population to withstand the impacts of climate change (MINAM, 2015). Studies show that by 2030, 15% of the country's Protected Areas (NPAs), under the current exposure conditions and adaptive capacity will be highly vulnerable to climate change and 62% of the NPAs will have medium vulnerability (SERNANP-WWF Peru-GIZ, 2014).

**Table 1:** Vulnerability and risk matrix showing occurrence of climate risks and potential impacts for the Amazon, coastal and Andean regions (MINAM, 2015).

Climate hazards	Climate impacts and vulnerability in Peruvian regions		
	Amazon region	Coastal region	Andean region
Glacier retreat	Change in the hydrological cycle Water scarcity	Change in the hydrological cycle Water scarcity	Change in the hydrological cycle Water scarcity
Increase of surface temperature	Extension of endemic areas Increase in vector-borne diseases	Increase in vector-borne diseases	
Change in precipitation patterns	Flooding in cities in the Amazon Increase in diseases	Critical water scarcity for domestic use in urban areas and for agriculture	Critical water scarcity for domestic use in urban areas and agriculture
Sea level rise and increase of ocean temperature		Flooding in coastal cities Reduction of fisheries productivity and changes in the distribution of marine resources	
Extreme cold			Loss of lives of population and livestock



El mayor incremento en la temperatura mínima alcanzará 1.4°C (0.47°C/década). Regiones como la costa central-sur y la selva sur no mostrarían mayores cambios hacia el 2030 con respecto a las temperaturas extremas.



Las lluvias extremas estimadas mostrarán un probable decrecimiento en los próximos 30 años en gran parte del territorio.



**Figure 1.** Maps showing variation of precipitation and temperature according to climate projections: (a) Percentage variation of the temperature for the year 2030 and (b) Percentage variation of the precipitation for the year 2030 (MINAM, 2015).

## GOVERNANCE OF CLIMATE CHANGE ADAPTATION

The Peruvian Government has introduced and implemented policies and strategies that regulate adaptation to climate change, both at the national and local levels. Climate change and adaptation are comprehensively addressed in policies and planning instruments.

In Peru, climate change planning at the national level initiated in 1993 with the creation of the National Climate Change Commission (CNCC in Spanish)<sup>1</sup>. The Commission is a consultative body, which includes 25 entities (12 government agencies, 2 private organizations, 7 academic institutions and 4 civil society organizations), organised in multi-sectoral working groups. Its mandate is to provide relevant information to support climate change initiatives.

In 2003 the National Strategy on Climate Change (ENCC in Spanish)<sup>2</sup> was published, shaping climate adaptation and mitigation actions at the national level. The Strategy is a

legally-binding document<sup>3</sup>; however, it lacks a concrete and long-term vision. It had two main objectives: (i) Conduct vulnerability studies for prioritized sectors and zones where adaptation measures should be implemented, and (ii) Limit emission of greenhouse gases. Ten years later, the National Strategy on Climate Change was revised and updated by the National Climate Change Commission to become a more comprehensive framework. The new version demonstrates an integrated approach and outlines two objectives: (1) Adaptation: Increased awareness and adaptive capacity of the population, economic sectors and the State to address climate risks and (2) Mitigation: Protection of carbon reserves and contribution to the reduction of greenhouse gas emissions. Moreover, the National Strategy on Climate Change seeks to establish synergies with the environmental sector and explicitly recognises the role of biodiversity, ecosystems and natural protected areas in climate change adaptation and mitigation efforts.

<sup>a</sup> Decreto Supremo No086-2003-PCM

<sup>b</sup> Examples of nature conservation actions under the ERCC: Biodiversity conservation (Apurimac, Arequipa, Cusco, Puno, and others); Sustainable management of forestry and agroforestry (Amazonas, Apurimac, Cajamarca, Ucuyali, and others); Mountain ecosystem conservation (Arequipa, Amazonas and Lambayeque).

Another critical step in framing the climate governance was the establishment of the Ministry of Environment (MINAM in Spanish) in 2008 as the leading authority for the integration of climate change in development planning. The Ministry of Environment later became the overseeing entity for the National Climate Change Commission. In turn, the Ministry of Economy and Finance (MEF in Spanish) is the Nationally Designated Authority for the Green Climate Fund, among other international funds, thus it is a key actor in the formulation of climate change-related initiatives.

Regional governments also have an important role in implementing actions to address climate risks and promote integrated approaches to ecosystem management. Each regional government is required to have a Regional Climate Change Strategy (ERCC in Spanish)<sup>3</sup> established by a legal requirement under Law 27867 (2003). The Regional Climate Change Strategies aim to identify the most vulnerable areas and sectors of each region, to design and implement measures that reduce the negative impacts of climate change, and identify actions with the greatest potential for greenhouse gas mitigation. This management instrument is well articulated with the National Strategy on Climate Change, through its objectives, indicators and goals. Currently, 18 of the 25 regions have developed Regional Climate Change Strategies and recognise the importance of nature conservation<sup>b</sup>.

In September 2015, the Peruvian State presented its Nationally Determined Contributions (NDCs)<sup>4</sup>, which incorporates the vision of the National Strategy on Climate Change. The NDCs are currently the key guiding strategy and internationally binding climate change commitment. The adaptation component prioritizes five sectors: (1) water resources; (2) agriculture; (3) fisheries; (4) forests; and (5) health. Disaster risk reduction and gender are included as cross-cutting topics, and the important role of private finance for adaptation is highlighted. Ecosystem-based principles are considered throughout the proposed adaptation actions, thus providing an enabling environment for greater uptake of EbA in the prioritized sectors. A Multi-Sectoral Working Group (GTM in Spanish) under the NDCs is composed of representatives of 13 ministries and the National Centre for Strategic Planning (CEPLAN in Spanish) and is responsible for the creation of technical instruments to support the implementation. At present, the Ministry of Environment is designing the roadmap for the drafting of the National Adaptation Plan, which will become the instrument for compliance of the indicators and goals established in the NDCs on adaptation.

The most recent development is the Law on Climate Change (2018)<sup>c</sup>, where adaptation is very prominent, and EbA is considered as the fourth of seven adjustment priorities.

Lastly, Peru is notable for its efforts to promote the integration of disaster risk management and adaptation to climate change. Key policy instruments are the National System for Disaster Risk Management (SINAGERD in Spanish) and the National Policy on Disaster Risk Management, which set guidelines to prevent, reduce and avoid risks and carry out adequate preparation, response and reconstruction in the event of disasters.

## ENVIRONMENTAL GOVERNANCE

In Peru, environmental governance was introduced recently, yet it has advanced rapidly and has developed a solid policy and institutional framework. In 2009, the National Environmental Policy was approved, providing a framework for actions related to conservation of natural resources. It guides environmental management actions and is mandatory for all entities that make up the National System for Environmental Management (SNGA in Spanish), at the three levels of government (national, regional and local). In 2011, the National Environmental Action Plan (PLANAA in Spanish)<sup>5</sup> was approved. This Action Plan sets the country's vision on environmental matters through 2021. Although these documents do not explicitly link ecosystems and adaptation, they establish an enabling framework by focusing on ecosystem management, while identifying climate change as a threat to ecosystems, and emphasizing the importance of overall climate change adaptation.

An emblematic advancement in acknowledging the role of ecosystem services is the Law on Mechanisms for Compensation for Ecosystem Services – Law 30215 (MERESE in Spanish)<sup>6e</sup>, which has a specific regulatory framework that supports such mechanisms at the national level. It includes the perspective of climate change impacts on water resources, but still has limited relevance and methodology to account for climate impacts on other ecosystem services.

The National Service of Protected Areas (SERNANP in Spanish) is an autonomous entity assigned to the Ministry of Environment in charge of managing the National System of Protected Areas (SINANPE in Spanish) and conserving biodiversity, in coordination with regional and local governments. It plays an important role in integrating climatic variables into the management and planning cycles of protected areas (e.g., vulnerability assessment guidelines).

At present, Peru has 67 Natural Protected Areas. These, together with Areas of Regional Conservation and the Areas of Private Conservation are regulated by the Master Plan for Natural Protected Areas (2009). The National Service of Protected Areas by the State also supports a co-management model for protected areas, which in the case of Community Reserves is coordinated by technical and administrative units known as Representative Unit of Community Reserves (ECA in Spanish)<sup>f</sup>.

<sup>c</sup> Ley Marco de Cambio Climático: [https://www.scribd.com/document/368875326/Dictamen-ley-marco-de-cambio-clima-tico#from\\_embed](https://www.scribd.com/document/368875326/Dictamen-ley-marco-de-cambio-clima-tico#from_embed)

<sup>d</sup> Plan Nacional del Ambiente: <http://www.minam.gob.pe/wp-content/uploads/2013/08/Pol%C3%ADtica-Nacional-del-Ambiente.pdf>

<sup>e</sup> Definition of Mechanisms for Compensation for Ecosystem Services according to Law 30215: Schemes, tools, instruments and incentives to generate, channel, transfer and invest economic, financial and non-financial resources, where an agreement is established between taxpayers and referees to the ecosystem service, oriented to the conservation, recovery and sustainable use of sources of services ecosystems.

Figure 2 presents a timeline with key advances in policy and governance on adaptation to climate change with relevance to ecosystem-based adaptation.

As described in this section, policies on climate change adaptation and nature conservation in Peru demonstrate clear objectives with a long-term vision to address climate change

challenges at the national, regional and local scale, while supporting international efforts. If adequately enforced, these will contribute to reducing the vulnerability of the country to climate risks.

