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Executive Summary

Addressing Environmental Risk Management and Climate Change in Central Europe

CENTRAL EUROPE 2007-2013 is a transnational programme within the European Territorial Cooperation objective of the EU's cohesion policy that aims to make central European regions more competitive, innovative, attractive and accessible. The programme is supporting EU transnational cooperation activities in line with four programme priorities, which are assigned to six themes (Technology transfer and business innovation, Sustainable public transport and logistics, Environmental management and climate change, Energy efficiency and renewable energies, Demographic change and knowledge development, Cultural heritage and creative resources).

This thematic study is based on an analysis of the achievements of CENTRAL EUROPE projects that contribute to the thematic area 'Environmental risk management and climate change'. This study highlights the added value created for the territories concerned, and aims to identify the relevance of transnational cooperation for this thematic area. CENTRAL EUROPE projects are making a contribution towards achieving the aims of a diverse range of EU Directives and other EU and national legislation.

Central Europe faces a variety of challenges linked to the 'Environmental risk management and climate change' thematic area, and the regions of the programme area are at different levels of preparedness to tackle these issues. For example, waste management practises vary within central Europe to a considerable extent. Countries also perform quite differently in terms of resource efficiency: some countries are already making efforts to achieve their material use and material efficiency targets, while in others such targets remain to be set.

In terms of vulnerability to climate change, the most severe climate-related problems that central Europe faces include flooding, hotter summers and heat waves, and water scarcity in southern areas. With regard to air pollution, the main sources are traffic-related pollutant emissions, industry and agriculture. Soil erosion and contamination is another issue confronting some of the central European regions.

Primary ecosystem-related challenges include biodiversity and habitat losses and degradation, the increase of invasive alien species, augmented pollution and nutrient loads and overexploitation. Some of the main challenges in terms of landscape protection include increased urban sprawl, land fragmentation and vulnerability to climate change. There is also a significant need to revitalise brownfield sites (abandoned or underused industrial facilities, mining sites etc.) in central Europe.

Project achievements are analysed and presented in this study according to two sub-themes: 'Cooperating to prevent environmental hazards and reduce the negative effects of climate change' and 'Cooperating to protect and preserve nature and landscapes'. The sub-themes are further subdivided into a number of environmental topics, namely:

- 'Waste management and resource efficiency',
- 'Risk prevention and climate change adaptation',
- 'Water management and flood protection',
- 'Soil protection and land use',
- 'Reduction of air pollution' and
- 'Biodiversity and landscape protection'.

With regards to waste management and resource efficiency, cooperation within central Europe has enabled partners to address region-specific waste management issues and to find jointly applicable solutions. Projects have addressed a wide spectrum of issues such as transboundary informal waste collection and shipment, setting up repair and re-use systems, improving packaging recyclability and cleaner production.

Risk prevention and climate change adaptation issues have been addressed by projects tackling in particular the need for methodological and technical solutions with regards to extreme weather events, heat island phenomenon, and climate change related threats to habitats.

In addition, projects have tackled challenges related to water management and flood protection. In particular, in the case of the Danube River and its tributaries, as well as the Elbe River, flowing through several countries, joint action is required to address ecological, water management and flood protection issues related to these shared rivers. The projects adopted approaches tailored to the specifics of the territory and provided methodological and organisational basis for flood risk management and development of river-specific cooperative strategies.

As the conservation status of rivers and lakes is an issue of concern for central Europe, projects make an important contribution to the knowledge base needed to address these challenges. Project results were also related to the revitalisation of urban sections of rivers by creating high-quality public spaces alongside riverbanks.

A number of industrial sites continue to pollute groundwater, particularly in Member States that acceded to the EU in 2004. Project results contribute to solve this issue by providing tools to identify sources of groundwater pollution. In addition, a Water Footprint Approach has been developed for monitoring and evaluating water use and water conservation in urban areas.

Project achievements are targeting soil protection by providing appropriate tools in order to enable planners to take account of soil sealing within the assessment processes. Furthermore, projects focus more specifically on land use. Brownfield sites, which are unused and often also affected by pollution, are a major problem for many central European territories. As this is a complex issue, projects are addressing it from different perspectives, such as building knowledge and practical expertise concerning brownfield management, developing a 'circular land use' concept, exploit mining legacies as assets for future regional development.

Air pollution is addressed by projects have a mostly urban focus and tackle the ill-health effects of ultrafine particle air pollution and air pollution from the combustion of fossil fuels.

Biodiversity and landscape protection is the focus of projects dealing with transnational ecological corridors to counter landscape fragmentation. This has resulted in strategies and action plans to ensure that policymakers will apply management strategies that promote the preservation of these areas. More specifically, projects address 'high nature value' grassland and help to maintain landscapes and habitats typical of the region.

Conclusions

The analysis conducted shows that climate change and environmental risks are issues for which transnational cooperation between regions has a special relevance. Efforts to adapt

to climate change or to minimise and prevent environmental risks cannot be taken by countries and regions in isolation if they are to be effective. Cooperation between regions participating in the CENTRAL EUROPE Programme is therefore an important tool for enhancing cohesion and approaching issues that have spatial development characteristics.

An important aspect of the projects supported by the CENTRAL EUROPE Programme is their focus on ensuring sustainability and long-term impacts of project results. Specifically, many of the project achievements will continue to play a major role in effective policy planning and implementation beyond the project lifetime. For example, several project partners will continue to carry out further data collection and processing in order to contribute to better informed decision making and policy actions on environmental issues. Web portals, measurement systems and laboratories for collecting and sharing environmental information will continue to operate and remain accessible after the project's end.

The achievements of the projects supported by the CENTRAL EUROPE Programme are especially relevant for improving knowledge and capacity of beneficiaries to address environmental risk management and climate change issues in the region. An important result of project activities has been the uptake of accumulated knowledge and experience in the preparation and implementation of policies, plans, programmes or strategies – for example, the development of management plans for lakes, or climate change adaptation plans for natural sites. Regions and local authorities have indicated that the knowledge acquired during the project activities on various environmental issues will help policymakers to formulate more effective policies and strategies for the future and to implement them more successfully.

Various cooperation mechanisms (such as memoranda of understanding, charters, business cooperatives, institutional networks, and educational or training programmes) have been established to ensure the continuation of climate change and natural risk management activities already implemented within the projects. Examples of innovative practices and mechanisms include the foundation of an “European School for Brownfield Redevelopment”, the establishment of Regional Re-use Centres, the adoption of the “Memorandum of Flood Protection”, etc. In addition, small-scale pilot investments – for example, to revitalise urban river courses or remediate brownfield sites – have brought concrete and immediate benefits to the project areas.

The main niche characterising transnational cooperation supported by the CENTRAL EUROPE Programme is its territorial relevance and focus. As a result, the programme has the ability to address climate change and environmental issues that are specific to the programme area and which cannot be addressed with the same effectiveness if different national and regional actors act alone. In spite of its limited resources, transnational cooperation helps to increase the understanding of climate change and environmental risks as policy issues and in a transnational context at local and regional levels; moreover transnational cooperation encourages local and regional actors to work together to develop joint strategies, solutions, tools and monitoring systems. The programme has supported local and regional efforts in contributing to the achievement of EU strategic objectives in the thematic field. Another essential feature of transnational cooperation is its ability to promote territorial integration and foster the creation of critical mass for tackling various environmental issues. Transnational cooperation also provides opportunities for mutual learning and exchange of experience between Member States which have specific and diverse territorial characteristics and are at different level of preparedness to address environmental problems.

Recommendations

Types of interventions to be supported

- The future CENTRAL EUROPE Programme should continue to support projects delivering results and outputs with high spin-off potential. These include, amongst others, establishing networks; developing policy documents and implementing activities leading to policy improvement; strategies and action plans; implementing pilot actions that include physical investments; and preparing tools and guidelines.
- It is recommended that support for demonstration and pilot actions should continue. Specifically, actions that are focused on technologies and systems development and application can be targeted as they can help to raise levels of knowledge and awareness amongst decision makers and businesses. Such demonstration actions can also help to bridge the gap between the scientific knowledge on climate change, and other environmental issues and its uptake into policies and plans; they can also improve environmental management practises in urban areas.
- Follow-up activities focusing on building the capacity of SMEs to invest in cleaner production, improve waste management practises and create green jobs can be especially beneficial. Follow-up work and cooperation between institutions beyond the project lifetime is also essential for flood management and other risk prevention measures in a transnational context.

Actions and themes to be supported

- With regard to waste management and resource efficiency, there is considerable potential for further exchange of experience and the adoption of novel practises that can be used to alter (for the better) behavioural patterns related to consumption and production. Other areas in this topic with potential for transnational cooperation initiatives are: waste prevention; creating incentives to increase re-use and repair; stimulating recycling and recovery; and transfer of waste management technologies.
- Adaptation to climate change, as well as disaster prevention and management is an issue of particular relevance for transnational cooperation. Specifically, local and regional authorities can benefit from transnational cooperation in areas like development of monitoring methodologies, early warning systems, information exchange related to natural disaster situations and mainstreaming adaptation issues in sector-specific plans.
- Concerning water management and flood protection, proper flood management schemes will require ecosystem-based solutions. It is recommended that transnational cooperation continues to be a platform for generating ideas and producing tools and methodologies to facilitate this shift.
- It is recommended that CENTRAL EUROPE Programme supports actions aiming to improve capacity of authorities to design and implement measures that help to reduce harmful emissions from industry, traffic, energy plants and agriculture.
- Regarding land use, transnational cooperation opens up opportunities for sharing best practises and innovative approaches towards increasing the attractiveness of



urban areas through revitalisation efforts and improved urban environmental management.

- Transnational cooperation can also continue to play a strong role in integrated development in the coming years, while also helping to preserve the region's natural and cultural heritage. As the efficient protection of landscapes is a trans-boundary issue, there is a need to further build the capacities and networks of relevant local and regional actors in landscape policy and management.

Actors to be involved

- The long-term success of the projects depends very much on the follow-up activities. It is therefore recommended to involve actors during project implementation that can carry the work forward after the project draws to an official close. Decision makers can play an essential role in placing the project in the context of already existing initiatives and in expediting planning for further activities beyond the project's lifetime.
- It is recommended that academia and research institutes continue to be involved in the projects, as they bring theme-specific knowledge and expertise.
- It is essential that the problems addressed by the projects are tackled in an integrated way, and that a wider group of relevant stakeholders becomes involved in project implementation. The profiles of these institutions may vary, and will depend in any case on a project's specific focus. For example, to address climate change issues successfully there is the need for a robust exchange of ideas and collaborative working across sectors involving a wide group of stakeholders, such as businesses, housing associations, NGOs, technical advice bodies, etc.



1. Introduction

1.1 Background

In recent years the European Union has maintained a constant focus on sustainable growth-oriented policy, which is now codified as one of three Europe 2020 Strategy priorities, the other two being ‘smart’ and ‘inclusive’ growth.

CENTRAL EUROPE (2007-2013) is a transnational programme within the European Territorial Cooperation objective of the European Cohesion Policy that aims to make central European regions more competitive, innovative, attractive and accessible. The Programme supports transnational cooperation activities in line with the four Programme priorities: facilitating innovation across Central Europe; improving accessibility to, and within, Central Europe; using our environment responsibly; and enhancing the competitiveness and attractiveness of cities and regions. The projects that received funding are grouped into six themes according to their thematic focus.

One of the thematic areas of CENTRAL EUROPE Programme is ‘Environmental risk management and climate change’. This thematic area is highly relevant for the region covered by the Programme, as central Europe is rich in diversified natural capital, including large areas of forested and agricultural land, mountainous areas, watercourses, unique coastal landscapes, maritime environments, lakes, plains and urbanised areas. The programme area is also home to several important river systems (e.g. the Vistula, Danube, Elba/Labe and Oder/Odra). With a view to sustainable development, this diversity of natural heritage is one of central Europe’s biggest assets, while its range of territorial coverage both raises the need and offers opportunities for trans-border and transnational cooperation.

However, industrialisation, intensive agriculture, traffic and urbanisation and a growing tourist industry have combined to generate severe environmental problems and financial burdens, such as derelict areas, air-, soil- and water contamination, and insufficient water and waste infrastructure. Natural and manmade disasters – the former partly attributable to climate change – with transnational dimensions have also occurred frequently in recent decades (e.g. poisoning of the Tisza River in 2000 and severe flooding in 2002 and 2013), thus raising the need to develop effective warning systems and early-response plans.¹

Figure 1: CENTRAL EUROPE Programme area



Source: CENTRAL EUROPE Programme website

¹ CENTRAL EUROPE Programme 2007–2013: Operational Programme, March 2011.

1.2 Study objectives

Projects under the CENTRAL EUROPE Programme’s ‘Environmental risk management and climate change’ thematic area aim to address risks posed by climate change and extreme weather events, and to confront relevant issues that demand trans-border cooperation. Therefore the objective of the thematic study is to identify the relevance of transnational cooperation for this thematic area of CENTRAL EUROPE Programme. The study aims to:

- give evidence of the critical mass mobilised at transnational level related to Environmental risk management and climate change;
- verify the potential relevance of project achievements and their uptake into and contribution to policies (e.g. regional, national or EU level), and proposing or adopting practical measures; and
- reflect territorial relevance and added value created for the territories concerned by mapping the main achievements.

For the purposes of this study, ‘capitalisation’ within a transnational context means taking advantage of achieved results in order to facilitate future activities and identify opportunities to benefit the region. The study also focuses on taking advantage of knowledge accumulated as a result of project cooperation in order to facilitate the planning and implementation of future Programme activities.

To achieve these objectives the study is based on an analysis of existing and planned achievements of CENTRAL EUROPE projects. Within the funding period 2007-2013 26 projects involving a total of 272 partners have been co-financed under the ‘Environmental risk management and climate change’ thematic area. Approximately EUR 55 million from the European Regional Development Fund (ERDF) was granted for the implementation of these projects, which were selected during four calls launched by the Programme. These projects are generating pilot investments amounting to about EUR 3.15 million and creating nine permanent cooperation networks and 80 jobs.²

The Programme’s ‘Environmental risk management and climate change’ thematic area covers two subthemes: 1) ‘Cooperating to prevent environmental hazards and reduce the negative effects of climate change’, and 2) ‘Cooperating to protect and preserve nature and landscapes’. Table 1 gives an overview of the projects assigned to those two subthemes.

Table 1: Project distribution according to subtheme

Subthemes	Projects	Total
Subtheme 1 <i>‘Cooperating to prevent environmental hazards and reduce the negative effects of climate change’</i>	ACT Clean, TransWaste, CERREC, ECOPaperLOOP, PRESOURCE, INCA-CE, UHI, (HABIT-CHANGE*), TAB, UFIREG, URBAN SMS, FOKS, UrbSpace, COBRAMAN, ReSOURCE, CircUse, EULAKES, REURIS, (URBAN WFTP*), LABEL, CEframe, INARMA	20

² Cooperating on Environment in Central Europe, March 2013.

http://www.central2013.eu/fileadmin/tmpl/images/pdf/central_europe_infographic_environment_WITHOUT_RGB.pdf

Subtheme 2 <i>‘Cooperating to protect and preserve nature and landscapes’</i>	Greennet, SALVERE, TransEcoNet, HABIT-CHANGE*, VITAL LANDSCAPES, URBAN WFTP* *The HABIT-CHANGE and URBAN WFTP projects have been assigned to both subthemes.	6
Total		26

Under Subtheme 1, the projects cover a wide range of environmental topics: ‘Waste management and resource efficiency’, ‘Risk prevention and climate change adaptation’, ‘Water management and flood protection’, ‘Soil protection and land use’, and ‘Reduction of air pollution’. Projects assigned to Subtheme 2 focus primarily on the topic of ‘Biodiversity and landscape protection’.

1.3. Structure of the study

The present study is structured as follows:

- **Chapter 1: Introduction** provides an overview of the CENTRAL EUROPE Programme, describes Programme efforts in the context of the ‘Environmental risk management and climate change’ thematic area, and outlines the objectives of the study.
- **Chapter 2: Thematic Background** presents key challenges, trends and developments relevant to the ‘Environmental risk management and climate change’ thematic area at EU level and in central Europe. This section draws also parallels with the European strategic policy framework.
- **Chapter 3: Thematic Achievements** focuses on the analysis of main CENTRAL EUROPE project results and good practises within the context of the two subthemes. The analysis illustrates how the results of transnational cooperation projects are of interest to other regions and how they contribute to improving policies in the field.
- **Chapter 4: Conclusions and Recommendations** summarises the results of the study and provides recommendations for the future.



2. Thematic Background

This chapter provides an overview of current environmental challenges that central Europe now faces. It also presents an EU-level strategic framework within the field of environmental risk management and climate change. Connections are made between strategic EU policy goals and key topics addressed by projects supported by the CENTRAL EUROPE Programme.

2.1 Challenges and trends in environmental risk management and climate change in the central Europe region

This subchapter summarises the main environmental risk management and climate change issues in central Europe and outlines some related trends. Specifically, key issues and tendencies in the following areas are presented:

- Waste management and resource efficiency
- Risk prevention and climate change adaptation
- Reduction of air pollution
- Soil protection and land use
- Water management and flood protection
- Biodiversity and landscape protection

Waste management and resource efficiency

High percentages of landfilled municipal waste in some countries, as well as low rates of waste recycling, are key challenges with regard to waste management and resource efficiency in central Europe.

The generation of municipal waste per capita in central Europe ranges between 315 kg (Poland) and 602 kg (Germany). The figures for Germany, Italy and Austria are above the EU-27 average of 505 kg per capita, and lower the rest of the countries in the region. Waste management capacity has improved: percentages of recycled packaging in Austria, Czech Republic, Germany and Italy are higher than the EU-27 average, while Slovenia's rate is close to the EU-average (*see Table 2*).

High levels of waste generation in some countries in the central Europe region suggest the need for policies targeting waste prevention and minimisation and a more sustainable use of resources. In Italy, an analysis of the correlation between waste generation, GDP and household consumption shows that waste generation is growing more rapidly than economic indicators.³ In Poland, on the other hand, against a background of constant GDP growth, the amount of industrial waste has remained at approximately the same level over the past 10 years, which can be interpreted as the result of actions taken to rationalise waste management.

As a consequence of past policy decisions, landfill waste disposal is still a dominant method of waste removal for several of the countries (e.g. Czech Republic, Hungary, Poland, Slovakia and Slovenia). In the Czech Republic, for instance, the majority of

³ Italian Ministry of Environment: State of Environment Report 2009, Italy.
http://www.minambiente.it/export/sites/default/archivio/biblioteca/ras_rsa_2009_summary_eng.pdf

municipal waste is landfilled due to a lack of waste- and energy-recovery facilities. Contaminated sites that pose a risk to public health and the environment are an ongoing concern. One positive trend is that the disposal rate of municipal solid waste is declining, while the upgrading of landfills and the establishment of new regional waste management centres have minimised environmental pollution from waste deposition. Also, many landfill sites have been re-cultivated in recent years, mostly under EU co-financed projects.

On the other side of the spectrum is Germany, where three-quarters of waste is pre-treated and landfill disposal of municipal waste has almost ceased. Sustained high recovery rates in Germany show that waste management in the country is making a significant contribution towards saving primary materials in production. Efforts to improve recycling and recovery can also be observed in other countries from the central Europe region.

Central Europe is heterogeneous with regard to resource efficiency. Austria, Germany and Italy, for example, have material use and material efficiency targets, while other Member States in the central Europe area do not.⁴

Table 2: Waste statistics for the central Europe region (2010)

	Austria	Czech Republic	Germany	Hungary	Italy	Poland	Slovakia	Slovenia	EU-27
Municipal waste generated (kg per capita)	558	317	602	403	537	315	333	422	505
Landfilled (%)	3.2	71.2	0.005	73.5	49.5	65.2	76.5	64	39.5
Incinerated (%)	27.1	11.1	31.6	8.6	12	0.9	8.7	1	19.5
Packaging waste recycled (as % of total packaging waste)	66.6	70	72.7	51.7	64.4	38.9	45.7	61	63.3

Source: Eurostat

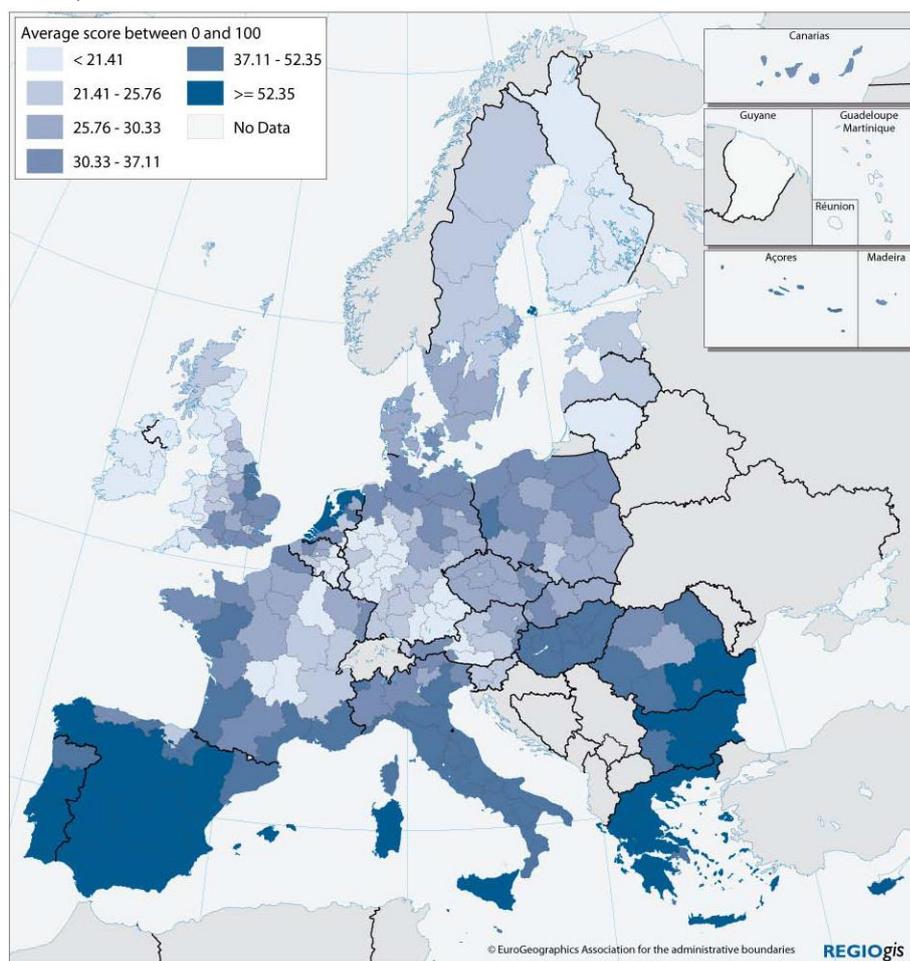
Risk prevention and climate change adaptation

In the long run, climate change will lead to increased average annual temperatures, changes in rainfall patterns and quantities, rises of sea levels and greater risk of coastal erosion. In the short and medium term, climate change will increase the number of extreme weather events (e.g. storms, heavy rainfall, droughts, and higher peak temperatures during summer). It is deemed likely that the future impacts of climate change will have negative effects on countries in the central European region.

