

Introduction

We are facing a broad range of challenges, such as unsustainable urbanization and related human health issues, degradation and loss of natural capital and the ecosystem services it provides (clean air, water and soil), climate change and an alarming increase of natural disaster risks.

Currently over 70% of Europe's population live in cities, expected to increase to over 80% by the middle of the century. This translates to 36 million new urban citizens, who will need housing, employment and care by 2050.

When it comes to reducing and managing climate change risks, nature-based or ecosystem-based adaptation is often a nifty choice.

It includes various ways of working with nature and with ecosystems to make cities, regions, coastlines, river basins, forests etc. more resilient.

Concrete examples include the reforestation of slopes, restoration of natural flood retention areas, peatland restoration, turning intensive farming areas into agroforestry systems, or opening green corridors in cities (and all of these examples, one way or the other, have also to do with ecosystem-based adaptation in water resource management).

Some of these approaches will be vulnerable to climate change themselves. They therefore must be carefully assessed, selected, planned and implemented, adapting them to the specific regional and local circumstances.

However, if chosen and implemented carefully they can be very cost-effective compared to purely technical, 'grey infrastructure' type solutions (e.g. compared to protective forests, technical slope stabilisation in the Alps is extremely expensive).

Also, they will usually not only enhance resilience to the negative effects of climate change. But they will also deliver additional benefits - like better health, greater food security, more biodiversity, or new economic and job opportunities.

Ecosystem-based adaptation takers should therefore be taken into consideration systematically, at all levels of government and planning - from international agreements to national adaptation plans to individual local projects.

Nature-based solutions are integrated in many EU policies, including adaptation.

The EU's Adaptation Policy and its evaluation

The Commission began to consider the need to adapt to climate change in 2005. As a result, in 2009 it adopted a **White Paper**, and then in 2013 a fully-fledged EU Strategy on Adaptation.

The Strategy focused on eight actions aiming towards **3 general objectives**:

- To increase the resilience of EU countries, regions and cities.
- To better inform decision-making on adaptation.
- To increase resilience in key vulnerable sectors and EU policies.

In November last year, the Commission evaluated the 2013 Strategy and found that, although the strategy has delivered and adaptation as progressed enormously, many areas require further action and there is a growing need to adapt: emissions have not yet peaked, neither globally nor in Europe.

This implies that **the new Commission**, as of 2020, will need to decide whether the EU's adaptation policy must expand to match rising emissions, and complement the Vision 2050 it has set out for a climate-neutral Europe with “a mid-century adaptation vision”.

The new Commissioner for Climate will have to face a complex, very horizontal policy where both the EU and Member States are expected to deliver as part of the Paris Agreement's **first global stocktake in 2023**.

Some of the **lessons learned** arising from the evaluation could help define the future of adaptation in Europe. For example:

- The 2013 Strategy focuses on the EU's territory, and it did not address the potential interrelations with climate change adaptation outside the EU. But **international developments** have created a new need to align adaptation in the EU to the Paris Agreement, the Sendai Framework for Disaster Risk Reduction and the Sustainable Development Goals.
- The **need to adapt to accelerating changes is bigger** than in 2013: for example, following multiple extreme weather events in 2018 and evidence from all quarters, notably the Commission's own scientific services (JRC), we need to strengthen economic sectors and infrastructure against extreme weather events and the expected impacts of climate change. Investing now will save costs later.
- Member States' must start to **focus on the implementation** of their strategies.

- **Ecosystem-based** adaptation is crucial. Conservational agricultural practices, green infrastructure, nature protection, etc. provide multiple benefits including for biodiversity, ecosystems, climate change adaptation, climate change mitigation, air and soil quality and societal well-being. This multi-functionality should be better embedded in the assessment and choice of adaptation options.
- **Sub-national action** must be reinforced. Cities hold a lot of promise but they need political and financial support, which the Commission already provides and intend to expand in the next few years through the EU Covenant of Mayors and the Global Covenant of Mayors.
- New knowledge about tipping points and high-emission scenarios call for an enhanced climate-proofing of economic sectors and infrastructure, and for a more fluid dialogue between **DRR and adaptation** practitioners.
- **Businesses, investors and insurers** must be involved in adaptation efforts. It is difficult to measure, but it seems that business are not considering the risks brought about by climate impacts that are happening now and in the short-term, not to mention the long-term. Adaptation investment should develop in line with the Action Plan for Financing Sustainable Growth adopted by the Commission in March 2018.

