Ministry of Tourism and Environment, Albania

Project Reference No: 5386

ALBANIA: "BUILDING THE RESILIENCE OF KUNE-VAINI LAGOON THROUGH ECOSYSTEM-BASED ADAPTATION (EbA)" (SPECIAL CLIMATE CHANGE FUND)

Ecosystem-Based Adaptation Technical Guidelines

April 2018

“"BUILDING THE RESILIENCE OF KUNE-V AINI LAGOON THROUGH ECOSYSTEM-BASED ADAPTATION (EbA)" (SPECIAL CLIMATE CHANGE FUND)

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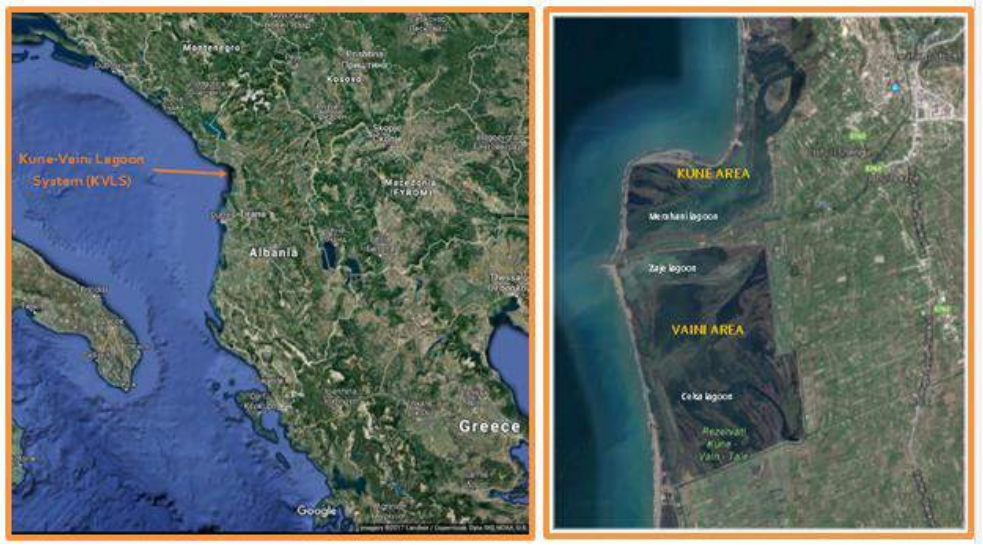
April 2018



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Acronyms

CBA	Cost-benefit Analysis
CCA	Climate Change Adaptation
DMRD	Drini-Mati River Deltas
EbA	Ecosystem-based Adaptation
EU	European Union
GDP	Gross Domestic Product
GEF	Global Environment Facility
GhG	Greenhouse Gas
GoA	Government of Albania
IEbAE	International Ecosystem-based Adaptation Expert
ICZM	Integrated Coastal Zone Management
ISPA	Institutional Support for Protected Areas in Albania
IWRM	Integrated Water Resources Management
IUCN	International Union for the Conservation of Nature
KVLS	Kune-Vaini Lagoon System
MTE	Ministry of Tourism and Environment
MARD	Ministry of Agriculture and Rural Development
MIE	Ministry of Infrastructure and Energy
NEA	National Environmental Agency
NGO	Non-Governmental Organisation
NPV	Net Present Value
PV	Present Value
REC	Regional Environmental Centre
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention on Climate Change
WB	World Bank

1. INTRODUCTION

1.1. Overview

Ecosystem-based adaptation (EbA) approaches are commonly defined as *"the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change"*[1]. This may include sustainable management, conservation and restoration of ecosystems as part of an overall adaptation strategy that takes into account the multiple social, economic and cultural co-benefits for local communities. Management, conservation and restoration of ecosystems, that are informed with climate variability and expected climate change, can hereby maintain and restore 'natural' infrastructure such as wetlands and forests, whilst reducing biodiversity loss, and maintaining or enhancing ecosystem function. Furthermore, such approaches can improve the resilience of biodiversity and ecosystems to climate change so that they can continue to provide a full suite of ecosystem services. This is particularly important for sustaining natural resources on which vulnerable communities depend for their subsistence and livelihoods, and for providing alternative livelihoods in the face of climatic uncertainty. Such approaches should have a clear and robust monitoring system to track benefits to communities vulnerable to climate change.

EbA in coastal environments is now being considered as a valid concept to help address the consequences of climate change. It represents a range of adaptive management approaches that use biodiversity and natural habitats/services as part of an overall approach towards helping coastal business and communities to better adapt to the negative effects of climate change.

1.2. Project Purpose

The design and implementation of coastal adaptation measures, using the EbA approach, is a key goal of the current GEF funded project objective (being executed by the Ministry of Environment) which involves (specifically for the Kune-Vaini Lagoon System- KVLS), a range of coastal EbA interventions that include:

- The implementation of coastal forest restoration of some sites of the Ceka. These areas have deteriorated over a number of years, and support is needed to help stabilize the sandy dunes and restore the damaged natural habitats, selecting native plants resilient to climate change.
- Dune rehabilitation. Stabilizing the upper level of the sand dunes, to control erosion caused by normal tide/wave activities and wind erosion, by planting native water and salt resistant species.
- Opening a new tidal inlet channel between the Ceka Lagoon and the Adriatic Sea;
- Purpose of these EbA Technical Guidelines

Building on the technical "EbA Protocols" document recently produced by McCue (2017), which focused on engineering and implementation support for future delivery of EbA project interventions, this **EbA Technical**

[1] CBD COP 10 Decision X/33

Guideline Report is designed for policy decision makers to help support the future planning and implementation of EbA interventions.

This Guideline is produced in partnership with local Albanian experts and shall be used to develop and deliver EbA related training (during 2018) to all relevant government staff. It is designed as a "step-by-step" guide towards setting up future EbA interventions within defined coastal zone of Albania. It promotes an integrated approach to EbA with the ultimate goal of "building resilience of socio-ecological systems". Additionally, the Guideline introduces the reader to the building blocks of an EbA strategy and how these can be developed, including summary Annexes on current institutional, legislative and regulatory approaches currently being used. It is designed to be accessible (translated) for a broad audience of Albania policy makers who work in a variety of development fields and are not necessarily experienced in ecosystem management.

1.3. Structure of the Guideline

The Guideline structure is set out as follows:

1. Section 1: Introduction;
2. Section2: Mainstreaming EbA in Albania;
3. Section 3: Guidelines for Ecosystem based Approaches to Adaptation (Stepped Approach);
4. References;
5. Annexes.

2. MAINSTREAMING ECOSYSTEM-BASED ADAPTATION IN ALBANIA

2.1. Approach to Mainstreaming EbA and Climate Resilience

2.1.1. Why do it?

Increasingly, countries are realizing that, in the long term, climate change adaptation needs to be supported by an integrated, cross-cutting policy approach (in other words, mainstreamed into national development planning). Options for such "mainstreaming" in Albania may appear somewhat chaotic as there are over 40 separate pieces of legislation which address environmental matters. There are numerous government related agencies that are involved in activities which, in varying degrees, may perform functions relevant to the management of the environment. These agencies can be placed into several broad categories:

- There is control at the ministerial level;
- There is control at the level of departments of government, such as the Fisheries Division;
- There is control by certain statutory bodies (boards, tribunals, authorities and commissions);
- There are government-owned or controlled companies that are charged with developing an industrial estate and which introduced environmental requirements in leases;
- Finally, there are the municipal corporations made up of the elected local government officials, which also perform certain environmental functions. The Ministry of Environment (MoE) advised that there are some 50 agencies with environmental functions.

The multiplicity of agencies serving environmental functions has resulted in a somewhat uncoordinated approach to environmental management. This is likely to influence the approach towards dealing with climate change. In spite of this lack of focus, the wellbeing and security of Albanians depend on equitable, continuous and environmentally sound access to the benefits that forests, wetlands and sustainable agricultural lands provide. For the most part, these benefits or "ecosystem services" certainly play a key role in climate change adaptation either by (i) providing Albanian people with food and clean water – thus reducing vulnerabilities and boosting livelihoods - or (ii) by regulating climate and controlling floods, thereby weakening actual or potential climate-related hazards.

Policy rationalization and harmonization and inter-agency coordination will be critical to ensuring inclusion of climate change considerations into coastal management within Albania. It is this absence for institutional and organisational cooperation and coordination that forms the underpinning basis for future EbA mainstreaming.

2.2. The Benefits of Mainstreaming

Climate change is already affecting development in Albania. Rising sea level and changing rainfall patterns are challenging infrastructure, water supply, agriculture, fisheries and natural ecosystems. Extreme weather events such as floods, droughts and cyclones are having significant impacts from the household level up to the level of national economies. Under current climate change scenarios these impacts can be expected to worsen in the coming decades.

Mainstreaming climate change is not a new concept in many countries, but it has become increasingly popular since the late 1990s as a means to (more effectively) tackle increasing development issues such as environmental degradation. The idea is that a cross-cutting issue should be a central feature of national planning and the supporting delivery of all public and private sector activities of development as opposed to it being addressed as separate sectoral initiatives. Mainstreaming climate change has often been described as a 'holistic' or 'development-first' approach, whereby adaptation (and mitigation) objectives are integrated within all stakeholder agendas. In other words, climate change risks are not addressed through separate initiatives but inform ongoing policy-making, planning and activities across all sectors (Klein et al., 2007; Olhoff and Schaer, 2010).

Mainstreaming climate change within Integrated Coastal Zone Management (ICZM) is a way of reducing these potential impacts on coastal developments, by seeking to improve forward thinking and hence planning incorporating climate risks into all development planning decisions. It needs to be addressed by all government agencies, at all levels of government, and across all sectors (e.g. finance, health, agriculture, and environment), as well as by civil society and the private sector. In fact, when climate risk is explicitly considered and incorporated into policies, plans and practice, development efforts become more resilient to climate uncertainty, and hence more likely to reach their developmental planning objectives leading to more sustainable development and more resilient communities. Indeed, should climate change not be mainstreamed into decision making, there is a real risk that development goals will not be achieved.

The most effective route to mainstreaming is believed to be achieved through an integrated 'whole-of-government' approach, preferably coordinated at the highest level of government. Good governance, reflected in vision, commitment, transparency and accountability, provides a vital foundation for climate change mainstreaming. It may therefore be stated that:

1. raising awareness of climate change, and adaptation options that are available, is an important first step towards mainstreaming within the general population.
2. mainstreaming at the strategic level refers to incorporating climate risks into strategies, policies and plans usually at the national level, but also at other strategic levels.

2.3. The Role of Ecosystem-based Adaptation (EbA)

EbA can provide a structure to ensure mainstreaming leads to an integrated and holistic approach that promotes an effective way to respond to climate change (Figure 2.1). This is because:

1. EbA is based on a comprehensive understanding of the ecosystem and articulation of the full set of societal objectives to be met.

2. EbA integrates the people who make decisions about, can inform or have a stake in how an ecosystem is managed, including relevant policymakers, managers, stakeholders and scientists.
3. EbA uses a process of adaptive management that makes it possible to learn from and continuously improve management actions.
4. EbA encourages a foundation that includes a legal framework that supports multi-sectoral management; management structures that facilitate collaboration; financial resources that sustain implementation; and effective communications that promote integrated approaches.

Such a structure can avoid policy conflict and help to reduce risks and vulnerabilities thus leading to greater efficiency compared with managing adaptation as a series of separate sector activities. In addition, such an approach can with the leverage of much larger climate finance sources and amounts in all developmental sectors that are affected by climate risks than if climate financing sources were pursued separately. This is because EbA helps to make the connection between ecosystems and biodiversity and supporting policy decisions that are required to develop adaptive measures that secure longer tem resilience and improvements to human well-being (Figure 2.1).

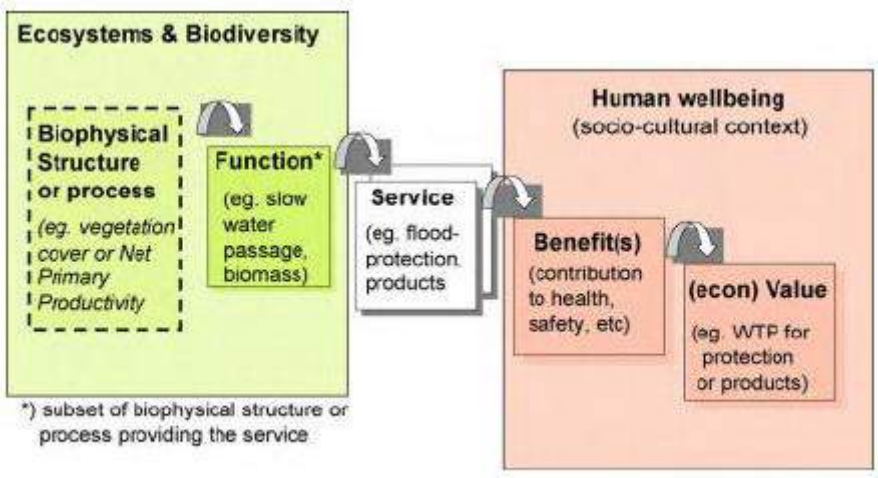

Figure 2.1: Framework for linking human well-being and ecosystem services (de Groot, Alkemade, Bratt, Hein and Willeman 2008)

The outcome of embedding EbA within an ICZM focused mainstreaming framework is that all technical sector activities will include the:

i. identification of critical coastal and marine concerns, needs and problem areas;
ii. determination of the current state of relevant coastal and marine components and systems;
iii. specification of a timeframe within which improvements in coastal and marine habitat performance and quality are to be achieved (typically by between five and twenty years);
iv. development of goals and targets for coastal and marine ecosystem performance and quality, consistent with national policies, strategic plans and objectives;
v. identification of actions and activities that are required to meet the specified targets;
vi. identification of the implementers and sourcing of financing;
vii. identification and implementation of a system to achieve changes in coastal and marine ecosystem performance and quality;

viii. review of progress at pre-determined intervals (i.e.: monitoring of indicators over time to measure effectiveness of the measure implemented); and
ix. improvement of feedback mechanisms (i.e.: information from the review process into the implementation process).

EbA can, therefore, help structure mainstreaming at different levels make the trade-off decisions between climate change and development and avoid maladaptation. For example, when stakeholders understand climate change and the risks it brings, they can incorporate these risks into their own decision making. Mainstreaming of climate risks is relevant across all levels of development decisions.

2.4. Current Barriers towards Implementing EbA

Within Albania, the effective implementation of EbA concepts into climate change adaptation measures or interventions can be faced with some constraints or barriers as follows:

- The adopted national laws/regulations may not be in line with climate change policy and regulations;
- Weak implementation of national laws/regulations related to environment and climate change;
- The construction of tourist infrastructure, especially in coastal areas, has been made without considering climate change risks and hazards such as extreme flood and storm events, shoreline erosion, and drought;
- Not all approved regional/local development plans have taken in consideration climate change adaptation practices or measures;
- Adaptive capacity is particularly low among smallholder farmers in Albania, who have limited access to financial resources;
- Lack capacity on effective early warning systems for emergency plans for climate change risks;
- Not all developed sectoral strategies of national economy have considered climate change risks and adaption measures;
- Low human resource capacity and experience on EbA and ecosystem protection techniques;
- Lack of capacity and experience to develop a comprehensive national adaptation plan for climate change adaption and its integration in national, local and crosscutting strategies;
- Lack of data availability and accessibility for all national entities; institute of Geosciences, energy, Water and environment (hydro-meteorological data), Albanian Geographical Survey, etc.;
- Lack of private financial resources to implement change adaptation measures or interventions;
- Lack of public financial resources (local government) to implement change adaptation measures or interventions; etc.