	2002 - 2008	2009 - 2014	2015 - 2018
National Climate Change Policy Processes	The public policy framework provides indirect support for climate risk management.	The public policy framework offers greater support for climate risk management through the Bicentennial Plan.	- Strengthening climate change policy framework with the NDC and adopting a roadmap for the elaboration of the National Adaptation Plan. - Law on Climate Change (2018)
National Planning instruments	- Climate change planning instruments at the national level are established: the National Climate Change Strategy. - The Ministry of Economy and Finance integrates requirements for addressing climate risks in public investment projects.	Establishment of a financial mechanism for ecosystem services conservation: Law on Mechanisms for Compensation for Ecosystem Services.	The Ministry of Economy and Finance integrates explicit requirements for considering natural infrastructure in public investment projects.
Regional Climate Change Policies Processes	Regional governments initiate planning for adaptation through Regional Climate Change Strategies.	Regional governments advance in planning for adaptation - more than 14 ERCC are approved.	Regions start implementing adaptation projects: Regional leadership is strengthened to design and implement adaptation projects, which integrates EbA.
Cross-sectoral articulation	Climate risk management continues to be considered "an environmental issue" in the different sectors.	- National Plan for Risk Management and Adaptation to Climate Change in the Agricultural Sector. - Establishment of the National Commission for Climate Change.	Advances in engaging sectors under the NDC through a space for coordination: establishment of the Multi-sectoral working group on NDC.
Emblematic EbA projects		1) EbA Flagship Programme: Mountain EbA 2) EbA Amazon 3) Mainstreaming EbA – Strengthening EbA in planning and decision-making processes	

**Figure 2:** Timeline of governance and policy processes on climate change adaptation in Peru.

<sup>f</sup> Representative Unit of Community Reserves (ECA in Spanish), is a technical and administrative unit with a social base that represents the beneficiary indigenous communities of the area, The management is shared with SERNANP. For more information and the example of ECA AmaraKaeri: <http://eca-amaraKaeri.org.pe>

### III. Ecosystem-based adaptation in Peru

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The EbA approach is not entirely new in Peru since pilot projects in protected mountain or forest areas have already been implemented over the past decade or are currently under implementation. The positive experience generated through the adoption of the EbA approach has increased interest and willingness to further explore its potential to address climate risks in different areas and sectors. These flagship projects have demonstrated the multiple benefits of EbA paved the way for mainstreaming through planning instruments for protected areas and budget resources.

Peru has enabling policy processes at the national and regional levels that recognize the role of ecosystems for climate change adaptation. The country perceives EbA as a promising approach to address climate risks, especially with regards to water availability. Hence, EbA is considered a critical element for climate strategies. Peru's overarching planning documents provide supportive frameworks for planning and implementing EbA measures at all governance levels (i.e. national, regional and local). The National Strategy on Climate Change includes an integrated ecosystem-based approach to adaptation and identifies critical ecosystem goods and services, from which sectoral or regional plans can select and prioritize in their planning. In turn, the new Law on Climate Change (2018), clearly recognizes the importance of EbA and focuses explicitly on adaptation measures to address water resource challenges.

Institutional leadership for policy change promotes EbA in various sectors and across governance levels. The institutional structure shaping EbA governance in Peru is notably led by two

national actors: the Ministry of Environment (MINAM), through its Directorate General for Climate Change and Desertification and the Ministry of Economy and Finance (MEF). The Ministry of the Environment is the governing body for climate change management and the entity that leads, promotes, facilitates and provides technical assistance to sectors, regional and local governments for the inclusion of EbA in development planning.

Natural infrastructure is an integral part of the national planning and budgeting processes. In addition to the system and institutional setting that support EbA, appropriate legal frameworks and financial resources are crucial for operationalization. Peru has an emblematic experience in integrating climate change and EbA-relevant policies into budget allocations and expenditures. Guideline frameworks highlight the role of natural infrastructure in public investment processes, making them an integral part of the national planning and budgeting processes. The Ministry of Economy and Finance, Ministry of the Environment, the National Service of Protected Areas by the State and other national and international actors with joined efforts achieved this critical advance.

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**Figure 3:** Jefatura RPNYC. Photo by: UNDP Peru.

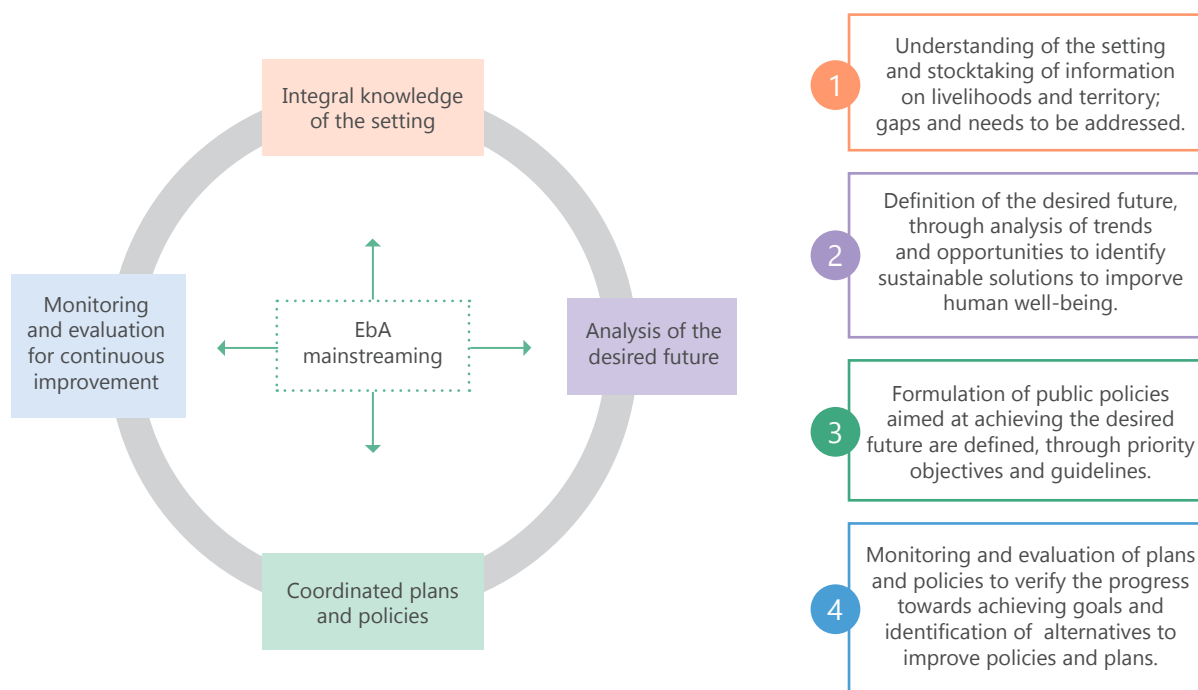
## IV. Entry points for EbA mainstreaming

Mainstreaming into policy and decision-making processes can broadly be defined as integrating the EbA approach into development and climate policies and practices across sectors. Mainstreaming can be initiated and supported by different stakeholders, including the government, civil society, local and indigenous communities and the private sector, each of whom have distinct motivations. Also, EbA mainstreaming may occur at any governance level. This assessment aims to identify and understand the planning processes, key actors and their roles, policy setting and other factors that may be relevant to EbA mainstreaming efforts.

### STRATEGIC PLANNING CYCLE

The analysis seeks to identify the entry points for mainstreaming EbA at different levels, considering both top-down and bottom-up approaches. As shown in figure 4, the proposed entry points

are based on the four stages defining the strategic planning cycle for continuous improvement of policies in Peru - Directive N°001-2017 (CEPLAN/PCD, 2017): (1) Integral knowledge of the setting; (2) Analysis of the desired future; (3) Coordinated plans and policies and (4) Monitoring and evaluation for continuous improvement. Each entry point is further analysed by describing: (i) examples of EbA measures; (ii) key policy instruments and (iii) responsible actors (key and supporting).



**Figure 4:** The strategic planning cycle for continuous improvement of policies in Peru and potential for EbA mainstreaming. (Adapted from CEPLAN/PCD, 2017).

## PHASE 1. INTEGRAL KNOWLEDGE OF THE SETTING

This phase focuses on understanding the setting in terms of the territory, the available resources (physical, environmental, economic, social, cultural), their interrelations and the living conditions of the population. It seeks to identification the importance and urgency of an issue or a problem, its definition and integration in the development agenda at the national scale.

With regards to the adaptation process, phase 1 includes stocktaking of information on climate change impacts, vulnerabilities as well as gaps and needs of the enabling environment. Through this phase, an image of the current reality is obtained, which guides the agenda setting process at national and regional level with regards to climate change. Therefore, there are a number of ways to ensure that this early phase of the process considers the role of ecosystems in adaptation measures and resilience building, including the following:

- Undertake stocktaking on ecosystem health and vulnerability and their role in adaptation and resilience building of territories, sectors, communities and their livelihoods.
- Ensure the meaningful participation of diverse stakeholders to better understand capacity gaps, adaptation needs, and perceptions on climate change and ecosystems.
- Align the adaptation process with national biodiversity and nature conservation policy commitments, including relevant policies for priority sectors.