As shown in Figure 2, vulnerability to climate change varies significantly across regions and sectors in Europe. This makes adaptation a context-specific and location-specific challenge. In central Europe, vulnerable regions include the coastal areas of Italy, Slovenia and Croatia; the eastern part of Hungary; Slovakia, Czech Republic and Poland; as well as mountains and cities prone to flooding. Of those countries participating in the CENTRAL EUROPE Programme, Hungary and Italy face the greatest pressures, followed by Slovakia, the Czech Republic and Poland.

⁴ EEA, Resource Efficiency in Europe, 2011.

Figure 2: Medium-term regional exposure to climate change (Climate Change Vulnerability Index)⁵



Source: EC, Regions 2020

The most severe climate-related problems that central Europe faces include flooding, heavy rainfalls, landslides, hotter summers and heat waves. Droughts have made the southern part of the central European region vulnerable to heat waves and water scarcity.

Climate change is affecting the frequency and intensity of extreme events. Extremes of warm and cool temperatures are important indicators because they can have strong impacts both on natural and human systems. Central Europe has shown the largest increases in warm days and nights and, by the 21st century, will likely experience the same number of hot days currently experienced in Spain and Sicily. Extreme high temperatures across Europe are projected to become more frequent and to last longer during this century.

Heavy precipitation events are likely to become more frequent in most parts of Europe. Changes are expected to be greatest in east-central Europe during summer. Flooding in central Europe is a major problem, especially in Germany, Austria, Hungary and the Czech Republic, and has significant impacts on human health, infrastructure and the economy.

⁵ The Climate Change Vulnerability Index is based on changes in population affected by river floods, population in coastal areas below 5m, potential drought hazard, vulnerability of agriculture, fisheries and tourism, taking into account temperature and precipitation changes.

The largest numbers of population affected by floods (on a per capita basis) are found in south-east Europe, eastern Europe and central Europe.⁶

Drought is occurring with greater frequency in central and eastern Europe, and adversely affects crop production in the region. The number of consecutive dry days is projected to increase significantly in southern and central Europe, particularly in summer. Negative effects from drought are expected for some Hungarian regions, while negative impacts on agricultural production will mainly affect regions in Poland. Also, many invasive alien species are predicted to increase their range and abundance in central Europe under a warming climate.⁷ Western European countries have a high overall capacity to adapt to climate change, but countries in central and eastern Europe have only medium capacity at present to do so.

Decreased glacier mass, reduced snow cover, thawing of permafrost and changing precipitation patterns are expected to continue in mountain areas. Several plant and animal species face extinction due to barriers prohibiting them from moving upwards or northwards to more suitable habitats. Negative consequences for tourism are likely to occur, especially in Austrian alpine areas.

Reduction of air pollution

Air pollution in Europe is a local, regional and trans-boundary problem that is caused by the emission of specific pollutants which, either directly or through chemical reactions, lead to negative impacts. Each pollutant produces a range of effects from mild to severe as concentration or exposure increases. Air pollution can cause health problems and result in premature death due to respiratory and cardiovascular diseases. It also reduces crop yields, alters ecosystems and species composition, and causes damage to buildings and materials.

The main problems of air pollution in central Europe include pollution from suspended particulate matter (PM)⁸ and tropospheric ozone concentrations.⁹ Urban PM concentrations in central Europe are the highest in the EU. In addition, target values for a pollutant called Benzo(a)pyrene have been exceeded by significant amounts.¹⁰ Excessive concentrations of nitrogen dioxide are present in some countries (Poland, Italy), despite recent downward trends of emissions (Italy).

Economic transformations, particularly the restructuring of industry and gradual advances in energy efficiency, have contributed to emissions reductions in some countries. Traffic-related pollutant emissions are among the main sources of air pollution in many of the countries in the central Europe region. Industry and agriculture are other main sources contributing to air pollution.

With regard to urban populations, exposure to PM-type air pollution is on the rise, except in Italy and Slovenia. In only two of the central European countries, Germany and Austria,

⁶ EC, Regions 2020: An assessment of future challenges for European regions, 2009.

⁷ EEA, Climate change, impacts and vulnerability in Europe: An indicator-based report, 2012.

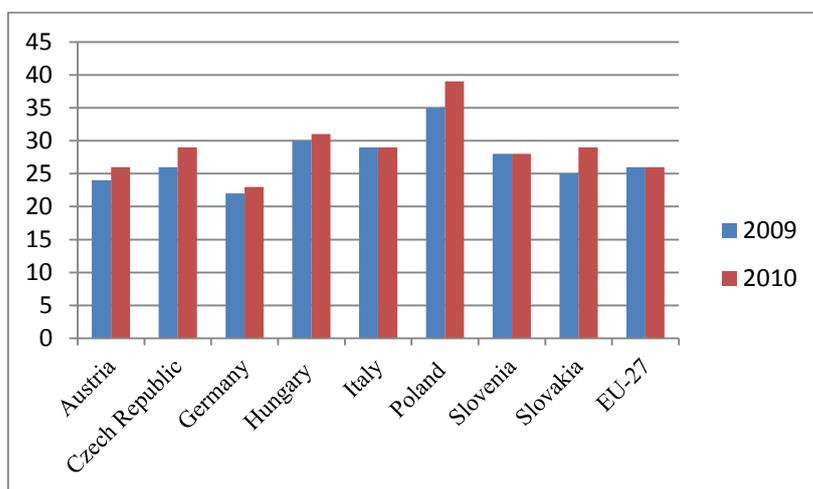
⁸ Fine particulates (PM10): particulate matter with a diameter of less than 10 micrometres can be carried deep into the lungs, where they can cause inflammation and affect people with heart and lung diseases.

⁹ Ozone at ground level is one of the major constituents of photochemical smog, which is formed when pollutants such as nitrogen oxides (from vehicle and industry emissions and volatile organic compounds emitted by vehicles, solvents and industry) react photochemically with sunlight.

¹⁰ EEA, Air quality in Europe, 2012 report.

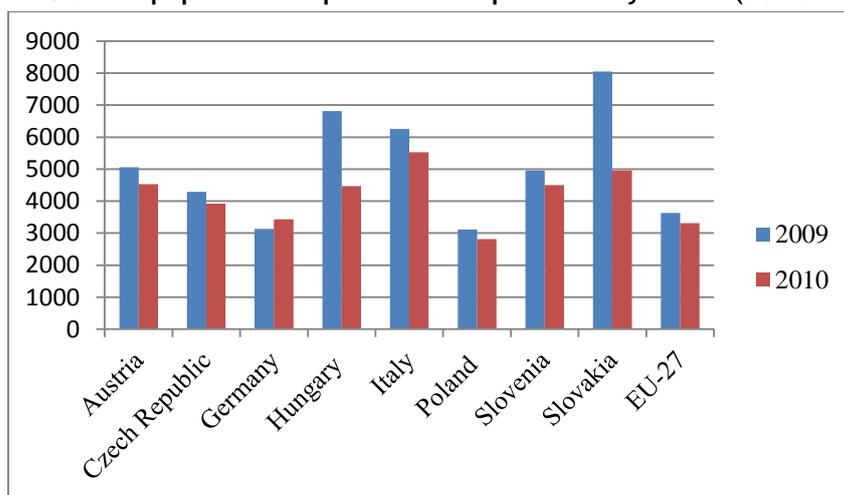
the 2010 figures are equal to or lower than the EU average, while populations in the rest of the countries are more strongly affected by air pollution caused by PM. While exposure rates of urban populations to ozone air pollution are trending downward throughout the central Europe region, they are nonetheless higher than the EU average, with the exception of Poland (see Figure 3 and Figure 4).

Figure 3: Urban population exposure to air pollution by particulate matter (% of micrograms per m³)



Source: Eurostat

Figure 4: Urban population exposure to air pollution by ozone (SOM035 level, µg/m³ per day)



Source: Eurostat

Growing industry, increased traffic and domestic heating installations have caused air quality to deteriorate in many of the countries. Exposure to air pollutants is still a considerable threat to human health, vegetation and ecosystems. It is estimated that exposure to PM could reduce life expectancy significantly in the most polluted zones. There are significant differences in air quality between rural and urban areas in Hungary.

Cross-border emissions contribute significantly to air pollution in Slovakia and Slovenia. Slovakia, in an effort to protect human health and ecosystems, has made progress since 1990 in reducing many forms of air pollution. A range of limit and target values have been

implemented to ensure protection. Similarly, the implementation of air protection programmes at local and regional level is helping Poland to improve its air quality.¹¹

Soil protection and land use

The deterioration of soil quality in Europe is caused by erosion, organic matter decline, landslides, uncontrolled soil sealing, soil contamination and water contamination, air pollution by particulate matter, and biodiversity loss.¹² Incremental losses and deterioration of Europe's soil resources will continue, but the process will likely accelerate as a result of climate change, land-use changes and other human activities. There is a number of major issues related to the deterioration of soil protection in the central Europe region. For example:

- Some countries, such as the Czech Republic and Slovakia, suffer from soil erosion and related problems. The Alpine and the Mediterranean areas of the region with highly erodible soils, combined with intense and abundant precipitation, are more prone to landslides.
- Parts of Italy and Germany have low or very low organic matter content, and are vulnerable to further decline due to human activities and climatic changes.
- Soil contamination is also a widespread problem in the central Europe region. The most frequent contaminants are heavy metals and mineral oil, and problem areas include abandoned military, industrial and storage sites. Although remediation efforts are being taken, progress is slow and there is still risk of further contamination from polluting sites.
- Artificially induced salinisation affects parts of Italy, Hungary and Slovakia, while soil acidification is problematic in Poland and in parts of the Czech Republic and Germany.

Soil sealing, one of the main causes of soil degradation in the EU, is adversely affecting agricultural land, jeopardising biodiversity and increasing the risk of flooding. According to the European Environment Agency, since the mid-1950s the total surface area of cities in the EU has increased by 78%, whereas population has grown by only 33%.¹³ Soil sealing in the CENTRAL EUROPE Programme area has some specific characteristics compared to other parts of Europe. According to the 2009 'Land use/cover area frame survey' (LUCAS)¹⁴, central and eastern European EU Member States have, on average, a lower percentage of land used for residential and economic infrastructure and services than the rest of Europe; and a higher percentage of land in these countries is used for agricultural purposes.¹⁵

While most of the territory of CENTRAL EUROPE Programme area is predominantly rural and not densely populated, the capital regions of the participating countries, such as Vienna, Bratislava, Budapest and Prague, have artificial land-use rates of higher than 15%. In addition, the northern Italian and eastern German regions involved in the programme also show higher rates of land use for residential and economic purposes in urban areas (see Figure 5).

¹¹ EEA SOER 2010: Air pollution.

¹² EEA SOER (2010), Thematic Assessment on Soil

¹³ EEA (2006)

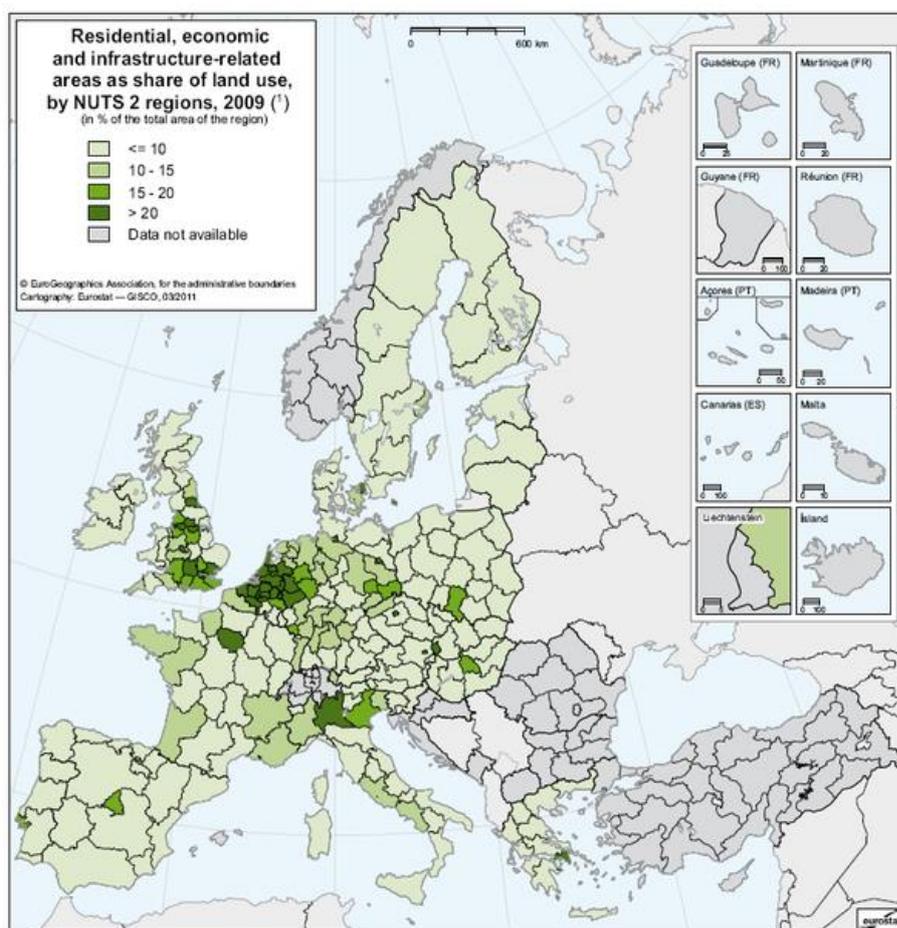
¹⁴ Land cover/use statistics (LUCAS):

<http://epp.eurostat.ec.europa.eu/portal/page/portal/lucas/data/database>

¹⁵ EEA SOER 2010: Land use and Land cover/use statistics (LUCAS):

<http://epp.eurostat.ec.europa.eu/portal/page/portal/lucas/data/database>

Figure 5: Residential, economic and infrastructure-related areas as share of land use by NUTS 2 regions (2009)¹⁶



© EuroGeographics Association, for the administrative boundaries
Cartography: Eurostat — GISCO, 03/2011

Source: Eurostat

Although the rate of urban areas is lower in the central Europe area compared to other areas in Europe (e.g. Benelux countries, central and southern parts of England), it is expected to increase in the future.¹⁷ Related to built-up areas, challenges related to ‘urban sprawl’ include uncontrolled land uptake by the housing sector and the development of city infrastructure.

Another important problem relates to a significant need to revitalise brownfield sites (abandoned or underused industrial facilities, mining sites, etc.). After 1990 most of the countries in central Europe underwent major political and economic transition, which resulted in several unutilised or contaminated brownfield sites, while capacities to tackle this problem remained rather limited.¹⁸ The issue is still rather difficult to address, due to insufficient knowledge, inadequate national-level regulations and various other legal obstacles.

¹⁶ EC, EUROSTAT:

http://epp.eurostat.ec.europa.eu/statistics_explained/index.php?title=File:Residential_economic_and_infrastructure-related_areas_as_share_of_land_use_by_NUTS_2_regions_2009.PNG&filetimestamp=20111125125531

¹⁷ EEA SOER (2010), Land use

¹⁸ Jackson, J. and Garb, Y., *Facilitating Brownfield Redevelopment in Central Europe: Overview and Proposals*, 2009.

Water management and flood protection

Central Europe is generally rich in water resources, but the distribution of resources varies greatly. Freshwater resources per inhabitant are relatively abundant in Austria, Hungary, Slovakia and Slovenia, but rather limited in the rest of the studied countries (*see Table 3*). Meanwhile, both groundwater and surface water abstraction point to a generally decreasing tendency in the last decade in most of the studied countries, except the Czech Republic and Slovenia.

While the rate of population connected to a public water supply with easy access to good-quality drinking water is high (above or around 90% in all countries), the rate of population connected to urban wastewater treatment is 90% or above only in Austria and Germany, and considerably lower (52-76%) in the Czech Republic, Hungary, Poland, Slovakia and Slovenia (*see Table 3*).

Table 3: Key statistics related to water resource management (2008)

	Austria	Czech Republic	Germany	Hungary	Italy	Poland	Slovakia	Slovenia
Freshwater resources per inhabitant (1,000 m ³ per inhabitant)	10	2	2.5	12	3	2.5	15	16
Population connected to public water supply (%)	95	92 *	99 *	95	100	87	87	n.a
Population connected to urban wastewater treatment (%)	92**	76	95*	57**	n.a	63	57*	52

Source: Eurostat, *figure for 2007 and ** figure for 2006

Affected by pollution and heavy modifications to watercourses, the ecological status of lake and river ecosystems in central Europe is generally rather poor.¹⁹ Throughout central Europe the percentage of classified water bodies with less than 'good ecological status' or potential is over 70% (except in Slovakia). Although wastewater that is either untreated or insufficiently treated still remains a considerable environmental pressure, point and diffuse pressures (i.e. pollution) on freshwater resources represent a less severe problem in the programme intervention area but are more present in the northern part of the central Europe region.²⁰

As discussed previously, both drought and flood occurrences have increased in central Europe as a result of climate change. The increased occurrence of floods is especially problematic due to high rates of trans-boundary water resources and river flows generated

¹⁹ EEA, [Assessing biodiversity in Europe: 2010 report](#).

²⁰ EEA report 2012: European waters: Current status and future challenges.

outside the countries.²¹ Also, winter precipitation has decreased noticeably in certain parts of central Europe, and ‘longest dry periods’ are also expected to increase in duration throughout the region.²² Droughts and reduced annual precipitation can also deplete groundwater quantities in the region, and already contribute to poor groundwater quality in the Czech Republic.

Biodiversity and landscape protection

Central Europe has suffered from high rates of biodiversity loss from the 1960s, with notable decreases in the number of plant and animal species in wetland, grassland and agricultural ecosystems. In order to develop informed environmental policies to address this problem, comprehensive and detailed knowledge about biodiversity losses in the area is essential.²³

In terms of assessing biological conservation status, Europe is divided into nine bio-geographical regions, which are characterised by identical or similar habitats and species.²⁴ The CENTRAL EUROPE Programme area includes three bio-geographical areas, namely: the Pannonian region (the steppes of Hungary and southern Slovakia, and the dry grasslands of the Carpathian basin); the Continental region (the heartland of Europe, spanning 11 countries from France to Poland); and the Alpine region (forests and rocky peaks, and mountain chains – i.e. the Alps, Apennines and Carpathians – with high altitudes and cold, harsh climates).

Where conservation status implies serious danger to a habitat, or even its extinction, changes in management and policy are required. The European Environment Agency (EEA) has assigned an ‘unfavourable status’ to more than 80% of habitats in the Pannonian bio-geographical region, to 70% of habitats in the Continental region, and to more than 60% of Alpine region habitats. Regarding the conservation status of species, the same study assigns an ‘unfavourable status’ to 50% of species in the Pannonian region, 70% in the Continental region and 60% in the Alpine region. From all nine bio-geographical regions, the risk of species extinction is highest in the Continental region.

Within the three bio-geographical regions of the Programme area, the conservation status remains ‘unknown’ for 5% of habitats and 15-20% of species.

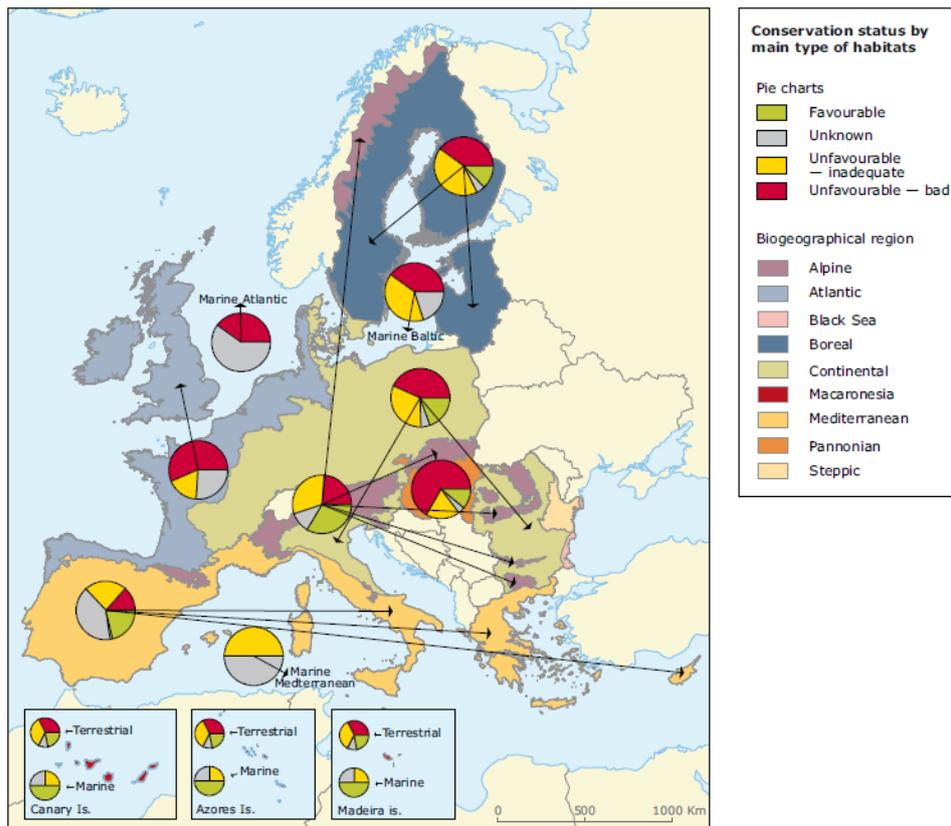
²¹ EEA report 2009: Water resources across Europe: Confronting water scarcity and drought.

²² Ibid.