Ecosystem-based Adaptation in EU policy

Ecosystem services can be used in an effective way to reduce greenhouse gas emissions and to conserve and expand carbon sinks, but at the same time, the natural functions of ecosystems can support human life in the face of the negative effects of climate change, such as heat waves, floods, drought etc. Both approaches seek to increase the resilience of ecosystems and thereby to the provisioning of important services, for example coastal and flood protection, water filtration, soil fertility, air quality, and carbon storage.

The EU Adaptation Strategy recognises the multiple benefits of ecosystem-based approaches, and their contribution to achieving its **objective of a climate-resilient Europe**.

Equally, we see a lot potential in their application **for disaster risk reduction**. This is why the EU Action Plan on the Sendai Framework for Disaster Risk Reduction promotes ecosystem-based approaches for disaster risk reduction and effective measures to increase resilience.

At the international level, the **Convention on Biodiversity** published in mid-2018 its ‘Voluntary guidelines for the design and effective implementation of ecosystem based approaches to climate change adaptation and disaster risk reduction’. They include important principles but also safeguards (like ex-ante environmental impact assessments) to make sure that, when put into practice, these approaches do indeed have positive effects on people, ecosystems and biodiversity.

Looking at the EU legislation, the EU's **Water Framework Directive** encourages natural water retention measures to reduce exposure to floods and extreme precipitations.

Also, the **EU Nature Directives** (Habitats and Birds Directive) have resulted in the creation of the Natura 2000 network, the largest coordinated network of protected areas in the world stretching over 18 % of the EU's land area and almost 10%% of its marine territory. It harbours not only to Europe's most valuable and threatened species and habitats, but is also of high interest in an integrated water resource management context:

The **Guidelines on Climate Change and Natura 2000**, published already in 2013, include a whole chapter on how Natura2000 areas can support climate change adaptation and resilience. For instance, many of them can reduce run-off during periods of heavy rain. And natural meandering rivers with functioning floodplains avoid water rushing downstream, protecting human settlements from floods.

Nearly 40% of the EU is forests and another 40% agricultural land. The new LULUCF rules supports climate-smart agricultural, forestry and soil management through, for example, supporting farmers in developing climate-smart agriculture practices, which seek synergies between productivity, resilience and emissions reductions. So here we are also talking about **adaptation in the agricultural and forestry sectors**.

Policy is however not enough for nature based solutions: **funding instruments** need to underpin the policy framework to foster adoption and implementation.

For example, the **European Structural and Investment Funds** (ESIF) [42% of the EU budget] contribute €115 billion to climate change mitigation and adaptation. ESIF offers interesting opportunities for nature based solutions, including for rural areas, and boosting competitiveness, growth and jobs.

A case in point is the **HyMoCARES project** which the EU supports with €2.1 million under the 2014-20 European Regional Development Fund INTERREG

programme. It will develop a transnational framework and operational tools to integrate ecosystem services into the planning and management of Alpine river ecosystems, securing their conservation of ensure that they remain viable places to visit, work and live. The project involves Austria, France, Germany, Italy, Slovenia and Switzerland.

There is also the **LIFE funding programme** for environmental projects, which tend to adopt integrated or ecosystem-based approaches to flood management, agriculture, forest management and urban resilience. LIFE has more than € 800 million earmarked for climate change. Recent project examples include:

- The LIFE DICCA project which will develop a climate change adaptation strategy for Vienna's Danube Island that will improve ecosystems and water management, deliver a 15% reduction in the maintenance costs of the island, and be replicable by other cities (total budget €2 million, EU contribution €1 million)
- The LIFE SPARC project which will make the estuary of the Belgian river Scheldt and its highly urbanised area more resilient to climate change. At present, financial damage from flooding in the Scheldt estuary can exceed €50 million on an annual basis. The project therefore wants to enlarge and strengthen the estuary ecosystem to reduce flood risks and improve its function as habitat. (total budget €8.5 million, EU contribution €2.3 million)

If you want to benefit from LIFE funding, too, don't wait and start working on a funding application now: the next funding round has started with the publication of the annual call for project proposal earlier this month, and the deadline to submit climate proposals is 12 September 2019, at 16:00 sharp. €24 million for adaptation projects are up for grabs, including in the following three areas:

- Urban adaptation and land use planning which limits the impacts of climate change
- Resilience of infrastructure, including application of blue-green infrastructure and ecosystem-based approaches to adaptation
- Sustainable management of water in drought-prone areas, flood and coastal management

Nature based solution for adaptation and disaster risk reduction are supported also through the **EU development cooperation**. In our work with developing partners, nature-based solutions are promoted as sustainable, cost-effective, multi-purpose and flexible alternatives for climate change adaptation to and

disaster risk reduction. They enable participation of grassroots communities to adaptation action, fostering ownership, inclusiveness and sustainability.