Attempts to counter these barriers are presented within the remainder of this EbA Guideline document. Section 2.5 introduces some useful "entry points" that may be used to assist how EbA may be better mainstreamed into national policy setting.

2.5. Entry Points for EbA Mainstreaming

2.5.1. Overview

There are multiple entry points for mainstreaming EbA and CCA into the planning and development process in Albania. However, regardless of which entry point is used, mainstreaming is essentially about integration of climate risks into national planning and development. For example, it can be achieved at a strategic level when developing or revising national sustainable development plans, sectoral policy and plans, or when developing community-based strategic plans (see Annex 1). It can also be 'added-on' to an existing strategic instrument, i.e. an existing policy or plan can be retrospectively 'climate-proofed'. Mainstreaming can also take place at an 'on-the-ground level' mainstreaming that integrates climate risk considerations into local economic, social and environmental development projects, as well as identifying and implementing climate-oriented initiatives to reduce specific risks, manage residual risk, and/or build resilience of targeted communities.

The following sub-sections outline each approach in more detail.

2.5.2. Strategic Level Mainstreaming

Mainstreaming at the strategic level refers to incorporating climate risks into strategies, policies and plans usually at the national level, but also at other strategic levels. Planning at the national level provides the overall framework within which sectoral and other sub-national levels operate. The national level is where the policy goals from long-term visions and national development strategies are translated into actions plans and budgets. Key planning interventions often include applying a "climate lens" to sectoral plans and initiating new programmes to enable adaptation which may, for example, reallocate funds to more vulnerable sectors or regions.

Mainstreaming adaptation often starts at the national level as this is where overall political responsibility is located. This level is essential for climate change adaptation efforts because it plays following roles:

- Provide guiding policy framework;
- Establish legislation and regulation;
- Co-ordinate sectoral policies and ministries;
- Provide the focal point of international relationship;
- Interface with development partners.

Within a sector there are often several entry points that are possible (see Figure 2.2). Entry Points I and II apply to the sub – heading "strategic mainstreaming" as follows. Until recently, national agencies and the development community seldom considered the threats posed by climate change to lives and livelihoods during development planning. This approach is changing slowly as climate change adaptation rapidly gains importance on national and international agendas. National climate change adaptation strategies (Entry Point I – see Figure 2.2) need to be better mainstreamed into other development initiatives such as poverty reduction strategies, country strategies and sector plans.

In light of the above, while there are many possible entry points at the national level, it is essential to have a strong agency that possesses the authority and capacity as the "champion" of any adaptation initiative. This will help to ensure effective coordination and helps to avoid redundancy and/or inefficiencies amongst the

various agencies involved. It also helps to ensure that coastal climate change adaptation (as a key sector) finds a consistent budget line within national budgets. In some cases the most effective approach to help achieve this is to create a national coordination committee, chaired by a government department with authority, such as a country's planning or finance department. Nationally, an inter-Ministerial Working Group on Climate Change (iMWG) is already in existence, which is leading the preparation of the National Adaptation Program (NAP) to identify priority activities that respond to urgent and immediate needs to adapt to climate change. Additionally, the National Adaptation Programme of Action (NAPA) carried out through the United Nations Framework Convention on Climate Change (UNFCCC) has led some countries to examine several facets of EbA and climate change and the need for adaptation measures. It provides support towards mainstreaming and implementing climate adaptation. However, having a NAPA does not immediately translate to effective EbA or climate change mainstreaming. Of relevance to this discussion, Albania is currently a Candidate Country for accession to the European Union and as such, has embarked on a formal process to 'approximate' its legislation and policy framework to align with EU requirements under the "Stabilization and Association Agreement". Therefore, in accordance with EU Policy on Climate Change Adaptation, the mainstreaming of climate change mitigation and adaptation has started to integrate actively to Albanian national policy and development programs.

Within the recently approved National Strategy for Development and Integration 2015-2020 (NSDI) by DCM No. 348, dated 11.05.2016, the adoption to climate changes is noted as one of the main issues of sustainable national development. Thus, some activities are highlighted, as following:

- ✓ implementation of climate changes adoption measures in territorial and urban planning;
- ✓ intervention of climate changes adoption measures especially on coastal development plans and programs as these areas are threaten by coastal erosion;
- ✓ application of climate changes adoption measures on forest, water and agriculture management;
- ✓ improvement of human health on considering climate changes, etc.

Furthermore, in the draft law "for Climate Changes" dated 15.03.2017, on paragraph number 26 "Strategy and National Adoption Plan (NAP)" is highlighted that all relevant ministries to climate changes have to mainstream EbA measures in actual strategies and in NSDI, as well to be integrated appropriately in relevant implementation plans and programs (see Annex 1 for further information).

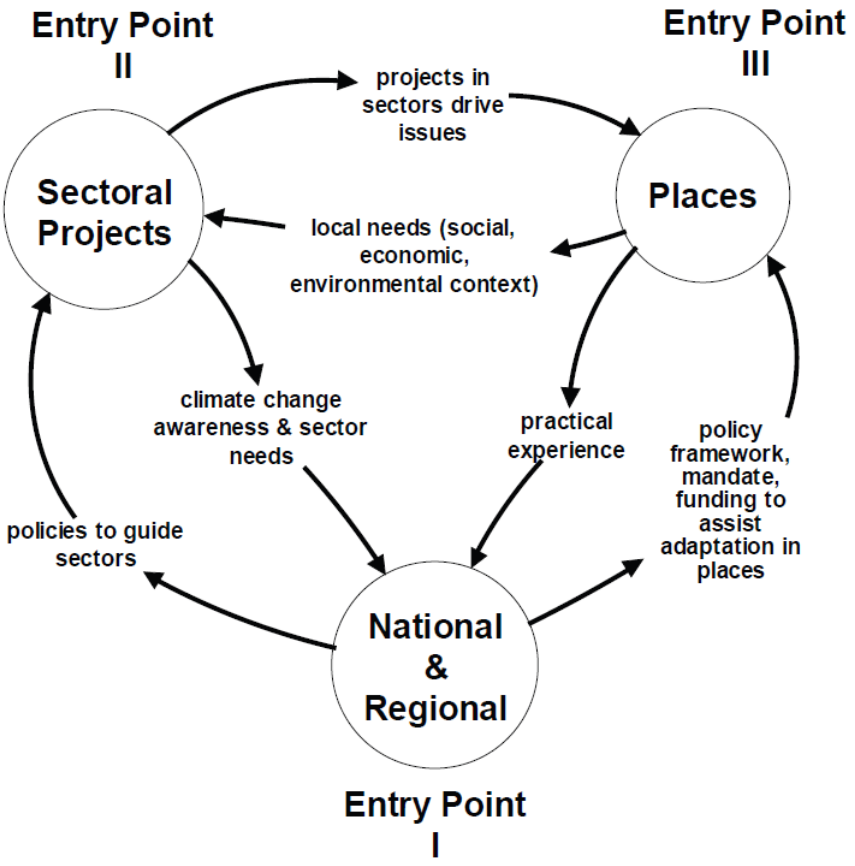

Figure 2.2: Climate Change Mainstreaming Entry Points and how each reinforces each other and contributes to a more integrated strategy (from USAid 2009).

Some further entry points for climate change mainstreaming in Albania are identified and respective stakeholder / institutions for policy formulation and implementation, which are presented in the Table 2.1.

Table 2.1: Identified Entry points to mainstream EbA in Albania

Entry point	Stakeholder / Institution	Document for Mainstreaming EbA measures
EU accession Policies and legislation	Government of Albania	Approximation of National legislation on align with EU requirements by including recognition of climate risk and adaption
National Strategy for Development and Integration 2015 - 2020 (NSDI)	Government of Albania and Relevant Ministries	Incorporation of Climate lens and EbA measures on National policies and strategies and on national and regional development plans and programs;
The Environment Cross-Cutting Strategy	Ministry of Tourism and Environment	Incorporation of Climate lens and EbA measures on National environmental policies and strategies
National annual budget	Government of Albania and Ministry of Finance	Allocation of funds for adaptation specific activities and more funding for vulnerable

		sectors or regions
Other Sectoral/Cross Sectoral policy and Strategies	Ministry of Infrastructure and Energy; Ministry of Agriculture and Rural Development; Ministry of Health and Social Protection	Integration of EbA policy and measures to sector-level development plans and budget envelope

With reference to (Entry Point II), sectoral investments often emanate from national goals and strategies, which define specific strategies for various sectors (livelihoods, food security, water accessibility, energy, infrastructure, health, safety, biodiversity conservation). This can often be an effective starting point for mainstreaming adaptation, and for securing funds for effective implementation through capital investment plans, donors or other financing organizations. This often compliments current donor strategies and thinking towards how to mainstream climate change into existing development frameworks and sectoral investments. This is important as development banks are becoming increasingly concerned that a considerable amount of infrastructure investments remain at risk from the direct impacts from climate change. In fact it is estimated that 25% of the World Bank's portfolio may be at such risk (World Bank, 2006). This may, in turn, increase community vulnerabilities. For example, infrastructure on the coast that cannot be adapted to withstand the impacts of climate change may expose more coastal communities, livelihoods and assets to coastal flooding and erosion risk. In response, organizations have developed screening tools and guidelines for integrating climate change concerns into development assistance. The Inter-American Development Bank (IADB) (for example in Barbados as part of the current Coastal Risk Management Programme - CRMP) are requesting the donor recipient countries that any plans for sectoral investments (e.g., tourism, fisheries) consider climate change issues in all components of the projects they fund, including in project identification, assessment, ranking and selection, administrative design, financing, and throughout monitoring and evaluation. A similar "model" will be requested for Albania for improved implementation into 2018 and beyond.

Tourism development investments for specific coastal sites (in Albania) must be able to demonstrate and account for dynamic shoreline processes, natural hazards such as potential flooding and storm events, and the effects of climate change that can accelerate, intensify or alter the coastal conditions required for successful tourism. Figure 2.3 illustrates (as an example) the significance of mainstreaming coastal adaptation in tourism. The centre column lists the coastal conditions needed to ensure the success of a tourism investment. On the left side are threats that degrade critical features of coastal tourism. This includes those that are generated by unsustainable tourism development itself, and those that are provoked by the impacts of climate change. On the right side are a list of tourism adaptation measures that reduce or avoid the effects of climate change and inappropriate tourism development.

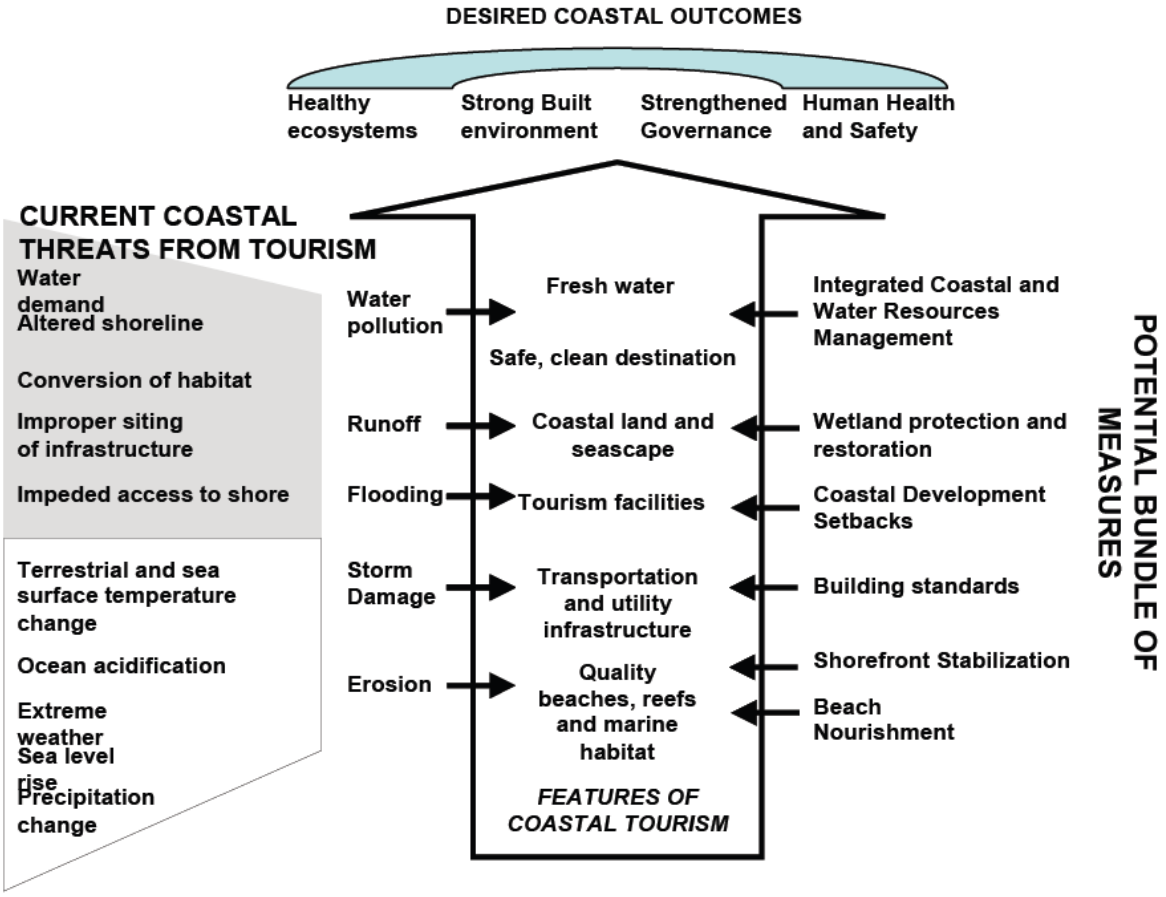

Figure 2.3: Mainstreaming Adaptation into coastal Tourism (from USAid 2009).

In efforts to mainstream at the Sectoral level (Entry Point II – see Figure 2.2), it is important to think about existing processes where planning and capital investments are designed. Within a typical project cycle, there are several opportunities to mainstream climate change including the following:

a) Project programming stage - Vulnerability assessment outcomes can be incorporated into Albanian country strategy documents.

b) Project identification - Identify ICZM planning options and implement actions for adaptation.

c) Preparation, appraisal, approval - include criteria for assessing the project's climate-sensitivity and proposed adaptation.

d) Monitoring and evaluation – does the project appropriately anticipate and address climate change and vulnerability concerns?

2.5.3. On-the-Ground Mainstreaming

On-the-ground mainstreaming of climate change (Entry Point III – see Figure 2.2) means ensuring that current and future climate risks are considered from planning and development stages of any activity to implementation and monitoring and evaluation. On the ground mainstreaming (local delivery) can be considered as the operational actions that emerge from a strategic-level of CCA mainstreaming. This

operational level mainstreaming has two core objectives, namely 'climate proofing' and 'building adaptive capacity'. Climate proofing is a means to ensure that development interventions are resilient over the long term, reducing climate-related risks to 'acceptable levels' (Olhoff and Schaer, 2010). Building adaptive capacity implies enhancing (and not inadvertently constraining) the ability of individuals, communities or institutions to respond to climate change (Care, 2009).