Specific entry points	1. Integrate EbA principles and criteria across the four stages of NAP process 2. Reinforce EbA-related measures and commitments when integrating the NAP into sectoral planning.
Key policy instruments	1. National Strategy for Climate Change 2. Nationally Determined Contributions 3. National Adaptation Plan (In preparation)
Main actor(s)	Ministry of Environment, National Center for Strategic Planning, Multi-Sectoral Working Group for NDC
Supporting actor(s)	Ministry of Economy and Finance, International Cooperation Agencies

### National agenda

The three policy documents that make up the national agenda on climate change (i. e. National Strategy on Climate Change, NDC and Climate Change Law) vary in context, vision and scope, therefore the extent and consideration of EbA also differ considerably. These documents include an explicit connection between ecosystems and climate adaptation and provide objectives, strategies and targets for ecosystem management, which enables EbA mainstreaming. However, there need

to be more concrete steps in strengthening the role of EbA measures in proposed adaptation actions in NDCs and the NAP preparation process.

**Reinforce EbA-related commitments when aligning the NDC with sectoral planning.** The NDC adaptation component promotes strategies with direct reference to EbA under the priority sectors of forestry, water and agriculture. Most notable propositions, which can be seen as a stepping stone towards EbA include: i) Water sector - water harvesting; (ii) Agriculture sector – sustainable land and water management practices; (iii) Forest sector – reforestation of degraded areas and community forest management; and (iv) Fisheries sector - recovery and sustainable use of the mangrove ecosystems.

**Integrate EbA principles and criteria across the four stages of NAP process.** The NAP is a means to promote more long-term programmatic approaches, beyond projects and initiatives and therefore it is a key entry point for EbA mainstreaming. Given that the National Adaptation Plan will be the implementation mechanism of the NDC for adaptation, new policy opportunities will arise and it is therefore pivotal that the EbA approach is integrated as a crosscutting element. As the National Adaptation Plan is currently being formulated, there is a potential for the EbA approach to be integrated across the four stages related to the NAP process (UNFCCC, 2012):

1. Laying the groundwork and addressing gaps - e.g. including biodiversity, ecosystems and ecosystem services as a specific sector highlighting their link with livelihoods and climate change;
2. Assessing climate vulnerabilities and identifying adaptation options - e.g. vulnerability of ecosystems, their goods and services to climate risks; provide a catalogue with concrete EbA measures for sectors and eco-regions;
3. Reviewing and prioritizing adaptation options - e.g. use prioritization methods that include EbA-relevant criteria; and
4. Reporting, monitoring and review – e.g. develop EbA-relevant indicators to monitor the advances of adaptation processes in different time-scales.

### Regional agenda

Specific entry points	Strengthen the EbA case at basin and landscape scale in regional climate change planning processes and align them with development planning.
Key policy instruments	1. Regional Strategy for Climate Change 2. Regional Development Plans
Main actor(s)	Ministry of the Environment, Ministry of Economy and Finance, National Service of Protected Areas, the National Centre for Strategic Planning, National Water Authority, and regional governments
Supporting actor(s)	Local governments and communities, other ministries

**Strengthen the EbA case at basin and landscape scale in regional climate change planning processes and align them with development planning.** Regional governance of climate change and development actions is mandated through the Regional Strategies for Climate Change and the Regional Development Plans. Although the guidelines for the Regional Strategies for Climate Change do not mention the role of ecosystems for adaptation measures, the main objective of most strategies is to protect people and their livelihoods (with a focus on health, habitat and food security), recognizing the link between ecosystems and vulnerable populations. For EbA mainstreaming, articulation with regional development strategies is vital since they consider land-use planning, as well the management of protected areas, presenting yet another entry point, with special focus on basin and landscape scales.

## PHASE 2: ANALYSIS OF THE DESIRED FUTURE

This phase focuses on process of analysing a desired future, through analysis of trends and opportunities to identify sustainable solutions to improve human well-being. The analysis of plausible scenarios considers trends, opportunities and risks that could affect, positively or negatively, the provision of services and the well-being of people.

With regards to the adaptation process, phase 2 focuses on identifying adaptation options to address the risks and vulnerabilities defined in the previous phase. However, knowledge of impacts and vulnerabilities does not necessarily lead to the most cost-effective and efficient adaptation policy decisions. This phase in the planning process for climate change adaptation has the objective to identify adaptation options and prioritize among them, especially when financial resources are limited. Often EbA measures remain overlooked when compared to more conventional and engineered solutions. Therefore it is important to safeguard that this phase highlights the multiple benefits of EbA measures and ensures that the prioritization process takes it into account.

Specific entry points	Define and use social, environmental and economic criteria to strengthen the case for EbA in identification and prioritization process of adaptation options.
Key policy instruments	1. National Strategy for Climate Change 2. Nationally Determined Contributions 3. National Adaptation Plan (In preparation) 4. Regional Strategy for Climate Change 5. Relevant sectoral policies and plans
Main actor(s)	Ministry of the Environment, Ministry of Economy and Finance, National Service of Protected Areas, other ministries, National Centre for Strategic Planning, National Water Authority, and regional governments
Supporting actor(s)	Local governments and communities, NGOs

**Define and use social, environmental and economic criteria based on EbA principles to strengthen the case for EbA in identification and prioritization process of adaptation options.** Compare the relevance of different potential adaptation measures should consider selected criteria, with special attention to EbA measures. To better account of the additional benefits of the EbA measures – e.g. erosion prevention, water quality improvement, reducing the risk of water-borne diseases, climate change mitigation, natural habitat provision and positive economic impacts – an adequate analysis and evaluation is required. Available tools – e.g. cost-benefit analysis Multi - criteria analysis – provide the necessary guidance.

## PHASE 3: COORDINATED POLICIES AND PLANS

This phase refers to the formulation of policies in an articulated way between sectors and levels of government, aimed at achieving the image of the desired territory, through priority objectives and guidelines. The policies are reflected in plans with objectives, indicators and goals in accordance with national, sector and multi-sector and regional policies.

With regards to the adaptation process, phase 3 focuses on finding synergies between targets at the national and regional climate change agenda with sector-related policies and plans. It seeks to enhance capacities to implement adaptation actions in the sectors. Three of the prioritized sectors in the NDCs are analysed to identify entry points for EbA mainstreaming: (i) agriculture; (ii) forestry; and (iii) water and sanitation. Moreover, two additional areas demonstrate high potential to promote entry points: protected areas and disaster risk reduction. To safeguard that this phase of the process will nurture cross-sectoral mainstreaming of EbA, the following points should be considered:

- Align the sectoral policies with national and regional adaptation process and safeguard cross-sectoral synergies (e.g. agriculture, water, forestry) to obtain the multiple benefits from EbA.
- Strengthen the sector's resource allocation process to ensure that budgets consider planning, analysing, implementing and monitoring for EbA actions.

## SECTORAL AND MULTI-SECTORAL POLICIES AND PLANS

### Agriculture

The agricultural sector has made many efforts in formulating and implementing climate change adaptation initiatives, many of which highlight the role of ecosystems and the need for sustainable practices.

**Integrate EbA aspects in the design of water management practices to prevent desertification and reduce flood risk for agriculture.** A key climate risk for the agricultural sector is decreased water availability, therefore water management policies and practices present multiple opportunities to promote EbA and they can be considered an entry point for mainstreaming. While existing plans promote ecosystem-based solutions such as conservation practices, sustainable

use of natural resources and crop diversification, these do not explicitly outline their relation to climate risks. The National Plan for Risk Management and Adaptation to Climate Change in the Agricultural Sector (PLANGRACC in Spanish)<sup>9</sup> is of specific relevance for potential EbA solutions via its Strategic Pillar 3 on Prevention and Reduction of Disaster Risk. It highlights the need for restoration of high Andean ecosystems (forests, *bofedales*<sup>9</sup>, pastures, etc.), to prevent desertification, degradation and soil erosion, and promotes reforestation of riverbanks for flood risk reduction.

**Document evidence of the role of ecosystems for food security to reinforce EbA consideration in local and regional policies.** An additional opportunity for EbA mainstreaming is to demonstrate the great potential of the approach to address food insecurity in a climate change context. EbA measures, as seed banks and diversified agricultural systems applying agro-ecological principles, are key strategies for enhancing food security. A key policy mechanism is the National Strategy on Food Security and Nutrition<sup>9</sup>, which explicitly highlights that climate change impacts are expected to affect food security, and that adaptation and disaster risk reduction solutions are needed urgently. The Strategy emphasizes the role of crop diversification and the role of ecosystems for supporting livelihoods. The operating Technical Work Group on Food Security and Climate Change involves diverse actors and presents a suitable platform for EbA mainstreaming among the institutions engaged.

Entry points	<ol style="list-style-type: none"> <li>1. Integrate EbA aspects in the design of water management practices to prevent desertification and reduce flood risk for agriculture.</li> <li>2. Document evidence of the role of ecosystems for food security to reinforce EbA consideration in local and regional policies.</li> </ol>
Key policy instruments	<ol style="list-style-type: none"> <li>1. Plan for Risk Management and Adaptation to Climate Change in the Agricultural Sector</li> <li>2. National Strategy on Food Security and Nutrition</li> <li>3. National Strategy for Family Farming.</li> </ol>
Main actor(s)	Ministry of Agriculture and Irrigation, Local and regional governments, Local agricultural committees, Technical Work Group on Food Security and Climate Change
Supporting actor(s)	Ministry of Economy and Finance, Ministry of Environment, International Cooperation Agencies



**Figure 5:** Conserving traditional potato variations.. Photo by Thora Amend.

<sup>9</sup> Bofedales: an Andine Highland wetland ecosystem with underlying peat lands.