²³ <http://www.uni-goettingen.de/de/76754.html>

²⁴ EEA, [Assessing biodiversity in Europe: 2010 report](#)

Figure 6: Conservation status of assessed habitats in the EU-25, by bio-geographical region²⁵



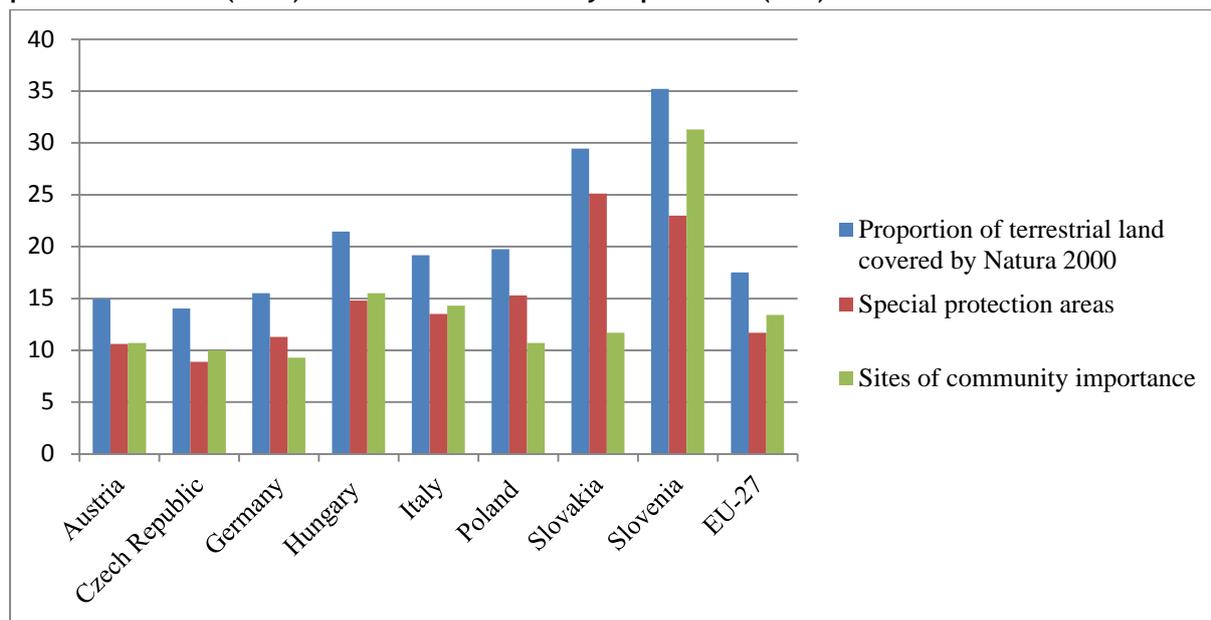
Source: EEA

The main challenges involving different ecosystems of the three relevant bio-geographical regions include: habitat loss and degradation, an increase of invasive alien species, augmented pollution and nutrient loads, overexploitation and unsustainable human use (i.e. tourism), and climate change. With regard to mountain ecosystems the challenges are especially difficult to tackle, as there is no dedicated framework for the protection of mountain areas. As for forest ecosystems, the conservation status of the vast majority of such habitats is ‘unfavourable’ in the Pannonian region (above 90%), while an ‘unfavourable conservation status’ applies to 70% of species in forest ecosystems of the Continental region, the worst in Europe. As for agro-environmental and grassland ecosystems, the conditions of both the Pannonian and Continental regions are considerably worse off compared to other bio-geographical regions in Europe.

Confirming the rich biodiversity of the region, the percentage of national territories covered by Natura 2000 areas (covering Special Protection Areas and Sites of Community Importance) are higher than the EU-27 average in most of the central European countries, except Austria, Czech Republic and Germany.

²⁵ EEA (2010), [Assessing biodiversity in Europe: 2010 report](#)

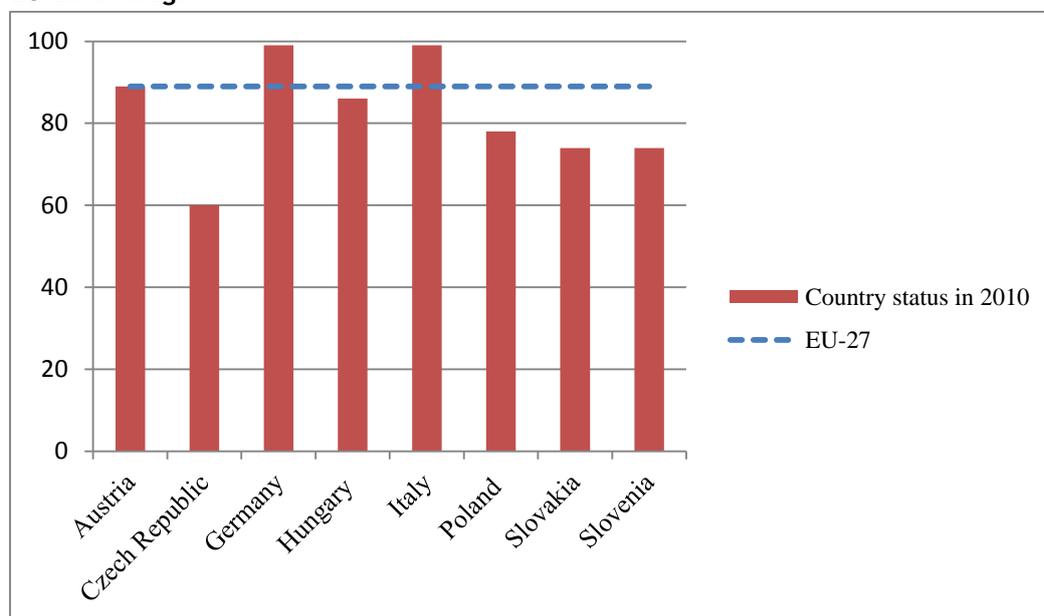
Figure 7: Proportion of terrestrial land covered by Natura 2000 and the share of special protection areas (SPAs) and sites of community importance (SISs)



Source: Eurostat, EEA

Regarding the sufficiency of sites designated under the EU Habitats Directive, only Germany and Italy are above the EU-27 average of 89%, reaching full compliance, while the Czech Republic, Poland, Slovakia and are well below this average.

Figure 8: Percentage of sites designated under the EU Habitats Directive, compared to the EU-27 average

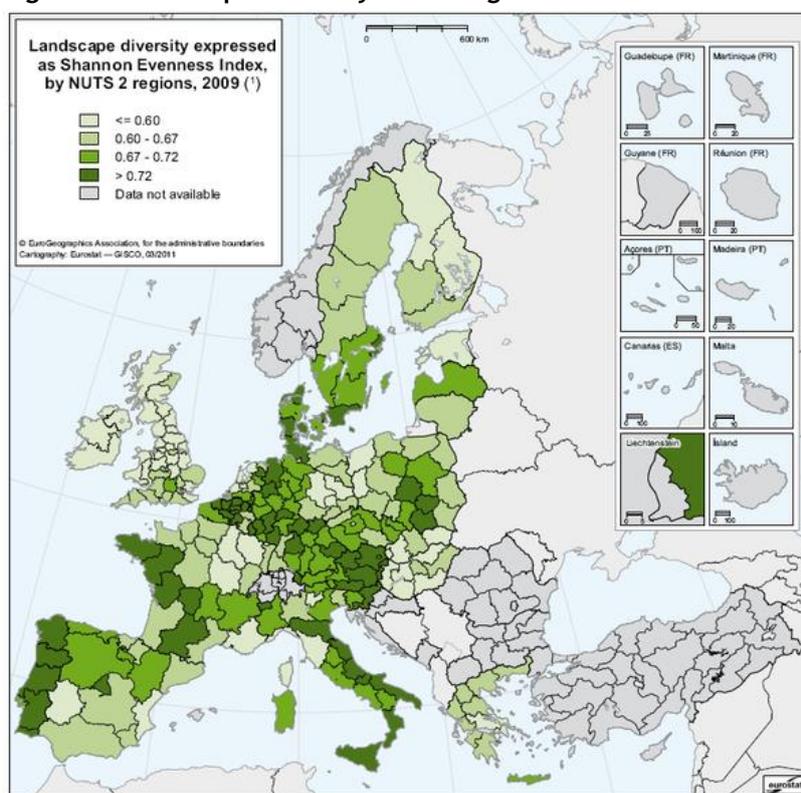


Source: Eurostat, EEA

In terms of landscape variance (which can be measured by the Shannon Evenness Index)²⁶ within the CENTRAL EUROPE Programme area, Austria, Slovenia, northern Italy, the Czech Republic and the south-central regions of Poland have the greatest diversity. As countries with mountainous or hilly areas tend to have greater landscape diversity, eastern Germany, Hungary and Slovakia have lower landscape variance.

The number of artificial areas is relatively lower in central Europe compared to other parts of Europe; and while predominantly concentrated around the capital city regions, they will likely increase in the future. Nonetheless, the distribution of cropland, woodland and grassland landscapes throughout the area shows high heterogeneity, which makes it difficult to draw general conclusions about land-use patterns.²⁷ Due to traditions of large-scale collective farming, the percentage of cropland in certain regions of the Czech Republic, Hungary and Poland is above 50%, while grasslands used for livestock farming are below or near the European average throughout the area. Higher percentages of woodland areas are more typical in hilly regions such as in the Alps (Austria, Germany and Slovenia) and the Apennines (Italy).

Figure 9: Landscape diversity according to the Shannon Evenness Index, by NUTS 2 regions²⁸



(¹) Bulgaria, Cyprus, Malta and Romania were not included in the LUCAS 2009 survey.

Source: EEA

Main challenges for sustainable land use and protection of the land in central Europe include: increased urban sprawl (which can result in losses of biodiversity and ecosystem services), increased land fragmentation, vulnerability to impacts of climate change, and

²⁶ The index provides information on area composition and richness. It also covers the number of different land cover types observed along the straight line and their relative abundances. Values vary between '0' and '1'.

²⁷ [http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:Shannon_evenness_index_\(SEI\)](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:Shannon_evenness_index_(SEI))

²⁸ http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Land_cover_and_land_use_statistics_at_regional_level

http://epp.eurostat.ec.europa.eu/statistics_explained/index.php?title=File:Landscape_diversity_expressed_as_Shannon_Evenness_Index_by_NUTS_2_regions_2009.PNG&filetimestamp=20111125130837

landscape homogenisation in agricultural areas, the combined result of which is a decrease of semi-natural environments (such as woodlands, semi-natural grasslands and hedge and field margins) next to agricultural areas.²⁹ Further problems include poor coordination of different policy areas (e.g. agriculture, nature conservation, economy) that deal with landscape issues. Urban sprawl and rural development also pose threats to public health.

2.2. European policy framework

This subsection provides an overview of the current and future policy framework relevant to the topics presented in Subchapter 2.1.

Waste management and resource efficiency

The EU Waste Framework Directive 2008/98/EC requires that waste is to be managed without endangering human health and harming the environment. Preventing waste and promoting its re-use, recycling and recovery is another priority of the Directive. It incorporates provisions on hazardous waste and waste oils and includes two new recycling and recovery targets to be achieved by 2020: the preparation of 50% of certain waste materials from households and other similar origins for re-use and recycling, and the preparation of 70% of construction and demolition waste materials for re-use, recycling and other recovery methods. The Directive requires that EU Member States adopt waste management plans and waste prevention programmes.

The Strategy on the Sustainable Use of Natural Resources (COM/2005/0670) sets out guidelines for action over the next 25 years aimed at more effective and sustainable use of natural resources throughout their life cycle. The overall aim of the Strategy is to reduce the negative environmental impacts of the use of natural resources (e.g. resource depletion and pollution) while meeting economic growth and employment targets. All resource-consuming sectors are taken into account with a view to improving resource yields while reducing the environmental impacts of resource use.

One component of the Europe 2020 Strategy's 'A resource-efficient Europe' flagship initiative³⁰ calls for decoupling economic growth from resource use by increasing the use of renewable resources, promoting energy efficiency and creating a cleaner transport sector. This effort will be crucial towards mobilising funding for regional policy, and also for streamlining available financial resources with other available funds. The Roadmap to a Resource Efficient Europe is a main building block of the resource efficiency flagship initiative. The Roadmap sets out a framework for the design and implementation of future actions and outlines the structural and technological changes needed by 2050, including milestones to be reached by 2020.

Risk prevention and climate change adaptation

The EU Strategy on Adaptation to Climate Change³¹ was adopted by the European Commission in April 2013. The Strategy aims to strengthen preparedness and capacities at

²⁹ EEA (2010), [Assessing biodiversity in Europe](#)

³⁰ COM(2011) 21 http://ec.europa.eu/resource-efficient-europe/pdf/resource_efficient_europe_en.pdf

³¹ COM/2013/0216

local, regional, national and EU levels to respond to the impacts of climate change. It also calls for the development of a coherent and coordinated approach to climate change adaptation actions. Specifically, the strategy focuses on the following main objectives: encouraging EU Member States to adopt comprehensive adaptation strategies; promoting adaptation in key vulnerable sectors such as agriculture, fisheries and cohesion policy; and addressing gaps in knowledge about adaptation.

Mapping Guidelines for Disaster Management (SEC(2010) 1626) and EC Risk Assessment are documents that aim to improve coherence and consistency among risk assessments undertaken by Member States at national level during the prevention, preparedness and planning stages. Coherent methods for national risk assessments will support a common understanding of the risks faced by the EU and its Member States, and will facilitate cooperation in efforts to prevent and mitigate shared risks, such as cross-border risks. The Guidelines follow up on an EC communication³² focused on the prevention of natural and manmade disasters, and sets out an overall disaster prevention framework while proposing measures to minimise disaster-related impacts.

Reduction of air pollution

European air pollution policy aims to achieve levels of air quality that do not result in unacceptable impacts on and risks to human health and the environment. The Thematic Strategy on Air Pollution from 2005³³ is designed to make substantial progress towards this long-term EU objective. The Strategy has identified a number of key measures to be taken to help meet 2020 interim objectives for human health and the environment, and recommends that current legislation be modernised and better focused on the most serious pollutants, while ensuring that more is done to integrate environmental concerns into other policies and programmes. Directive 2008/50/EC on Air Quality and Cleaner Air also defines EU objectives with regard to ambient air in Europe.

Air pollution travels over long distances and beyond national boundaries. Directive 2001/81/EC on National Emission Ceilings for certain pollutants (the NEC Directive) established, for each EU Member State, upper limits on total emissions of the four pollutants responsible for acidification, eutrophication and ground-level ozone pollution, but leaves it largely to Member States to decide which measures to take – on top of Community legislation for specific source categories – in order to achieve compliance. The NEC Directive has been amended as part of the accession of new EU Member States. Parallel to the development of the EU NEC Directive, Member States participate in a multi-pollutant protocol under the Convention on Long-Range Transboundary Air Pollution (the so-called Gothenburg protocol, agreed in November 1999). Emission ceilings in the protocol are equal to or less ambitious than those in the NEC Directive.

Soil protection and land use

A number of EU policies (e.g. on waste, water, chemicals, industrial pollution prevention, nature protection, pesticides, agriculture) contribute indirectly to soil protection. However, the current policy scope is insufficient to ensure an adequate level of protection for all soil in Europe, as scarcity of data currently limits efforts to prevent large-scale soil

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:DKEY=725522:EN:NOT>

³² COM(2009) 82

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0082:FIN:EN:PDF>

³³ COM(2005) 446

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2005:0446:FIN:EN:PDF>

degradation. With an objective to protect soils across the EU, the Commission adopted a Thematic Strategy for Soil Protection (COM(2006) 231) and a proposal for a Soil Framework Directive (COM(2006) 232).

The Thematic Strategy for Soil Protection explains why further action is needed to ensure a high level of soil protection, and puts forth a strategy detailing what kinds of measures must be taken. It also establishes a 10-year work programme for the European Commission. The Soil Framework Directive proposal sets out common principles for protecting soils across the EU, and within this common framework EU Member States will be in a position to decide on the best ways to protect soil and use it in sustainable ways.

In 1999 the European Spatial Development Perspective (ESDP) called for focusing on territorial balance and cohesion, as well as for more sustainable management of natural and cultural resources in the EU. In 2006 the Thematic Strategy on the Urban Environment³⁴ set out co-operation measures and guidelines to improve integrated urban environmental management for cities. More recently, the EU's Regional Policy, the Territorial Agenda of the European Union 2020³⁵ and Water Framework Directive collectively address integrated spatial development by minimising sectoral policy trade-offs regarding land use. A more integrated approach to land-use planning requires compliance with the precautionary principle, efficient use of natural resources and minimisation of waste and pollution.³⁶ Underlying this approach, the EU Thematic Strategy on the Sustainable Use of Natural Resources³⁷ considers both land and maritime spaces as resources. Because land-use planning is a cross-cutting issue, it is addressed as such in the Nitrates Directive, the European Floods Directive and EU policies on climate change adaptation. The cross-cutting character of land use is also highlighted in EU rural development policies. The Common Agricultural Policy also plays a significant role in shaping the use of agricultural and forested land, while also addressing issues related to land-use intensity.³⁸

Water management and flood protection

The EU Water Framework Directive (2000/60/EC) aims to expand the scope of water protection to all water bodies, surface waters and groundwater, as well as achieving 'good' status for all waters by 2015. EU Member States must adopt management plans in order to improve the chemical and ecological state of waters. Water management is to be based on river basins – the natural geographical and hydrological unit – as opposed to administrative or political boundaries. In addition, for each river basin district – some of which will traverse national borders – a river basin management plan will need to be established and updated every six years, and this requires coordinated efforts among the countries involved.

Protecting quality standards of groundwater resources is the main goal of Groundwater Directive 2006/118/EC. Other European regulations that address issues related to water pollution include the Nitrates Directive (91/676/EEC), which is aimed at reducing nitrate and organic matter pollution from agricultural land. The Urban Waste Water Treatment Directive (91/271/EEC) focuses on reducing adverse effects of urban wastewater

³⁴ http://ec.europa.eu/environment/urban/pdf/com_2005_0718_en.pdf

³⁵ <http://www.eu-territorial-agenda.eu/Reference%20Documents/Final%20TA2020.pdf>

³⁶ EEA SOER (2010), Land use.

³⁷ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2005:0670:FIN:EN:PDF>

³⁸ EEA SOER 2010: Land use.

discharges and discharges from certain industrial sectors, while the Integrated Pollution Prevention and Control Directive IPPC (96/61/EEC) aims to control and prevent the pollution of water by industry. The Drinking Water Directive (98/83/EC) aims to ensure access to high-quality drinking water, and the Flood Directive (2007/60/EC) requires EU Member States to assess whether or not all water courses and coastlines are at risk from flooding and to take adequate and coordinated measures to reduce flood risks.

Biodiversity and landscape protection

The EU Biodiversity Strategy to 2020³⁹ provides the strategic framework for biodiversity and ecosystems protection and restoration in the EU and defines to a great extent the focus of further investment in preserving EU biodiversity and Natura 2000. The legal basis for Natura 2000 comes from the Birds Directive (2009/147/EC) and the Habitats Directive (92/43/EEC), which form the basis of the EU's biodiversity policy. The EU Biodiversity Strategy aims to expedite the EU's transition towards a resource-efficient and green economy within the wider framework of Europe 2020. Improving the conservation status of species and habitats covered by the Birds Directive and Habitats Directive is another priority of the strategy. The Water Framework Directive (2000/60/EC) is an important policy framework in terms of protecting the diversity of freshwater ecosystems, while the international framework of the Alpine and Carpathian Convention is relevant to the protection of mountain ecosystems in the central Europe region. The newly introduced 'Green Infrastructure' concept contributes to all other targets of the EU Biodiversity strategy, particularly the full implementation of the Birds and Habitats Directives. The recently launched European Green Infrastructure strategy is expected to provide the strategic framework for green infrastructure development.⁴⁰

The European Landscape Convention has served to promote the protection, management and planning of European landscapes from year 2000, while also facilitating Europe-wide cooperation on landscape issues. It is the first international treaty to be exclusively concerned with all dimensions of the European landscape. It applies to towns and villages, open countryside, coastal and inland areas, ordinary and even degraded landscapes, and also to areas afforded official protection. The Convention complements the Council of Europe's and UNESCO's heritage conventions.

³⁹ COM/2011/0244 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52011DC0244:EN:NOT>

⁴⁰ [Green Infrastructure \(GI\) \(COM\(2013\) 249 final\)](#)

3. Thematic achievements

This chapter focuses on achievements and best practises of projects funded within the CENTRAL EUROPE Programme under the ‘Environmental risk management and climate change’ theme. The first subchapter introduces the methodology used to analyse the project achievements, and then describes the added value of transnational cooperation within the context of this thematic area. This is followed by a summary of types of project outputs. In its final part, the chapter offers a detailed analysis of project achievements by subtheme and topic.

3.1. Methodology

The first step of the analysis carried out was an initial screening of all 26 projects assigned to the ‘Environmental risk management and climate change’ theme. Subsequently, a questionnaire was developed and sent to project Lead Partners to gain a further understanding of project achievements, their impact, as well as the added value derived from transnational cooperation. Data received from Lead Partners were further analysed.⁴¹ Also, a total of five interviews were conducted with selected project partners that were further developed into a number of case studies, and which are included in this chapter. The selection of case studies was considering a good representation of environmental topic, as well as their high potential to demonstrate and transfer good practises.

In addition, for each environmental topic several good practise examples have been identified, which have grouped according to the following categories:

- 1) Integrating economic and social considerations into environmental projects.
- 2) Development of tools for use by public authorities and other stakeholders to ensure a coordinated approach (e.g. decision support systems, handbooks, guidelines)
- 3) Involvement of multiple groups of stakeholders to increase capacities, awareness, ownership and durability of solutions, and to ensure that all relevant views are taken on board
- 4) Integrating innovative (technical) solutions and application of novel research findings into projects to ensure high quality and relevance

The information and analysis provided below is mostly based on a review of documents relating to individual projects. These include project application forms submitted to the CENTRAL EUROPE Programme, information available on the CENTRAL EUROPE Programme website, in particular in the Programme output library⁴² and project database,⁴³ especially project publications, newsletters and presentations, reports at the Programme level, including evaluations and implementation reports and other documents and publications found on the project websites. Based on the information contained in these documents, we have gained an understanding of the projects’ most useful and important achievements, while identifying good practises and confirming the added value of transnational cooperation within the ‘Environmental risk management and climate change’ thematic area.

⁴¹ The questionnaire is contained in Annex 1.