On-the-ground (local) mainstreaming is therefore about reducing context-specific risks, managing residual risks and/or building resilience of targeted communities, including integrating climate risk considerations into economic, social and environmental development projects. On-the-ground initiatives produce clearly specified outputs, and at times specific outcomes, within a defined time period and budget. Consequently, Entry Point III is often seen as a more preferable option as opposed to Entry Points I and II (starting with overarching national plans and policies, or sectoral development). The reason behind this is that municipalities, districts, provinces, and other sub-national entities already play an important role in disaster response and natural hazard planning on the coast. They often implement or co-sponsor local infrastructure, health and development projects. Therefore, although mainstreaming cross-cutting coastal adaptation issues within overall government may appear difficult to achieve and time consuming, it can prove less costly to undertake when local stakeholders take ownership of the actions and the benefits to be gained are shared with national decision makers.

It is important to stress that Entry Point III is not solely restricted to existing administrative entities. Ecosystems such as coral reef systems, estuaries, coastal watersheds, and wetland habitats, are compelling focal points for adaptation planning as they also form the logical unit for scientific studies (USAid 2009). Coastal shoreline systems, whether altered or natural, that are already subject to a mix of uses e.g., settlements, tourism, fisheries, recreation, and marine transportation also need to be studied from an ecosystem perspective. Users of such areas must recognize that their continued use and benefits depend on the integrity of a functioning ecosystem.

2.6. Mainstreaming Principles and Policy Protocols

There are some key differences between mainstreaming at the "strategic" (presented in Section 2.5.2) and "on-the-ground" levels, and these are essentially temporal and spatial in scope. For example, strategic level responses to climate change by governments often create the enabling environment (policies, plans and legislations) for government agencies to engage with climate risk reduction and risk management, and for private sector and communities to take their own steps to reduce their risks and manage residual risks. These strategic instruments are also used by government agencies to engage with development partners to secure their financial and other support. It is therefore important that the Government of Albania considers the approach needed for mainstreaming EbA principles and policy protocols for the future (2018 onwards). It is hereby recommended that early consideration is given to the following three primary considerations:

- the need for shoreline management created by the existing or intended upland use;
- the risks created by shoreline and upland management alternatives; and
- the goal of preserving or enhancing ecosystem services that provide public benefits.

Individual permit reviews begin from the assumption that the intended use represents an informed local decision about the consequences of development options for the shoreline reach and local watershed. From this basis, project review is intended to identify preferred management alternatives that:

1. **allow the use permitted by zoning**

This step involves elimination of coastal adaptation alternatives that would prohibit intended use of a coastal site. It does not, however, avoid consideration of altered site planning or reduced intensity of use that may lessen risk and/or minimize impacts to ecosystem services.

2. **reduce on-site risks to both use and ecosystem services**

This involves preserving and/or enhancing the riparian buffer to the maximum extent possible consistent with the intended use. It also involves consideration of the long term impacts of the site design for water quality, habitat, and sediment stabilization in the riparian and littoral zones.

3. **reduce off-site risks to existing uses and ecosystem services**

This step seeks to ensure that the on-site coastal adaptation alternatives do not increase risks on adjacent properties for existing uses. This includes consideration of increased erosion potential, decreased sediment supply, and increased risk to existing defensive structures. This assessment also considers the impacts of alternative management strategies on the ecosystem services (particularly water quality and habitat) currently provided by adjacent properties.

4. **maximize the potential for the site provide ecosystem services that benefit the public**

Within the constraints of the foregoing considerations, the management alternatives that provide the greatest potential for sustained ecosystem services on-site will be identified as the preferred strategy.

2.7.Use of Technical "model" Approaches to Identify EbA Alternatives

To better determine alternative coastal EbA approaches of relevance to specific situations, a number of technical methodologies and "models" can be used to help determine future scenarios based on available baseline datasets. The following text is supported with additional exemplar text presented in Annex B.

2.7.1. River Flood and Climate Models

River floods are the most common natural disaster in Albania resulting in large economic losses through direct damage to infrastructure, property, and agricultural land and through indirect losses within flooded areas and beyond. The costs arising from floods have increased rapidly during the last decades, although the observed upward trend in flood damage can be attributed largely to socioeconomic factors. Global warming associated with deforestation, poor land management is expected to increase the erosion degrading ecosystems. The last decade intensity, magnitude and frequency of extreme precipitation it was a frequent event. Estimates of changes in the frequency / severity of river floods are based on simulations using the LISFLOOD hydrological (applied in EU countries also from Institute of Environment and Energy). This model is developing or operational flood forecasting at the river basin scale and is a combination of a grid-based water-

balance model and a one dimensional hydrodynamic channel flow-routing model. Because it is spatially distributed, the model can take account of the spatial variation in land use, soil properties, and climate variables. From the calculated flood inundation depths, expected annual economic damage and the population exposed are estimated using country-specific flood depth–damage functions, information on land use, and data on population density. An example approach adopted in Albania is presented in Box 1.

Box 1. Buna Drini Delta climate change "Model"

This "Model" is based on the "Integrated Methodological Framework" (KMI), which includes various sectoral interests and complexities of their administration. In particular, the integrated approach combines consideration of socio-economic and physical issues and proposes unified measures and responses to them. The benefits of this integrated approach are the potentials for win-win solutions in which tackling the problems of one sector can bring benefits to other sectors, creating economies of scale through joint reactions, along with reducing the likelihood of conflict between sectoral interests, both at the level of natural resource management and at the level of economic planning. Integrated approach also facilitates cross-sectoral issues / problems such as climate change. Several methods are used in the monitoring and management evaluation process. In our country, the "Management Effectiveness Tracking Method (METM)" was applied. The use of METM helps managers track the progress in implementing certain measures for protected areas, ranging from Rapid Evaluation to Priority Methodology, under the Convention on Biological Diversity. The method is generally used in cases where it can help monitor progress towards improving management effectiveness.

Historical view

Coastal regimes have changed due to sediment erosion and deposition caused by wind, tidal, wave and floods of the Buna, Drini and Mati rivers. The coastal strip of Drini Buna delta has been drawn to some parts of the coast in the mouth of Buna with about 500 m since 1936 and about 50 m in the last 20 years. This coastal area is a protected zone. "Protected areas are most effective when they have good capacity, efficient management, agreed governance structures and strong support from local and resident communities. Ideally protected areas and conservation needs should be integrated into wider landscape and seascape strategies. The best protected areas are inspirational models for maintenance and management of natural ecosystems. In many places where population or development pressures are particularly strong, protected areas are the only remaining natural ecosystems and thus play a particularly critical role in regulating the supply of ecosystem services."

Impacts

Important impacts on the functioning of the ecosystem have been observed in recent decades: (i) erosion of soil adjacent to the rivers, (ii) the natural mode and natural course of sediment and water flow of Buna are broken, (iii) eutrophication is present in transitional and coastal waters (iv) the biological status of surface water was assessed as weak, (v) Some local and varietal (agricultural) cultivars are falling and disappearing and (vi) Flood risks have increased. The frequency and intensity of flooding has increased - two flood incidents in 2010 were the worst recorded in the last 80 years. Reduction of the bird population is estimated at 10-20% - however, no field monitoring program is being implemented to verify these figures. The suitability of the Buna Delta for propagation of migratory birds has been damaged. Accurate impacts cannot be assessed as data is limited due to the lack of regular and co-ordinated monitoring at national and transboundary levels. There is a decrease in the quantity of fish caught in the last 25 years at the level of 20-80% depending on the species (according to the Albanian fishing association).

Definition of Management areas by habitat importance approach

- Sub-Zone of Central (GO), to which the first degree of protection applies. Extremely high natural performance, with little or no concern on human activity. Priority is given to the overall preservation of nature, biodiversity, endangered species, nature monuments, unique landscaping, seaside, extraordinary natural morphological features without the need for permanent remedial interventions, which are managed in such a way that preserve the natural state, support the facilitation of scientific research and environmental monitoring.
- Effective Sub-Zone of Management (ZME), to which the second degree of protection applies. High natural performances, with very important natural habitats or settlements with rare and endangered species. Priority is the overall conservation of biodiversity, natural areas, physiographic and scenic areas for spiritual, scientific, educational purposes, integrating the management of the protected area with sustainable and balanced use. It is characterized by ecosystems, landscape values and other values of nature in which, activities that are not inconsistent with the purpose of protection and management objectives can be exercised. Only environmental ecotourism, education according to the rules, and clear limitations for the subzone are allowed.
- Sub-Recreation Area (ZR), to which the third degree of protection applies. Good natural performance. It is defined as a subzone that has adequate ground, water and sub-surface area and should ensure that the harmonious interaction of nature with culture is not affected by the protection of landscape quality, the continued use of land, waters, seashore and sea, in a traditional way ; of construction practices and social and cultural manifestations of traditional and traditional. Eliminate or prevent, where necessary, the use of land, waters, seaside and seawater, carrying out activities that are inappropriate in size and content. Allow opportunities for education, outdoor and submarine recreation, non-massive sports activities, entertainment and facilities that respect the functions of the protected area, ecological values, natural and cultural landscape.
- Sustainable Development Sub-Zone (SDD), to which the third degree of protection applies. Sufficient natural performance.

Priority is given to the harmonization of conservation of nature, landscaping and biodiversity, coordinating the management of the protected area with sustainable economic and social development.

www.al.undp.org/.../identification-and-implementation-of-adaptation

2.7.2. Erosion Vulnerability Assessment

Soil erosion in Albania remains a permanent problem for land use and is a persistent environmental problem in agriculture. For more than two decades, conditions that enhance and exacerbate erosion for erosion have occurred. Some of the factors that influence erosion are climate conditions, such as rainfall (amount, intensity, and frequency), temperature, physical characteristics of soil; relief (slope) and land use; vegetation cover degradation (deforestation, fires, overgrazing, etc.); topography modifications (construction of roads, urban centers, etc.); water management policy (sewers, hydro works, dikes, etc.). Land erosion is estimated to be at high levels in all river basins and especially along the Seman and Shkumbini rivers. Measures to prevent erosion are often missing or not appropriate to the local situation. Sporadic investments have been undertaken only along some streams in the vicinity of residential areas or next to road axes. Agronomic practices in these areas are orientated towards pasture plants (alfalfa), contributing to better protection of the soil from erosion.

The risk to agricultural lands at from erosion is considered moderate to high. Official data show that about 167,646 ha or 25% of agricultural land the potential danger from erosion is moderate, while about 442,200 ha or 75% of land the danger is high. Cultivation of nuts and olives has led to a positive contribution in protecting land from erosion. Management practices of community forests have improved the situation of low forest (oak), causing a positive impact on the protection of land resources. Erosion acts against the natural balance of ecosystems. Coastal areas are more susceptible to weathering than highland areas of the Center and the East. In addition to land erosion, landslides transport considerable amounts of nitrogen, which seriously damages the fertility of the land. Human activity that alters land-use causes increased levels of soil erosion (construction, tourism, etc.).

Erosion vulnerability models are often used in other countries to help classify shoreline "reaches" according to the probability that the intertidal and riparian features will persist in the face of natural events. This model assesses the potential for shoreline retreat due to erosion and/or inundation, and the potential for shoreline features, such as marshes and forested buffers, to persist. This model is used to assess the need for shoreline management to support the intended site use. The erosion vulnerability model is based on the probability that site conditions will permit significant wave energies to strike the shore. This assessment is based on an integration of: fetch (unobstructed distance over open water), nearshore bathymetry (the slope of the bottom next to the shoreline), and orientation (predominate direction the shoreline reach faces), and the existing erosion protection on site whether natural (marsh, reef, sand bar), or anthropogenic (bulkhead or other revetment). The assessment characterizes the shoreline segments as being at high, medium, or low risk for continuing shoreline erosion. As such, the assessment evaluates the relative need for managing a shoreline based on natural processes.

Site development impact models are also used to characterize the potential for a realized site plan to impact:

- littoral zone water quality through alteration of storm/groundwater flows and quality;
- riparian and littoral habitat services through alteration of land use/land cover; and
- riparian and intertidal sediment stability through alteration of storm water flows.

This type of model is used to identify alternative site development plans that can minimize impacts to a site's long-term capacity to provide ecosystem services with public benefits. The model is based on existing site conditions. The location and type of existing structures on the site is considered in light of the erosion vulnerability assessment. This determines if there is an obvious need for shoreline management. In the case of new development, the site plan is considered to determine if risk is being unnecessarily created in locating structures. Potential impacts to ecosystem services are evaluated by considering existing riparian and intertidal vegetation and current bank condition (stable, eroding, undercut). Alternative development strategies are indicated based on: reduction in long-term risk to structures; preservation/enhancement of vegetative cover; preservation/enhancement of contact between vegetation and runoff/shallow groundwater flows; and minimization of any disruption of connections between riparian, intertidal and subaqueous environments.

Box 2 outlines an erosion vulnerability model that has been applied for the Drini Mati Rivers Vulnerability Assessment exercise undertaken by UNDP (2015).

Box 2: Approach to Erosion Vulnerability Assessments - Drini Mati Rivers Vulnerability Assessment exercise	
Steps of a vulnerability assessment	**Description of DMRD scope, data, exposure, adaption option, prioritizing actions, adaption measures and monitoring**
Identification of scope	The "Identification of adaptation response measures in the DMRD" project has carried out a range of studies producing (23 reports) covering the natural ecosystems, two principle economic sectors (agriculture and tourism) and focused studies covering features and information requirements needed to formulate an adaptation strategy on Coastal geomorphology – erosion (and other such as Natural ecosystems, Climate change scenarios, Environmental economics, Environmental restoration, Geographic Information Systems, Hydrology/water resources, Integrated monitoring of ecosystems, Institutional analysis, Strategic adaptation planning to climate change; and Integrated Coastal Zone Management).
Baseline data	Topographical maps of sites, Sedimentation of Buna and Drini rivers, Flooding data, Biodiversity charts of sites, Bathymetric maps of sites, Information on state of coastal resources (including mangroves, seagrass, and fisheries), Management Plan, Strategic documents, Site census data (population density per village, household size, etc.), Site socio-economic profile (sources of income, location of settlements etc.), Site fisheries profile (or related information from respective fisheries or aquatic resources agency; presence or status of fish ponds, if any), Fisheries or resource use plans, Site management plans, Land use or zoning plans, Data on solid waste monitoring, Data on water quality monitoring.
Characterizing Exposure	The northern portion of the Kune sub cell is also characterised by erosion that places the Merxhani Lagoon at threat from marine inundation. At the same time towards the south the lagoon mouth could close and cut-off the exchange of water between the lagoon and the Adriatic Sea at the same time as high sedimentation is making the lagoon shallower. To negate the need for continued excavation of the river mouth, a shore-normal breakwater was constructed between 2007 and 2009 out from the beach on the south side of the river. This structure is a barrier to sediment entering the Drini River mouth and reaching Kune Beach; sediment is building up against the southern side of the breakwater leading to enhanced erosion of Kune Beach (over and above its already high rate of erosion). Historically, the Drini River was a major supplier of sediment to the coastal zone, but now, major diversions and construction of dams along its course in the interior have reduced this supply significantly. Very little sediment now enters the coastal zone from the Drini River; this is the main reason for the overall sediment starvation and erosion of the Kune and northern Vaini-Patok sub cells. Within the Vaini-Patok sub cell, the Mati River has been managed in the 1970s to control flow further south to convert areas adjacent to Patok Lagoon to freshwater wetland suitable for agricultural reclamation. So, the key factor causing coastal erosion along the Kune and northern Vaini-Patok littoral cell is low sediment supply, manifested in three main ways: -Reduced sediment input to the coast from the Drini River due to upstream diversion;