More than 70% of the projects supported by the **Global Climate Change Alliance** (more than 700 m€ for around 77 projects in LDCs and SIDS) make good use of nature based solutions for adaptation. Examples include rehabilitating gallery forest to prevent floods in Benin, or rehabilitating mangroves in Mozambique always as a tool for flood protection.

Mobilising private sector finance is also important. That is why we have set up, with the European Investment Bank, the **Natural Capital Financing Facility**, that will provide and mobilise resources for the preservation of natural capital, including adaptation to climate change, in the Member States. Altogether, the NCFE has a budget of €185 million for the finance facility. To date, five projects have been signed for a total NCFE investment of EUR 44.5m i.e. more than €100 million is still up for grabs! If you are interested you can find out more on the EIB website.

One new project that is currently under consideration is a €20 million project to **renaturalise** of a 20km stretch of the **Alzette River** between Luxembourg City and Mersch - to reduce flood risks, benefit biodiversity and improve water quality.

But how do we ensure actions takes place where it is most needed? According to an Eurobarometer survey, 83% of **citizens are interested in the wider use of nature-based solutions**. In the EU, 6 out of 10 citizens favour NBS over technological solutions and around half want to be involved directly if a NBS was implemented in their area.

However, there is still much room for improvement of public awareness about the potential applications and benefits offered by nature-based solutions. We think engaging **local and regional actors** is critical to step up awareness. In Europe, the Covenant of Mayors for Climate and Energy encourages cities to adopt green solutions – and we have already many good examples. But stepping up public awareness on NBS is critical. Regions and cities which are directly in charge of building codes, urban mobility, energy efficiency, floods management, urban planning, will make the difference, and can support or hinder the rolling out of nature based solutions.

While European transnational regions are vulnerable to climate change across their wide range of economic sectors and natural ecosystems, the diffuse character and long-term effects of climate impacts could deter transnational

action. Benefiting of the EU Interreg **transnational cooperation programme** covering all transnational regions, with an overall funding support from the European Regional end Development Fund of of EUR 2.1 billion for the period 2014-2020, the climate action framework and plans developed under the four EU macro-regional strategies provided leverage for action in that regard.

As a result, European countries have already taken steady steps forward on **ecosystem-based adaptation at macro-regional level**. Such relevant actions include:

- policy frameworks like the **Climate Adaptation Strategy for the Danube River**, developed in 2012 and including five adaptation categories, one of them proposing ecosystem-based measures aiming to reduce the impact of a changing climate;
- flagship initiatives like **iWater, developed under the EU Strategy for the Baltic Sea Region** and spanning form 2015 to 2018, with the key objective to improve urban planning by developing integrated and multifunctional storm water management in the Central Baltic cities as an adaptation and risk prevention management objective;
- or complex long-term climate targets/indicators systems, like the **Alpine Climate Target System 2050** which has been approved this April by the 8 countries grouped in the Alpine Convention. Eco-system based adaptation targets feature prominently amongst the soft, but verifiable objectives for the 2050 climate horizon, in relation to: planning systems in risk management; maintained and restored Alpine ecosystem services; accelerated forest conversion; or resilient and climate friendly agriculture.

There are many other good examples of NBS success studies already implemented in Europe:

- The city of Glasgow avoided flood damage of 13 million in 2011 and 2012 through nature-based flood storage areas (the White Cart Water project in the UK)
- A water retention landscape which was developed on a farm in an arid region of Portugal generated tourism, increased land value and the carbon storage potential of the land (Tamera Water Retention landscape in Portugal).

However, much of the evidence that nature-based solutions make good economic sense is restricted to context-specific case studies. The public benefits of NBS are often not quantified and there are also long time lags in between the investment and reaping its benefits. How do we make NBS a viable business case?

Last but not the least, filling the knowledge gap is essential: in our research and innovation programme, **Horizon 2020**, a significant amount of resource, around 55 million EUR, is allocated to nature-based solutions.

Information also needs to reach potential users: for instance, the European Climate Adaptation Platform, **Climate-ADAPT**, holds information and guidance for key sectors, as well as case studies on ecosystem based adaptation at different levels – from regions to cities.

In conclusion, the four key ingredients for nature-based solutions are indeed policy, funding, stakeholder engagement and knowledge.