## Forestry

In climate-related policies, forest conservation initiatives are primarily considered a part of mitigation rather than adaptation strategies. Restoration of degraded lands through reforestation practices can help build synergies between mitigation and adaptation objectives. As part of the Bonn Challenge, Peru is committed to recovering 3.2 million hectares of degraded areas, both as plantations for commercial purposes and for the recovery of ecosystem functions<sup>a</sup>.

Entry point	Restoration of degraded lands through re/afforestation considering EbA principles
Key policy instruments	1. National Strategy on Forests and Climate Change 2. National Program for Recovery of Degraded Areas ( <i>in preparation</i> ) 3. National Plan for Forests and Wildlife <sup>h</sup> ( <i>in preparation</i> )
Main actor(s)	Ministry of Agriculture, via its Forestry and Wildlife Service, the National Service of Natural Protected Areas, regional governments, basin committees, and the private sector
Supporting actor(s)	Ministry of Economy and Finance, Ministry of environment, local and indigenous communities, international cooperation agencies

### Restoration of degraded lands through re/afforestation considering EbA principles.

The National Strategy of Forests and Climate Change (ENBCC in Spanish)<sup>10</sup> seeks to address deforestation and forest degradation in a comprehensive and articulated manner at the national, regional and local level in order to promote sustainable development, and improve the resilience and reduce the vulnerability to climate change of the population that depends on these ecosystems, with special emphasis on indigenous peoples. It includes aspects such as adding value to the forest, sustainable forest management, reforestation, REDD+, NAMA, among others. Restoration plans need to be designed and implemented at a landscape or ecosystem scale, which is the appropriate scale to integrate EbA. An important aspect is to promote local species for reforestation, which will contribute to more resilient forest ecosystems and community livelihoods and avoid invasive species, which threaten ecosystem services (e.g., eucalyptus and pines). This, however, is overlooked when reforestation has commercial purposes. The National Program for Recovery of Degraded Areas has considered a concrete percentage of reforested lands to be for commercial tree species, which as well will have the capacity to recover ecosystem services. Additional examples of EbA measures include: forest conservation; community forest management; and agroforestry for sustainable production (e.g. cacao, coffee).

More importantly, for these efforts to effectively represent EbA actions, reforestation and restoration actions ought to be implemented taking into consideration climate hazards and in a way that reduces vulnerability of human populations and livelihoods. For instance, restoration actions can be prioritized in sites where tree cover can help regulate the water cycle and therefore reduce water stress for downstream communities.



Figure 6: Plant nursery for reforestation. Archivo NCI, 2016.

## Water and Sanitation

Water management is not only a priority sector under the NDCs, but it also has a multi-sectoral importance (e.g. agriculture, food security, health etc.). Therefore, policy development on climate change adaptation and disaster risk reduction for different sectors presents a potential entry point for EbA mainstreaming through water management actions.

Entry points	Integrate natural infrastructure as an alternative or hybrid option to ensure sustainable and more-cost-efficient water resource management.
Key policy instruments	1. National Policy and Strategy for Water Resources 2. National Plan for Water Resources 3. National Law on Water Resources
Main actor(s)	Ministry of Environment, National Water Authority, National Sanitation Services (Sunass in Spanish), Ministry of Agriculture, Ministry of Energy and Mines, Ministry of Housing, Construction and Sanitation, regional and local governments, basin committees
Supporting actor(s)	Ministry of Economy and Finance, NGOs, local communities, international cooperation agencies

**Integrate natural infrastructure as an alternative or hybrid option to ensure sustainable and more-cost-efficient water resource management.** The National Law on Water Resources (Law 29338) empowers the National Water Authority (ANA in Spanish) and the Ministry of Environment to develop strategies and plans for the prevention and adaptation to the effects of climate change and its effects on the amount of water on local, regional and national scale. Although EbA measures are not explicitly mentioned, there is a clear reference to the role of ecosystems in these strategies and plans. Integrating natural infrastructure - constructing wetlands, riparian buffers, reconnecting rivers to floodplains – presents an opportunity to showcase a more sustainable and cost-efficient alternative to gray infrastructure. Also, evidence shows that natural infrastructure can complement grey infrastructure thus promoting hybrid solutions.

The National Policy and Strategy on Water Resources<sup>11</sup> includes a strategic pillar on ecosystem conservation and promotes risk prevention and climate change adaptation measures. Yet, the proposed actions are rather general, highlighting the need for ecosystem conservation and raising awareness on the importance of protected areas. This strategy, together with the National Plan for Water Resources are key policy instruments creating an enabling environment for promoting concrete EbA measures to enhance adaptation efforts and effectively address water-related risks.



**Figure 7:** Laguna Llanganuco, Photo by Lili Ilieva.

## Natural Protected Areas

Climate change has adverse effects on different ecosystems and therefore the provision of goods and services and biological diversity, it is precisely the latter that can minimize such impacts by making ecosystems more resilient. This is a clear example of the existing synergies between climate change and biological diversity. In this sense, the Natural Protected Areas (NPAs) play a fundamental role in the implementation of climate change adaptation and mitigation measures.

Entry points	<ol style="list-style-type: none"> <li>1. Include EbA measures in as an integral part of the Master Plans for Protected Areas and their budgeting processes.</li> <li>2. Use co-management agreements with indigenous and local communities for EbA implementation in community nature reserves.</li> </ol>
Key policy instruments	<ol style="list-style-type: none"> <li>1. National Strategy on Natural Protected Areas</li> <li>2. National Environmental Plan</li> <li>3. National Action Plan for Biodiversity</li> <li>4. Master Plan for Protected Area Management</li> </ol>
Main actor(s)	Ministry of Environment, SERNANP, Regional governments, ECA, Local and indigenous communities
Supporting actor(s)	Ministry of Economy and Finance, NGOs, Research institutes, Local and indigenous communities

### **Include EbA measures in as an integral part of the Master Plans for Protected Areas and their budgeting processes.**

There have been advances in integrating climate change in the management of protected areas (e.g. Working document no. 14 – Natural Protected Area Master Plan incorporating climate change, along with Working document no. 12 - Analysis of the vulnerability of Natural Protected Areas to climate change). However, these advances are promoted in an isolated manner, without considering a nation-wide strategy or standardized guidelines to integrate vulnerability and climate change factors in all Natural Protected Areas. In consequence, it is necessary to integrate EbA approach into the strategic, institutional, budgeting and operational components of the master plans.

### **Use co-management agreements with indigenous and local communities for EbA implementation in community nature reserves.**

Indigenous peoples and local communities have long managed climate variability, uncertainty and change by interacting with the environment and exercising their traditional knowledge to cope with those challenges. At present, one instrument for promoting the sustainable management of territory and natural resources in nature reserves are the co-management agreements for conservation with the communities. These agreements create ownership of processes that in turn can ensure sustainability of projects and initiatives in the long run. The primary objective is to strengthen the institutional capacity of the local organizations and their relationship with communities. The agreements contribute to the articulated planning of the areas and the community territory, oriented to a vision of integral development and implementation of the communities' so-called „life plans “. EbA measures can be promoted in these plans and agreements for co-management to assure climate-compatible development. The National Service of Natural Protected Areas supports this management model, which is coordinated by technical and administrative units ECA.



**Figure 8:** Indigenous populations in communal reserves. Photo by Sally Jabiel/UNDP Peru.

## Disaster Risk Reduction

Healthy ecosystems, including forests and wetlands, play a critical role in disaster risk reduction (DRR). As a priority issue in Peru, there are certain advances in policy development on disaster risk management. However, there is very limited reference to the ecosystem approach as a potential solution to support preventive actions for risk reduction.

Entry point	Include ecosystem-based solutions as an integral component of investment projects and plans for disaster risk reduction, recovery and reconstruction.
Key policy instruments	1. National plan for disaster risk reduction 2. Plan for Reconstruction with Changes.
Main actor(s)	Ministry of Environment, Presidency of the Ministry Council, National Centre for Assessment, Prevention and Reduction of Disaster Risk, regional and local governments, basin committees, Local communities
Supporting actor(s)	Ministry of Economy and Finance, NGOs, international cooperation agencies

**Include ecosystem-based solutions as an integral component of investment projects and plans for disaster risk reduction, recovery and reconstruction.** Recent floods and landslides in the country resulting from the “extraordinarily strong” El Niño are a driver of impacts, but also a “window of opportunity” for changes in policy, institutions, and society. Disaster prevention interventions that aim at promoting resilience and effective ecosystem management play a vital role in these objectives. While ecosystem approaches to disaster risk reduction (Eco-DRR) are considered in other sector strategies such as agriculture, forestry, or water, they have not yet been explicitly incorporated into disaster management policies. EbA measures, such as reforestation of riverbanks and riverine flood control through natural infrastructure (e.g. flood bypasses, riparian buffers, wetland construction, etc.), combined with improved land-use planning, especially in affected sites or high risk prone areas, present an opportunity to consider EbA principles in disaster risk reduction initiatives. A key policy instrument is the National Plan for Disaster Risk Reduction<sup>12</sup>, although it does not mention the role of ecosystems in disaster risk reduction, this plan act as guidelines and provides an opportunity to mainstream EbA measures across different actions for disaster risk reduction and reconstruction.