	-Changing location of the Drini River mouth as a result of anthropogenic effects; and -Alteration of longshore sediment transport rates due to construction of a breakwater south of the Drini River mouth.
Change of impact on time	The DMRD coastline is extremely dynamic and a prediction of the alignment of the coastline in 2100 with no management interventions (a do nothing approach) is difficult. Some general statements can be made regarding the potential long-term evolution of the geomorphological system components over the next 90 years or so: -Shëngjini Beach north will continue to accrete in the lee of the port breakwater. With a growth rate of 2 m/year, by 2100 the beach will be approximately 180 m wider in comparison to the present day; -Shëngjini Beach south will continue to erode. With a future erosion rate of 3 m per year (the current average rate higher estimated to increase sea level) the beach will be 270 m inland compared to nowadays. This could result in loss of the track, buildings in the linear settlement, and a large area of the wetland; -Most of Kune Spit will be eroded and Merxhani Lagoon will be lost. With a future erosion rate 3m/year, the larger part of litoral will be lost in sea by 2100 and the main shoreline will be adjacent to the flood embankment at the back of the lagoon; -The continued presence of the Drini River breakwater will result in the disappearance of Kune Beach; -Kune Island will be separated permanently from the mainland and be much smaller than today due to continued erosion; -Sand will continue to build up in the lee of the Drini River breakwater. With a growth rate of 2 m/year, by near 2100 the beach will be approximately 180 m wider in comparison to the present day; -North Tale Beach will continue to migrate landward, but Zaje and Ceka Lagoons will be preserved as the buffer zone is wide enough to prevent total loss; -South Tale beach will continue to be stable; and -The Mati River spit will join the spit growing north from Ishmi Beach, and will seal the Patok Lagoon tidal inlet to form a continuous barrier. In summary, much of the existing beach-barrier, spit and lagoon system between Shëngjini Beach and the Drini River will be lost and will leave an open coastline aligned with the current flood embankments. Shëngjini Beach will be approximately 300 m inland of its current position.
Identifying adaption option	The adaptation programme for DMRD has four inter-related themes/goals to develop: (i) Resilient natural environment, (ii) Resilient infrastructure and buildings, (iii) Resilient economy, and (iv) Resilient society. Based on the sectorial analysis of climate change effects, a strategic risk assessment with the active participation of local community was undertaken to address the potential impacts of climate change in the DMRD region. The objective of the risk assessment was threefold: -Identify and prioritise the potential risks of climate change to the DMRD region. -Identify and prioritise adaptation strategies to address the identified impacts. -Build capacity of DMRD stakeholders (regional and local) to evaluate the impacts of climate change and develop adaptation strategies. The aim was to engage stakeholders throughout the DMRD region in identifying, analysing and evaluating the potential impacts of climate change, with the subsequent task of identifying adaptation strategies to address the identified risks. A risk assessment template (Microsoft Excel based tool) was developed and applied to undertake the risk assessment. Risk is a combination of consequence and likelihood. Therefore, risk analysis involved establishing the likelihood that the risk will occur, and the consequences of that risk arising. Risks to community, ecosystems and the natural (hydrology) and built environment were considered.
Prioritizing actions	A total of 42 risks across the areas of community, ecosystems, and natural and built environment were identified for the DMRD. Almost one-third of risks were allocated a medium and high risk rating, while the highest percentage of risks (40 %) was extreme. Interestingly, no low risks were identified. These findings are significant in that all risks identified are assessed as requiring some form of management intervention.

	The heading criteria are: 1. *Financial Indicative Cost* - covering the secured and estimated cost and expenditure associated with the project and the sources of finance. 2. *Time Frame Criteria* - measure or action in question to the time implementation planning, that may impact on the timing or success of a proposed project. 3. *Potential Partnership* - particularly in relation to support for or opposition to a proposed project and mobilization of additional funds. 4. *Principle of Additionality Criteria* - that assesses existing institutions or related activities//measures projects that could not consider climate change issues and could provide additional values. 5. *Win-Win Criteria* - covering the wider economic framework (costs, benefits and affordability), relating directly to the nature of the project and how it can be imple
Adaptive measures	The main coastal erosion issues of the DMRD are confined to the sediment starved Shëngjini, Kune and northern Vaini-Patok littoral cells. The southern Vaini-Patok littoral sub cell is healthier because sufficient sediment enters the coastal zone from the Mati River despite the extraction of gravels (and sands) from the river bed. There are three main approaches to mitigate coastal erosion in the Shëngjini, Kune and northern Vaini-Patok littoral cells that could be considered: -Eliminate factors that exacerbate erosion such as reintroducing sediment to the coast down the Drini River and removing the Drini River breakwater; -Beach restoration strategies particularly beach nourishment and dune management to slow erosion rates; and -Structural methods of sand retention. Methods to achieve these approaches are described in the following sub-sections: 1. ***Re-introducing sediment discharge from the Drini River;*** 2. ***Remove the Drini River breakwater;*** 3. ***Beach nourishment;*** 4. ***Dune management;*** 5. ***Structural methods of sand retention;*** 6. **Water exchange;** 7. ***Tidal channel maintenance;*** 8. ***Saltmarsh restoration and flood defence;*** 9. ***Maintenance of embankments***
Monitoring	The design of an integrated monitoring system (IMS) for the DMRD to support decision-making would need to include observation: ***-meteorological*** - air pressure, temperature and humidity, precipitation, wind (velocity and its direction), solar radiation; ***-hydrological*** - sea level, river levels and discharge, groundwater level, water exchange between the sea and the lagoons; ***-physical*** - temperature; conductivity and transparency, total suspended solids, salinity.
Report "Identification and Implementation of Adaptation Response Measures in the Drini – Mati River Deltas" **(UNDP 2015)**	

3. GUIDELINE FOR ECOSYSTEM-BASED APPROACHES TO ADAPTATION

The following stepped approach (Figure 3.1) is designed to support the appropriate future deployment of coastal EbA approaches in Albania. The steps are structured to provide practical and operational advice to the Ministry of Environment in Albania and supporting government/non-government actors. The guideline is designed to help complement the review criteria to be applied on all current and future projects and programmes planned for the coastal zone of Albania.

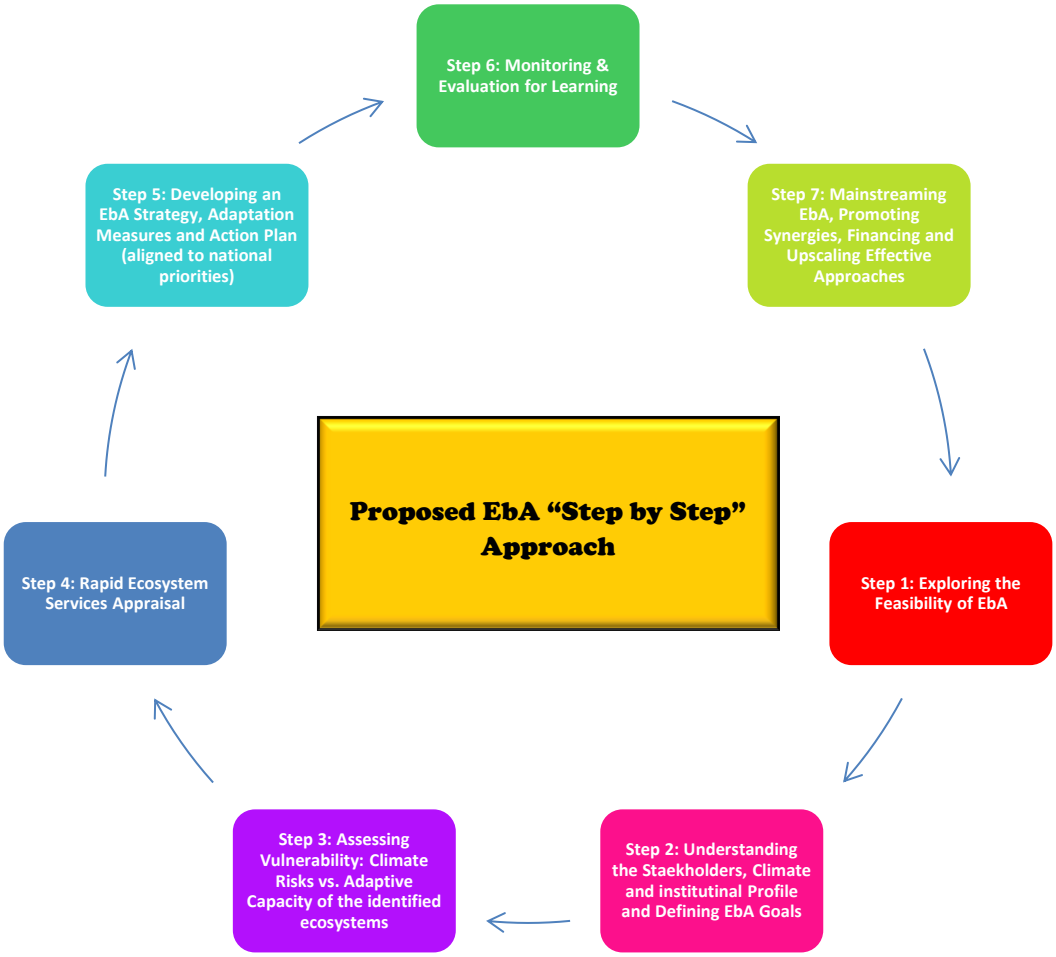

Figure 3.1: Step by Step Approach for coastal EbA in Albania

Step 1: Exploring the Feasibility of EbA

1.1 Goal of this Step

The goal of this Step is to verify whether EbA could be a suitable concept for the site under consideration. In order to do so, one has to carry out a rapid scoping to assess whether the target site, its people, and existing institutions and policies allow for the implementation of EbA. The outcome of this stage is a "**yes" or "n**o" on the suitability of the site to apply EbA.

Important to note is that the ultimate aim of EbA in any Albanian coastal situation is to contribute to increasing people's climate resilience through the delivery of "ecosystem services". The focus should be on securing those ecosystem services that benefit communities by reducing vulnerabilities or by mitigating hazards that can be triggered by changing climate patterns and extreme events.

A wide variety of ecosystem services can be considered as being "adaptation services", i.e. ecosystem services that are useful for adaptation in addition to other purposes. The local context will largely determine whether an ecosystem service should be considered or not as an "adaptation service" for the area under consideration. This is not a new, formal category of ecosystem services; instead adaptation service is just a term used in this Step (and within the Guideline) for easy reference (see Box 3).

If EbA is determined as being a suitable option for the area being considered, then multi-stakeholder engagement should be planned at the onset of the whole process. In order to ensure equitable stakeholder engagement at all stages make sure EbA workshops are timely programmed during each step of the process, aiming at:

• Convening actors from the EbA target site -and its catchment area- besides local and national experts of interest for EbA;

• Having sessions on e.g.: (a) mapping and spatial analysis; (b) risk profiling; (c) stakeholder identification; (d) institutional and policy screening; (e) ecosystem services appraisal; (f) evaluating and deciding on adaptation measures and defining M&E indicators.

1.2 Albanian Ecosystem Services

Box 3. Ecosystem Services in coastal areas of Albania

The term "ecosystem services" is usually interpreted to imply the contribution of nature to a variety of "goods and services," which in economics would normally be classified under three different categories : (1) "goods" (e.g., products obtained from ecosystems, such as resource harvests, water, and genetic material), (2) "services" (e.g., recreational and tourism benefits or certain ecological regulatory and habitat functions, such as water purification, climate regulation, erosion control, and habitat provision), and (3) cultural benefits (e.g., spiritual and religious beliefs, heritage values).

The ecosystem services in Albania are wide and varied, ranging from the agro-ecosystems that provide food to protected areas that provide sensitive habitats for birds and animals. Some of the ecosystem functions in coastal areas within Albania are presented below:

Sea food. In the coastal areas, sea-food remains an important economic activity and source of protein for local consumption and marketing. In coastal lagoons (Butrint, Karavasta, Narte, Kune Vain, Patok and Vilun)

the quantity of fish caught by fishermen is almost 20% of the total fishery. The maintenance of lagoon ecosystems is therefore directly related to the quantity and quality of fishing effort undertaken.

Coastal protection. Planted dunes and mangroves are the most effective natural protectors along for protecting the coastline. A stabilized coastline to help attenuate and dissipate waves.

River bed and delta erosion control (erosion control). Rivers in Albania are characterized by fast flowing waters sourced from mountainous areas (> 1000 m altitude) resulting in erosion of channels and delta areas where there is an absence of vegetation, especially woodlands on river banks etc. Average amount of river sediment supplied from upper catchment reaches varies from 590 to 5,600 g m3. These sediments contribute to the accretion of delta area which influences navigation routes 9need for constant dredging etc).

Equilibrium maintenance hydrological cycles. Mangrove and other vegetation in the coastal area are good regulators of hydrological cycles. They store large amounts of water near their root systems and also retain fresh water in the ponds that supply water aquifer deposits. A good percentage of the population on the coast is supplied by aquifer stock (Durres, Kavaje, Lushnje).

Water purification. The role of marine ecosystems is strongly influenced by the chemical, physical and biological quality of transitional waters. Many water quality indicators such as: salting, dissolved oxygen, quantities of macro-elements dissolved in water (N and P), heavy metals and other qualities are dependent on the functioning of the ecosystem. Many plants and trees are capable of purifying the water through their metabolic processes and phyto-extraction/phytoremediation chemical elements by avoiding eutrophication and degradation of water quality.

Maintenance of fishery. Aquatic vegetation and breeding ground provide suitable reproductive habitat and nursery ground.

1.3 Carrying out a Strategic "Landscape Analysis"

1.3.1 Why is this important?

A land use analysis at the target site is needed to understand some of the development processes in the area. Basic spatial and qualitative analysis of the landscape (including key ecosystems) and its land uses will shed light on the adaptation services. It provides a spatial and qualitative analysis of **the landscape** and its land use including key ecosystems.

GUIDING QUESTIONS
The main question to be answered here is whether the ecosystem can and will continue to provide current adaptation services if the current rate of change in land uses is maintained or increases. Through the analysis of both official and community maps – i.e. resource maps (see below) – and information that can be provided by key stakeholders, we can obtain a spatial overview and understanding of the landscapes at the target site.
Are major land uses, including natural ecosystems and agricultural systems, that are potentially providing key adaptation services mapped, and can changes (trends) affecting them be observed: i.e. which land uses are receding and which ones are becoming predominant? Can we clearly see and understand the main trends in land use?

Would ecosystems be able to keep on providing adaptation services in the future if these trends persist?
NB: "Resource maps" or "Spatial maps": these are community maps including features such as the arrangement of houses, fields, roads, rivers and other land uses and which resources are assessable and owned by the community or individuals.