⁴² <http://www.central2013.eu/central-projects/implementing-a-project/output-library/search-in-pdf/>

⁴³ <http://www.central2013.eu/nc/central-projects/approved-projects/>

3.2. Analysis of project achievements

The analysis of 26 projects shows that there are many different types of outputs already produced or are in the process of elaboration depending on the stage of project implementation. Most projects are carrying out pilot actions to test small-scale practical implementation of activities, which may in turn be used to learn lessons regarding large-scale implementation. REURIS carried out six successful pilot actions focusing on different aspects of river revitalisation, the FOKS project conducted pilot investigations of contaminated sites in four CE countries and tested innovative remediation concepts, and TransWaste focused its pilot actions on ensuring the re-use of goods in cooperation with social enterprises. Almost all projects are preparing studies or background documents, handbooks or guidelines, and have organised or will organise awareness-raising events and workshops or trainings. Whether intended for the general public, public authorities or the private sector, the general aim of such outputs is to increase knowledge. Most projects involve the creation of policy documents, strategies, action plans and recommendations for policy improvement. These documents are aimed at policymakers and focus specifically on improving environmental policy. Examples of relevant projects include ECOPaperLOOP, which prepares policy guidelines for sustainable recycling approaches, TransEcoNet, which provided planning instruments to regional planners and policy makers, and HABIT-CHANGE, which has prepared a policy paper on increasing resilience of the Natura 2000 network to climate change.

Many projects create permanent networks and institutional structures that will be active beyond the project lifetime, such as CERREC (which will create repair and re-use networks) and Urban WFTP (which is creating urban Water Footprint Labs). Examples of good practises are provided in Section 3.4 dealing with project achievements by environmental topic and individual project.

Project outputs deemed ‘very useful’ by Lead Partners include pilot actions, policy documents and other deliverables aimed at policymakers, as well as tools, handbooks and guidelines aimed at increasing knowledge and capacity building. However, project Lead Partners have not identified a single type as most relevant to project success or best suited to meet the needs of the target groups, which suggests that different projects with different targets groups have different needs.

Spin-off values result from outputs ensuring that results will continue to have an impact beyond the project lifetime. Strategies, action plans and recommendations for policy improvement, awareness-raising activities and pilot actions are identified as outputs with significant spin-off value potential.

Project activities also strive for ensuring post-project impact. These efforts will be used to prepare and implement policies, plans, programmes or strategies, and to establish institutional networks to ensure that project results have a lasting impact. Yet other project results can be used to leverage funds for follow-up investments or the continuation of activities, as well as to organise and support trainings, awareness-raising events or annual expert meetings.

Project target groups make use of the project outputs in different ways. The most frequently mentioned ways that outputs have become part of further activities are good practise examples and contributions of knowledge to the stakeholder base. Other examples include educational curriculum tools and efforts to improve the functional capacity of organisations.

The following section provides an analysis of project achievements under subthemes 1 and 2 of the ‘Environmental risk management and climate change’ thematic area. The subthemes have been further subdivided into a number of environmental topics, as explained in Section 2. This further subdivision is useful for presenting project achievements and describing how projects contribute to EU policies.

The section also contains a general description of the subthemes, followed by a detailed description of the projects under each topic.

The general description:

- addresses environmental topics by subtheme;
- references EU legislation and policy documents to which the projects contribute; and
- gives an overview on partners participating in project implementation, including the number of partners and country representation.

The detailed description of project achievements is grouped by environmental topic⁴⁴. These sections contain the following:

- an outline of partnership characteristics;
- a summary of project aims, outputs and project achievements;
- a description of contributions to EU legislation and the improvement of environmental quality in the Central Europe area; and
- examples of good practise.

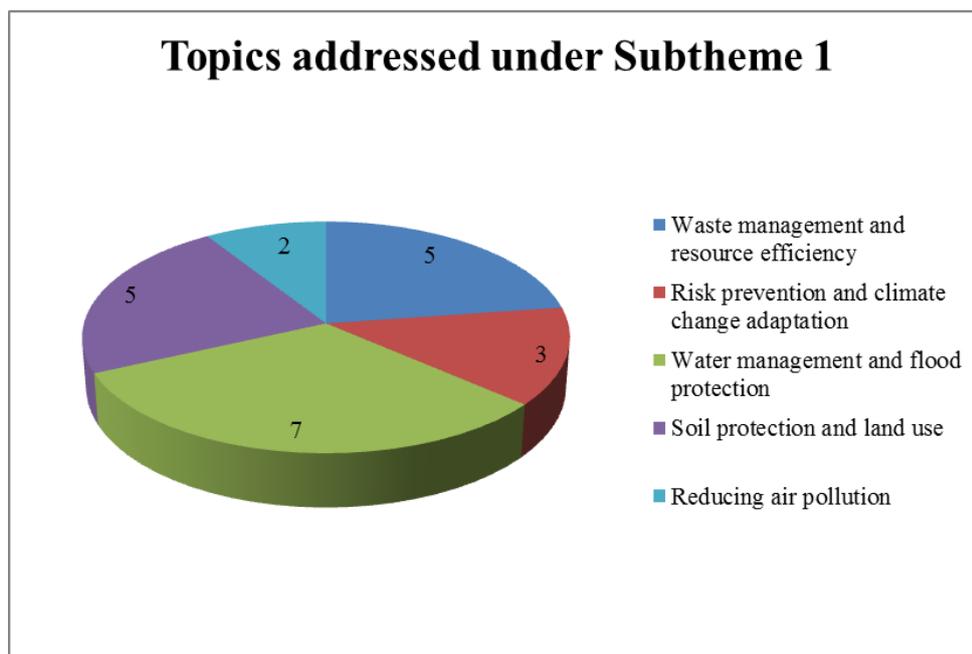
As projects are in different stages of implementation, the maturity of outputs is different. Some of the outputs have already been achieved, while others are either being implemented or still in the planning stage. In the latter cases, best practises have been identified based on information provided in the project application forms. In other cases, best practises are identified based on project reports and information available on the project websites. In selecting best practises to showcase, an effort has been made to include best practise examples from every category as described in Section 3.1

Subtheme 1: Cooperating to prevent environmental hazards and to reduce the negative effects of climate change

Subtheme 1 covers a wide range of topics. Efforts to prevent environmental hazards focused on waste management, water management and flood protection, soil protection and land use, reduction of air pollution, and biodiversity and landscape protection. Most projects (19 in total) deal with environmental hazards, while three projects focus on climate change. Figure 11 shows the distribution of projects by topic within Subtheme 1.

⁴⁴ The number of projects, project partners and budget for each environmental topic does *not* add up to the total number of projects, partners and budgets of the ‘Environmental risk management and climate change’ thematic area, as some projects are included under more than one topic.

Figure 11: Topics addressed under Subtheme 1: ‘Cooperating to prevent environmental hazards and reducing the negative effects of climate change’



The projects implemented under Subtheme 1 are contributing towards achieving the aims of a diverse range of EU Directives and other EU policy documents. The most important contributions of the projects towards fulfilling EU legislation are presented in Table 4 below.

Table 4: CENTRAL EUROPE projects assigned to Subtheme 1, ‘Environmental risk management and climate change’, and their links to the EU strategic framework⁴⁵

Topic	EU strategic framework on risk management and climate change	Name of project
Waste management and resource efficiency	EU Waste Directive Thematic Strategy on Sustainable Use of Natural Resources Resource Efficiency Flagship Roadmap to a Resource-Efficient Europe	ACT Clean, TransWaste, CERREC, ECOPaperLOOP, PRESOURCE
Risk prevention and climate change adaptation	EU Strategy on Adaptation to Climate Change	INCA- CE, UHI, HABIT-CHANGE
Reducing air pollution	Air Quality Framework Directive	TAB, UFIREG

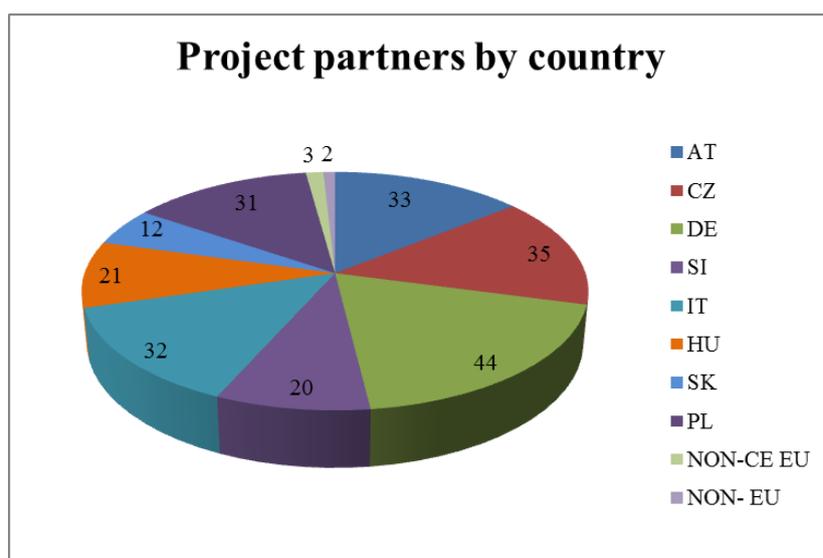
⁴⁵ The table includes references to EU legislation only, except where legislation does not exist. References to other policy documents are mentioned in the sections detailing project achievements by topic.

Soil protection and land use	EU Soil Directive (proposal) Thematic strategy for soil protection Thematic Strategy on the Urban Environment European Spatial Development Perspective Territorial Agenda of the EU 2020 Thematic strategy for soil protection Thematic Strategy on Sustainable Use of Natural Resources	URBAN SMS, UrbSpace, COBRAMAN, ReSOURCE, CircUse
Water management and flood protection	EU Water Framework Directive	EULAKES, REURIS
	Droughts Communication	URBAN WFTP
	EU Groundwater Directive	FOKS
	EU Water Framework Directive, EU Floods Directive	LABEL, CEframe, INARMA,

Partnerships

A total of 233 partners are involved in implementing 22 projects under Subtheme 1. With regard to country representation, the most partners are from Germany (44), while the fewest are from Slovakia (12). Three project partners are located outside the central Europe programme area,⁴⁶ while two project partners⁴⁷ are not from EU Member States. The distribution shows that project involvement does not necessarily reflect the size of the countries involved or their populations, or even the acuteness of environmental issues within the territory of a given country.

Figure 12: Countries of partners participating in projects under Subtheme 1 of the ‘Environmental risk and climate change’ theme of the CENTRAL EUROPE Programme



⁴⁶ There were two partners from Romania and one partner from a region in Germany, which does not belong to the central Europe region.

⁴⁷ There were two partners from Ukraine.

Public authorities comprise around 44% of all project partners. Public equivalent bodies dominate the types of organisations involved, comprising nearly 45% of all partners. Just 11% of total partners are from private institutions.

Topic: Waste management and resource efficiency

Five projects of the CENTRAL EUROPE Programme focus on the topic of ‘Waste management and resource efficiency’: TransWaste, CERREC, ECOPaperLOOP, ACT Clean and PRESOURCE.

The representation of project partners across geographic regions is relatively even within this topic, with representatives from all Member States of the central Europe area participating in waste management-related projects, and the number of partners from each Member State reflecting the size of the Member State. The number of project partners per project (around 9) is slightly below the average of about 11 for the CENTRAL EUROPE Programme. The geographic level of activity of most partners is at national level, with some regional actors also involved. This reflects the approach taken in most Member States towards waste management, which is generally organised at national level and not at regional level.

Summary of project of aims, outputs and achieved results of projects under the topic ‘waste management and resource efficiency’

The main goal of the **TransWaste** project is to address the issue of informal waste collection. Informal waste collection is a transnational issue because those involved in informal collection of waste move across borders, which impacts formal waste collection and recycling levels in the target countries. Informal cross-border waste collection is to some extent driven by income differences across borders, thus informal waste collectors traverse borders from poorer to richer countries. As in the central Europe region, income differences between old Member States and those who joined the EU in 2004 still persist, making cross-border informal waste collection a typically ‘central European’ issue. Cooperation within the scope of the TransWaste project has enabled partners to address waste management issues specific to the region, and to find their own solutions. The project has examined potential solutions to informal waste collection and has developed a Transnational Action Plan that proposes solutions which are environmentally, economically and socially beneficial. Several pilot actions have also been carried out within the project framework. One of the pilot actions, WISE (Work Integration Social Enterprise), focuses on developing a business plan for cooperation between EU Member States in terms of collecting, trading and repairing goods, and recommends that such cooperation should involve social enterprises already dealing with the re-use of goods.

The **CERREC** project contributes to compliance with the Waste Directive, which requires that Member State waste policies adhere to a waste hierarchy that prioritises re-use, recycling and recovery. Current waste management policies tend to focus on recycling of materials and on recovery, especially in the form of energy recovery (waste incineration), while typically neglecting re-use strategies. The CERREC project addresses the challenge of turning the re-use sector into a core segment of waste management and bringing it into the mainstream to meet the goals of European environmental policies and regulations. The project aims to provide tools, develop strategies and promote ambitious implementation of re-use requirements of the Waste Framework Directive. Regional Re-Use Centres are being established in four central European regions, and cooperation between waste

management and socio-economic enterprises is being created to prolong product longevity, while at the same time creating green jobs for the long-term unemployed and providing affordable goods. It is estimated that a single Re-Use Centre in upper Austria would increase the number of employed persons by 70.

The **ECOPaperLOOP** project strives to bring greater awareness in the private and public sectors about recyclability issues, and also to help build a shared, collective knowledge base. The project focuses specifically on improvement of paper waste management. The separate collection of municipal wastepaper is made compulsory by the EU Waste Directive, and specific targets apply for the recycling of paper that must be attained by 2020. The EU Waste Directive does not address the transnational dimension of recycling, but focuses on national and sub-national approaches to waste management. Project partners of the **ECOPaperLOOP** project realise the relevance of transnational cooperation for meeting national-level EU targets related to recycling. This necessitates transnational standards on wastepaper collection in order to ensure adequate quality for recycling. Other project aims are to establish new capabilities for the diffusion and application of paper recyclability assessment and to foster innovation in the environmental sector through the introduction of better solutions for the recyclability of paper products. The project is producing policy guidelines that will enable industry and public administrations to adopt more sustainable recycling approaches and to develop concepts related to eco-design, eco-recyclability and eco-collection.

The **ACT Clean** project supports eco-efficient production processes in SMEs by improving knowledge of existing best practises and thereby promoting their access to environmentally friendly technologies and management tools across central Europe. The project has developed permanent structures for supporting SMEs to develop cleaner production, connecting 200 institutions in the field of cleaner production. It has also developed workshops and trainings for SMEs. In addition to providing support to SMEs, the project supports policymaking related to cleaner production through its 'Act Clean' transnational agenda. The project not only contributes to compliance with EU directives, but it also plays a role in making companies in central Europe more competitive through enhancing resource efficiency in SMEs.

The potential for increased resource efficiency is also the focus of the **PRESOURCE** project, which especially targets SME manufacturers in the agricultural, construction and transportation sectors. The project aims to increase resource efficiency in the central Europe region by promoting transnational incentives for eco-innovation. This is done by examining innovative financing schemes, and by issuing recommendations to establish dialogue between relevant stakeholders. The project is creating a tool (EDIT VALUE) for SMEs in the industrial sector to help them increase their resource efficiency.

The approaches and outputs of the projects under this topic have several common characteristics. One common feature is the strong focus of project outputs on businesses and actors involved in waste management. The International Second Hand Service (ISHS) of the TransWaste project provides training to informal waste collectors, CERREC focuses on waste management and socio-economic enterprises, ActClean and PRESOURCE target SMEs, and **ECOPaperLOOP** is targeting the paper industry. Much of the focus of the projects is on capacity building and dissemination of knowledge to the targeted actors through tools (e.g. EDIT VALUE of the **PRESOURCE** project or the Method for the Assessment of Packaging Recyclability of **ECOPaperLOOP**), trainings, and the setting up of permanent structures to aid stakeholders (e.g. ISHS of TransWaste, Re-Use Centres of CERREC or a permanent offer of trainings by ActClean partners, a transnational resource-efficiency network by **PRESOURCE**). Another way of influencing stakeholders is through

demonstrating good practise: the Act Clean and PRESOURCE projects has collected best practises and made them available to stakeholders through a database, matchmaking mechanism and toolbox.

Contribution to EU legislation and improvement of environmental quality in the central Europe area under the topic of ‘Waste management and resource efficiency’

Both the TransWaste and CERREC projects focus on waste management activities that rank quite high in the waste hierarchy: re-use in particular. The EU Waste Directive defines re-use as “any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.” The Directive allows Member States to apply different approaches to achieve these targets, and the CERREC and TransWaste projects have helped to identify solutions that fit within current central European practises and realities, including social realities. In addition to environmental benefits, both projects focus simultaneously on employment of low-skill labour and social aspects of re-use and repair.

The TransWaste project is also contributing to achieving EU goals related to hazardous waste. With the movement across borders of obsolete electronic products and other materials, the hazardous waste content of these products also crosses borders, such as CFCs, HCFCs, HFCs, fluorescent lighting and electronics. By providing training to former informal waste collectors, the project is helping to ensure that collection and transportation of hazardous waste are carried out in conditions that provide protection for the environment and human health, as required by Article 17 of the Waste Directive. Finally, by establishing regional repair and re-use centres and networks (CERREC), the project is helping to reduce the amount of waste generated, which is also a goal of the Waste Directive.

As described in Chapter 2, the central Europe region is very heterogeneous regarding waste management achievements. While almost no waste is landfilled in Germany, in many other EU Member States – such as Hungary, Czech Republic, Poland and Slovakia – landfilling is still the main solution for dealing with municipal waste. Transnational cooperation in the field of waste management has enabled stakeholders from these countries to learn from top-performing countries. Specifically, the German and Italian partners participating in the ECOPaperLOOP project have high levels of expertise with regard to recycling paper, and this has enabled a transfer of knowledge and experience to partners in countries with less experience in wastepaper recycling.

The Act Clean and PRESOURCE projects collectively contribute to achieving the targets set in EU Directives, especially the Waste Directive, as well as the Europe 2020 Strategy’s ‘A resource-efficient Europe’ flagship initiative. An EC Communication titled ‘Roadmap to a Resource-Efficient Europe’ tasks Member States with ensuring that advice and support is available to help SMEs identify and improve their resource efficiency and the sustainable use of raw materials. The Communication emphasises the importance of exchanging information on resource efficiency between partners in value chains and across sectors, including SMEs. The ACT Clean project contributes directly to this goal by providing trainings specifically targeting SMEs.

The central Europe area shows high variance with regard to resource efficiency. Austria, Germany and Italy, for example, have material use and material efficiency targets, while other Member States in the central Europe area (e.g. Czech Republic, Hungary, Slovakia)

do not.⁴⁸ Data on resource efficiency is not so clear-cut, with different Member States performing well with respect to different indicators (e.g. water abstraction, human appropriation of net primary production, or domestic material consumption). This implies that cooperation enables participants from different Member States to learn from each other in different areas of research efficiency. The *Eurobarometer* report⁴⁹ dealing with resource efficiency in SMEs reveals clear differences in attitudes across the EU. Within the central Europe region, only 35% and 36% of German and Austrian SMEs aspire to comply with but do not exceed environmental legal requirements, the respective figures for the Czech Republic, Slovakia and Hungary are 56%, 49% and 59%. There is therefore some potential to further improve awareness of SMEs in some countries, and the two projects focusing on SMEs provide good opportunities for joint learning and capacity building in this field.

Table 5: Examples of good practise under the topic of ‘Waste management and resource efficiency’

International Second Hand Service (ISHS) - TransWaste	
Brief description	Added value
Within the pilot action, the organisation that provides training for former informal waste collectors is established. The training is based on training materials developed by the Austrian and Hungarian partners. To date, 70 persons have received training. ⁵⁰	<i>Integrating economic and social considerations into environmental projects</i> The project demonstrates good recognition of the fact that waste collection has social as well as environmental aspects, and seeks to integrate social aspects into its activities. The ISHS is an advocacy association for used-item collectors established in Hungary that represents their interests; its members are former informal waste collectors. A special training is organised for these waste collectors to ensure that they are aware of and in full compliance with the requirements of environmental legislation. They also receive vocational training to enable them to participate in repair-related activities. The ISHS and its trainings ensure that informal waste collectors can continue to earn a living from waste collection, and also ensures an enhanced level of environmental protection.
Work Integration Social Enterprise (WISE) - TransWaste	
Brief description	Added value
Creation of re-use centres and repair of goods	<i>Integrating economic and social considerations into environmental projects</i> WISE is a cooperative effort between business stakeholders in the western and eastern part of the central Europe region, with activities focused on collecting, trading and especially the repairing of goods. The cooperation includes social enterprises already dealing with the re-use of goods. As a result of project activities, a memorandum of understanding between the social enterprise BAN in Austria and the City of Devecser in Hungary has been signed. In addition, the Regional Waste Management Plan for Lower Silesia in Poland has included the creation of re-use corners at waste collection centres as an action to be pursued, where used items will be collected and then transferred to the needy, either free of charge or in exchange for a small fee.
Collection of implementation models for repair and re-use networks - CERREC	
Brief description	Added value
The project elaborates a report containing	<i>Development of tools</i> Compared to recycling and energy recovery, ‘repair and re-use’ is

⁴⁸ EEA, Resource Efficiency in Europe, p. 66, 2011.

⁴⁹ Flash Eurobarometer 342: SMEs, Resource Efficiency and Green Markets, March 2012.

⁵⁰ Other outputs include a methodology for handling informal waste activities and the development of a business plan for an enterprise to integrate informal waste collectors and formalise their work, as well to integrate informal waste collectors into the existing formal waste collection regime.

examples of current practises regarding repair and re-use, process-chain requirements for repair and re-use, and implementation models and potential barriers.	overlooked in waste management despite its potential environmental and social benefits. The report can be used by policymakers and interested stakeholders to help sharpen their focus on re-use activities, and the guidance contained therein can be used to set up workable re-use schemes. The following are also being developed: quality-standard guidelines, a handbook describing an accreditation system for creating repair and re-use networks and centres, and national re-use action plans.
Re-Use Centres and networks - CERREC	
Brief description	Added value
The project raises awareness and assists in establishment of regional Repair and Re-Use Centres and networks.	<i>Integrating economic and social considerations into environmental projects</i> Regional Repair and ReUse Centres and networks are established to ensure cooperation between waste management and socio-economic enterprises in order to prolong product lifetimes (good products, when disposed of, will be re-used), to create green jobs (especially for the long-term unemployed) and to provide affordable goods.
Packaging Recyclability Score Card - ECOPaperLOOP	
Brief description	Added value
The project is developing a method for assessing the recyclability of packaging.	<i>Development of tools</i> The method for assessing packaging recyclability targets paper value chain stakeholders who can use the methodology to verify the recyclability performance of their products. The method is currently being tested on 120 packaging products and 60 printed products. Use of the method by paper value chain stakeholders increases capacity in the private sector to address an environmental issue and ensures the use of a consistent and verified approach across countries and regions.
Cleaner production workshops and trainings - ACT Clean	
Brief description	Added value
An offer of industry workshops and B2B trainings is established in which suppliers of clean technologies and those who apply them meet face to face. The trainings focus on cleaner production in SMEs.	<i>Stakeholder involvement - capacity building</i> SMEs typically lack the financial resources and capacity to invest in cleaner production, despite potential benefits in the form of increased resource efficiency resulting in monetary savings from decreased energy and material expenses. This action strengthens SME capacity with respect to cleaner production, and opens up capacity-building opportunities beyond the project lifetime.