**Figure 9:** Post disaster. Photo by Renzo Velasquez Bernet/UNDP Peru.

## PHASE 4. MONITORING AND EVALUATION FOR CONTINUOUS IMPROVEMENT

This phase refers to the need for assessing the effectiveness and success of the proposed and implemented policy. Evaluation of policies, planning and investments related to climate change adaptation aim to track progress in implementing the interventions and the extent to which they reduce vulnerability, improve adaptive capacity and support the overall well-being of the population. The evaluation stage involves many government and societal actors from across different sectors. Evidence-based evaluation is needed to improve policies (IDB, 2016).

Entry points	1. Document and communicate evidence on EbA benefits to inform and improve decision-making and policy processes 2. Develop EbA-related indicators, collect and use the data for monitoring of adaptation processes
Main actor(s)	Ministry of Economy and Finance, National Centre for Strategic Planning, Ministry of Environment and other relevant institutions
Supporting actor(s)	International cooperation agencies, NGOs, private sector

### Document and communicate evidence on EbA benefits to inform and improve decision-making and policy processes.

Although evidence-based evaluation is key to strengthen the case for EbA mainstreaming in policies and programs, at present, very little is known about what works and does not work in addressing the challenges of climate change and disaster risk. It is therefore needed to deliver credible and rigorous evidence on EbA multiple benefits, which will be documented in evaluation processes to inform decision makers and hence, improve the effectiveness of public policies.

### Develop EbA-related indicators, collect and use the data for monitoring of adaptation processes.

Since climate change affects a broad range of sectors that are crucial for a country's overall development, such as agriculture, water, forestry among others, adaptation policy and planning should take place across sectors and be integrated into development planning at the national and local levels. These interventions must consider integration in, or linkages to existing Monitoring and Evaluation structures (GIZ, 2015). Considering indicators for example to track changes in human vulnerability related to climate risks or changes in human vulnerability related to ecosystem service changes, would contribute to better integrating EbA principles and criteria along the entire policy development cycle.

## BUDGETING AND RESOURCE ALLOCATION PROCESS

The regulatory and planning framework is a critical enabling factor for mainstreaming EbA across governance levels and sectors. However, in the absence of financial and other resources, stakeholders are unable to implement actions on the ground. The government's budget process is the central access for resource allocation and is therefore important in terms of ensuring that budgets consider the financial resources needed for the planning, implementation and monitoring of EbA measures. Peru has experience in successfully integrating natural infrastructure as a required component in public investment projects and thus created an enabling environment to mainstream EbA in budget development processes.

Entry point	Integrate EbA principles into the criteria for formulation and implementation of investment projects in sectoral and territorial planning.
Key policy instruments	1. Directive for Formulation and Evaluation in the Framework of the National Multiannual Programming and Investment Management System 2. Policy Guidelines for Public Investment in Biodiversity and Ecosystem Services 3. Law on Mechanisms for Compensation for Ecosystem Services 4. Law on Modernization of Sanitation Services
Main actor(s)	Ministry of Economy and Finance, Ministry of Environment and other relevant institutions
Supporting actor(s)	International cooperation agencies, NGOs, private sector

### Integrate EbA principles into the criteria for formulation and implementation of investment projects in sectoral and territorial planning.

There are two viable policy instruments that provide an enabling environment for EbA mainstreaming with regards to resource allocation: (1) National System of Multiannual Programming and Management of Investments - [Invierte.pe](http://Invierte.pe) and (2) The Mechanism for Compensation of Ecosystem Services.

National System of Multiannual Programming and Management of Investments - [Invierte.pe](http://Invierte.pe): In 2017, the recently created National System of Multiannual Programming and Management of Investments - [Invierte.pe](http://Invierte.pe), developed its regulation. It incorporates the concept of natural infrastructure as "the network of natural spaces that conserve the values and functions of ecosystems, providing ecosystem services".

<sup>i</sup> Validated through Resolución Directoral N° 002-2017-EF/63.01

It establishes explicitly that natural infrastructure can be considered part of the public infrastructure projects, which are in turn part of the multi-year investment plans. A key policy instrument that provides an enabling environment for EbA mainstreaming is the Directive for Formulation and Evaluation in the Framework of National Multiannual Programming and Investment Management System<sup>i</sup>. In 2015 the joint work between the Ministry of Economy and Finance, Ministry of Environment, National Service of Natural Protected Areas and other national and international actors led to the elaboration of the Policy Guidelines for Public Investment in Biodiversity and Ecosystem Services<sup>13</sup> (approved by Ministerial Resolution and currently under revision). The policy guidelines promote biodiversity and ecosystem conservation measures in formulating and implementing of public investments at local, regional and national level. Therefore, the guidelines present an opportunity to develop EbA projects for public financing at country-wide scale and with a cross-sectoral approach. It also encourages public investment to shift from traditional, grey infrastructure to green infrastructure and nature-based solutions as EbA measures. Additionally, in 2018, the Ministry of the Environment approved a technical form for the formulation of standard investment projects in the restoration of Andean ecosystems, as well as accompanying instructions for its completion. The use of this official tool is expected to facilitate the planning of ecosystem restoration investment projects at regional and local levels.

Mechanism for Compensation for Ecosystem Services: On the other hand, the Mechanism for Compensation for Ecosystem Services (MERESE in Spanish) regulates the compensation for hydrological ecosystem services as part of the drinking water and sewage tariff through the Law on the Modernization of Sanitation Services (Law No. 30045). The law includes the perspective of climate change impacts on water resources and proposes to add part of the tariff in reserve destined for disaster risk management and adaptation to climate change. Thus, the water and sanitation sector offers an opportunity to make more sustainable investments as public investments on water and sanitation are part of all development plans at the regional and local levels. Thus, there is opportunity to integrate EbA measures explicitly focusing on natural infrastructure into development planning and scale up the sustainable investment approach to other sectors. This presents an opportunity to explore the potential to use this mechanism for financing EbA measures in the water sector as a mainstreaming instrument.

## V. Case studies

As mentioned earlier, EbA mainstreaming can be driven and supported at different governance levels and by different stakeholders. In that sense, different sets of actors can hold key roles in EbA governance and mainstreaming can take place through bottom-up or top-down approaches. However, in order to achieve long-lasting change, both at the policy level and on the ground, collaboration across levels of governance and sectors is crucial. This section represents an overview of different case studies in which EbA mainstreaming was achieved to different extents. Table 3 represents an analysis of the case studies based in terms of the governance structure, highlighting that there is no one governance structure that should be followed, but that initiatives can take different formats and be successful. For each case study, we analyse which stakeholders were responsible for and engaged in initiating, following and implementing different EbA measures.

### OVERVIEW OF SELECTED EBA CASE STUDIES

The following case studies were selected to demonstrate the range of sectors and stakeholders that can play a role in the

different stages of mainstreaming. A common characteristic across the five case studies is that the majority of them (with the exception of case study 2) mainly aim to address current and potential threats to water availability. As one of the sectors highly vulnerable to climate change impacts, improvement of water resource management is a key national priority.

These case studies highlight that this priority issue is recognized at different governance levels and that local communities acknowledge the potential for nature-based solutions. They also show that the challenge can be addressed through different sector-specific EbA measures, such as forestry, agriculture, water and sanitation, among others. Therefore, there are different possible entry points for mainstreaming EbA measures and promoting sustainable and adaptive water resource management. Table 2 summarizes the case studies and describes their location, climate change objectives, and socio-economic and environmental benefits.

**Table 2:** Description of selected EbA case studies.

	Case study 1	Case study 2	Case study 3	Case study 4
Name of the project	EbA Amazonia	Recovery of hydrological ecosystem services from forests and natural grasslands.	Flagship EbA Mountain Program (Peru, Uganda, Nepal)	Reforestation and recovery of degraded ecosystems
Year of implementation	2013- 2017	2017 - present	2011 - 2015	2011 - present
EbA measure	Forest conservation in native community reserves	Restoration of forests and natural grasslands	Restoring water channels wetlands and community grassland management	Reforestation in the upper basin and introduction of agroforestry systems
Area of implementation	Amarakaeri Communal Reserve, Madre de Dios, Amazonas	Chancay, Huaral basin, Lima Region	Reserva Paisajística Nor Yauyos Cochabamba (RPNYC), in the department of Lima and Junin.	Lower Alto Mayo watershed, San Martín
Climate hazard addressed	Overall vulnerability to climate change and ecosystem service decline	Drought, flood, landslides	Drought, erosion	Drought
Implementing agency	United Nations Development Programme (UNDP)	Council of Water Resources of the Chancay-Huaral Basin, Regional Government of Lima	United Nations Development Programme (UNDP) UN Environment (UNEP); International Union for Conservation of Nature (IUCN); Mountain Institute (MI)	Moyobamba water company (EPS), Ministry of the Environment (MINAM), Alto Mayo Special Project (PEAM), Regional Government of San Martín (GORESAM)
Funding source	Germany's Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)	Government of Peru	Germany's Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB)	Project development funded by the German Agency for International Cooperation (GIZ); compensation mechanism funded by GORESAM and water users - "sustainable tax"
Financing amount	US\$ 7.9 million	US\$ 6 million	Euro 11.5 million	US\$ 48,000/year (equivalent to US\$ 1/user/month) + US\$ 200 000

**Table 3:** EbA – Governance matrix for entry points of EbA mainstreaming

Governance type	Governance by Government			Shared Governance/ external agents or impulse		Private Governance			Indigenous peoples & local community governance	
	Federal / national ministry or agency	Regional govts. or agency in charge	Local gov.	Collaborative or joint management	External agents (e.g. donors)	Individual land owner	Non-profit organization	For profit organization / company	Indigenous peoples	Local communities
<b>EbA case study 1:</b> EbA Amazonia	②				① ③				①	
<b>EbA case study 2:</b> Recovery of hydrological ecosystem services from forests and natural grasslands.	②	①	③	①				②		③
<b>EbA case study 3:</b> Flagship EbA Mountain Program	②	②	②		① ③		② ③			③
<b>EbA case study 4:</b> Reforestation and recovery of degraded system in sub-basin	②	①	①					① ③		③

Legend      ① Stakeholder who initiated the EbA process      ② Stakeholder who followed      ③ Stakeholder who sustained the process

### GOVERNANCE MODELS OF MAINSTREAMING EBA

This section analyses the five case studies, looking at stakeholders’ motivations and objectives, the governance model, potential for mainstreaming, and the enabling conditions that allowed for the case study to succeed. As summarized in Table 3, each case study shows a different example of governance model and leadership at different levels. While some case studies highlight more than one governance model simultaneously, the case studies were selected to show at least one example for each level: local, regional, national, shared and private governance.