1.4 Questions to Ask within this Step (Key Training Area)

1. Following the Strategic "Landscape Analysis" exercise (see Section 1.3), is the wider landscape and its land uses capable of delivering sufficient adaptation services (as will be detailed in Step 4)?
2. Are actors aware of the adaptation services delivered by ecosystems and do they value these?
3. Is there a social and institutional framework which can be strengthened and given responsibility in relation to EbA? Examples are institutions in charge of development planning, Disaster Risk Reduction (DRR) or water resources and ecosystem management.
4. Within this framework, is there experience and willingness to generate policies and actions to keep the aforementioned ecosystems in good health and able to supply key adaptation services?
5. Could the role particular ecosystems play in delivering key adaptation services be acknowledged and valued in spiritual, aesthetic, ecological and economical terms?
6. Are actors and decision makers willing to strengthen development planning policies with adaptation strategies that take adaptation services into account?

If the answer to the majority of these questions is no, then EbA would not be a suitable option for the site under consideration. If the answer to the majority of these questions is yes then one can proceed with the following six steps in this guide to set up an EbA strategy.

NOTES

Ecosystem services that are useful in terms of climate resilience – hereafter referred to as 'adaptation services' – include for instance freshwater supply, flood control and protection against storm surge. Adaptation services are at the core of any EbA intervention and are to be maintained by means of an adaptation strategy that involves sound environmental governance, wise land use practices, and ecosystem protection, restoration and sustainable management.

Step 2: Understanding the Stakeholders, Climate and Institutional Profile and Defining EbA Goals

2.1 Goal of this Step

This step will provide understanding of the context at any proposed coastal EbA target site. This is a key step and it is proposed that the following intermediate outcomes are achieved during this time:

(A) a quick overview of the **stakeholders at risk,** and of relevant institutions and land-use policies.

(B) a **climate risk profile**.

(C) an analysis of the **institutional and policy** environment for EbA.

At the end of Step 2, you will have the basic elements to design a preliminary "Theory of Change" for your EbA intervention.

2.2 Stakeholder Overview

2.2.1 Why is this important?

EbA interventions are to be designed with the participation of all actors at the target site (e.g. farmers) and, if relevant, in the wider region (e.g. Ministry of Agriculture). Their timely and continuous engagement is essential for the success of EbA, as they are the ones who have the knowledge, experience, capacities, and resources; they also run the institutions dealing with land use and climate risks on site.

In Table 3.1, key government stakeholders for the environment in Albanian are presented who have responsibilities for implementation of EbA interventions. More information about their functions are presented in Annex 1.

Table3.1. Albanian institutions which have legal responsibility for the environment

Ministries and Municipalities	Agencies and Institutions
Ministry of Tourism and Environment Ministry for Europe and Foreign Affair Ministry of Agriculture and Rural Development Ministry of Finance and Economy Ministry of Infrastructure and Energy Ministry of Health and Social Protection Municipalities and Local Government Units	The National Environmental Agency (NEA) The National Agency for Protected Areas (NAPA) Regional Environmental Directorates State Inspectorate for Environment, Forests and Water Public Health Institution National Territorial Planning Agency Territorial Development Agency The National Coast Agency National Agency of Natural Resources

GUIDING QUESTIONS
The two following types of actors are essential to any EbA intervention: (I) Actors who have an influence on land use changes and risk factors at different levels, from the community to the national level: 1. *Which stakeholders –from community to national level- are changing land uses in a way that promotes the delivery of adaptation services (i.e. they are improving the environment through sustainable land use and ecosystem restoration)?* 2. *Which stakeholders –from community to national level- are causing ecosystem degradation and, as a result, undermining the delivery of adaptation services?*
(II) Vulnerable stakeholders who are exposed to hazards and only have limited resources and capacities: 1. *Which (groups of) vulnerable stakeholders would benefit from EbA: e.g. those exposed to drought, storms, landslides and floods; those with unstable livelihoods, depending on threatened ecosystems for their living; etc.?* 2. • *How are these vulnerable actors currently coping with climate variability? How are they organized and politically positioned? How do institutions, policies and funding, assist them?*
For each type of stakeholder, determine their roles and the organization, sector or community they represent or belong to.

2.3 Climate Risk Profile

2.3.1 Why is this important?

Awareness on current climate variability and potential climate change is central to any EbA intervention. It is important to understand the current climate risk and the likely impacts faced by different social groups, land uses (including natural ecosystems), livelihoods and economic sectors.

Focus must be on understanding the risk factors of the highest relevance for the sector, resource or activity targeted by your EbA intervention (e.g. agriculture, water resources, coastal development, urban planning, etc.).

2.3.2 Climate change expected in Albania (to 2100)

Latest predictions of climate change for Albania, even under conservative scenarios, show that significant change is expected for the coastal environment as a consequence of increase temperatures, storm conditions and precipitation. These changes can be expected to have an impact on the coastal environment and supporting populations with the majority of impacts expected to lead to negative consequences. For instance, changes in temperature regimes are expected to lead to more frequent and severe droughts, more extreme solar radiation days and subsequent heat waves.

According to the Census data of 2011, the narrow coastal belt is inhabited by 1/3 of the total population (36.3%). The biodiversity found on the coastal zone of Albania, and in particular areas such as Kune-Vain,

Karavasta, Narta and Butrint that have designated protected areas, is of global significance. The analysis of biodiversity is focused on the coastal zone as this area is expected to be more sensitive and vulnerable to climate change scenarios currently developed. The most important lagoons along the coast of Albania are Karavasta, Narta and Butrinti. Karavasta lagoon and Butrinti lagoon (lake) are designated as Ramsar Sites of Albania, whilst Narta is a potential Ramsar Site. The coastal zone of Albania is already subject to considerable anthropogenic perturbation and alteration and because coastal ecosystems provide more services and more value to Albanian communities, the potentially impact of climate change is believed to be significant (as outlined in Table 3.2 below).

Table 3.2: Climate Change Conditions and Expected Impacts for the Albanian Coastal Zone

Climate change scenario according sub-sectors	Expected climate change
Climate Conditions	
Precipitations	All the scenarios reveal a likely decrease in annual precipitation related to 1990 for all time horizons. In particular: (i) A1F1MI projects the highest average decrease in precipitation after 2040, likely to reach values up to -63.6 % by 2100 in the summer season (highest/max. scenario), (ii) A1BAIM projects an average decrease in precipitation after 2040, likely to reach the value -54.7% by 2100 in the summer season (average scenario), (iii) A2ASF project a decrease of 47.2% by 2100 always in the summer season, (iv) B1IMA projects the lowest decrease after 2040, likely to reach the value -43.8% (Lowest/ min. scenario) and (v) B2MES scenarios project the lowest value of precipitation -42.5% by 2100 in the summer season.
Temperature	All the scenarios indicate an increase in annual temperatures related to 1990 for all time. In particular: (i) A1F1MI projects the highest average increase in temperature after 2040, likely to reach values up to 4.8°C by 2100 (highest/max. scenario), (ii) A1BAIM projects an average increase of 1.7 °C by 2050 and to 3.2°C(average scenario), and (iii) B1IMA projects the lowest increase after 2040 (lowest/min. scenario). A consequence of the predicted temperature changes and precipitation changes are that more hot days and heat waves are very likely over the coastal area. More frequent and severe droughts with a greater fire risk are expected. The increases in the air temperature are also projected to lead to an increase in the "cooling degree days"
Sea level	Due to climate change the sea level rise and the level of the rivers is expected to increase in the upper parts of the basin and the flow will decelerate. In total, until 2050, approximately 1082.45 km^2 (32% of the coastal area or 3.76% of the country's surface) will suffer direct consequences from flooding. A majority of existing agriculture and industrial areas will be lost due to sea level rise. Huge amounts of arable lands will be lost or become un-usable due to inundation and increased salinity. Most coastal habitats, such as sand dunes, fresh and brackish water wetlands, marshes and lagoons, will be lost or further deteriorate.
Water Resources Sector	Projections suggest that water needs for both domestic and industrial use are within existing capacity and that there is no need to increase water production but to reduce water losses through infrastructure improvement. Climate's impact on water demand is driven by water use and electric power consumption. In coastal area, water demand is lowest in the winter, when colder temperatures reduce the use of water31. But in late spring, summer and early fall there is a rise in the use of water and in demand for electrical power. During summer periods the demand rises significantly, peak daily demand often rises by a factor of 2 or more times the annual average, and peak hourly demand rises to even higher levels. However, even in the worst case

	scenario the difference between production and the need of water can be accommodated by technical and policy actions.
Climate on flooding	Climate change will lead to increases in flooding as a consequence of predicted heavier precipitation, and there is already evidence of increasing frequency of high rainfall events. The coastal area is flooded not only from rivers but also by sea water inundation (storm surges). During a flooding event with a mainly of a pluvial origin waters may inundate the floodplain in a matter of hours (flash floods) or for several weeks, as sometimes occurs during the winter period when the period of rainfall is longer or during spring floods caused by snowmelt . The likely increase in frequency and intensity of heavy rains could make the coastal region even more vulnerable, urging the mainstreaming of Disaster Risk Management (DRM) and adaptation into long-term development strategies.
Groundwater	The average discharge from groundwater aquifers varies from 200 to 400m3/day to 800m3/day. The water is generally fresh and soft. Exploitable reserves of these waters are enormous; flow from wells varies from 10 to 100 l/s. Currently, little is known about the actual availability, and groundwater extraction capacity nationwide. There has been evidence of saltwater intrusion into aquifers of the coast of the Adriatic Sea, near the towns of Lac and Lushnja, probably caused by overexploitation. When considering water resources in coastal zones, coastal aquifers are important sources of freshwater. It can be anticipated that groundwater systems will be affected by changes in recharge, and changes in use related to irrigation where this source is used for this purpose. A link between rising sea level and changes in the water balance is suggested by a general description of the hydraulics of groundwater discharge at the coast.
Coastal erosion and Land Erosion	Factors that make coastal agriculture vulnerable form flooding and erosion are: • Topography: flooding occurs in lowland areas and close to the rivers and coastal areas, • Altitude: an important portion of agricultural area are less than 5 meters above sea level, • Climate factors: in coastal areas precipitation is expected to be reduced much more than for inland areas. Temperatures will increase; potential evapotranspiration (ETo) will be significantly higher due to increases in temperature and wind speed, • Coastal erosion: Some parts of the coast are eroding at rates of 0.3-20 m/year40. • Coastal erosion destroys natural barriers (dunes, green belts, etc.), which can bring salt water into inland and agriculture area. It can lead to saltwater intrusion into freshwater aquifers, which can lead to contamination of drinking water sources and water used for irrigation (wells).
Agriculture, Biodiversity and Economy	
Cropping/Livestock	The largest increase in temperatures is expected to be during the periods of summer and spring, which coincides with the period of plant growth and their fructification, which is expected to lead to negative effects for the majority of agricultural crops. High temperatures will limit yields in many vegetables. Higher daytime temperatures can cause major heat related problems in plants, while higher night temperatures have large negative effects on vegetables, especially fruiting vegetables. A further consequence of elevated temperatures is drought stress that can lead to crop failure or the inability to plant or harvest a crop in a timely manner. The projected increase in the number of days with temperatures in excess of 350 C will also increase the demand for freshwater for irrigation purposes to alleviate temperature and drought stress. Projected increases in the occurrence of flooding and extreme precipitation events will impact crop productivity where a change in the pattern of precipitation events may be even more important than a change in the annual total. Farmers depend on rain-fed agriculture, which makes the agricultural economy vulnerable to changes of precipitation that also determines water availability. A reduction of rainfall accompanied with increased temperature will have a negative effect in crop yields. Considering the period of plant growth (their phonological stages) some crops are expected to be more influenced by this factor than others.
Forest	Climate change will affect forests through the following impact factors: • Atmospheric CO_2 increase will limit the ability of trees to increase their growth rates,

	• Changes in temperature: production is already limited by low air humidity and soil water, therefore, growth and yield under climate change is expected to decrease, • Changes in precipitation and hydrology: extreme events such as extended droughts and hot spells have drastic consequences on tree growth, • Abiotic disturbances: fire, wind storm, flooding and drought are expected to increase significantly, • Biotic disturbances: climate change will affect herbivores and pathogens directly and indirectly.
Biodiversity	As well as impacting vegetation, a decline in precipitation and resulting water shortages will further deteriorate fresh and brackish water wetlands along the coast and consequently effect ecology and aquatic life, especially breeding water birds. A reduced temperature range, resulting from a higher rate of increase in minimum versus maximum temperatures, is likely to occur over nearly all coastal areas. The number of frost days and cold waves are very likely to become fewer. Under this scenario, the number of species of wintering water birds and waterfowls along Albania's coastal wetlands will markedly reduce. The increased temperature and the increased number of intensive rain events will likely lead to further invasion of alien plant and animal species along the coast and increase their impacts on native plant and animal species and communities.
Tourism	In coastal areas, tourism is predominantly of the sun and sea type, focused on beaches. However, due to active marine erosion, the shoreline is moving inland destroying each year hundreds of square metres of beach area, and drying and destroying hundreds of pine trees. Although some of this change can be attributed to climate change, its cause is mainly because of the poor management of rivers outlets and coastline. Predictions suggest that: - *by 2030* Patoku beach is expected to totally disappear while Kune and Seman beaches will only partially remain; - *by 2050* most parts of Kune and Seman beach is expected to disappear; - *by 2080* serious consequences are expected to Vlora beach and in most beaches of the Adriatic sea. Besides the destruction of existing beaches, new beaches will be formed inside the territory, which could be used for tourist purposes, but the existing infrastructure and tourist structures will be out of use and new ones must be constructed. This is expected to lead to higher costs affecting the budget of tourist, communities and the regional economy. Moreover, the disappearance of beaches is expected to coincide with both a growth in population and when tourist numbers are expected to increase as a result of temperature rise (the hot summer days are easier to cope with on the coast).
Source: Third National Communication of the Republic of Albania under the United Nations Framework Convention on Climate Change-Report. 2016	

KEY GUIDING QUESTIONS
1. *Have climate variability and change been observed at the scale of the target site: is there any record on changes in weather patterns and historical trends; which extreme weather events have occurred in the past 25 years?*
2. *What do the (most recent) IPCC Assessment Reports state on predicted climate change in the region in which the target site occurs?*
3. *Do we have basic maps identifying climate-related hazard zones? Are there data on the frequency and intensity of hazards and their impacts?*

4. *Do we have local climate change models?*
5. *Do we know how climate-related hazards may affect resource availability, sectors and livelihoods?*
6. *Do we have basic risk profiles of vulnerable actors, assets and land uses of interest for the EbA intervention?*
If the answer to any of these five questions is no, proceed to fill in the information gaps. Then use this information to draw up a summary climate risk profile by answering the following questions:
1. *How do hazards affect the most vulnerable people?*
2. *Could assets, sectors, land uses, natural ecosystems and livelihoods be affected by climate hazards? How?*
3. *Where and when do impacts strike, particularly on those vulnerable sectors of interest for EbA?*
4. *Have climate impacts been increasing? Why?*

2.4 Institutional and Policy Environment Analysis

2.4.1 Why is this important?

Environmental governance is central to any EbA intervention, especially within the current political climate of Albania. We need to know which local actors have a say in decisions on development planning, land use and access to resources. In addition, we should list and understand the scope of main development policies that influence the landscape, such as policies dealing with farming, biodiversity conservation, water resources management, and health and food security; or with Disaster Risk Reduction (DRR) and urban zoning; etc.

In Albania, there are several approved laws and regulation showing national policy for environment and climate changes adoption, but few of them are talking about EbA measures as the concept of EbA is new in Albania. The main law and regulations related to environmental and climate changes adoption issues are presented in Annex 1.