Topic: Risk prevention and climate change adaptation

Three projects of the CENTRAL EUROPE Programme focus on the topic of ‘Risk prevention and climate change adaptation’: INCA-CE, UHI and HABIT-CHANGE.

The average number of partners per project for this theme is significantly higher than the average of about 11, with each of the three projects having 16 to 18 partners. This reflects the complexity of risk assessment and climate change adaptation, which often requires a multidisciplinary approach and the participation of partners from numerous fields. Representation of project partners across geographic regions is relatively even in this topic, with representatives from all EU Member States of the central Europe area being involved in projects, and the number of project partners is representative of the size of the Member States. The legal status of project partners (almost all are public authorities or public equivalent bodies) reflects the fact that climate change adaptation and environmental risk prevention activities are coordinated and implemented by public

bodies. The geographic scope of partner activities is fairly evenly distributed between international, national and regional efforts.

The Lead Partners have identified national and regional authorities as their main target group. This reflects the composition of partners in the project partnership. In addition to their involvement as partners, the projects also target stakeholders through capacity building (INCA-CE) as associated partners and members of the Advisory Board (HABIT-CHANGE), and by collecting information from stakeholders (UHI). The involvement of the target groups as project partners and associated partners guarantees the continued use of project outputs.

Summary of project of aims, outputs and achieved results of projects under the topic of ‘Risk management and climate change adaptation’

The **INCA-CE** project aims to reduce adverse effects of weather-related natural disasters (e.g. windstorms, flooding, mudflows, icing, drought) by establishing a state-of-the-art, high-resolution, real-time analysis and forecast system on atmospheric, hydrological and surface conditions. These real-time meteorological forecasts are then joined with practical applications designed to manage road safety, civil protection and hydrology in various locations of central Europe. This combination of forecasts and practical applications enables public authorities to use meteorological information to better prepare for hazardous weather events, thereby reducing risks to the general public. By increasing cooperation between scientists and practitioners, the project also encourages the use of more practical and user-friendly meteorological products. An added value of the project is that it enables meteorologists to share information across borders, which increases the precision of meteorological forecasts. Systems set up by the project will continue to operate beyond the project lifetime. The World Meteorological Organization (WMO) is using the project as a ‘World Weather Research programme/Forecast Demonstration project’, which makes it possible for meteorological organisations and public authorities worldwide to learn from the project results. The project has implemented a number of pilot actions, which are focused on three areas: hydrology, civil protection and road safety. These pilot actions aim at improving hydrological forecasting and enhancing cooperation and information exchange between civil protection and ‘nowcasting’ to ensure that early warning systems trigger an appropriate and timely disaster response.

Vulnerability to climate change, according to the definition of the Intergovernmental Panel on Climate Change (IPCC), depends on three factors: exposure to changing climate; sensitivity of geophysical, biological and socio-economic systems; and, adaptive capacity. The central Europe region faces some common challenges related to climate change, as described in Chapter 2. Transnational cooperation provides an opportunity for the regions and Member States of Central Europe to learn from each other and to pool resources to address common challenges. Despite common challenges, vulnerability to climate change in the central Europe region will vary, as adaptive capacity – which depends on the availability of financial resources and institutional capacity – differs across the region. The INCA-CE project has enabled the Austrian Lead Partner to pass knowledge and know-how to organisations in other Member States. The Lead Partner has ample experience with nowcasting that other organisations have not had the capacity to develop, forcing them to resort to sub-optimal forecasting methods with larger scope for error.

The **UHI** project deals with the ‘urban heat island’ (UHI) phenomenon, which is a microclimatic occurrence in metropolitan areas that results in a significant increase in

urban temperatures compared with surrounding peri-urban and rural neighbourhoods. Heat (together with flooding and water scarcity and drought) is one of the main challenges mentioned by the EEA report 'Urban adaptation to climate change in Europe', which can be effectively addressed at the level of cities. As stated by the report, heat waves have resulted in most human fatalities in the EU amongst all extreme weather events, with urban areas particularly vulnerable. Temperatures in cities due to the UHI phenomenon can be as much as 10°C higher than in surrounding areas. The report cites the impact of the intense heat wave in Eastern Europe in the year 2010, which led to an estimated death toll of 55,000. The UHI project aims to develop policies and practical actions to reduce the impact of UHI phenomenon. The regions involved in the project (including five capital cities in central Europe and several industrial centres) are some of the most important in terms economic and social development in the region, and their experiences could help pioneer new approaches to urban planning and be generally useful in terms of knowledge integration.

Specific characteristics of particular city play an important role in the UHI phenomenon, and can therefore effectively be dealt with at local level. However, as cities lack the knowledge and experience in dealing with this issue, transnational cooperation is an effective way of initiating and supporting local action and contributing to local knowledge on the subject. The EEA report 'Urban adaptation to climate change in Europe'⁵¹ mentions Stuttgart as a good example of a city that has addressed UHI successfully due to a climate planning strategy that exploits the effect of natural wind patterns and natural vegetation in lowering urban temperatures. Therefore, The UHI project contributes to capacity building and knowledge exchange in participating cities with differing levels of experience. Similar to INCA-CE project, UHI is also contributing to transnational exchange of knowledge and information that will increase adaptive capacity in the central Europe region.

The main aims of the **HABIT-CHANGE** project are to evaluate, enhance and adapt existing biodiversity and nature management and conservation strategies in protected areas to respond proactively to climate change-related threats to habitat integrity and diversity. The project has modelled the expected impact of climate change in a number of protected areas in central Europe. Based on the model results, the project has prepared seven Climate Adapted Management Plans (CAMPs) for administrations of protected areas. The CAMPs enable national park authorities to better respond to threats aggravated by climate change, such as the increased spread of invasive species, drier climate, etc. The project applies satellite observation and monitoring techniques, making it possible to collect and analyse medium to long-term developments in protected areas resulting from climate change and to verify model forecasts, and also to adjust adaptation strategies as necessary. The UNESCO Man and Biosphere Programme selected HABIT-CHANGE as a 'good practise project'. The project results were presented at several forums and events, including the meeting of the European Network of Heads of Nature Conservation Agencies (ENCA).

The EEA report 'Adaptation in Europe'⁵² states that the "advantage of a regional focus is that it makes it possible to deal with region-specific issues of vulnerability and adaptation." The report mentions the almost exclusive role that European Territorial Cooperation, together with LIFE, is playing in transnational and multilateral climate

⁵¹ EEA (2013), Urban Adaptation to Climate Change in Europe: Challenges and opportunities for cities together with supportive national and European policies, EEA Report No. 2/2012.

⁵² EEA (2013), Adaptation in Europe: Addressing risks and opportunities from climate change in the context of socio-economic developments, EEA Report No. 3/2013.

change adaptation actions. Without these instruments, transnational adaptation actions would be a small fraction of what they are today, as most are financed with one of these two instruments. The territorial focus of transnational adaptation action within the EU is on northwest Europe and the Alps, with other regions in need to increase their efforts in this area. The CENTRAL EUROPE Programme is making an important contribution in this respect towards filling a gap in currently existing efforts.

Common output types of the projects are pilot actions and awareness raising activities. In addition, projects have produced outputs targeted at public authorities, with the aim of improving their risk prevention and management practises. The guidelines for developing CAMPs created by HABIT-CHANGE and the ‘gold standard for the assessment of UHI’ both provide steps and methodologies that enable public authorities to carry out risk-prevention activities at a high level.

Contribution to EU legislation and improvement of environmental quality in the central Europe area under the topic of ‘Risk management and climate change adaptation’

The Adaptation Strategy of the EEA foresees the integration of climate change adaptation into the Covenant of Mayors initiative, which has in the past focused on climate mitigation in cities. Participating cities will develop their own adaptation strategies. The UHI project, by addressing the urban heat island phenomenon, is providing useful information for the development of one aspect of these strategies.

Both the UHI and HABIT-CHANGE projects are helping Member States and regions in central Europe to develop their own national and/or regional adaptation strategies, as required by the EU Adaptation Strategy. As part of the Adaptation Strategy package, a separate Commission Staff Working Document⁵³ deals with adapting to the impacts of climate change on human, animal and plant health. The document focuses on all three areas addressed by CENTRAL EUROPE Programme projects, including climate change and biodiversity loss, the urban heat island phenomenon, and the human toll of extreme weather events. The document mentions a lack of “consistent and comparable epidemiological studies and analyses, including urban effects of heat-related phenomena and heat waves.” The UHI project is addressing this noted gap in knowledge.

Table 6: Examples of good practise under the topic of ‘Risk management and climate change adaptation’

Joining meteorological forecast and warnings with practical application - INCA-CE	
Brief description	Added value
The Integrated Nowcasting through Comprehensive Analysis (INCA) weather model allows timely and coordinated response to severe weather conditions.	<p><i>Integrating research and application</i></p> <p>The INCA weather model processes measurement data to show current conditions and create projections of upcoming weather patterns. It is continuously updated by the participating institutions to better meet the needs of the three application areas - civil protection, hydrology and road safety, including a feedback loop between developers and end users.</p> <p>By using the nowcasting system, responsible civil protection authorities, hydrologists and road maintenance services can benefit from timely warnings of potential problems to take better coordinated action.</p>

⁵³ European Commission, Adaptation to climate change impacts on human, animal and plant health, Working Document SWD (2013) 136 final.

	INCA-CE is currently the only project in the world that provides this kind of extensive cross-discipline and transnational cooperation on extreme weather issues.
Gold standard for the assessment of the urban heat island phenomenon (UHI)	
Brief description	Added value
The project is developing a gold standard for assessment and monitoring of UHI.	<i>Development of tools</i> The 'gold standard' is targeted at cities that have not yet set up monitoring or have insufficient monitoring capacity. This will enable cities to identify critical areas and develop optimal strategies for adapting to or mitigating the UHI impacts.
Toolset for adaptation of management practises - HABIT-CHANGE	
Brief description	Added value
The project is developing seven Climate Adapted Management Plans (CAMPs), including adaptation measures, a monitoring concept, indicators and stakeholder analysis.	<i>Development of tools</i> The project is developing seven Climate Adapted Management Plans (CAMPs) for six protected areas in Poland, Hungary, Slovenia and Romania to ensure that management of these sites will facilitate adaptation to climate change. The toolset and detailed guidelines enable the development of CAMPs for natural sites not covered by the project, thereby facilitating broader use of the results.

Topic: Reducing air pollution

Two projects of the CENTRAL EUROPE Programme deal with the topic of 'Reducing air pollution': TAB and UFIREG.

The number of partners per project (7.5 on average) is lower than the average of about 11 for the CENTRAL EUROPE Programme. With only two projects under this topic it is difficult to draw general conclusions about the geographic representation of partners. The legal status of project partners reflects the high relevance of policymakers in dealing with the issue of air pollution: many project partners are public entities. However, as the projects address pollutant sources from the private sector (e.g. industry and transport), these sectors are involved in the TAB project primarily through consultation.

The geographic scope of project activities is quite evenly distributed between national, regional and local project partners. This reflects the fact that air pollution has local sources, but that the impacts can be felt and addressed on a regional, national and even international scale.

Summary of project of aims, outputs and achieved results of projects under the topic of 'Reducing air pollution'

The focus of the TAB project is air pollution from three sources: industry, transport and households. The project addresses the issue through transnational cooperation because, although the impacts of air pollution on human health manifest themselves at local level, pollution may be caused far away from where its main effects are evident. The project approach focuses on finding joint solutions with a wide group of stakeholders, including local governments, industry, the health sector, public interest groups and other interest groups. A key tenet of the project is to develop a set of integrated tools and actions that are sustainable in environmental and economic terms, an approach that is facilitated by the involvement of all relevant stakeholder groups. Another innovative aspect of the

project is that it also focuses on the interaction between climate change and the impacts of air pollution. The project conducts the collection and comparison of air-quality data through various locations in central Europe; this data is then made available on the project website through a Virtual Observatory. The project also involves the development of plans for minimising the impact of air pollution in central Europe, which in turn enables decision makers to respond appropriately to the issue. The project helps to reduce the health effects of air pollution in the central Europe region, and project outputs will be integrated into the Central European Healthy Environment Platform.

The **UFIREG** project addresses air pollution in five central European cities. The project focus is on ultrafine particle pollution, which has been shown to be particularly harmful to human health, causing cardiovascular and respiratory diseases. Despite this, studies on the precise health impacts of ultrafine particles in the central Europe region are currently lacking. A report of the European Environment Agency, 'Air quality in Europe'⁵⁴ mentions the lack of data on particulate matter, with data mostly available for particulate matter (PM10), but not for finer particles. The UFIREG project thus fills an important gap in information by setting up a monitoring system for ultrafine particulate matter in five cities that will continue to function beyond the project lifetime and can be used by municipal authorities to inform their decisions affecting local air quality. The list of prominent cities included in the project increases the visibility of project results and thereby promotes public awareness of the issue. The project is not purely research oriented, and brings together research institutes with public health and environment officials to ensure that research results will be followed up with a policy response. The project develops a database to help analyse the impact of ultrafine particle air pollution on human health by correlating air-pollution data with epidemiological data. A handbook, guidelines and strategies are developed for public authorities. The project also provides new evidence of the health impacts of ultrafine particle pollution during a time when the review of air policy at the EU level is ongoing, and evidence shows that stricter air quality requirements would be cost-effective due to the large health gains that would result.

Common types of outputs for both projects include the development of databases with the intent of increasing the knowledge of the public and policymakers concerning levels of air pollutants in the atmosphere. Other types of common outputs include documents (strategies, handbooks and guidelines) aimed at policymakers to address the issue of air pollution, which also include information on health impacts of pollutants.

Contribution to EU legislation and improvement of environmental quality in the central Europe area under the topic of 'Reducing air pollution'

Air pollution is a major cause of increased mortality and morbidity. Different types of air pollutants have different health impacts. Both projects have a mostly urban focus and address the health effects of air pollution. Both projects address particulate matter (PM), which causes respiratory and circulatory disease. There is no minimum threshold where negative health impacts of PM are not observed. The TAB project also addresses a range of other pollutants, including SO₂, NO_x, CO and O₃. O₃ also poses a serious health hazard and causes a number of different respiratory diseases. As a result of air pollution, life expectancy is lower in cities with high pollution levels. With the exception of CO and O₃, which are local pollutants due to their unstable chemical properties, the other pollutants addressed by the two projects also cause transnational pollution. The TAB project

⁵⁴ EEA (2012), Air quality in Europe, Report No. 4/2012.

addresses a number of pollutants with transnational impacts, and this provides a strong rationale for addressing the issue through transnational cooperation.

Both projects contribute to achieving the targets of the Air Quality Framework Directive, which merges most previous EU legislation on air quality into a single policy document. The Directive establishes objectives for ambient air quality aimed at ensuring that harmful effects on human health are decreased or avoided. It is the responsibility of EU Member States to measure and assess ambient air quality and to make data available to the general public. The Virtual Observatory, set up by the TAB project will provide information on air pollution that can easily be accessed by the public; this is an example of a potential technical solution that can be applied across the central Europe region. The Directive also aims to promote enhanced cooperation between Member States to reduce air pollution. Cooperation between project partners of the UFIREG and TAB projects can be a first step and serve as an example to authorities to work together across borders to reduce the health impacts of air pollution. Finally, both projects supply information that is relevant for the formulation of Air Quality Plans required by the Directive in zones and agglomerations where pollutant levels exceed allowable limits.

Table 7: Examples of good practise under the topic of ‘Reducing air pollution’

Virtual Observatory - TAB	
Brief description	Added value
The Virtual Observatory provides online access to data on air pollution levels.	<i>Development of tools</i> The Virtual Observatory provides publicly accessible information on levels of air pollution in various locations in the central Europe region, searchable by date. Air-quality data is aggregated into a single index (the Health Quality Index), which enables non-experts to evaluate levels of air pollution in their cities. The tool is also an important information source for decision makers who have an influence on clean-air policies.
Measurement of ultra-fine particles (pilot actions) - UFIREG	
Brief description	Added value
The project sets up measurement systems for ultrafine particles in the air of five selected central European cities.	<i>Development of tools</i> The measurements of ultra-fine particles in Dresden (Germany), Augsburg (Germany), Prague (Czech Republic), Ljubljana (Slovenia) and Chernivtsi (Ukraine) provide valuable information to decision makers about concentrations of ultrafine particles in air and enable them to take appropriate policy responses to protect human health.

Topic: Soil protection and land use

Five projects of the CENTRAL EUROPE Programme focus on the topic of ‘Soil protection and land use’: URBAN SMS, COBRAMAN, ReSOURCE, CircUse and UrbSpace.

The average number of partners per project within this topic is 11, which matches the average size of partnerships in other thematic areas of the CENTRAL EUROPE Programme. The geographic representation of project partners is relatively even across the central Europe region, reflecting the importance of the issue of land use across the entire region, with low representation only from Hungary. In addition to a large number of public authorities and public equivalent bodies, a small but significant number of partners from private institutions are also participating. This reflects the important role of the private sector in dealing with planning, financing and implementing regeneration activities. The

geographic scope of project partner activities is evenly distributed between international, national, regional and local projects.

The Lead Partners of the projects have identified regional authorities as the main target group, followed by universities and research institutes and the private sector. All three types have been involved as project partners. In addition, there are various other ways that projects have involved relevant stakeholders, in particular through conferences, workshops and training events.

Summary of project of aims, outputs and achieved results of projects under the topic of 'Soil protection and land use'

The main goal of **URBAN SMS** is to address the issues of land use and urban soil sealing. The project has developed several outputs aimed at different stakeholders. Urban planners comprise the primary target group of the project, which is developing a methodology allowing them to consider the value of soil and its functions in urban planning process. Additional outputs include a set of IT tools for assessing soil and processing spatial data, and a tool for integrating soil considerations into the Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA) processes. An awareness-raising package is targeted at the general public. The project has provided expert input for the Technical Document on Soil Sealing developed by the European Commission.

Soil sealing damages important soil functions and capabilities, such as water retention, providing a habitat for species, absorbing pollutants and microclimate regulation. The extent of urban soil sealing shows some variation in the central Europe area.⁵⁵ Soil sealing as a share of the urban morphological zone (UMZ) is high in Bratislava, Budapest, Prague and Warsaw, each with a greater than 50% share of UMZ. Berlin and Vienna, with soil sealing rates slightly below 50%, fare only marginally better. The project has the potential to make an important contribution towards improving these figures. As the extent of soil sealing is closely related to the 'urban heat island' UHI phenomenon, the **URBAN SMS** project provides tools relevant for addressing this issue. (This phenomenon is also the primary focus of the UHI project, which is described in the section on 'Risk prevention and climate change adaptation'.) The **URBAN SMS** project is making a contribution to the Soil Thematic Strategy and the proposed Soil Framework Directive, which has yet to be adopted. The Directive will require an approach to soil sealing that ensures a more rational use of land and will require that land users take precautionary measures to minimise damage to soil functions. The **URBAN SMS** project provides the exact tools needed, thereby enabling planners to take account of soil sealing within the EIA and SEA processes when making decisions about investments that have the potential to damage soil functions.

COBRAMAN deals with the revitalisation of brownfield sites in order to combat urban sprawl, contribute to improving urban environmental quality, and address urban segregation and competitiveness issues by providing knowledge to assist with site-revitalisation efforts. The project has trained and certified brownfield managers. A permanent result of the project is the setting up of the European School for Brownfield Redevelopment, which now offers graduate, post-graduate and e-learning courses in the field of brownfield management. As part of the e-learning course, the project has created an online database that includes information about projects related to revitalisation

⁵⁵ <http://www.eea.europa.eu/articles/urban-soil-sealing-in-europe>

efforts carried out in central European countries. Furthermore, the project also has resulted in the development of brownfield redevelopment concepts, as well as the implementation of pilot actions in several partner territories, such as Bydgoszcz, Kranj, Ferrara, Most, Stuttgart and Usti nad Labem.

The **ReSOURCE** project aims to address environmental, economic and social problems caused by mining and mine closure. The project focuses on the diverse assets of specific former mining regions, including the environment, manmade infrastructure and cultural assets of mining, and aims to turn these into resources from which communities can benefit. The project has contributed directly to identifying potentials in improving environmental quality by utilising the natural assets of mining areas and supporting the preparation of feasibility studies for a number of renewable energy projects, mainly geothermal energy, but also biomass. In addition, the use of former mining sites for cultural purposes also has an indirect positive environmental impact, as it contributes to the innovative re-use of brownfield sites. The project has drawn from its unique experiences to develop a knowledge database of 70 best-practise examples to inspire post-mining development efforts.

CircUse aims to limit the environmental impact of development by limiting urban sprawl. It has developed a concept of land-use planning that re-uses previously developed land, referred to as circular land use. In addition to contributing to preservation of the environment by re-using brownfield sites, the project is helping to overcome spatial and urban development-related problems in central European cities resulting from: loss of traditional industries, military conversion, inner-urban segregation, migration and demographic change. The project has produced a data management tool, action plans and position papers. The project has also assessed the potential to use financial instruments to support further revitalisation projects. Project outputs are intended for use by a variety of stakeholders and include: legislative proposals for national policymakers, an IT tool to assist local authorities in circular land-use management, and teaching materials for schools. The project has resulted in the creation of a land management agency in the Voitsberg pilot region in Austria, which is aimed at supporting the five involved municipalities in re-using brownfield sites. An investment is also being carried out to revitalise a former industrial area in Piekary, Poland.