**Figure 10:** Capacity building for public officials on integrating EbA in development planning, Peru. Photo by Thora Amend.



CASE STUDY 1: EBA AMAZONIA<sup>1</sup>



Figure 11: EbA Amazonia. Photo by Mey Lin Chiang/UNDP Peru.

<b>Location</b>	Amarakaeri Communal Reserve, Madre de Dios, Amazonas
<b>Sector</b>	Water, agriculture and forestry
<b>Climate hazard addressed</b>	Overall vulnerability to climate change and ecosystem service decline
<b>Measure</b>	Forest conservation in native community reserves
<b>Leading stakeholder</b>	United Nations Development Programme and the Representative Unit of the Community Reserves
<b>Contributing stakeholders</b>	Ministry of Environment, National Service of Protected Areas
<b>EbA Mainstreaming Impact</b>	Mainstreamed EbA in co-managing agreements for sustainable natural resource management for local communities

<sup>1</sup> More information about EbA Amazonia project: <http://www.undp.org/content/undp/en/home/librarypage/poverty-reduction/making-the-case-for-ecosystem-based-adaptation.html>

**Motivation and objective for promoting EbA:** Forests provide the Amazonian indigenous population with food, water, clothing, culture, and medicine, among other environmental services. Given the vulnerability of the forests to changes in temperature and precipitation, it is important to reduce the risks that might lead to a probable shortage of environmental services. EbA Amazonia follows a multi-scale approach, which reflects the specific objectives guiding the activities at each level. The key objective is to reduce the vulnerability to climate change of indigenous communities that depend on fragile ecosystems. The initiative promotes EbA measures as part of the co-management agreements with Indigenous Community Reserves; capacity building for the organizational structure of the ECA shall enable them to better design and implement their management plans integrating EbA measures.

**Governance model:** The EbA Amazonia project was initiated by UNDP and the Representative Units of the Community Reserves (ECA) of Amaraeri (Madre de Dios) and Tuntanain (Amazonas), recognizing that climate and other underlying risks are threatening the local communities. The initiative is supported by Ministry of Environment and implemented by the National Service of Protected Areas in coordination with the Representative Unit of the Community Reserves of Amaraeri (Madre de Dios) and Tuntanain (Amazonas).

**Potential for EbA mainstreaming:** Mainstream EbA in co-management agreements with local communities for sustainable natural resource management and strengthening capacities of local organisations. Additionally, contribute to the Regional Climate Change Strategy of Madre de Dios and the national agenda for climate change (NDC on both adaptation and mitigation).

**Enabling factors:** National policies recognize that the Amazon forest plays a key role for both adaptation and mitigation strategies and the forestry sector is prioritized in the NDCs as part of adaptation and mitigation efforts. A key enabling factor for promoting EbA measures is the opportunity it provides to increase the potential for strengthening synergies between adaptation and mitigation. From a governance perspective, the presence of local actors as the ECAs is essential to engage with indigenous populations and encourage the mainstreaming of EbA in community plans for natural resource management.

CASE STUDY 2: RECOVERY OF HYDROLOGICAL ECOSYSTEM SERVICES FROM FORESTS AND NATURAL GRASSLANDS<sup>k</sup>



Figure 12: River spring in. Photo by Thora Amend.

<b>Location</b>	Chancay-Huaral basin, Lima Region
<b>Sector</b>	Water, agriculture, forestry and hydropower
<b>Climate hazard addressed</b>	Drought, flood, landslides
<b>Measure</b>	Restoration of forests and natural grasslands
<b>Leading stakeholder</b>	Council of Water Resources of the Chancay-Huaral Basin, Regional Government of Lima
<b>Contributing stakeholders</b>	Ministry of Environment, Ministry of Economy and Finance and Ministry of Agriculture, hydroelectric company and water supply service providers, district and provincial municipalities, local community of the province of Huaral, board for users of irrigation
<b>EbA Mainstreaming Impact</b>	Included EbA measures as part of the Regional Climate Change Strategy and Development plan

<sup>k</sup> Project investment number (SNIP in Spanish) – SNIP 345246. For more information: <http://www.regionlima.gob.pe/portalttransparencia.php>

**Motivation and objective for promoting EbA:** The Chancay–Huaral basin consists predominantly of rural agricultural areas that are highly sensitive and exposed to climate change impacts. In addition, environmental degradation and deforestation due to land use changes on slopes and riparian areas enhance this vulnerability. Extreme weather events like droughts, floods, and landslides have impacts on agricultural and livestock productivity, as well as installed infrastructure, such as hydropower plants. These conditions compromise the region’s food security, livelihoods and the energy sector. The proposed EbA action is the restoration of forests and natural grasslands to sustain a stable hydrological regime in the basin.

**Governance model:** This case study shows that regional government actors, in collaboration with joint management and governance structures, are vital in promoting EbA initiatives at river basin scale. Two regional key stakeholders initiated the project – the Council of Water Resources of the Chancay – Huaral Basin and the Regional Government of Lima. Stakeholders who joined and sustained the process include Ministry of Environment, the Ministry of Economy and Finance, the Ministry of Agriculture and the hydroelectric company and water supply service providers. The implementation stage engaged local actors, including the district and provincial municipalities, the local community of the province of Huaral and the Board for users of irrigation.

**Potential for EbA mainstreaming:** Mainstream EbA in the Regional Climate Change Strategy and the Regional Development Plan, employing their instruments for planning and management, as well as their financing schemes for climate adaptation through public investment funds and Law on Mechanisms for Contributions for Ecosystem Services. The initiative also has the potential for mainstreaming EbA into sectoral planning: the forest, agriculture and water sectors, as part of the regional development planning.

**Enabling factors:** Enabling factors for the design and implementation of EbA measures are the policy framework and financial mechanisms. With regards to the existing policy framework, the region has policies and instruments for planning and management for adaptation to climate change both under the Regional Strategy of Climate Change and the Regional Development Plan, which enable the implementation of EbA measures. With regards to the existing financial mechanisms, the incorporation of criteria associated with adaptation to climate change in public investment projects is key at the regional level. At the national level, the Ministry of Economy and Finance has approved the guidelines for the incorporation of risk management and natural infrastructure in a context of climate change in public investment. Moreover, the existing Mechanism for Compensation for Ecosystem Services provides an opportunity for the private sector to engage in financing EbA initiatives.

CASE STUDY 3: FLAGSHIP EBA MOUNTAIN PROGRAMME<sup>1</sup>



Figure 13: EbA Mountain. Photo by Anelí Gómez/UNDP Peru.

<b>Location</b>	Reserva Paisajística Nor Yauyos Cochabamba (RPNYC), in the department of Lima and Junín
<b>Sector</b>	Water, agriculture
<b>Climate hazard addressed</b>	Drought, erosion
<b>Measure</b>	Restoring water channels wetlands and community grassland management
<b>Leading stakeholder</b>	Ministry of Environment, National Service of Protected Areas by the State, UN-Environment
<b>Contributing stakeholders</b>	Regional Government of Junín and municipal governments, IUCN, the Mountain Institute, Management Committee of RPNYC, and local communities
<b>EbA Mainstreaming Impact</b>	Potential to mainstream EbA in protected area management plans

<sup>1</sup> More information about Mountain EbA project: <http://www.adaptation-undp.org/projects/mountain-eba>

**Motivation and objectives for promoting EbA:** The initiative seeks to generate scientific, economic and practical evidence on the benefits of EbA. The EbA Mountain Program was implemented in Peru, Uganda and Nepal as a Flagship Program. Its main objective was to strengthen capacities at national, regional and local levels to implement EbA options focusing on (i) development and implementation of methodologies and tools for EbA in mountain ecosystems; (ii) implementation of EbA pilots; and (iii) formulation of national policies. A key element was to recover traditional knowledge for water resource management (Dourojeanni, et al. 2015; 2016).

**Governance model:** This case study demonstrates a distinct example of shared governance model with multi-stakeholder engagement and coordination at international, national, regional and local levels. The project was initiated jointly by three institutions (1) Ministry of Environment, as the main political partner at the national level in charge of project management and the promotion of synergies with other initiatives; (2) National Service of Protected Areas by the State (SERNANP), in charge of directing and establishing the technical and administrative criteria for the conservation of the Protected Natural Areas, and protection of biological diversity, and (3) UN-Environment, having the lead in the design of tools and methodologies for vulnerability assessments and for the identification of specific implementation strategies. This process grasped the attention of other actors at the national and regional scale, including the Ministry of Finance and the Regional Governments of Junin and the Municipalities, who joined and sustained the process. Implementation was carried out under the leadership of IUCN, working in partnership with the Mountain Institute. Both organizations were in charge of the identification and implementation of robust adaptation measures and capacity building at the local level. At the local level, key partners include the Management Committee of RPNYC and 12 local communities located in Nor Yauyos and Cochabambas Basins.