KEY GUIDING QUESTIONS
Identify institutional actors at different levels:
1. *Which are the relevant institutional actors, their main field of work and their levels and scopes of action (community, municipal or national)?*
2. *Which role do local organizations (e.g. cooperatives, organized women groups and risk management committees) play in the regulation of resource use, land tenure, etc.?*
3. *Identify policies, initiatives and development projects:*
4. *Which are the relevant policies at different levels that influence the landscape and society under consideration?*
5. *Which are the major private sector initiatives having an impact on the target site? (I.e. agriculture, irrigation, energy, mining, tourism, etc.)*

All these policies, initiatives and projects should be linked to your own EbA targets in order to begin identifying either potential conflicts or likely synergies.

2.5 Preliminary "Theory of Change"

2.5.1 Why is this important?

Once you have a clear view regarding land use changes and trends (Section 2.1), stakeholders' roles (Section 2.2), their climate-risk profile (Section 2.3) and their adaptation needs, and the policy environment (Section 2.4), one can start defining the key objectives of your EbA intervention, i.e. the adaptation goals.

A Theory of Change (ToC) is a useful tool for this. Use all information produced up to now to draft a preliminary ToC and complete your ToC as you move down the next five steps proposed in this Guidance Report. Table 3.3 presents a quick guide for the development of a ToC.

Table 3.3: ToC aspects to be considered when defining adaptation goals

Aspects to be considered when formulating a Theory of Change (ToC)	
ASPECT	**MEANING FOR YOUR EBA STRATEGY**
What are the issues to be addressed?	Natural and socio-economic context, sectors / actors, resources at risk (Steps 1 & 2) and adaptation goals.
What are the foreseeable changes in climatic and socio-economic conditions?	Current trends and future scenarios for land uses, socioeconomic and climate risk projections (Steps 1, 2 &3).
How will the projected changes impact the area under consideration?	Land use trends, risk profile and vulnerability assessment (Steps 1, 2 & 3).
What will this mean for the delivery of ecosystem services in your context?	Assess what would happen with / without EbA measures in a changing climate.
Aspects to be considered when defining adaptation goals as part of your ToC	
ASPECT	**YOUR EBA STRATEGY WILL INCLUDE ACTIVITIES TO**
What is your problem: what should you adapt to and how?	Address detrimental land use change; reduce current and future climate risk (Steps 1 & 2).
What would your preferred future look like?	Envision achievable climate resilience through adaptation including EbA.
How would you get there?	Formulate EbA measures, a M&E framework and an action plan for mainstreaming EbA (Step 3 to 6)

Source: Adapted from UNEP 2012

After completing this step, one should have a snapshot of the context in which the EbA intervention will take place. One should then have a good understanding of the landscapes, land uses and stakeholders at risk as well as institutions and land-use policies. You can begin to outline a preliminary ToC, defining the adaptation goals of your EbA intervention.

Step 3: Assessing Vulnerability: Climate Risks vs. Adaptive Capacity of the identified ecosystems

3.1 Goal of this Step

In Step 3, one should now focus on the vulnerability to climate variability and change that different stakeholders, sectors and livelihoods may be facing at the target site. One should also determine the adaptive capacity of the target site.

3.2 Guiding Questions

Before commencing, policy makers should consider the format to present the vulnerability profile (e.g., a map of vulnerability hotspots, a ranking of vulnerable sectors/livelihoods, etc.). When answering the questions below, please ask yourself the following:

- *Are changes on local living conditions, land uses and ecosystems mainly driven by climatic or by non-climatic factors?*

Determine exposure. Using results from Step 2, address the following questions:

• *To which climate-related hazards is your system exposed?*

• *Which people, economic sectors, livelihoods and assets are in a situation or location in which they could be affected by climatic hazards and impacts? Indicate their importance.*

Determine sensitivity. Using results from Step 2 address the following questions:

• *What characteristics make your EbA target (people, sectors, livelihoods, etc.) sensitive to changing climate conditions?*

• *Which characteristics make zones with a high exposure particularly prone to disaster?*

Determine adaptive capacity. Adaptive capacity refers to capacities and resources used to deal with impacts and recover from damage. The key questions here are:

• *Which adaptive capacities increase resilience to adverse climate change impacts? Consider among others:*

• *Knowledge: is there knowledge or expertise, which might support adaptation?*

• *Technology: are there technical options to enhance adaptive capacity?*

• *Institutions: Is the institutional environment contributing to adaptive capacity?*

• *Economy: which economic and financial resources are available for enhancing adaptive capacity or implementing adaption measures?*

After completing this step, you have a vulnerability profile available that is ready for validation. This profile can be used to start informed discussion on vulnerability hotspots.

Step 4: Rapid Ecosystem Services Appraisal

4.1 Goal of this Step

In Step 4, the goal is to understand which services are provided by ecosystems, how these services contribute to climate resilience at the landscape and local scales, and how these services are changing. The purpose of this Step is to "map" the relevant adaptation services and understand how they will change due to climate change. Using the assessments undertaken (Steps 1-3), establish linkages between humans and ecosystems as follows:

a. Under current climate conditions and future projections develop understanding of ecologically and socially relevant, as well as inter-linked, variables at suitable spatial and temporal scales.

b. Identify feedback linkages and loops between ecosystems and humans.

c. Establish direct linkages between climate change vulnerability of communities and development initiatives, and ecosystem health.

d. Develop an understanding of the key social processes between system components and the institutions that govern them.

e. Determine exposure, sensitivity and adaptive capacities of vulnerable groups and ecosystems to climate variability and future climatic change (see Annex 2 – TESSA "model".)

4.2 Methodologies of economic valuation of ecosystem services

4.2.1 Total Economic Value Analysis

The assessment of the economic values of certain type of protected area takes often the form of a Total Economic Value (TEV) analysis. In a TEV economic values of all ecosystem goods and services (provided by a given area) are quantified in monetary terms and summed together. In the context of conservation, TEV studies have been often used to raise awareness of the benefits provided by protected areas to local, regional, and global communities and justify public spending. In other cases, benefits and costs of a conservation option are compared to benefits and costs of alternative scenarios of use such as conversion to agriculture or urban use or a business as usual scenario in which the current prevailing use patterns are maintained. Annex 2 provides an example from Albania (Lake Ohrid).

Once these values are made apparent through quantification, mechanisms can be devised to equally redistribute the costs and benefits of maintaining effective conservation over time. Not all benefits and costs, though, are easily quantifiable. This is especially the case of people's preferences for intangible benefits that come from nature, such as the importance of protecting species for the future. Societal costs of environmental degradation are also difficult to capture in a TEV framework due to the complexity of measuring impacts on species and on human health.

Guiding Questions
The aim is having a spatial understanding of the relationships between land uses, people, assets at risk and ecosystems delivering services, making use of all information and maps available in the previous steps. Taking the EbA target site and its surrounding catchment area into consideration:
• Describe the main characteristics of the landscape and the key ecosystems;
• Indicate which ecosystems provide services that are vital for coping with current climate extremes (variability) and for recovering after a (potential) disaster?
• List all adaptation services provided by the key ecosystems, e.g. freshwater supply, flood control, erosion control, etc.
• What are the main drivers of change affecting these services (besides climate change), and which plausible trends can be expected for the ecosystems providing these adaptation services in two, five and ten years from now?
• Which ecosystems are the most important when considering the current and future dependence of livelihoods and sectors on their services (owing to their role in food security, disaster risk reduction, adaptation capacity etc., or for cultural reasons)?
• Locate these key ecosystems on a convenient map of the area.
In case additional information on ecosystem services must be generated, the *rapid appraisal method for site-scale ecosystem services assessment* introduced in the TESSA Toolkit can be used to identify (i) habitats and drivers of change and (ii) ecosystem services and their beneficiaries. This toolkit also may provide you with some tables that can help you organize the information. After completing this step, one should have identified and mapped the relevant adaptation services at your target site along with the main drivers and actors of land use change. This will help you develop a specific "strategy" for EbA implementation.

Step 5: Developing an EbA Strategy, Adaptation Measures and Action Plan (aligned to national priorities)

5.1 Goal of this Step

In this step, the focus is on building the EbA "strategy", defining adaptation priorities and designing EbA measures. These adaptation priorities must refer to the intended outcomes of the adaptation intervention and they should be cognizant of ecosystem services delivery in the area under consideration. The development of ecosystem-based approaches for adaptation interventions should ideally be based on scenario exercises, comprehensive assessments and comparison against an array of possible adaptation measures (see Figure 5.1). This has already been exemplified using the example of the Drini Mati Rivers Delta (see Box 2).

Guiding Questions
Along with stakeholders, define the adaptation priorities for your sector/resource considering the analysis of the context, vulnerability profile and ecosystem services from the previous steps:
• Which landscape and ecosystem components are at the base of key livelihoods & sectors and are essential to increase their adaptive capacity in the face of change (e.g. forest, wetland, grazing lands, and assets such as water supply facility, health centre, road, etc.)?
• Which ones are the most vulnerable to current and future climate impacts?
• Which ones could clearly benefit from enhanced ecosystem services?
• List and map ecosystems which would deliver these enhanced services?
Using the climate and socio-economic context and the future scenarios at hand (from Steps 2 & 3) revise the main trends potentially increasing climate vulnerability and propose EbA measures:
• Determine which ecosystems (and services) are to be managed in order to (i) reduce current vulnerability and (ii) increase future adaptive capacity according to trends under different scenarios.
• Based on these, propose a feasible set of EbA measures (Table 2) in line with the adaptation goals defined when formulating your Theory of Change (see Table 1).
• If necessary perform a cost-benefit analysis aimed at selecting those EbA measures that are affordable and which best fit the socio-economic context.

Measure	Notes	Type of data and resources
Coastal habitat restoration	Must respond to policies aimed at reducing disaster risk and strengthening livelihoods.	Sediment dynamics and biodiversity and its use in coastal habitats.
Livelihood diversification	Aimed at relieving pressure on ecosystems providing adaptation services.	Resilient livelihoods' strategies (community level); cultural preferences.
Promoting agroforestry systems	Choose native species apt for your adaptation goal. Start with pilots.	Planning at the household and farm levels.
Land use planning / zoning	Requires legislation, funding, public policies and strong leadership for implementation.	E.g. maps on land capability and hazards.
Setting up biological corridors	Requires data and strong negotiation skills between stakeholders. Sustainable land use incentives shall be allocated to privately and community owned lands.	Survey of species using different habitats through the year or moving along altitudinal gradients as climate changes.
(PES) Payment for ecosystem services	Requires funding sources, policies and negotiated strategies for equitable PES.	Example: water provision (m3/s); disaster risk mitigation costs ($).
Coordination between government units relevant for EbA	Responsibilities, institutional roles and budgets must be clear.	Existing public policies on land use regulations.

Figure 5.1: Examples of EbA Measures

To define the EbA strategy, one could possibly seek to analyse the trade-off for each priority EbA measures proposed for each sector or livelihood of interest;

- A cross-sectoral trade-off analysis should be done at the watershed scale to ensure that negative effects are anticipated and mitigation measures defined before the implementation of the EbA strategy; this is to avoid maladaptation.
- Priority shall be given to measures with overall positive effects not only for the targeted beneficiaries but also on different sectors, livelihoods or social groups.

Individual EbA strategies could address more than one sector, allowing for greater synergy and cost-efficiency, and these synergies should be the main target of EbA measures.

To prepare implementation of the identified EbA measures a planning and allocation of roles must be made. EbA measures must strengthen climate resilience on site as well as at broader levels according to previously defined adaptation goals:

- Define clear roles and responsibilities for implementing EbA measures, i.e. institutional and community roles, and allocate corresponding budgets to those involved.
- Define who does what, when and using which resources.
- Set up a team for monitoring and evaluating EbA progress at a broader/watershed level (if possible) - see Step 6.

Step 6: Monitoring & Evaluation for Learning

6.1 Goal of this Step

The goal of this step is setting up a Monitoring & Evaluation system (M&E) that assesses project effectiveness through indicators that measure ecosystem health, provision of ecosystem services to the vulnerable populations and reduction in the level of climate risks. The indicative tasks involved are likely to include the following:

a) Include indicators that reflect ecosystem health;

b) Include indicators that can measure ecosystem services delivered to vulnerable populations;

c) Incorporate mechanisms to quantitatively or qualitatively assess vulnerability and resilience of the human communities after adoption of ecosystem-based adaptation measures;

d) Choose indicators that reflect resilience of all the components of the human-environment system and their inter-linkages;

e) Design monitoring systems that include both short- and long-term indicators, and operate at the most appropriate scale to assess project effectiveness and any changes in vulnerability;

f) Involve local communities in monitoring to enhance local adaptive capacity and monitoring efficiency;

g) Through a participatory process, regularly monitor, and evaluate the adaptation benefits to communities, and adjust the adaptation actions as necessary (see TESSA methodology as an example of such an approach – see Annex 2).

6.2 Monitoring the Threat and Impact of Climate Change

In order to evaluate the EbA Initiative expected effectiveness it is important to check on which of the threats (climate change stimulus) and Impacts (consequences of the manifestation of the climate threats in the human context) are tackled by the initiative. Threats and impacts are shown in Table 6.1 below.

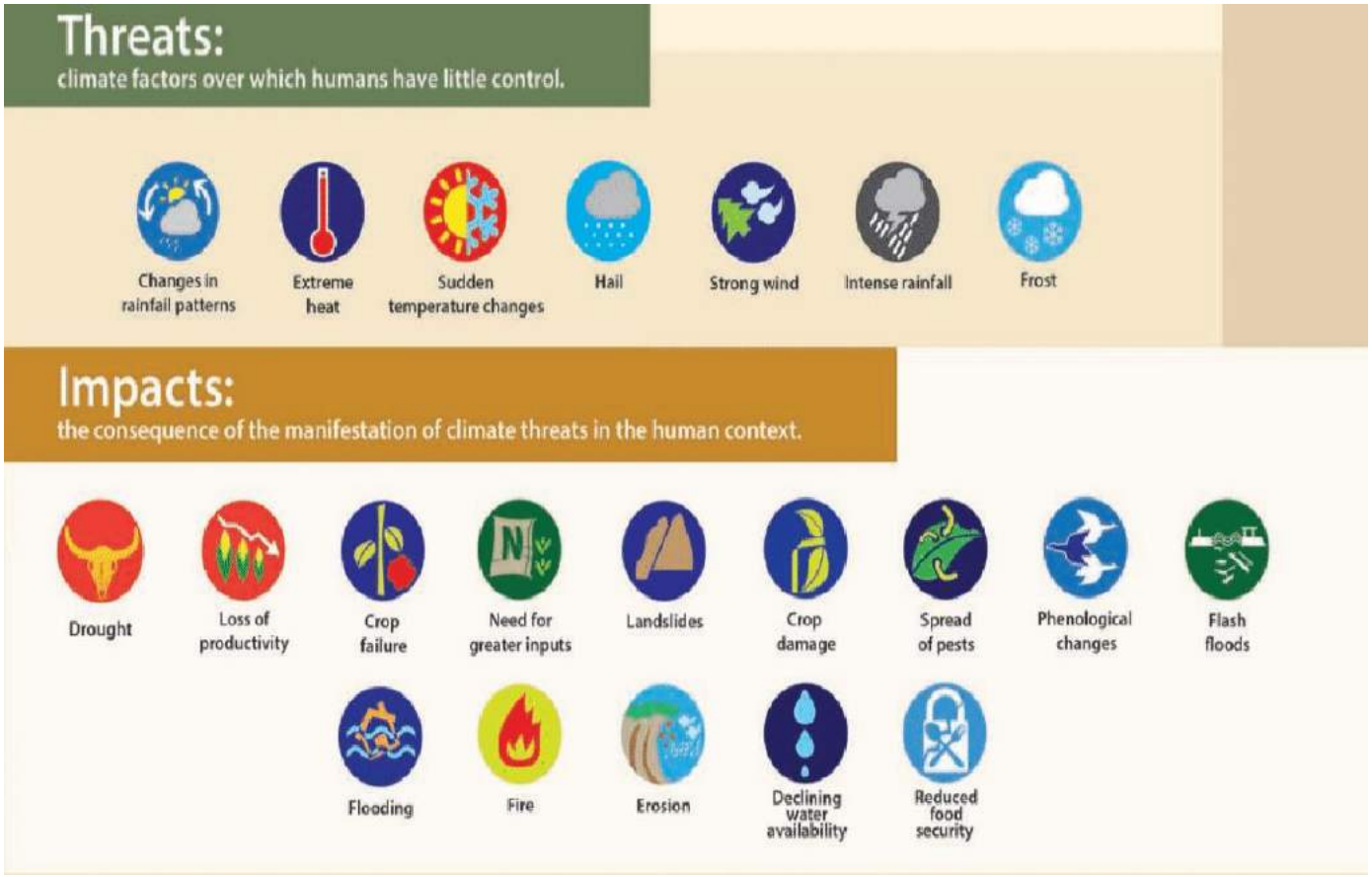

Figure 6.1: Simple "evaluation card" to outline threats and impacts of climate change in Albania.