The **UrbSpace** project focuses on processes of shaping and revitalising urban open spaces. The project has invested in renovating five public spaces. Inspired by the project, a further 10 public spaces in various locations were renovated using other financial sources, half in the Czech Republic and half in Slovakia. In addition to pilot investments, the main project activities included state-of-the-art analyses, definitions of criteria and principles for public space design, and the development of joint strategies and tools for sustainable urban spaces. The project has developed a user-friendly tool, the Joint Strategy and Methodology Action Plan, for professionals (e.g. land or building architects, city planners) and town offices, which can be used to ensure that renewal processes take into account all different aspects and characteristics of public areas. Project results are being used at several levels. At local level, the Accessibility Plan for Erfurt, Germany delivered to municipal authorities facilitates discussion for further urban development. As a result of the plan, Erfurt has changed its internal construction rules on tactile surface indicators. The University of the West of England and the Faculty of Architecture in Bratislava, both members of the project's Scientific and Technical Committee, will use the Methodology Action Plan in their teaching curricula. At EU level, the project results have been considered by the European Network of Experts on Public Spaces.

Common project outputs include tools, strategies and guidelines aimed at local experts and decision makers. The development of an IT tool of the URBAN SMS project, as opposed to written guidelines, is a good practise in this respect because the target groups can use it directly. The implementation of physical investments as pilot actions is also a successful output, as they enable the demonstration of site remediation benefits. Such pilot investments were carried out by COBRAMAN and UrbSpace. Also, ReSOURCE and CircUse have developed feasibility studies and actions plans as pilot actions.

Contribution to EU legislation and improvement of environmental quality in the central Europe area under the topic of ‘Soil protection and land use’

As mentioned under the ‘Water management and flood protection’ topic, the historical legacy of Member States who joined the EU in 2004 includes many polluted industrial sites for which it is difficult to assign responsibility for clean-up efforts, and these polluted sites contaminate groundwater and surface waters. In addition to posing direct environmental risks, due to potential contamination from hazardous substances, these sites are also less attractive to investors due to the cost of remediation: investors often prefer greenfield sites to brownfield sites. This also has economic and social consequences, as investors avoid areas of former industrial activity. Addressing this issue requires legal, economic, environmental, urban-planning and engineering expertise.

This complex issue is being addressed by the COBRAMAN, CircUse and UrbSpace projects, each focusing on different aspects of revitalising brownfield sites. All four projects acknowledge the importance of environmental aspects of remediation and revitalisation, but take social and economic aspects into consideration as well.

There is no EU legislation on urban planning or land use, but the revitalisation of polluted or former industrial sites can contribute to the goals of both the proposed Soil Framework Directive and the Groundwater Directive. As mentioned previously, the Groundwater Directive requires that EU Member States prevent and limit discharges of pollutants into groundwater, which are often the result of indirect contamination from contaminated soils. The Commission proposal for a Soil Framework Directive provides for Member States to identify contaminated sites on their territory, to put in place a method for determining whether a site is contaminated, and to ensure that contaminated sites are remediated. In addition, a number of non-legislative EU documents exist related to the issues of urban sprawl and soil sealing, including the Thematic Strategy on the Urban Environment, the European Spatial Development Perspective, the Territorial Agenda of the European Union 2020 and the Thematic Strategy for Soil Protection.

Table 8: Examples of good practise under the topic of ‘Soil protection and land use’

Soil Management Suite - URBAN SMS	
Brief description	Added value
The Soil Management Suite encompasses two IT tools (a web-based tool and a desktop tool) for evaluation of soils during the planning process.	<i>Development of tools</i> The tools enable urban planners to identify and consider the capacity and quality of soils to fulfil various functions in urban areas. This in turn enables planners to better integrate soil-related considerations into the planning process, and to use software outputs when carrying out an Environmental Impact Assessment. The tools are applied to evaluate and visualise soil quality in eight pilot areas across of the central Europe region.

Remediation pilot project in Bydgoszcz - COBRAMAN	
Brief description	Added value
The site in Bydgoszcz is remediated and being developed as a pilot project.	<i>Development of tools</i> The Bydgoszcz pilot site located in the heart of the city covers 1,130 square metres and contains wall remnants that are highly contaminated from former industrial use. Work on the site showcases the complete regeneration process of a contaminated micro-site, including groundwater investigation, demolition of previous infrastructure, remediation works and the development of a recreation area and playground. This is a good practise example of remediation, and also benefits the citizens of Bydgoszcz.
Remediation pilot project Kranj Railway Station - COBRAMAN	
Brief description	Added value
Redevelopment of the Kranj Railway Station is promoted by providing information to potential redevelopers.	<i>Development of tools</i> Work on the Kranj Railway Station site aims to promote publicly driven sustainable development of degraded areas through innovative spatial planning instruments. An 'information point' placed inside the pilot area promotes redevelopment to potential investors and the general public.
Pilot action for the utilisation of mining sites for renewable energy production - ReSOURCE	
Brief description	Added value
Investment has been prepared for the geothermal utilisation of mine water in the former copper mining district of Mansfeld-Südharz.	<i>Development of tools</i> The project evaluates and classifies 20 mine water locations in the Mansfeld-Südharz area, and prepares feasibility studies for a subset of these sites (four in total). In addition to the value to the local communities in terms of supporting the re-use of these sites, the evaluation and development of feasibility studies will also yield some results that can be transferred to other sites. These include a 'criteria matrix' for the selection of suitable locations and decision criteria to assess the economic efficiency of the use of mine water for geothermal energy production.
Brownfields handbook - CircUse	
Brief description	Added value
The project is developing six action plans, including one for Saxony.	<i>Development of tools</i> The action plans have different impacts on different sites, depending on the specific issues being addressed. In Saxony, indicators have been developed according to the 'circular land use' concept; also, a data management tool is being created and stakeholders are involved through workshops.
Involvement of local stakeholders in planning the sustainable use of public spaces - UrbSpace	
Brief description	Added value
The project involves a large number of stakeholders in planning, and considers their needs when making proposals and carrying out pilot actions for urban public spaces.	<i>Stakeholder involvement - local communities</i> The project is innovative in its approach in that it involved local communities in the planning process for public spaces to a much higher degree than is usually done in the region. The project gives explicit consideration to social aspects, gender-specific needs, accessibility and crime prevention. An example of the result of this participatory approach is the renewal of an area in Prešov: this involved renovating a formerly functionless space to suit the needs of different demographic groups – including children and parents, adolescents and the elderly – by developing a playground, green spaces, benches and public lighting.

Topic: Water management and flood protection

The CENTRAL EUROPE Programme supports seven projects focusing on 'Water management and flood protection': EULAKES, LABEL, CEframe, INARMA, FOKS and URBAN WFTP.

The number of project partners per project (approximately 8.5 on average) is lower than the average of about 11 at programme level. The high representation of project partners from some countries (e.g. Austria, Czech Republic and Hungary) compared to country size reflects the importance of water management and flood protection for countries with large rivers that have suffered great damage from floods in recent years. All but three project partners are public authorities or public equivalent bodies. The legal status of project partners reflects the fact that water management and flood protection activities are coordinated and implemented by public bodies. This is similar to the related topic of 'Climate change adaptation and environmental risk prevention'. Additionally, some project also address Water commissions are (e.g. the Elbe Commission will embed the results of LABEL project into its activities).

Project Lead Partners have identified regional and national authorities as their primary group, but there is also a strong focus on the private sector, universities and research organisations under this topic. Public authorities are involved in the project as project partners. Other types of targeted organisations have been involved as associated institutions or have provided information and knowledge to the projects through various means.

Summary of project of aims, outputs and achieved results of projects under the topic of 'Water management and flood protection'

REURIS addresses a growing demand for attractive and accessible watercourses in urban areas. The project focuses on developing sustainable river revitalisation measures through transnational cooperation. Six pilot actions (encompassing four physical investments and two feasibility studies) have been developed in three countries. The project views rivers both as important ecological systems and aesthetic elements contributing to attractiveness of the cities. The aim is therefore to address both the ecological sustainability of urban river areas and to develop 'vital spaces' for public recreational use. The areas revitalised within the framework of pilot actions not only function as public spaces but in Katowice and Stuttgart also contribute to better flood protection.. The project has generated a cost-benefit analysis of urban river revitalisation, adding to a growing volume of evidence on the monetary value of ecosystem services.

As mentioned in relation to the 'Water management and flood protection' topic, the central Europe area has some heavily modified watercourses. This is especially true for waterway sections in urban areas that are particularly prone to hydromorphological pressures resulting from the straightening of rivers, canalisation, floodplain disconnection, dams, weirs and bank reinforcements. Waterfronts are typically heavily developed, and hydromorphological changes have further impacts on water flow, sedimentation and aquatic species habitats.⁵⁶

The **EULAKES** project tackles the impact of climate change on central European lakes, as well as other environmental challenges. As the conservation status of rivers and lakes in central Europe is among the worst in the EU, and with pollution also a significant problem in many parts of the region, the project is making an important contribution to the knowledge base to address these challenges. The project carried out four pilot actions related to four lakes in central Europe, focusing on the ecological impact of invasive species, the impact of pollutants such as pesticides, heavy metals and cyanotoxins, and

⁵⁶ EEA (2012), European waters: Assessment of status and pressures, EEA Report No. 8/2012.

controlling nutrient inputs into lakes through grazing management and alternative agricultural practises. The Water Framework Directive aims to achieve good ecological status for all water bodies by 2015. This includes both ecological and environmental pollution-related targets. The EULAKES project, by addressing multiple issues (invasive species, numbers of pollutants, eutrophication, etc.), contributes towards building a knowledge base regarding the current status of lakes in central Europe, and towards developing management strategies to cope with environmental pressures and pressures from climate change.

The EULAKES 'decision support system' model introduces a web-based GIS platform allowing easy access to project results and outputs, and delivers geospatial data collected and organised by the project partners. It also provides information on the current environmental status of the four lakes involved in pilot actions, as well as information about climate-related risks. A joint transnational strategy guideline for lake management provides guidelines for management authorities across central Europe and beyond. It is anticipated that the project results will be used by many different stakeholders, such as research institutes and universities as a basis for further research, environmental authorities, who are expected to include the monitoring systems and techniques established by the project in their daily activities, and public authorities, who are targeted by the local and transnational guidelines developed within the project. The guidelines may also be implemented via lake management plans.

The LABEL project develops prevention measures and strategies to adapt to rising flood risk along the Elbe River. The approach is cross-sectoral, and the focus is on risk-adjusted regional land-use planning, tourism and shipping. The project has provided the informational, methodological and organisational basis for flood risk management in the Elbe catchment by developing cross-border maps, assessments and risk management plans through pilot actions. The project also deals with balancing different uses, such as tourism, transport and economic development. The project has therefore developed pilot spatial planning measures that ensure the coordination of different uses. Municipalities in Saxony, Germany have taken up the project results and will consider flood risk issues within their development plans and activities. The international Commission for the Protection of the Elbe is also using project outputs to develop its flood protection strategy.

The overall aim of the CEframe project is to ensure sustainable integrated flood protection management in catchment area of the Danube, Thaya-Morava and Leitha rivers. The main project focus is on the operation and maintenance of flood protection facilities and the elaboration of flood protection measures for the CENTROPE⁵⁷ region. The project involves mapping the current state of flood protection measures, assessing the functioning of protective measures, and mapping areas at risk from flooding. In addition, an emergency handbook for rescue organisations and public authorities has been prepared. A thesaurus containing 275 technical terms in five languages has helped to harmonise definitions and language concerning technical terms, as there are major differences between countries as to how definitions are applied and it is important to develop a common technical language. The most important project achievement has been the Memorandum of Flood Protection, which was signed by the representatives of ministries, regional authorities and water management organisations from four CE countries with aim to develop river-specific cooperative strategies. The signatures represent a commitment on behalf of public authorities to pursue future cooperation in this field. The Memorandum also supports the work of the transnational water commissions.

⁵⁷ Regions in Austria, Hungary, the Czech Republic and Slovakia.

The **INARMA** project focuses on small river basins and flash flooding – issues usually neglected within flood management activities in central Europe, which typically have a much stronger focus on large river basins. The project collected information on past floods, vulnerable areas and water management regulations in force. Based on the knowledge gained, the project developed the INARMA GIS, a forecasting tool that maps areas vulnerable to flooding. The developed tool was tested during the Civil defence exercises in Italy and Poland which were organised by local authorities . The project aims to encourage the application of non-structural flood protection interventions (i.e. softer measures such as organisational or emergency preparedness) in sub-regional catchment basins, and to transmit relevant information to civil defence personnel to ensure that damage is kept to a minimum. As a result of the conducted Civil defence exercises the project has elaborated the “Consolidated strategy and operational standard for flash-flood emergency management”.

The **FOKS** project aims to mitigate groundwater contamination by facilitating the implementation of a comprehensive, integral approach to groundwater risk management. The project has contributed to the development of a methodology for identifying key sources (hotspots) that contribute to groundwater pollution. This makes it easier to pinpoint liability for groundwater pollution and to enforce the ‘polluter pays principle’. The project has also elaborated risk management and remediation plans for four cities in the central Europe region, and has tested innovative technologies for remediation. The remediation plans developed by the project will be implemented using other EU funding, thereby ensuring that project results have more than a theoretical or small-scale impact and contribute to practical solutions. The project has a groundwater focus, but its findings are also very relevant for the revitalisation of brownfield sites, topics also dealt with by the COBRAMAN and CircUse projects.

The **URBAN WFTP** project focuses on water supply network management in urbanised areas with potential to improve currently used technologies and to integrate innovative tools for monitoring and managing water networks and wastewater treatment strategies. Water abstraction and appropriation is contributing to water scarcity and to the pollution of natural water bodies. High levels of abstraction can lead to overexploitation and greater risks to the ecosystem base flow. Pollution can endanger the ecological and economic functions of water. The Urban WFTP project is helping to preserve water by focusing both on quantitative and qualitative aspects of water use. It is developing a Water Footprint Approach for monitoring and evaluating water use and water conservation, which will enable decision makers to assess urban water policies, plans, strategies and technologies, and to ensure sustainability. The Water Footprint Approach is a multidimensional indicator that is spatially specific: this allows decision makers to obtain information about human uses of water, including ground- and surface water consumed, rainwater management and wastewater treatment. The importance of indicators for quantifying and evaluating water efficiency is emphasised by the EEA in its report ‘Towards efficient use of water resources’.⁵⁸ The report explicitly mentions the role of water foot-printing approaches as useful planning tools for environmental authorities, regulators, utility managers and water-intensive industries. The report states that water foot-printing research is currently underway. The Urban WFTP project is contributing to this research agenda and the pilot application of the resulting index. The approach being developed will be tested at three locations in central Europe, and water use and management plans will also be drawn up for these three urban areas. The project

⁵⁸ EEA (2012), ‘Towards efficient use of water resources’, EEA Report No. 1/2012

contributes to sustainable water management and the reduction of water stress in central Europe.

Visualisation is a main aim for most of the projects, and this is reflected in the outputs, which generally include GIS-based tools or maps (e.g. the Elbe flood hazards and risk maps prepared by LABEL, the INARMA GIS forecasting tool, or EULAKES' GIS platform). These help targeted groups to understand and interpret project results. The preparation of plans and strategies targeted at public sector decision makers is another strong focus of these projects (e.g. the flood risk management plans prepared under LABEL, flood risk assessment under CEframe, or the FOKS project's strategic framework for groundwater risk management). Strategies and plans are particularly successful if they are combined with a commitment on behalf of the project participants, such as the Memorandum of Flood Protection signed under the CEframe project. There has been a strong focus on pilot actions in several of the projects aimed at: solving conflicts between risk management and different land use options (e.g. regional development concepts and management plans of LABEL); gaining further understanding and in-depth knowledge of the situation (EULAKES project); or ensuring that project results are built on after the end of the project lifetime (Urban Water Footprint Labs of the Urban WFTP project). The civil defence exercise pilot actions of the INARMA project is a particularly useful pilot action, as awareness about risk prevention is particularly important: the general public plays a very important role in mitigating risk.

Contribution to EU legislation and improvement of environmental quality in the Central Europe area under the topic of 'Water management and flood protection'

The REURIS project contributes to restoring the ecological functions of rivers, and thereby makes a contribution to Water Framework Directive goal to achieve good ecological status for all water bodies by 2015. The project also contributes indirectly to achieving the goals of the Habitats Directive, as the morphological properties of rivers impact their ability to act as habitats for native species.

The Floods Directive requires EU Member States to prepare flood hazard risk maps and flood risk maps, and to develop flood risk management plans. Flood risk management plans may be developed separately, or as part of River Basin Management Plans (RBMPs), which are required under the Water Framework Directive. The LABEL project has prepared cross-border risk maps, risk assessments and management plans, thereby contributing to meeting the Floods Directive requirements for the Elbe River. Similarly, the CEframe and INARMA projects also involve the assessment and mapping of risks, in line with Directive requirements. The Water Framework Directive requires that Member States cooperate in preparing RBMPs for transnational river basins. Transnational cooperation activities established through the CENTRAL EUROPE Programme can contribute to this requirement of cooperation by establishing and strengthening working relationships between relevant actors.

As described in Chapter 2, there is a decreasing tendency of groundwater abstraction in central Europe, and quantitative pressure on groundwater resources is easing. The Groundwater Directive requires EU Member States to prevent and limit discharges of pollutants into groundwater. The Water Framework Directive requires that groundwater bodies attain good chemical status and good quantitative status by 2015. Groundwater contamination is often results indirectly from contaminated soils. A number of industrial sites, including sites currently operating and sites that no longer support industrial activity but have not been revitalised, continue to pollute groundwater. In particular, Member States that acceded to the EU in 2004, including those in the central Europe area, share a historical legacy of industrial production practises that showed little regard for the

environment, while changes in site ownership have resulted in a lack of records related to substances used and the treatment of hazardous waste. The Commission’s proposal for a Soil Framework Directive enables Member States to identify contaminated sites on their territory, to put in place methods for determining whether a site is contaminated, and to ensure that contaminated sites are remediated. The FOKS project contributes to these goals by developing a methodology for identifying sources of pollution, which is the first step towards putting an end to soil pollution and groundwater pollution.

The Urban WFTP project is helping to address the quantitative aspects of water stress. Water stress and the need to use water efficiently are mentioned in ‘Addressing the challenge of water scarcity and droughts’, an EC Communication which estimates that, at EU level, 20% of water is wasted through inefficiency. Issues related to water quality are mainly addressed by the Urban Waste Water Directive, which aims to protect the environment from adverse effects of wastewater discharges. The Directive requires the progressive installation of wastewater treatment facilities in agglomerations.

Table 9: Examples of good practise under the topic of ‘Water management and flood protection’

EULAKES model - EULAKES	
Brief description	Added value
The EULAKES model, available on a web-based platform, enables easy access to risk scenarios and simulations to help users to formulate restoration strategies.	<i>Development of tools</i> The EULAKES model platform enables scientists and management authorities not involved in the project to investigate, map and compare the environmental quality of the studied lakes. It also runs simulations and future risk scenarios, and facilitates the formulation of mitigation strategies and restoration scenarios (with regard to climate change, land use, tourism, etc.). The tool builds on research carried out during the project. This tool delivers static and dynamic geospatial data collected and organised by the project partners.
Pilot actions - EULAKES	
Brief description	Added value
The EULAKES project is carrying out a number of pilot actions to gain information about different types of environmental threats to lakes in the central Europe region.	<i>Development of tools</i> The Austrian pilot action deals with relationships between agriculture, natural vegetation and lake ecosystems. The pilot action has led to the creation of a management plan for agriculture activities around Lake Neusiedl. The Hungarian pilot action focuses on the effect of climate change on two new invasive fish species and their impact on Lake Balaton’s ecosystem. The Italian pilot action focuses on the analysis of potential toxin-producing cyanobacteria in Lake Garda, as well as a critical account on the chemo-diversity and quantity of cyanotoxins together with related diagnoses and medical treatments. The Polish pilot tests the water of Charzykowskie Lake for heavy metals and pesticides, and is publishing a document to support decision making processes at the policy level.
Flood Partnership - LABEL	
Brief description	Added value
Preparation of flood risk maps for the Elbe river.	<i>Development of tools</i> The project is preparing an improved map for the Elbe river and detailed flood risk maps for several pilot areas. The flood risk maps are prepared based on the analysis of a large amount of data on historical floods, as well as on information on river morphology and built infrastructure. The flood risk maps can inform decision makers about flood risks and help them better prepare risk prevention strategies. The project also



	prepares flood risk management plans and strategies for a number of pilot areas.
Methodology for assessment of residual risk - CEframe	
Brief description	Added value
The project develops a common methodology for flood risk assessment in four CE countries.	<i>Integrating research and application</i> The common methodology for flood risk assessment reflects national approaches in this field in Austria, the Czech Republic, Hungary and Slovakia, and helps to identify the strengths and weaknesses of each approach. Maps are created for the visualisation of results. The common methodology is innovative in its treatment of residual risk. This type of risk within flood risk management is important: ignoring it can lead to a false sense of security and lack of preparedness for unexpected events. The Austrian Lead Partner already possesses data, experience and methods not available in other countries of the CENTROPE region, and is able to transfer and further develop these during the project.
Civil defence emergency drill pilot actions - INARMA	
Brief description	Added value
Pilot actions carried out for civil defence, consisting of two emergency drills in Poland and in Italy.	<i>Stakeholder involvement - capacity building</i> This pilot action has increased the preparedness and cooperation of participants for civilian defence in case of flood disasters. Nearly 100 people were involved in each drill, including experts, volunteers, local police and squads of firefighters.
Toolbox for Integral Groundwater Investigation FOKS	
Brief description	Added value
The project is preparing a toolbox to help authorities investigate contaminated sites; it also provides them with tools to identify key sources of groundwater contamination.	<i>Development of tools</i> The toolbox is helpful in cases where there are multiple potential sources of groundwater contamination, conditions that can pose problems because it is not possible to identify and cease activities responsible for contamination, and liability for contamination and clean-up cannot be established. This new, integrated approach is demonstrated through pilot action in Treviso, Italy.
Urban Water Footprint Labs (UWFLs) - URBAN WFTP	
Brief description	Added value
UWFLs are being developed as pilot actions in three countries (Austria, Italy and Poland).	<i>Stakeholder involvement - capacity building</i> UWFLs help to ensure that project results are built upon after the project lifetime. The pilot action is financially sustainable, as the cost of UWFL management will be covered through financial savings from decreased water use. The UWFLs have multiple tasks, including helping to establish contacts between the private sector (SMEs, entrepreneurs), the public sector and research and educational institutes, which facilitates the diffusion and use of environmentally friendly technologies. They also assist with analysing user behaviour by developing SWOT analyses regarding water use and by applying the Water Footprint Approach.
Pilot action for revitalising a river section in Katowice - REURIS	
Brief description	Added value
The project carried out a pilot action aimed at revitalisation of the Slepjotka River channel in Katowice, Poland.	<i>Integrating economic/social considerations into environmental projects</i> The project focuses on the practical application of sustainable river management practises in urban areas where rivers are already strained by competing uses, river-bed modification and pollution. The pilot action demonstrates that even in heavily modified river areas, such as in the Slepjotka Valley, restoration is possible. The old river bed is partially re-naturalised and supplemented with native plant species and returned to

	a more natural state. A quasi-natural wetland is created, which has both water retention and biodiversity-related capacities. The project makes the area more attractive for residents.
Pilot action Revitalisation of the Feuerbach riverfront in Stuttgart - REURIS	
Brief description	Added value
The pilot project is revitalising Feuerbach Riverfront in Stuttgart, Germany.	<i>Stakeholder involvement</i> The project is an example of a green infrastructure project. It focuses on revitalising the Feuerbach River to increase its biodiversity of aquatic and amphibian species, and to restore floodplains and increase retention areas. The river is located in a formal industrial area of Stuttgart. Environmental impacts include benefits for groundwater, water, soil, biodiversity and local climate. The project also provides a great natural environment and enables recreation, while creating a green axis for cycling and walking. The pilot revitalisation has sensitised the development of the complex revitalisation plan of the river area by the City Council and leveraged approximately EUR 21 million of public and private funds.