**Potential for EbA mainstreaming:** Mainstream EbA in the guidelines through participating in ad-hoc working group meetings, and providing technical guidance on ecosystem-based adaptation measures. The initiative has the potential to mainstream EbA in management plans of protected areas and strengthen their role in sector development and climate change strategies as well as in the NDCs.

**Enabling factors:** The objectives of the EbA initiative fit directly with the general guidelines of environmental policy in Peru, which considers capacity building of the of the national, regional and local governments, as well as local populations to adapt to climate change. The Ministry of Environment grants a high priority to capacity building initiatives for adaptation, as well as to the incorporation of policies and strategies related to climate change in sustainable development plans at all governance levels. The collaboration with the Ministry of Economy and Finance has enabled the co-development of policy guidelines for public investment on biodiversity and ecosystems.

CASE STUDY 4: REFORESTATION AND RECOVERY OF DEGRADED ECOSYSTEMS<sup>m</sup>



Figure 14: Chachapoyas. Photo by Lili Ilieva.

<b>Location</b>	Lower Alto Mayo watershed - specifically, the Mishquiyacu-Rumiyacu and Almendra subwatersheds and the city of Moyobamba, Department of San Martin
<b>Sector</b>	Water, agriculture and forestry
<b>Climate hazard addressed</b>	Drought
<b>Measure</b>	Reforestation in the upper basin and introduction of agroforestry systems
<b>Leading stakeholder</b>	Sanitation Services Provider Moyobamba, Provincial Municipality of Moyobamba, Regional Government of San Martin and local communities
<b>Contributing stakeholders</b>	National Agency for Sanitation Services, Ministry of Environment and Ministry of Economy and Finance
<b>EbA Mainstreaming Impact</b>	Mainstreaming of EbA in multi-stakeholder financial mechanism to resolve the problem of urban water insecurity by promoting measures in the forestry, agriculture and water sectors

<sup>m</sup> More information about the project: [https://www.forest-trends.org/wp-content/uploads/imported/alto-mayo-iws\\_11-5-13\\_final-pdf.pdf](https://www.forest-trends.org/wp-content/uploads/imported/alto-mayo-iws_11-5-13_final-pdf.pdf)

**Motivation and objectives for promoting EbA:** Approximately 200 families from three villages: San Vicente, San Andrés and San Mateo, live in the Mishquiyacu-Rumiyacu and Almendra conservation areas. These conservation areas are of high ecological value and their purpose is to protect biodiversity and the headwaters of the micro-basins, which supply water to the city of Moyobamba. However, unsustainable land-use practices exacerbated by climate change result in increased risks of water stress for the urban area. The major concern comes from the local company for water service provision, who recognizes this problem. With the collaboration of the local and regional government the company proposed a mechanism for compensation for ecosystem services scheme, in which the collected funds from the water tariff are used for conservation actions, such as reforestation, agroforestry productive systems and environmental education.

**Governance model:** This case study demonstrates that the right incentives can motivate the private sector to take the initiative for promoting EbA in collaboration with local actors. The project was initiated and implemented in collaboration between the Sanitation Services Provider (EPS in Spanish) Moyobamba, together with Provincial Municipality of Moyobamba, Regional Government of San Martín (GORESAM in Spanish) through the Alto Mayo Special Project (PEAM in Spanish) which involves the Municipal Government of Moyobamba and District Government of Nueva Cajamarca, National University of San Martín and Public Technological Institute of Alto Mayo. Key National stakeholders who sustained the process are the National Agency for Sanitation Services, the Ministry of Environment and the Ministry of Economy and Finance.

**Potential for mainstreaming EbA:** Mainstreaming of EbA in multi-stakeholder financial mechanism to resolve the problem of urban water insecurity by promoting measures in the forestry, agriculture and water sectors, as part of local development planning activities.

**Enabling factors:** The existing legislation on Payments for Ecosystem Services has facilitated the process and ensured strategic collaboration and support from national agencies to introduce the scheme. Moreover, the implementation of a communication and environmental education strategy from the beginning of the initiative has been key to raising awareness of the issue and ensure the acceptance on behalf of the water users to pay an additional water tariff rate.



## VI. Enabling and hindering factors for EbA mainstreaming

An enabling environment is vital for effective mainstreaming of EbA in development planning. Key enabling factors that support the process refer mostly to institutional arrangements, the policy framework, and capacities (individual and institutional). Although significant progress in climate change governance and implementation tools has been achieved in Peru, there is still a need for further improvement of the policy and institutional framework to integrate comprehensive climate change policies and thus facilitate EbA mainstreaming. Figure 11 summarizes the key barriers and challenges limiting EbA mainstreaming in Peru, which might be also relevant in other country settings.

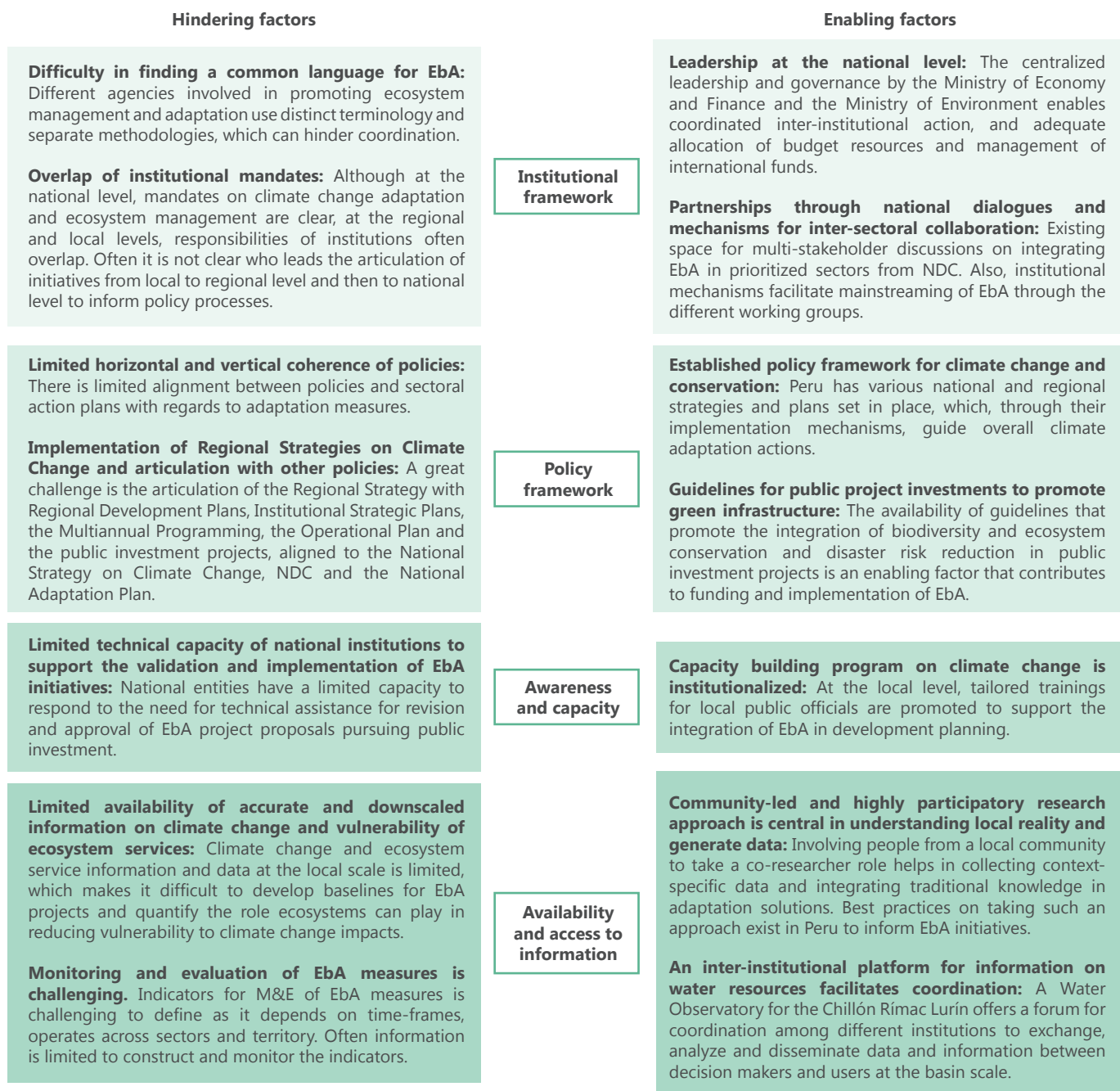


Figure 15: Enabling and hindering factors for EbA mainstreaming in Peru.

## VII. Lessons learned and the way forward

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There are several key considerations that need to be taken into account for the EbA mainstreaming process and its supporting activities. A preliminary step is to raise awareness among actors in all relevant sectors, including those outside the environmental and natural resource sectors, about the importance and value of conserving ecosystems and their contribution to adaptation efforts. As new policy initiatives require human resources, institutional capacity, and funding for successful development and implementation, it is vital to identify the people and organizations with the necessary interest and expertise to ensure progress on new policy development, while planning for and ensuring adequate funding and institutional capacity for future policy implementation.