Each EbA Evaluation Card (see Figure 6.1) should address the following elements:

1. Identify which of the 14 impacts are tackled by the measure *(a good initiative should tackle at least three).*
2. Identify the estimated time for results to be seen *(results usually including increased productivity, income generation or system stability etc).*
3. Indicate the type of investment needed for the implementation of the initiative *(consequent actions need to be taken in order to guarantee the implementation (supportive measures), indicate whether the initiative is private or public, individual or collective)*.
4. Identify the area and the location where the measure could be more useful and appropriate *(the bigger the area, the greater the impact).*
5. Identify the main benefits of the measure for the adaptation to climate change in relation to the impacts addressed, including a qualitative evaluation.
6. Identify the cost of the measure through feasibility studies for major initiatives or cost-benefit analyses for small scale measures usually identifying the cost of materials, labour and training *(maintenance costs should be taken in consideration during cost calculation)*.

6.3 Evaluation of EbA Initiatives/Projects

In order to qualify for future financing the EbA initiatives/projects, both private or/and public, need to be audited for compliance against the main goals of any EbA strategy or initiative being proposed. Indicative assessment questions of relevance to Albanian situations are presented below:

1. Will the proposed intervention/project reduce pressure on ecosystems and the services they provide?
2. Will the proposed intervention/project enhance the social or economic resilience of the vulnerable stakeholders who are exposed to hazards and have limited resources and capacities (link to Step 2 B)?,
3. Will the proposed intervention/project reduce risks that are associated with real time observed/monitored climatic/weather events?
4. Will the proposed intervention/project restore or use biodiversity and ecosystems in a suitable manner?
5. Will the proposed intervention/project positively impact the individuals' economy in the short term?

6.4 Choosing appropriate indicators for EbA

The following tips should be followed when selecting indicators for EbA projects in Albania:

a) Embedding the intervention's goals and activities within its specific climate change and development context: the socio-economic, environmental and climatic context in which activities will be implemented.

b) Characterizing indicators by type of outcome and devising a baseline to measure progress within each.

c) Defining whether the M&E will focus on adaptive capacity development, on the delivery of adaptation actions or both

d) 'Assets' and 'institutional functions' can be two types of indicators that are particularly useful in describing adaptive capacity;

e) Under adaptation actions, activities and decisions that address particular 'climate hazards', or work to reduce 'vulnerability drivers' are highlighted;

f) 'Ecosystem services' and 'livelihoods' can be used as indicators for demonstrating the long-term and systematic needs of sustaining development in a changing climate.

g) Use process indicators to check if the "direction of travel" is correct.

h) Use sound quantitative data for comparing with other types of adaptation actions or to deliver snapshots of adaptation progress, carefully choosing proxy15 indicators and evaluating the reasons behind the collected data.

i) Besides reviewing indicators of use for specific development sectors which could be applied for Climate Change Adaptation, it could be smart accounting for development projects and development gains relevant for EbA in the local context.

Key Guiding Questions
1) Determine how the M&E framework will contribute to improving learning and informing future interventions and decision-making.
2) Explore logic and assumptions in your Theory of Change: i.e. how inputs are to generate activities that will help you achieve your adaptation goals?
3) Dealing with uncertainty about future climate change, societal and environmental responses requires establishing *baselines* that will enable measuring progress, flexibility of the EbA intervention and if necessary, adjusting the EbA strategy and measures.

Step 7: Mainstreaming EbA, Promoting Synergies, Financing and Upscaling Effective Approaches

7.1 Goal of this Step

In this step, the goal is to identify what actions are needed in order to mainstream EbA into local, municipal and national policies relevant for increasing the resilience of people and ecosystems to changing climatic conditions. The context of this has already been presented within Section 2 of this Guideline. Successful completion of this Step will help to build the blocks of an action plan to mainstream EbA into climate sensitive sectors and policies, plans and strategies.

7.2 What is Mainstreaming of EbA?

Mainstreaming refers to the integration of adaptation objectives, strategies, policies, measures or operations so that they become part of the national and regional development policies, processes and budgets at all levels and stages. As mainstreaming "aims to enhance the effectiveness, efficiency, and longevity of initiatives directed at reducing climate-related risks, while at the same time contributing to sustainable development and improved quality of life16", EbA interventions - which increase overall development resilience - have a clear advantage over traditional adaptation options. In this regard, EbA mainstreaming – when supported by demonstrated good practice at local scales- will facilitate informing policies, promoting learning and enabling the up scaling of EbA.

To support Albania in taking a more strategic approach to climate change adaptation and to ensure that EbA measures are mainstreamed across priority policies, sectors and programs, some Policy Strategies can be proposed as follows:

- Amendment of the National Strategy for Development and Integration 2015 - 2020 (NSDI), by adding of specific reference to climate change adaptation.
- Revision of the Environment Cross-Cutting Strategy (integral part of the NSDI), especially strategic priorities and policies in order to support climate change mitigation and adaptation measures.
- Adjustment of the Environment Cross-Cutting Strategy by incorporating specific climate change adaptation actions and priorities for adoption and incorporation within other sector strategies.
- Establishment of a Climate Change Adaption Technical Working Group under the auspices of the Working Group for Environment.
- Ensuring that climate change adaptation has a specific focus area within the environment sector fiche developed under IPA programme (Climate Change measure).

Furthermore, some approved laws and regulation related to environment (see Annex 1), urban development and planning, agriculture and tourism have to be amended on integrating EbA measures, these are as following:

- Law no. 10431, dated 9 June 2011, "On Environmental Protection";
- Law 10440, dated 07.07.2011, "On the Environmental Impact Assessment ";
- Law 10448, dated 17.7.2011, "On Environmental Permits";
- Law no. 91/2013 dated 28. 02. 2013, "On Strategic Environmental Assessment";
- Law no. 9817, dated 22.10.2007 "On Agriculture and Rural Development";

- Law no. 107/2014, dated 31.07.2014 "On Planning and Territorial development (amended)";
- Low no. 9244, dated 17.06.2004 "On Protection of agriculture land (amended)";
- Law no. 81/2017, dated 04.05.2017 "On Protected Area";
- Law no. 93/2015, dated 27.07.2015 "For Tourism";
- DCM No. 266, dated 24.04.2003 "On the administrations of protected areas",
- DCM No. 267, dated 24.04.2003 "On the Procedures for the Proposal and Approval of Protected and Buffered Areas",

Also, Albania may wish to complete the preparation and subsequent approval of the NAP in order to implement EbA in all sectoral projects and regional development plans. In all sectoral investment and projects a portfolio has to be planned for implementation of EbA measures.

Despite the above, significant barriers to mainstreaming currently exist in Albania (see Section 2.7), which includes the lack of institutional and human capacities to assess climate change impacts and to design EbA measures in order to incorporate to policy and implementation development national and regional plans for a national sustainable development (Annex 1).

7.3 Financing EbA

Long-term sustained financing for EbA is made through:

- Public Finance;
- Incentive Schemes;
- Payments for Ecosystem Services.

Public financing for EbA can be allocated through national budgets across sectors and at multiple scales at a local, regional and national level. In order to guarantee inclusion within Albanian public finance programmes, strong EbA imposing policies need to be approved at a national level. EbA related sectors such as water, agriculture and environment have traditionally included EbA related budget lines however specific EbA are not generally budgeted specifically. Joint financing from central and local government (to assist the budgeting for EbA implementation) is a particularly relevant tool to adopt. Coupled with this, mainstreaming EbA into government policies and budgeting processes at a national level is critically important to help secure inclusion of EbA into national, regional and local planning, budgeting and implementation processes (see Step 4. It is recommended that Policy Guidelines are established for Public Investments Projects to help accelerate EbA principles within national budgets within the next five to ten year period in order to help translate EbA principles into practical projects and initiatives in Albania. From a financial budgeting perspective, this could be achieved through the following mechanisms:

Community economic Incentive schemes or EbA should form part of a broader approach to adaptation planning and implementation. In fact, there are at least 40 identified measures of EbA which could be promoted to the key beneficiaries (actors and vulnerable groups) through the adoption of specific selected measures that are prioritised and supported by national policy makers. These supported measures can be incentivised through the programs of state agencies that currently deal with project and policy setting (Operational Budget setting) for sectors including agriculture, environment and tourism. These measures can should be undertaken in cooperation with local government and using the support (where identified) from any parallel or "start-up" microfinancing programme opportunities that may exist.

Payments for Ecosystem Service (PES) provide another possible model for EbA financing. The beneficiaries of the ecosystem service, whether this is a state entity or a private company, should be encouraged to pay for

the service that it offers (conservation/clean water supply/clear air etc). Such payments can provide additional financing for verifiable EbA interventions that maybe undertaken by (for example) farmsteads who may act as "sellers" of such services. The PES "model" is useful as the establishment of such schemes can increase the understanding of the value of the ecosystem services and act as an incentive towards the implementation of EbA principles that may directly (or indirectly) contribute towards improving water supply, carbon storage, forestation, conservation all of which could be subject to the introduction of PES "fees" for the usage of the relevant service.

PES programmes also provide upfront funding opportunities for farmers to initiate parallel climate adaption activities. Microfinance market operators, for example, can be included within PES schemes to increase cash flow opportunities to, for example, farmers. Through clear demonstration of the value and success of PES schemes to a broader private audience, the result often manifests itself in an increase in the number of the parties (communities/financiers etc) will to participate in the future (often referred to as the "snowballing" effect). A parallel initiative that may prove of value in Albania is what are termed "Bundle credits" which are awarded to farmers based on proven delivery of effective re-afforestation programmes such as planting trees, introducing soil and/or water conservation measures or introducing watershed improvement services (flood alleviation that benefits a number of groups/communities etc), or any other priority measure identified by a specific PES programme. The credit for these types of schemes is often provided to the farmer/microbusiness after the implementation of the measures. Consequently, there may be the need to support the initial investment from microfinance institutions (low cost loans/credit arrangements etc).

Donors remain a current source of EbA finance within Albania based on the fact that major donor supported projects have been implemented in the EbA relevant sectors (water, agriculture and environment). This mode of finance is not, however, a sustainable model to rely on and demonstrated evidence of national financial budgets, that are mainstreamed into national mid and long term operational budgets is required to ensure long term financial sustainability of EbA. Demonstration of a step by step increase in annual national budgeting on issues relating to EbA promotion is an important aspect towards securing a constant commitment or support from donors in the coming years (i.e.: the engagement of donors towards them providing the necessary financing of mid and large scale measures at a national level).

Key Guiding Questions
In order to have an enabling environment to mainstream EbA, we should look for entry points and make the case to:
• Increase awareness, knowledge and understanding of climate variability and change– induced threat through capacity building.
• Enhance capacities of stakeholders and institutions across sectors and at different levels to jointly formulate and implement adaptive policies that take climate change into consideration.
• Ensure that EbA interventions complement other development initiatives: taking advantage of synergies and building common approaches.
The integration of EbA into relevant policies, strategies and plans to manage climate risk, must be done:
• Considering broader development frameworks and sectoral strategies.

• Through lobby and advocacy led by high level decision makers, strong institutions and EbA champions.
• Demonstrating positive processes and results of EbA interventions.
• Prioritizing adaptation strategies that deliver tangible and visible benefits in the short to medium term: e.g. vulnerability reduction and livelihoods' diversification.
• Ensuring a multi-stakeholder process of a continual improvement in adaptation outcomes.

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Annex 1. National Policy and Legislation on Climate Change Adaptation in Albania

The following text presents a summary of key some legislation and policy of relevance to the future implementation of the EbA Guidelines. For a detailed analysis of national policy and legislation of relevance to climate change in Albania, the reader should refer to the primary policy or legislation document for a full commentary on the legislative mandate /document in question.

A1 Institutional Arrangements

A1.1 Constitution

The "**Albanian Constitution"** (approved by the Albanian Parliament on 21 October 1998) represents the key document from which all laws and regulations are compiled and collated that relate to national economic development. Within the Albanian Constitution it is specified that national institutions have to maintain a healthy environment, ecologically suitable for current and future generations.

The concept of sustainable development is also included in the Constitution of the Republic of Albania, which has a separate article on this subject. The Article declares that: *"The state, within the constitutional authority and the available resources, and in addition to the private initiative and responsibility, aims: a) A healthy environment and ecologically suitable for today's and future generations, b) Rational use of forests, waters, pastures and other natural resources on the basis of the principle of sustainable development (Albanian Constitution, Chapter V, Article 59)".*

A1.2 Key Ministries and Institutions

The main national relevant institutions regarding environmental policy and climate changes adoption are listed below.

a) **The Council of Ministers** is the main national institution and has the responsibility of environmental policy in Albania, the approval of strategies and national and regional development plans.

b) **The Ministry of Tourism and Environment** has overall responsibility for environmental protection, specifically for air, chemical waste, climate change adoption, biodiversity. The Ministry aims to develop and propose policies, strategies and action plans for environmental protection, from the standpoint of sustainable development based on climate change adoption. **The National Environmental Agency (NEA), The National Agency for Protected Areas (NAPA)**, Regional Environmental Directorates, Regional Forestry and Forestry Directorates and State Inspectorate for Environment, Forests and Water, which are all under the dependence of The Ministry of Tourism and Environment have the responsibility for the implementation of environmental laws and standards as well interventions of EbA measures.

c) **The Ministry for Europe and Foreign Affairs** has the responsibility for coordinating environmental policies and the EU agenda using European programs and funding.

d) **Ministry of Finance and Economy** has the responsibility for the approving of funds for national and regional development plan and project as well their monitoring.

e) **The Ministry of Infrastructure and Energy** approves and monitors the national and regional plans of development. Depending on this ministry are the **Territorial Development Agency (TDA)** and the **National Territorial Planning Agency (ATPA),** which are responsible for drafting territorial planning and development documents, can permit development in accordance with national and local plans. Depending on this Ministry is the **National Coastal Agency,** which has the mission of protecting the coastal area, promoting and monitoring projects, pursuing the development of the coastal zone and plans approved by planning authorities. The objectives of the activity of this Agency are the protection and sustainable development of the coastal area; Implementation of policies and strategies for integrated management of coastal zone; the coordination of related programs in this area and the promotion of investments in the coastal zone. Depending on this ministry is also the **National Agency of Natural Resources** (NANR) which has as its object of activity, development, supervision of rational use of natural resources, based on government policies, and monitoring their post-use in the mining sector, hydrocarbon and energy.

f) **The Ministry of Agriculture and Rural Development** is responsible for the development of the agricultural sector and the legislation on the adaptation of policies, adaptation of crop cultivation technologies in accordance with climate change.

g) **The Ministry of Health and Social Protection** is responsible for the protection and improvement of human health and for the development of policies to adapt the health system to climate change in relation to diseases and parasites that may affect human health. Depending on this ministry is the **Public Health Institute** which implements the policies of this ministry in relation to the control of diseases and environmental degrading factors such as water and air quality.

h) **Municipalities and Local Government Units (LGUs)** are responsible for drafting and implementing territorial development projects including EbA intervention that are in line with sustainable environmental development.