Subtheme 2: Cooperating to protect and preserve nature and landscapes

This subtheme covers the topic of ‘Biodiversity and landscape protection and revitalisation’.

The projects under Subtheme 2 made a contribution towards achieving the aims of different EU Directives and other EU policy documents. The most important project contributions towards fulfilling EU legislation are presented in Table 10 below.

Table 10: CENTRAL EUROPE Programme projects assigned to Subtheme 2, ‘Environmental risk management and climate change’, and their links to the EU strategic framework

Topic	EU strategic framework on risk management and climate change	CENTRAL EUROPE projects under Subtheme 2: ‘Cooperating to protect and preserve nature and landscapes’
Biodiversity and landscape protection	EU Biodiversity Strategy to 2020, Habitats Directive and Birds Directive	Greenet, SALVERE, TransEcoNet, HABIT-CHANGE
Biodiversity and landscape protection	European Landscape Convention	VITAL LANDSCAPES

Partnerships

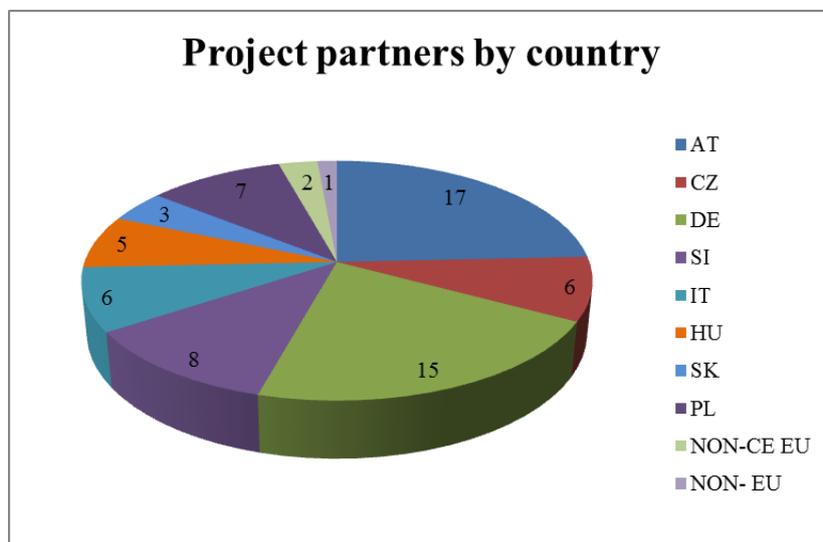
In total, 70 project partners are involved under Subtheme 2. With regard to country representation, the highest number of partners is 17 from Austria, followed closely by Germany with 15 project partners. The lowest number of partners, three, comes from Slovakia. This closely reflects the distribution of project partners for projects assigned to Subtheme 1. Two project partners are not from the CENTRAL EUROPE area,⁵⁹ while one project partner is from outside the EU.⁶⁰ The distribution shows that project involvement does not necessarily reflect the size of the countries involved. However, the overall level

⁵⁹ There were two partners from Romania.

⁶⁰ There was one partner from Ukraine.

of involvement from all Member States was good, and the Programme has ensured an opportunity for cooperation between several partners per project. The average number of partners per project is 14, significantly higher than the average of about 11 for the CENTRAL EUROPE Programme.

Figure 13: Countries of partners participating in projects under Subtheme 2 of the ‘Environmental risk and climate change’ theme of the CENTRAL EUROPE Programme



Around 65% of project partners are public equivalent bodies and another 22% are public authorities. This reflects the importance of the public sector in addressing biodiversity issues. The high proportion of national, regional and international organisations and the lack of local organisations among project partners reflect the larger geographic scale of biodiversity issues in general, which need to be addressed not at local level but at the level of natural habitats.

The target groups of the projects are national and regional public authorities, universities and research institutes and NGOs. These types of organisations are well represented among the project partners, or are involved through conferences, workshops and stakeholder dialogue.

Topic: Biodiversity and landscape protection

In total, five projects of the CENTRAL EUROPE Programme are focused on the ‘Biodiversity and landscape protection’ topic: GreenNet, SALVERE, TransEcoNet, HABIT-CHANGE, and VITAL LANDSCAPES.

Summary of project of aims, outputs and achieved results of projects under the topic of ‘Biodiversity and landscape protection’

The **GreenNet** project focuses on the ecological assets of ‘no man’s lands’ and border areas along the former ‘Iron Curtain’, which was sparsely populated and undeveloped and therefore retains many ecological assets. The main objective of the project is to support and strengthen policies by taking an approach towards safeguarding an interlinked ecological network while keeping a special focus not only on protected areas but also on

other ecologically valuable areas in the central European ‘green belt’. The project provides an opportunity for developing a common strategic approach to nature protection along this interconnected area. The project uses a combination of pilot actions at regional level, combined with awareness-raising events at transnational level. One of the project outputs is the Green Belt Charta, a transnational management strategy to ensure that long-term development in the area will preserve natural heritage, and at the same time contribute to rural development. During a period of increased habitat fragmentation throughout Europe, a focus on transnational cooperation to preserve ecological corridors makes a significant contribution to biodiversity preservation efforts. The European Commission has referenced the project as a “good practise example” in its Communication ‘Green Infrastructure: Enhancing Europe’s Natural Capital’.⁶¹

The overall aim of the **TransEcoNet** project is to provide a comprehensive inventory for the protection of ecological networks and their natural and cultural heritage. The project elaborates strategies and makes recommendations on how to develop and manage transnational ecological networks in central Europe. The inventory of ecological networks, including initiatives and gaps, has been one of the project’s most important outputs. It provides detailed information about organisations and initiatives working on this topic, and identifies gaps in ecological networks. The Strategy and Action Plan of the ‘Ecosystem Services and Biodiversity’ work package is another relevant output. It provides target groups with a structural framework for sustainable management and conservation strategies of ecological networks, including sustainable planning measures in sensitive regions along ecological networks. Outputs of the project include documentary films produced within the ‘Identities and Strategies’ work package. The interactive tools and documentaries developed by the project are now used by national park information centres and NGOs to inform the general public about landscape changes and ecological networks. The scientific results of the project (studies, methods and strategies) have been presented at various national and international conferences, and are now being refined further by the involved scientific partners. The project results have also been provided to policy actors (e.g. national ministries) and might be applied during the policy making process.

The **SALVERE** project aims to promote ‘high nature value farmland’ (HNVF) with biodiversity as a valuable resource to help sustainable rural development. It also aims to protect biodiversity presence in semi-natural grasslands. The project makes an important contribution towards countering the trend of decreasing biodiversity in agriculture by promoting HNVF, which currently comprises just 15-25% of total agricultural area in the EU. The SALVERE project deals with a number of different types of ‘high nature value’ grassland typical for the central Europe area, including the Arrhenatheretalia, Molinietalia, Festuco-Brometalia and Nardetalia grasslands. As a pilot action, the project harvests seeds from ‘high nature value areas’ (donor sites) and uses them to perform experiments in so-called ‘experimental sites’ and to create similar areas at demonstration sites in six countries within the central Europe region. One output of the project is a handbook that serves as a practical reference previously unavailable to experts. The project has also proposed to introduce an EU-level ‘HNV plant material certificate’. National and regional institutions and agencies are using project results to create a knowledge base (e.g. an inventory of species-rich semi-natural grasslands available as donor sites for native seeds to be used in ecological restoration) to allow for the practical implementation of biodiversity preservation efforts in semi-natural grasslands. The project

⁶¹ COM(2013) 249 final: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Green Infrastructure (GI): Enhancing Europe’s Natural Capital.

results are also being integrated into rural development programmes. The project is mentioned in the European Commission publication titled 'Guide to Multi-Benefit Cohesion Policy Investments in Nature and Green Infrastructure'. By pooling their resources, project participants have been able to exchange knowledge and gain new experiences with respect to their common natural heritage.

VITAL LANDSCAPES focuses on nature conservation and heritage preservation. It aims to help preserve the quality, diversity and beauty of cultural landscapes, while boosting their rural development potential. The project applies a cross-sectoral regional strategic approach engineered to promote both economic development and landscape protection. It also uses innovative technologies to visualise landscape changes, such as 3D modelling. The project is based on a participatory approach, building on novel moderation techniques and involving different regional stakeholders (e.g. land owners, community officials and workers, politicians, entrepreneurs, farmers, craftsmen, NGOs) and local residents, who exchange experience and know-how to jointly develop and implement integrative landscape management practises. In addition to landscape protection, the project contributes to landscape valorisation by, for example, promoting tourism and creating regional products and thereby strengthening rural economies.

The achievements of the **HABIT-CHANGE** project are summarised under the 'Risk prevention and climate change adaptation' topic. Several of the projects target EU-level experts and decision makers. HABIT-CHANGE organised a targeted event in Brussels to address and further disseminate project results to various stakeholders at European level, and elaborated a policy paper on enhancing adaptive capacity of Natura 2000 network to climate change. Greenet organised debates for Members of the European Parliament in Brussels. This approach has proved successful in capitalising on project results. Visualisation is also another important aspect of the outputs for several projects, and is sometimes linked to awareness-raising efforts targeted at non-expert members of the general public and decision makers. For example, VITAL LANDSCAPES uses 3D modelling to visualise landscape changes, and documentary films have been prepared by TransEcoNet. Visualisation aimed at experts has also been part of project outputs, including the mapping exercises of the TransEcoNet and Greenet projects. Most of the projects have carried out pilot projects.

Contribution to EU legislation and improvement of environmental quality in the central Europe area under the topic of 'Biodiversity and landscape protection'

Habitat fragmentation is one of the main factors responsible for biodiversity loss. Connecting protected areas by focusing on sites that are less valuable but provide a corridor between protected areas can make an important contribution to halting biodiversity loss. While the TransEcoNet project provides a comprehensive overview of ecological networks and network gaps within the central Europe region, the Greenet project deals specifically with one ecological corridor. The approach of connecting natural sites into a comprehensive network is an example of green infrastructure (GI). Green infrastructure is considered by the Biodiversity Strategy 2020 as a tool to combat landscape fragmentation and contribute to increasing biodiversity, as well as to promoting other ecosystem services. The Commission Communication on Green Infrastructure⁶² addresses the link between regional policy and green infrastructure. With respect to transnational cooperation, the Communication states that "Member States and regions are encouraged to seize the opportunities for developing GI in a cross-border and

⁶² EC(2013), Green Infrastructure (GI): Enhancing Europe's natural capital, COM(2013) 249 final.

transnational context through the macro-regional strategies supported by the ERDF⁴³ and through European territorial cooperation programmes.”

Article 10 of the Habitats Directive also advises Member States to “encourage the management of features of the landscape which are of major importance for wild fauna and flora” – that is, to ensure continuous structures between Natura 2000 sites essential to the migration of species between these sites. Both the GreenNet and TransEcoNet projects are helping to contribute to this aim.

All four projects, GreenNet, TransEcoNet, SALVERE and VITAL LANDSCAPES, contribute to goals of the Habitats Directive and the EU Biodiversity Strategy. The aim of the Habitats Directive is to promote the preservation of biodiversity by requiring EU Member States to maintain or restore natural habitats and wild species listed in the annexes to the Directive to favourable conservation status, and to introduce protection efforts for habitats and species of European importance. The SALVERE project directly contributes to the restoration of natural and semi-natural grassland formations, listed in Section 6 of Annex I of the Habitats Directive. The GreenNet and TransEcoNet projects have contributed to the goal formulated in Article 10 of the Habitats Directive, which advises Member States to ensure continuous structures between Natura 2000 sites that are essential to the migration of species between sites. By helping to preserve landscapes, the VITAL LANDSCAPES project is also making a contribution towards this goal. The project has implemented a number of pilot actions, both in protected areas such as the Saale Valley Nature Park, and in non-protected areas such as the Podmalokarpatsky region.

Table 11: Examples of good practise under the topic of ‘Biodiversity and landscape protection’

Integrated regional-international approach - GreenNet	
Brief description	Added value
The project uses a participatory approach, including the general public and various stakeholders, to develop a toolbox for safeguarding ecological networks.	<i>Stakeholder involvement - awareness raising and development of tools</i> The project creates an integrated set of awareness raising tools, part of which are aimed at the general public, with another part aimed at public administration, NGOs and other stakeholders. Tools aimed at the general public include the School of Landscape Awareness and workshops to solve conflicts of spatial interest. Research conducted through the pilot projects with relevant stakeholders provides a learning experience for stakeholders and will also serve as the basis for the development of tools to safeguard ecological networks.
Catalogue of techniques for harvesting and propagation - SALVERE	
Brief description	Added value
The project catalogues all available techniques for seed harvesting, propagation and trade, all of which are necessary to restore high nature value farmland.	<i>Development of tools</i> Natural grassland conservation is a complex task, and the damage done by human activity at some sites now calls for human involvement in the restoration of biodiversity. To this end, the project tests various methods of harvesting and propagation. The results of the experiments and good practises are included in the project handbook and further promoted to interested parties through conferences and demonstrations. As a result, experts and professionals have introduced the new methods to their own restoration activities.
Implementation of ecosystem services in central Europe - TransEcoNet	
Brief description	Added value
The project develops an approach to apply ecosystem services and sustainable planning, and tests this approach at different geographic	<i>Integrating research and application</i> The project has developed a methodology for implementing ecosystem services in protected and non-protected transnational regions and creating a structural framework for sustainable planning measures. The methodology was tested in six investigation areas across central Europe. The development of the methodology contributes to research

scales in the central Europe region.	on ecosystem services and helps policymakers gain an understanding of the value of ecosystems.
Pilot Action in Lower Saale Valley - VITAL LANDSCAPES	
Brief description	Added value
The project introduces an integrated development strategy for the Lower Saale Valley region.	<i>Integrating economic and social considerations into environmental projects</i> This integrated approach, focusing primarily on nature conservation and agricultural, economic, cultural and social issues, aims also to address issues of depopulation and unemployment. The development plan involves a focus on nature, landscape and cultural heritage as a basis for strengthening regional identity and developing an attractive network amenable to local recreation and tourism.
Innovative visualisation techniques - VITAL LANDSCAPES	
Brief description	Added value
The project develops tools to visualise landscape changes.	<i>Integrating research and application</i> The project uses 3D visualisation and GIS tools to present visual evidence of landscape changes. The aim of these tools is to communicate with local stakeholders and promote their involvement in participatory processes with regard to landscape planning.

3.3. Programme-level analysis

The Common Provisions Regulation (CPR⁶³) points to the areas of intervention where European Territorial Cooperation has particular added value. The relevant text from the CPR and other relevant documents has been included in the box below.

<p>Common provisions Regulation Annex I ‘Common Strategic Framework’ 7.2 (2) “Member States and regions shall, in the areas concerned, seek to draw on cross-border and transnational cooperation to:</p> <p>(a) ensure that areas that share major geographical features (islands, lakes, rivers, sea basins or mountain ranges) support the joint management and promotion of their natural resources;</p> <p>(b) exploit the economies of scale that can be achieved, in particular with regard to investment related to the shared use of common public services;</p> <p>(c) promote coherent planning and development of cross-border network infrastructure, in particular missing cross-border links, and environmentally friendly and interoperable transport modes in larger geographical areas;</p> <p>(d) achieve critical mass, particularly in the field of research and innovation and ICT, education and in relation to measures improving the competitiveness of SMEs (...)”</p> <p>ERDF ‘Whereas’ clauses (10)⁶⁴ It is important to ensure that, in promoting risk management investments, specific risks at regional, cross-border and transnational level are taken into account.</p> <p>Draft Thematic guidance Fiche for Desk Officers - Water management (Version 2 20/02/2014)⁶⁵ “The relevant territorial cooperation (European Territorial Cooperation (ETC))</p>

⁶³ Regulation (EU) No. 1303/2013

⁶⁴ Regulation (EU) No. 1301/2013

⁶⁵ http://ec.europa.eu/regional_policy/sources/docgener/informat/2014/guidance_2_thematic_objective_6_water_management.pdf

programmes should be considered in order to deal with trans-boundary spill over effects as regards water management.”

Draft Thematic guidance Fiche for Desk Officers - Climate Change Adaptation, Risk Prevention and Management (Version 2 20/02/2014)⁶⁶

“Cooperation across regions and Member States should (...) be carefully considered where relevant in order to deal with cross-border spill over effects, in particular in relation to flood protection, forests fires and coastal protection.”

These documents state that the critical mass achieved by cooperating in areas of research and the sharing of experience and good practises constitutes an added value of cooperation. The CSF mentions the common provision of public services as another instance when cooperation has added value, and cites waste treatment, water treatment and green infrastructure as potential examples. Both documents refer to improving governance as a result of coordinated policies as a potential gain from territorial cooperation. Finally, cooperation as a way of improving relations with EU neighbours is also a potential added value of territorial cooperation.

Our findings regarding the CENTRAL EUROPE Programme were very much in line with the Commission’s view on the added value of transnational cooperation.

We have found that the projects have made a contribution to jointly manage and promote the natural resources as shared assets of the programme area. Projects under Sub-theme 1 ‘Environmental risk management and climate change’ which have promoted joint management of natural resources include the INCA-CE project which has implemented joint risk prevention and management measures for weather-related risks, as have the LABEL, CEframe and INARMA projects, which jointly addressed transnational flood risks, an aspect of river management. The TransWaste, CERREC and ECOPaperLOOP projects have contributed to the joint management of resources through joint approaches to waste management aimed at increasing re-use and recycling. The TAB project has managed to decrease health risks through the reduction of air pollutants with transnational impacts. In particular, projects under Subtheme 2 (‘Cooperating to preserve and protect nature and landscapes’) have contributed to joint management of natural resources. Joint action was taken by the Greenet and TransEcoNet projects to protect cross-border habitats, and the VITAL LANDSCAPES project which promoted the preservation of cultural landscapes.

Many projects have focused on addressing environmental issues and challenges that do not have transnational impacts but are common to many regions and cities in the central Europe area. The EULAKES project has addressed environmental issues typically affecting lakes in the central Europe area. The SALVERE project dealt with ‘high nature value’ (HNV) grassland typical of the central Europe region. The ACT Clean and PRESOURCE projects addressed low levels of resource efficiency in SMEs, which is common in the transnational region. HABIT CHANGE has addressed climate risks that are common to the nature areas of the central Europe region, while the UHI project has promoted approaches to deal with the ‘urban heat island’ phenomenon, which is prevalent in many cities in the central Europe area. The Programme has also addressed urban issues that are common to many cities in the transnational region: URBAN SMS, COBRAMAN, ReSOURCE, CircUse and UrbSpace have dealt with soil and land use issues, while UFIREG has addressed air pollution in cities. The URBAN WFTP project has dealt with efficient urban water supply, and FOKS has addressed groundwater contamination. When these projects have addressed

⁶⁶ http://ec.europa.eu/regional_policy/sources/docgener/informat/2014/guidance_fiche_climat_change.pdf

issues without transnational impacts (but also for projects with transnational impacts), the sharing of experience and good practises constitutes an added value of cooperation, as described by the CSF. Learning from more experienced partners, and learning through the joint development of tools, approaches, strategies or pilot projects, are common elements in all of these projects.

Some projects have involved partners from outside the European Union. These include the UFIREG and Greenet projects, each of which involved one partner from Ukraine. In line with the CSF, these projects can be considered as contributing to improved relations with EU neighbours.

Added value of transnational cooperation in the CENTRAL EUROPE Programme area

Analysis has shown that the promotion of EU strategic policy objectives is one of the key characteristics of the projects; and the projects have demonstrated strong links to the achievement of EU policy goals related to topics within the ‘Environmental risk management and climate change’ thematic area by implemented activities. In addition, it has been discovered that transnational cooperation is essential for many project partners with regard to strengthening capacities and learning opportunities among regions with different levels of knowledge. Finally, transnational cooperation has been indispensable for addressing problems of a transnational nature (water management of transnational rivers, flood prevention, etc.) and jointly developing applicable solutions in the form of strategies, action plans, tools and monitoring systems or management structures.

These findings were confirmed by information gathered through the questionnaire addressed to Lead Partners, and were then used to analyse how project partners perceive the added value of cooperation.

Project Lead Partners perceive the CENTRAL EUROPE Programme as having high added value. Most of the project activities would not have been carried out or would have been less efficient and less effective without transnational cooperation. Lead partners offered several different opinions on why transnational cooperation is important and useful in addressing environmental issues relevant to their projects. Their responses were organised into four different categories, which are presented below.