### LESSONS LEARNED

The following are lessons drawn from Peru's efforts to date to mainstream EbA in development planning. We provide lessons on institutional arrangements, policy and legal processes and awareness and capacity building.

#### Institutional arrangements

**Institutional leadership is a critical enabling factor for EbA mainstreaming in policy-making processes:** Due to the crosscutting nature of climate change and EbA, mandates and responsibilities of varying government actors on national and sector levels often overlap, thus creating operational difficulties as coordination and budgeting. It is therefore essential to identify a central governance entity to lead the EbA mainstreaming efforts in collaboration with environmental institutions. In the case of Peru, the established collaboration between the Ministry of Economy and Finance and Ministry of Environment is well positioned to coordinate the activities of other ministries. This demonstrates political power to allocate financial resources for EbA through public investments and administration of national and international funds from (e.g., Green Climate Fund).

**The strong articulation of national agencies with existing local structures and policies enables EbA ownership and sustainability in the long run:** Experience often shows that parallel governance structures are formed for project implementation. Integrating EbA into existing structures, plans and policies can further make the case on the relevance of EbA benefits for existing goals and priorities (*examples: case studies 3 and 4*).

**Delivering necessary policy change for EbA requires collaboration across governance scales and procedures:** The role of institutions and policy processes at different

governance scales is essential for achieving EbA mainstreaming. Experience shows that policy processes for mainstreaming EbA can occur in two directions: (i) top-down or bottom-up (vertical) mainstreaming, and (ii) trans-sectoral (horizontal) mainstreaming. Peru demonstrates that taking such a synergistic approach provides opportunities and multiple benefits.

#### Policy and legal processes

**Integrating EbA into national investment processes enables its mainstreaming across sectors and diverse financial sources:** Peru demonstrates that public financing for EbA can be allocated through national budgets across sectors and at multiple scales, ranging from local to regional to national level. Apart from ecosystem-related sectors (e.g. water, agriculture and forestry), the country has made the case for the potential of the integration of biodiversity and ecosystem conservation in other sectors, such as infrastructure (moving from grey to green or hybrid measures). (*Examples: case studies 2 and 4*).

**Payments for Ecosystem Services provide a relevant model for EbA financing:** Such payments can provide additional financing, increase understanding of the value of ecosystem services and act as an incentive for implementing EbA at the basin scale, across forest landscapes or coastal wetlands. (*Examples: case studies 2 and 4*).

#### Awareness and capacity building

**Effective communication has the potential to mobilize capacity and resources for EbA.** Communicating climate knowledge and the benefits and potential co-benefits for socio-economic systems that EbA offers is a powerful tool to increase awareness and interest. If the message is successfully delivered, it might lead to the allocation of more resources. This is especially true for improving bottom-up and horizontal mainstreaming through inter and intra-organizational cooperation and participation in the development of sectoral plans and adaptation projects.

**Technical capacity building is critical to strengthen the role of local actors in planning and implementation.** As demonstrated throughout the assessment, local actors (e.g. municipalities, local businesses, individual landowners, communities, and indigenous associations) play a leading role in promoting and implementing EbA measures. They often have excellent knowledge about the factors that shape the vulnerability of the local population and ecosystems. Nonetheless, their capacity is constrained due to their often-weak technical knowledge and organizational skills. Continued and specialized capacity strengthening of local officials and

community representatives, in addition to technical assistance from relevant organizations (e.g. the Ministry of Environment and the National Service of Natural Protected Areas) are crucial to address these challenges and enable the leadership of local actors in mainstreaming EbA.

## THE WAY FORWARD: RECOMMENDATIONS

To unlock the full potential of EbA, it is vital to encourage interventions in policy-making and planning across sectors and scales. It is also essential to provide incentives for EbA implementation on the ground, foster enabling framework conditions at the national level and support globally agreed goals and common agendas. Based on the previous analysis, here we present insights on how to continue to mainstream EbA into the overall development agenda. While these are meant to be implemented in the Peruvian context, to a certain extent they can be adapted and implemented in other contexts.

### Implementation on the ground

**Before taking actions on scaling up of EbA measures, it is a prerequisite to integrate the variable on climate change and risk into the management and strategic instruments of sectors and land-use planning.**

**Forest landscape restoration is a national priority and can be transformed into a powerful strategy and tool for EbA mainstreaming.** Restoration strategies are known to contribute to both mitigation and adaptation to climate change by storing and capturing carbon, enhancing the resilience of forest ecosystems and reducing the vulnerability of resource-dependent communities. Peru has prioritized forest restoration as an implementation mechanism both under the NDC and to achieve the Bonn Challenge, which presents an ideal opportunity to embed EbA measures. To shape restoration strategies as a powerful tool for EbA implementation on the ground, technical and methodological gaps need to be addressed, such as: which climate hazards are addressed and how EbA will contribute to strengthening the resilience of human communities and livelihoods, identification of tree species that will be resilient in the face of the new climate conditions, methodological frameworks for the recovery of ecosystems, monitoring of processes and assessing adaptation indicators, or analyzing the loss of ecosystem services in different ecosystems. Addressing those knowledge gaps and engaging with the relevant actors at all governance levels to mobilize public investment is critical for successful up-scaling of EbA.

**Learning from disaster risk reduction experiences can open new “windows of opportunity”.** ‘Building back better’ refers to a reconstruction process, which has the aim to improve a community’s physical, social, environmental and economic conditions and strengthen resilience in the face of future disasters. Principles for building back better provide key entry points for incorporating nature-based solutions. These improvements may include enforcing environmental impact

assessments, improving land use planning, and integrating the role of well-conserved ecosystems to reduce the vulnerability of communities. Given the recent impacts of El Niño (2017), there is an opportunity to incorporate green infrastructure aspects into disaster recovery guidelines of different sectors.

### Framework conditions on the national level

**A common EbA roadmap as an integral part of the elaboration of the National Adaptation Plan and thus the NDCs would contribute to making ecosystem services a central component of climate adaptation efforts in Peru.**

There is an existing and growing practice of EbA in Peru, yet many of these initiatives are stand-alone projects, which if coordinated under a common program of work, would add considerable strength to the EbA-mainstreaming efforts. Currently, there are various advances in preparing an inventory of existing EbA measures, as well as planning and implementation tools. Nevertheless, there is a need for coordinated efforts to develop a roadmap for EbA initiatives, which will set out a vision and identify priority areas of action in order to influence policy and enable replication and scaling up of EbA interventions. Consideration should be given to the identification of research needs, possible areas of EbA implementation across different biomes, and to ensure effective connection across landscapes. The strategic framework may take the form of an implementation mechanism under the NDCs as a component of the National Adaptation Plan. This step can be taken under the leadership of the Ministry of Environment in collaboration with the Ministry of Economy and Finance and the National Service of Natural Protected Areas to ensure that it will be integrated in public investment schemes.

**Innovative financing mechanisms and collaboration with the private sector are key for EbA in a long run.** Apart from the allocation of public funds for EbA projects, Peru will require the mobilization of new and additional funding to tackle the financing gap. For instance, private sector involvement in the context of innovative direct financing models for EbA could help bridge this gap. However, there are only few examples of such initiatives to learn from, one of them being the Microfinance for Ecosystem-based Adaptation (MEbA)<sup>n</sup> in the agricultural sector, implemented by the United Nations Development Programme in Peru and Colombia. Other examples include the insurance sector with special relevance for the agricultural sector and the coastal zone of Peru. It is therefore essential to better understand what motivates and enables private sector engagement in order to foster additional financing for EbA.

**Exploring incentives in the mining sector through compensation schemes aligned with the social responsibility policies could enhance financing of EbA actions in the affected region, increase awareness and improve climate-smart practices.** Mining operates in many regions in Peru that are under serious water stress. Since water is a necessary input for various mining processes, a direct implication of water stress due to climate change is insufficient supply for mining operations. In addition, mining causes sedimentation in rivers

<sup>n</sup> UNDP project: Microfinancing for Ecosystem-based adaptation (MEbA): <http://unepmeba.org/sobre-nosotros/soluciones-meba/>

and often affects downstream communities and their source of drinking water. Although there are legal requirements for ecosystem restoration as compensation from the mining sector, there is a potential for linking EbA with these activities and foster adaptation efforts of communities. A concrete mechanism for mainstreaming EbA could be the introduction of a 'conditioned compensation scheme' with the specific requirement to only fund EbA actions identified by the affected community. Payment for ecosystem services (PES) schemes designed for the mining sector could encourage the operating companies to adopt techniques to mitigating climate change impacts and be more beneficial to the natural environment and to the population affected by the mining activities (and climate change impacts).

#### Opportunities at regional level

**Taking into consideration the complex dynamics of ecosystems and the services they provide, EbA planning and implementation works best at the landscape level, hence regional integration and transboundary coordination are crucial, especially for the Amazon and the Andean regions.**

Taking EbA at a landscape or ecosystem scale provides multiple benefits due to coordinated efforts of diverse actors. Sometimes the higher regional level can provide a more neutral platform for dialogue, avoiding the political or financial tensions that are more prominent at the national level. Discussions at the regional level (e.g. the Andean Community, the Amazon States) can also help address EbA as a transboundary issue and contribute positively to underlying non-climatic drivers of vulnerability and conflicts (e.g. illegal deforestation, wildlife trafficking, mining). Since Peru has experience in implementing EbA projects in both the Andean and Amazonian regions, a regional initiative could provide an opportunity for dialogue on EbA and an entry point to share the lessons learned from Peru.

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