A2 Legal and Regulatory Overview

The main law and regulations related to environmental and climate changes adoption issues are presented as following.

The National Strategy for Development and Integration 2015-2020 (NSDI) was approved by DCM No. 348, dated 11.05.2016. In this strategy the adoption to climate changes is noted as one of the main issues of sustainable national development. Thus, some relevant activities are highlighted, as follows:

- ✓ implementation of climate changes adoption measures in territorial and urban planning;
- ✓ intervention of climate changes adoption measures especially on coastal development plans and programs as these areas are threaten by coastal erosion;
- ✓ application of climate changes adoption measures on forest, water and agriculture management;
- ✓ Improvements to human health on considering climate changes, etc.

The Environment Cross-Cutting Strategy 2013-2020. One of the main objectives of this strategy is the approximation of legislation about climate changes adoption, and implementation of measures of climate changes adoption.

Law no. 10 431, dated 9 June 2011, "On Environmental Protection" aims protecting the environment at a high level, conserving and its improvement, preventing and reducing the risks to life and human health, ensuring and improving the quality of life, in the benefit of present and future generations, as well as providing conditions for sustainable development of the country.

Law 10 440, dated 07.07.2011, "On the Environmental Impact Assessment ". This law aims to provide a high level of environmental protection through preventing, minimization and compensation of damages to the environment, from the proposed projects before their approval for development.

Law 10 448, dated 17.7.2011, "On Environmental Permits". The aim of this law is to prevent, reduce and control the pollution caused by certain categories of activities before their approval for development in order to achieve a high level of protection of the environment as a whole, human health and quality of life.

Law no. 91/2013 dated 28. 02. 2013, "On Strategic Environmental Assessment". The aim of this law is to provide high environmental protection and sustainable development, through the involvement of environmental issues during drafting, approval, review, amendment or modification of plans or programs with potential negative environmental impacts.

Law no. 68/2014 and **Decision of the Council of Ministers no. 31, dated 20.1.2016.** *"For the approval of the strategic policy document for the biodiversity protection"*, has established the legal bases for the conservation and sustainable use of biodiversity and the achievement of objectives under the Convention on Biological Diversity and other Biodiversity Conventions, protected areas in which Albania is part. The law identifies the instruments for biodiversity planning (Biodiversity Strategy and Action Plan, inventory network and biodiversity monitoring, emergency plans and cross-border impact assessments), as well as three categories of protection: especially protected and degraded ecosystems, habitats and landscapes.

Draft Law dated 15.03.2017 "On Climate Change" aims to establish the legal basis for policy integration and effective measures which allow:

- The fulfilment of the obligations of the Republic of Albania towards the Convention in achieving its final objective through the promotion of the reduction of greenhouse gas emissions and the conservation and increase of absorbers and domestic reservoirs;
- Adapting on climate changes at the national level;
- Identifying the country's achievements in these directions using methodology according to the models of the Convention and the EU.

Law No. 9817, dated 22.10.2007 "On Agriculture and Rural Development" defines the objectives, measures and programming of agricultural and rural development policies, agricultural public services, research and vocational training as well as the database and information for policies in the agricultural and rural development sectors. In this law one of the most important objectives related to climate changes adoption is the Protection and conservation of the environment, on seeking to guarantee a sustainable agriculture development and protection of natural resources.

Law no. 107/2014, dated 31.07.2014 "On Planning and Territorial development (amended)". One of objectives of this law is to provide sustainable territorial development trough efficient use of land and natural resources.

Law no. 93/2015, dated 27.07.2015 "For Tourism", this law aims to develop tourism sector on using national natural and human resource and application of standard for sustainable development.

Annex 2. Possible Ecosystem Service "models" for Albania

As a Mediterranean country, Albania is characterized by high-intensity rainfall. Its sloping terrain, poor soil management, forest degradation, overgrazing are factors that favor strong erosion. Erosion has been a major issue, through a chain of physical processes, causing degradation of ecosystems in the coastal area directly related to food security and human health. For this reason, studies and improvement measures have begun for 50 years, which in the last three decades are inadequate. Below are some methods used within Albania and their conclusions, are summarized below.

2.1 TESSA Toolkit for Ecosystem Service Site-based Assessments

One of the biggest challenge experts face is lack of reliable information about the amounts of ecosystem services available, and how those services vary across landscapes. The Toolkit for Ecosystem Service Site-based Assessments (TESSA) tackles this challenge by providing a simplified approach to identify, assess and value ecosystem services at site level. The toolkit covers six services:

a) global climate regulation,

b) water-related services,

c) harvested wild goods,

d) cultivated goods,

e) nature-based recreation and

f) cultural services.

A key feature of TESSA is that it employs site-based assessments of real data at both the site of interest and a site that represents its alternative state (counter-factual) under a different management situation. The overall aim of TESSA is to generate data to guide decisions aimed at safeguarding ecosystems services for a sustainable future. This is particularly important in countries where many communities directly depend on ecosystem services for survival, yet increasing demand is leading to over-exploitation and degradation which ultimately threatens livelihoods. This is the case within rural areas of Albania.

It is hereby believed that future TEEB studies in Albania could be undertaken to reduce the pressures and threats on coastal habitats by mainstreaming the value of biodiversity and ecosystem services into coastal and marine planning policies. This will provide evidence of the benefits of community-based coastal and marine management, the introduction of alternative livelihood options, and the establishment of marine protected areas. TESSA is relevant to the Albanian situation because it allows users to develop an understanding of the benefits that people receive from nature, and assess their values, in order to generate information for decision making. The toolkit emphasises the importance of comparing estimates for alternative states of a site (for example, before and after conversion to agriculture) so that decision-makers can assess the net consequences of such a change. The toolkit focuses on the site scale to respond to the need to bring this type of work down to the operational level where decisions are usually made using information gathered locally. More information on TESSA can be found at the following link:

http://www.birdlife.org/worldwide/science/assessingecosystem-services-tessa

2.2 Modeling Rainfall Factor (MRF)

The combination of the mountainous terrain of Albania and a seasonally wet Mediterranean climate has led to some of the most extreme erosion in Europe. One of the methodologies used frequently, in Albania, to estimate soil erosion risk and provide a framework for soil conservation that can effectively and economically control soil loss. A one-dimensional hydrology, vegetation and erosion model (RDI/CSEP) is used to calculate accumulative soil erosion. This model provides an integrating the climatic, topography and associated vegetation components into soil erosion modeling. The forecast runoff, accumulated across the frequency distribution of storms, is used to give a climatic potential, which is then appropriately combined with measures of topography and soil erodibility to estimate the expected rate of soil erosion at a resolution of 1 km. Annual and monthly soil erosion maps of Albania are also developed in this research. The proposed approach for evolution and mapping soil erosion by water uses existing soil maps, land use maps, a digital elevation model (1 km), and interpolated climate data. The erosion maps clearly show that Albania is a country where erosion is potentially severe. The annual erosion rates are estimated at 10 t ha –1 y –1 or more, especially in the south and center part of the country. In three areas (two in Gjirokastër, and one in Sarandë) the annual erosion rate is more than 100 t ha –1 y –1 . Erosion rates are highest in October, November, February and December and lowest in June and July.
An approach to mapping soil erosion by water with application to Albania | Request PDF. Available from: https://www.researchgate.net/publication/228747483_An_approach_to_mapping_soil_erosion_by_water_with_application_to_Albania

2.3 The G2 erosion model: An algorithm for step assessments

In this study, soil erosion was mapped in Ishmi-Erzeni watershed, Albania, using the G2 model. The G2 model has been proposed as an agri-environmental service by the Global Monitoring for Environment and Security (GMES) initiative (now Copernicus programme). Based on the principles of the Universal Soil Loss Equation (USLE), G2 provides maps of actual soil loss at a monthly time-step. The main innovations of the model with regard to previous USLE family models are as follows: the introduction of a 'storm factor', which differentiates rainfall (R factor) per month when detailed rain intensity records are not available; the use of standardized biophysical parameters derived from satellite image time series in combination with land use information for calculating the vegetation retention factor (denoted here as V factor, corresponding to C factor of USLE); and the use of satellite imagery for calculating a new factor, namely the slope intercept factor (denoted as I factor), which expresses landscape feature alterations, thus functioning as corrective to the topographic influence factor (denoted here as T factor, the slope length and steepness (LS) factor of USLE). The model was originally implemented in the cross-border Strymonas river basin and on the island of Crete after revision; in both cases with encouraging results. The G2 model follows a data-driven methodology, while providing alternatives for all factor estimations with moderate data requirements.

https://doi.org/10.1016/j.envres.2017.11.010

https://doi.org/10.1007/s10666-015-9455-5

2.4 Economic loss Models - soil degradation in agricultural areas

The "model" can be applied on the available information on the land use changes and the soil degradation processes, and other resources base for agriculture like plants, livestock, and the use of agrochemicals. The

data is derived from the Statistical Yearbook of the Ministry of Agriculture, Food and Consumer's Protection (MAFCP), the Institute of Statistics (INSTAT), the World Bank, project reports of the Institute of Soils Study, scientific journals and the additional scientific investigations of Albania soils.

Soil erosion: It is caused by the combination of the Mediterranean climate, the dissected topography and the poor agricultural practices. Soil erosion affects about 350 000 ha of agricultural land, with a total loss of 60 million tons of solid materials (World Bank 2007). While the total nutrient loss from erosion is assessed at about 100 000 tons of N, 60 000 tons of P and 16 000 tons of K (Kovaçi et al. 1996), agricultural land damaged by both the erosion and gravelling is assessed at 6780 ha (MAFCP 2010). Losses of nutrients by erosion from the total area (Kovaçi et al. 1996) are corrected for the agricultural area, giving an annual loss of 69 609 tons nutrients (39 551 tons N; 23 730 tons P; 6328 tons K), which is by about 40% greater than the amount of nutrients added to the soil by fertilizers (fertilizer use in Albania was 49 717 tons of nutrients in 2010). In other words, farmers will need to increase the fertilizers use by 40% each year just to replace the nutrients lost through erosion. Its value is approximately US$ 98 million or US$ 82/ha/year, and it can be considered as an additional cost for the agricultural production.

Case Example: Values of ecosystem goods and services of Lake Ohrid in its present state

Market prices: The economic value of many environmental goods (e.g. medicinal plants) is estimated simply through market prices (e.g. price of pharmaceutical compounds extracted from plants).
Productivity method: Estimates economic values of biodiversity based on its contribution to the production of commercially marketed goods. For example: higher species richness in hay fields can result in higher yield. This gain, once monetarily quantified, will represent the monetary value of species richness.
Hedonic pricing method: Estimates are based on biodiversity's effects on market prices of some other good, such as housing prices. For example, houses' prices might be higher near a protected area with high species diversity. These increased costs are used to estimate the monetary value of the protected area with high biodiversity.
Travel cost method: Estimates are based on the amount of time and money that people are willing to spend to visit areas with high biodiversity. Visitor's spending and travel time to visit the most diverse biomes is the simplest way to apply this approach.
Avoided cost method: Estimates are based on costs of avoided damages, such as damages resulting from lost ecosystem services. For example, higher genetic diversity in agriculture often translates in higher resistance to pests. The monetary value of genetic diversity in this case is equal to the amount that would otherwise be lost to pests.
Replacement cost method: Estimates are based on the costs of replacing a service. For example, the cost of building a new water filtration system for the city of New York can be used as a partial estimate of the value of the natural water purification that results from maintaining healthy forests in the upper part of the city's watershed.
The contingent valuation method: Involves directly asking people, in a survey or interview, how much they would be willing to pay for biodiversity or a specific component of it. In some cases, people are asked for the amount of compensation they would be willing to accept to give up habitats of high diversity
Total economic value
Based on categories of ecosystem services within LOR, the preliminary list of goods and services can be identified and that is presented below:
Direct values: Commercial and recreational fishing, Hunting, Timber and firewood, Mineral extraction, Hay, Sand, Wildlife viewing, Research opportunities, Education opportunities, Nature tourism.
Indirect values: Flood mitigation, Nutrient abatement, Toxics abatement, Sediment trapping, Wildlife habitat.

Non-use (existence) values: National/global biodiversity significance
The annual value of ecosystem goods and services at LOR is currently 6,774,897.42 €. The lack of data and price variations were some challenges for assessment of the values of agriculture, livestock and other services. The fishing as ecosystem services contributes with 14.8% of the total value, while mineral extraction covers 70%.

Type of value	Ecosystem Service	Approach	Annual value (€)
Direct use	Fishing	Market values, simplified travel cost	1,004,129.39
	Hay	Official values	16,417.92
	Sand	Market value	65,412.00
	Wood and Timber	Official values	67,311.83
	Minerals	Market value	4,800,000.00
	Medicinal plants	Market value	359,856.63
	NTFP	Market value	256,380.65
	Research possibilities	Simplified travel costs	3,024
Non direct use	Spawining habitats	Replacement cost,	202,365.00
Non use	National Global biodiversity significance	n.a.	n.a.

2.5 Management Strategy Impact Models

A management strategy impact model is used to characterize the potential for any particular shoreline management plan to affect conditions in adjacent properties. This model considers the potential of management alternatives to increase erosion on adjacent properties, diminish beneficial sediment transport, diminish the effectiveness of adjacent existing shoreline management efforts, increase flooding potential on adjacent properties, or create some other detrimental off-site impacts. The model is based on existing management strategies on adjacent properties. If adjacent shorelines are unmanaged, then the preferred management strategy will be one that does not reflect energy or significantly alter sediment transport pathways. If adjacent shorelines have defensive structures, then preferred strategies will be ones that allow structures along the entire reach to work together effectively. This may result in avoidable short-term impacts to ecosystem services on the subject property in the interest of sustained performance of existing management strategies on adjacent properties.

2.6 Ecosystem Services Models

These are used to evaluate the potential that a site has for providing beneficial water quality, habitat, and sediment stabilization services to the local system. The models are based on the combination of physical and biological features that create and sustain capacity to deliver these services. As such, the models provide guidance for the maintenance and/or creation of desirable physical and biological features in shoreline systems. No specific further detail on this type of model is provided at this time though future updates shall be developed into the specific training exercises throughout 2018 and 2019.