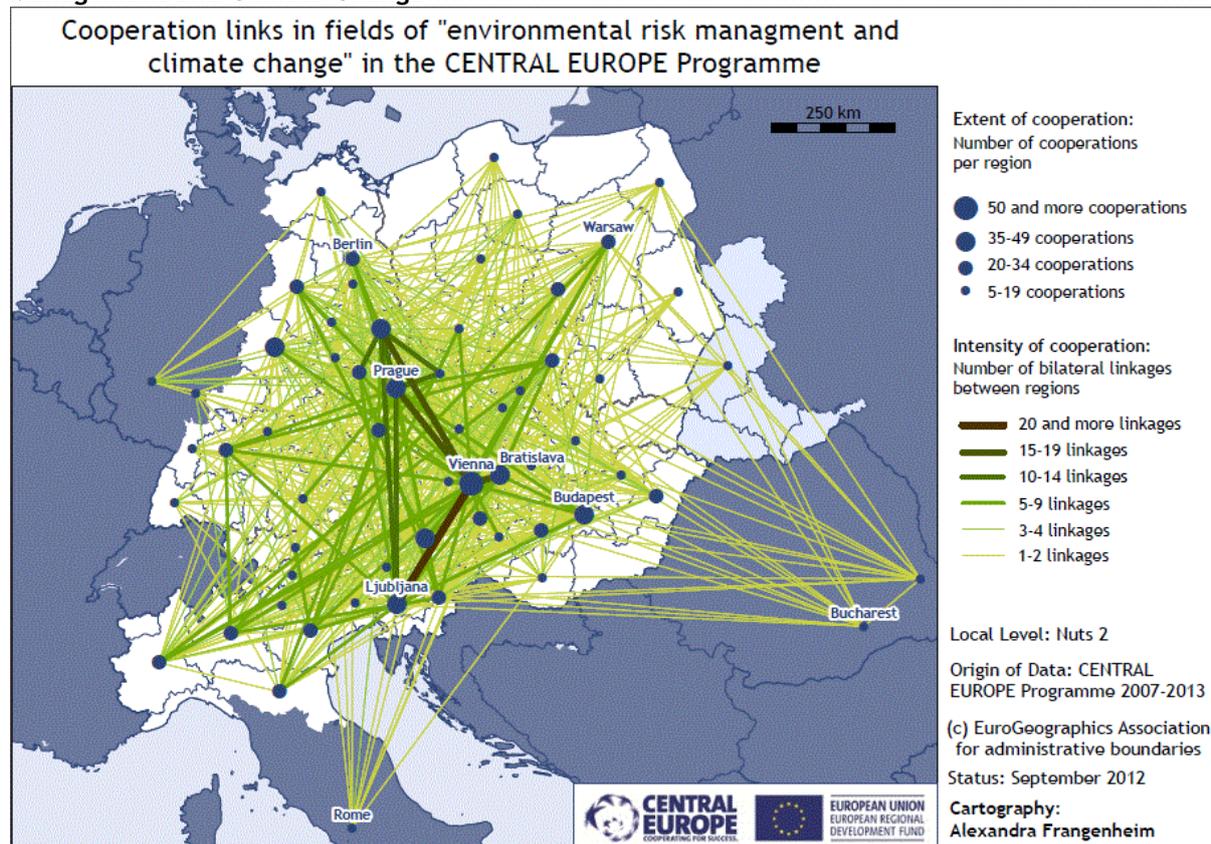
Learning, establishing a common understanding, and creating critical mass

The interaction between partners from different regions was intense, as illustrated in Figure 10. The ‘Environmental risk management and climate change’ theme of the CENTRAL EUROPE Programme involves a total of 276 project partners, with an average of about 11 partners cooperating in each project.

The intensity of cooperation between project partners from different regions has enabled them to share knowledge and experience with each other. This sharing of knowledge and experience has two types of benefits. On the one hand, it enables an exchange between different viewpoints, partners at different levels of preparedness, and therefore enables the passing on of knowledge from one partner to the other. On the other hand, the projects have enabled the creation of critical mass, whereby actors acting in cooperation can achieve more than if they acted individually due to the pooling of resources (knowledge, networks) available to them as a group.

This has been confirmed by the project partners stating that lack of transnational cooperation would, in many cases, have resulted in loss of efficiency and effectiveness. Attempts by Member States and regions to address issues separately often result in duplicated efforts, wasted resources, lost possibilities to exchange knowledge, experience and data, slower progress and lower environmental performance. Solitary action may also result in taking approaches that are too narrow-minded and lack multiple perspectives.

Figure 10: Cooperation links between project partners under the theme of ‘Environmental Risk Management and Climate Change’



Source: CENTRAL EUROPE Programme

Many responses provided by project Lead Partners reflect the view that transnational cooperation is useful because it provides the possibility for learning from each other and creating a common understanding. Listed below are some responses from Lead Partners:

- “The added value of the project’s transnational approach was to see different perspectives on similar problems in the different partner countries. [...] Working together focusing on the same goal helped us to find better solutions and methods.”
- “Transnational cooperation allows for the transfer of knowledge and mutual exchange of experiences.”
- Transnational cooperation helps with “improving communication and getting to know each other.”
- “The added value of transnational cooperation is also to exchange know-how.”
- “We benefit a lot from each other’s experience and create synergies that are not necessarily established in the national context.”

The relevance of critical mass is reflected in the following responses from Lead Partners:

- “Transnational cooperation between local, scientific and governmental experts at local, regional and national levels guarantees high quality that would not have been possible with just a single partner, because neither knowledge nor resources would have been sufficient.”
- “A concept developed by a transnational expert team has more credibility than results developed by one organisation only.”
- It is useful “to implement transnational networks between research groups.”

Tackling transnational or common environmental issues

Another recognised added value is that cooperation has added value because of the transnational nature of the environmental issue being addressed by the project. Cooperation is generally needed when an environmental issue has transnational spill-over effects (transnational externalities). Examples in this regard include protection of cross-border habitats and landscapes, protection of species that move across borders, water management and flood protection related to transnational rivers, cross-border pollution of air and water, etc. Attempts to solve issues individually in such cases are ineffective. For example, without a joint effort to address pollution of transnational rivers or lakes, there is no guarantee that a good ecological status will be reached.

Project Lead Partners mentioned the following in relation to addressing transnational environmental issues:

- “Ecological networks [...] don’t stop at borders.”
- “Neither habitats nor climate change impacts respect national boundaries.”
- “Rivers don’t know any borders.”
- “Weather knows no boundaries.”
- “Even if the air is polluted in another country, it doesn’t stay there but travels all over Europe.”
- “Products are not necessarily recycled in their country of origin.”

Transnational environmental issues where transnational cooperation is absolutely necessary include projects related to water management and flood protection of transnational rivers, such as LABEL, CEFRAME and INARMA. Further projects in the field of transnational landscape protection and biodiversity protection include GreenNet, TransEcoNet and HABIT-CHANGE. Finally, air pollution, as addressed by the TAB project, also crosses boundaries and requires transnational cooperative action.

Some project partners agree that “cooperation is useful because the environmental issue being tackled is common to the participating regions.” This tends to be the case when a project addresses environmental issues that might not necessarily involve transnational spill-over but are nonetheless common to the region because of, for example, similar habitats, landscapes or species; or partners face similar environmental challenges within the region. In such cases, partners might be able to address such issues alone because their own environment is not affected by the environment in other regions or countries; however, cooperation has added value because partners facing similar issues can learn from each other. Projects Lead Partners outlined the following:

- “This is an issue common to all of the largest urban agglomerations in the central Europe area.”

- “Different countries are facing similar problems relevant to water and climate change.”
- “Climate change and its relation with lake ecosystems is not a [purely] local issue.”

All projects aim to address environmental issues common to central European regions. For example, EULAKES addresses issues that are common to many lakes in the programme area, and its findings can be transferred to other lakes that the project does not explicitly address. Similarly, the SALVERE project addresses HNV farmland and explores the potential for seed exchange where similar species are grown. The VITAL LANDSCAPES project deals with issues related to cultural landscapes common throughout the programme area.

Helping to implement EU Directives

The projects have made two types of contributions to compliance with EU Directives: on the one hand, they have contributed to the achievement of environmental targets set out in EU legislation and other policy documents. In particular, the projects have contributed to the achievement of goals set out in the Birds and Habitats Directives, the Water Framework Directive, the Floods Directive, the Groundwater Directive, the proposed Soil Directive, the Waste Directive and the Air Quality Framework Directive. Projects have also made a contribution to various other policy documents, including the Biodiversity Strategy, Adaptation Strategy, Soil Thematic Strategy and the Resource Efficiency Flagship of the Europe 2020 Strategy. The contribution projects have made to compliance with EU Directives and policy documents is addressed in detail for each environmental topic in Section 3.3.

On the other hand, some EU Directives explicitly require cooperation between Member States, and the projects have contributed to such cooperation by establishing working relationships and networks between different actors in different Member States. This is the case, for example, with the EU Water Framework Directive and EU Flood Directive, both of which may require Member States to develop joint river basin management plans for transnational rivers and catchment areas. LABEL, CEFROME and INARMA are all making contributions to increasing cooperation between countries in the field of flood protection. The Air Quality Framework Directive also aims to promote enhanced cooperation between Member States to reduce air pollution. The TAB and UFIREG projects are helping to establish these cooperative activities in the field of air quality protection. The cooperative activity taking place among partners involved in transnational projects can be a seed for cooperation required by the directives, or it can strengthen already existing links between Member States and add value to cooperation activities.

Suitability of transnational cooperation for project implementation

Despite the availability of other funding instruments, which potentially could have been used to fund their projects, Lead Partners felt that transnational cooperation was particularly suited to meet their specific project needs. Lead Partners indicated three main reasons why transnational cooperation is more suited for funding their projects than other types of instruments.

One reason was the geographic focus of the funding instrument, as all of the projects focus on issues shared across the central Europe area.

Another response shared by many Lead Partners is that transnational cooperation provides an opportunity to deal with environmental issues in a territorially integrated way. Transnational cooperation allows different types of stakeholders (national government, regional government, business, education and research and non-governmental organisations) to work together. It also allows actors to take an integrated approach to the issues themselves – i.e. they address issues not within a narrow sectoral perspective but by integrating other considerations in addition to environmental interests, such as economic and social interests. The integration of economic and/or social considerations is of high importance for several projects. Examples include the Transwaste, CERREC and UrbSpace projects, which involve the integration of social considerations into activities related to waste management and the revitalisation of urban public spaces.

Finally, the integrated approach characterising transnational projects make transnational cooperation an attractive financing option according to Lead Partners. Unlike many other funding instruments, transnational cooperation provides support not only for one type of activity (research, physical investment, network, creation etc.), but for a complex set of activities, all of which are needed to achieve the desired result at territorial level. In general, Lead Partners indicated a wide variety of outputs that were developed or planned during the project lifetime. Other funding instruments generally focus on a narrower range of outputs (for example, research studies only or physical investments only). By contrast, transnational cooperation enables a wider and interactive range of outputs to help meet project objectives, including: the preparation of policy documents, strategies, action plans and recommendations for policy improvement; the development of tools background documents, guidelines and handbooks; awareness-raising events, workshops or trainings and setting up networks. In addition, feasibility studies, investment preparation as well as small-scale physical investments are supported.



3.4 Case studies

UFIREG - Ultrafine particles: Cooperating with environmental and health policy



Functional control unit at the Scanning Mobility Particle Sizer (SMPS) in Chernivtsi and Dresden.
Source: www.ufireg-central.eu

The main aim of the UFIREG project is to measure ultrafine particles (UFPs) in five European cities (Augsburg, Chernivtsi, Dresden, Ljubljana and Prague) and to gain a greater understanding of the impact of UFPs on human health. The project partnership involves seven research institutions from four countries (Czech Republic, Germany, Slovenia and Ukraine). UFIREG started in July 2011 and will be concluded in December 2014.

Air pollution spreads out beyond national borders, which means that air pollution is a problem that can be tackled predominantly through transnational cooperation. Nonetheless, unique historical backgrounds have an influence on how different countries address problems related to air pollution. The UFIREG project helps to assimilate these various approaches and share them between project partners.

In addition to awareness-raising activities, the project is producing a number of relevant outputs and conducting five pilot actions in central European cities aimed at measuring the level of ultra-fine particles. The UFP data from the participating cities is correlated with epidemiological data so that the impacts of air pollution on human health can be better understood. This data is presented in a transnational database on ultrafine particles and serve as a basis for the development of relevant guidelines planned to be distributed to representatives of local, national and international authorities and assist in the decision making and policy development.

The UFIREG project targets a diverse group of stakeholders that includes environmental agencies, health authorities, public administration personnel, public health institutions, universities, research institutes and related civic associations.

The project will continue to have an impact even after it ends. First, the UFP-measuring devices will remain in place and cities will continue to use them for data collection, especially if UFP pollution is shown conclusively to have adverse effects on human health. Second, the handbook, guidelines and strategies will be developed for future implementation, although precision planning will be possible only after outcomes from the analysis are known and disseminated.

UFIREG project website: <http://www.ufireg-central.eu/>

CEframe - Central European Flood Risk Assessment and Management in CENTROPE

The overall aim of the CEframe project is to facilitate transnational flood protection management efforts. The project started in April 2010 and was completed in March 2013.

The partnership comprises nine partners from Austria, the Czech Republic, Hungary and Slovakia, and includes ministries, regional authorities and water management organisations responsible for flood protection.

Within the project these four participating countries created, for the first time, transnational flood risk maps for the Morava, Thaya and Leitha rivers. This requires the partners to create their own methodology in order to achieve a comparable four-country

Floods don't know any borders

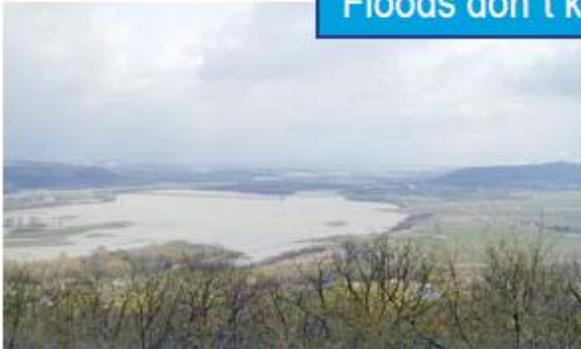


Figure 1: Danube, 2002



Figure 2: March/Morava, 2006



Figure 3: Thaya/Dyje, 2006



Figure 4: Leitha/Lajta, 2009

analysis, and involves bringing together numerous experts to provide support and resolve technical problems. The main project outputs have been developed in response to three main challenges.

The first challenge is to overcome the technical language barrier between participating countries, resulting in the development of the CEframe Thesaurus, a lexicon and dictionary of 275 technical terms presented in five languages (Czech, English, German, Hungarian and Slovak). As major differences exist between several flood protection-related terms, it is vital to establish a common understanding with regard to international cooperation efforts.

The second challenge is to develop the flood risk maps. Partners have collected historical flood data at national level and exchanging information. Each participating country has developed a flood risk map to identify endangered regions, but the methodologies under which these regions are defined vary from country to country. For example, differences in hydrologic data can negatively impact dike construction. The project has responded to this problem by developing a standardised methodology of flood risk mapping in order to harmonise country-level approaches.

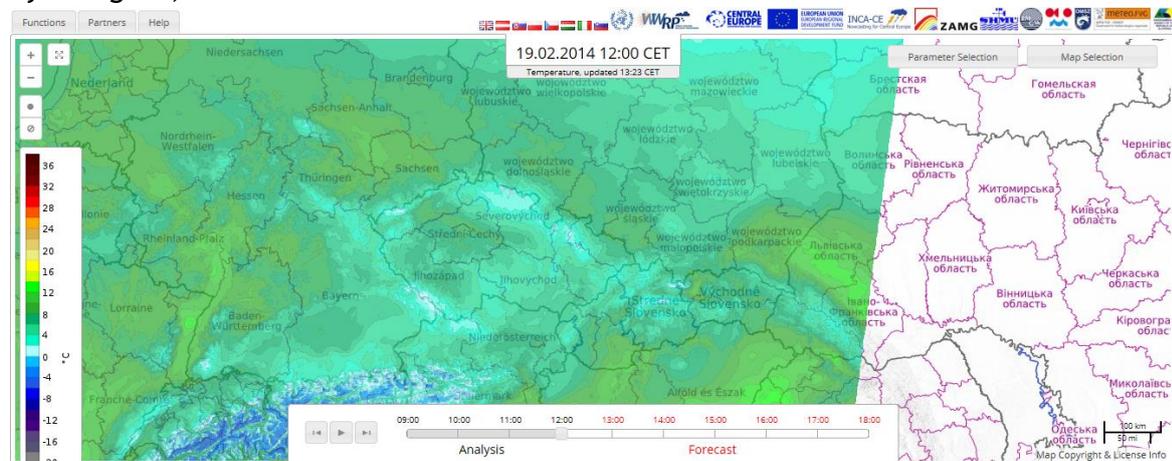
As a third step in the process, the partners developed and signed a Memorandum of Flood Protection that identified eight specific issues to be addressed in improving flood protection efforts between participating countries, especially along border areas. This was a rather lengthy and complex process, and it was difficult to reach an agreement because of its international – and hence political – nature. The fact that such a document had never been developed before merely added to this difficulty.

The project’s final outputs will remain important tools for responsible institutes and policymakers in the carrying out of daily work. Emergency units in different partner countries now have better instruments with which to communicate and understand each other. The Memorandum of Flood Protection, meanwhile, helps trans-boundary water commissions to implement effective flood protection policy. This final document of the project can serve as a guideline for future cooperation and as a good basis for further project ideas (such as forecast optimisation or restoration projects).

CEframe project website: <http://www.ceframe.eu>

INCA-Central Europe - Integrated nowcasting system for the Central European area

The INCA-CE project started in April 2010 and concluded in September 2013. Involving 16 institutions from eight central European countries the partnership brought together meteorologists, researchers, national authorities and concerned public agencies responsible for action in case of natural disasters. The project aims to limit the adverse effects of weather-related natural disasters by developing a state-of-the-art, high-resolution, real-time analysis and forecast system having to do with atmospheric, hydrological, and surface conditions.



INCA-CE web portal showing temperature forecasts. Source: www.inca-ce.eu

The project has implemented a transnational information system through the application of nowcasting methodology (i.e. immediate short-term weather forecasting), and by taking different social and economic sectors into account in order to reduce economic damage and protect human life from extreme weather events. Following a careful evaluation of the nowcasting system’s strengths and weaknesses, the results are used to prepare strategic documents and guidelines for road safety, civic safety and operational hydrology. These documents include common recommendations on the tool’s technical aspects and possible applications.

The INCA-system, which enables public and private-sector users to consider weather-related risks and hazards in a more timely fashion, with more precision, and in greater geographical detail, was tested within the project. Ten pilot actions related to three applications, namely to road safety, operational hydrology and to civil protection have been implemented in Austria, Slovakia, Hungary, Slovenia, Poland and Czech Republic. For road weather forecasting, the application makes the information available both to road management authorities and the general public, which can enhance road safety and improve road conditions, especially in winter. Also, a web portal for road maintenance authorities has been optimised, which proved helpful in taking decisions and carrying out daily work during the severe winter of 2012/2013. For civil protection, the aim of the application is to provide more detailed and accurate weather forecasts in time and space in order to optimise actions taken in severe weather situations. The hydrology application aims to optimise strategies for using weather information and its visualising capacity to increase preparedness for flash flood events.

The main added value of transnational cooperation achieved within the project is the achievement of a wider understanding of the 'warning chain' extending from weather models to the dissemination of results between countries. The exchange of such information is especially valuable in terms of achieving common standards across borders. The project has improved levels of preparedness for severe weather emergencies by deepening transnational cooperation between meteorologists and concerned public agencies. Within this multidisciplinary framework, input from diverse institutions and different countries makes it possible to refine the warning chain and to promote improved models more extensively than any single institution could. Also, without transnational cooperation and communication, several nations might be working simultaneously on the same issues without the others being aware of it, resulting in a needless waste of resources.

The project has achieved a lasting impact through the establishment of a network with other projects and collaboration in related fields of research and application. Also, the World Meteorological Organization (WMO) selected INCA-CE as a 'World Weather Research programme/Forecast Demonstration project'. The INCA model, with WMO support, has potential to be adopted in various countries around the world, allowing for an exchange of know-how, expertise and experiences, while new cooperation with developing countries is expected to help ensure low-cost local research and development. The INCA model is currently being used or investigated by 24 European partners.

INCA-CE project website: <http://www.inca-ce.eu>

COBRAMAN - Manager Coordinating Brownfield Redevelopment Activities

The COBRAMAN project started in December 2008 and finished in August 2012. The aim of the project is to assist municipalities with brownfield site management and revitalisation efforts by providing essential knowledge. The project involves nine partners from five countries within the CENTRAL EUROPE Programme area.

The main project outputs are a public database, a brownfield site management profile, and the establishment of a European School for Brownfield Redevelopment. The database contains information about revitalisation projects in Central Europe that are undertaken within the framework of European funding programmes. The database is used for trainings, MA/MSc studies, postgraduate studies and e-learning, and is also helpful for brownfield site managers, public administration workers, scientists and investors. The

development of the brownfield site manager profile addresses the need for a public institution to take on the complexities of brownfield site regeneration and stresses the primary importance of proper coordination throughout the process. Profile development begins with an analysis of skills required for steering and managing the revitalisation process; afterwards, a manager profile is drafted, followed by the development of tools and trainings. The establishment of the European School for Brownfield Redevelopment emphasises that the knowledge necessary for site management and revitalisation comes mostly from hands-on experience. To this end, an educational programme has been established that includes a master course in Ostrava (Czech Republic), a postgraduate course in Bydgoszcz (Poland) and an e-learning component as well.

Brownfield site management practises vary considerably between the partner countries, both in terms of approach and political importance. Bearing this in mind, the aim of transnational cooperation is to develop common tools, methods and educational schemes that can be tested as pilot cases in partner cities and be later applied at European institutions. The participation of multiple nations and diverse institutions within the project (e.g. urban planning and development agencies, local authorities and universities) ensures that problems have been tackled from different points of view. For example, during project seminars the partnership worked in small groups and developed a brownfield-specific SWOT analysis for each of the partners.



Pilot action site in Stuttgart. Source: www.cobraman-ce.eu

The project partners believe very strongly in reaching out to stakeholders and identifying the right channels of communication. As local and regional authorities can now introduce a ‘brownfield manager’ position to their organisational structures, it is important to directly target these authorities with information about the project outputs; thus several articles have been published in scientific journals, and partner cities have organised local

seminars and dissemination events. The city of Usti nad Labem (Czech Republic) has created a brownfield strategy and targeted volunteers to get involved in related activities. The stakeholder management approach is taken directly from an Irish example. Finally, educational programmes for universities and research institutions can further spread knowledge about the topic and create a long-lasting effect.

In terms of long-term impact, the project has achieved a number of results: first, universities will sustain the established educational schemes; second, the e-learning portal will remain accessible in the future; third, local and regional authorities will be able to use the brownfield manager profile to establish a dedicated expert position within their administrations. Finally, the project's local strategies and pilot actions are likely to have created long-lasting effects in the pilot cities. The Usti Brownfield Strategy aims at reducing the number of brownfields and creating a GIS inventory for the city, while pilot investments in Kranj and Bydgoszcz will continue after the project ends.

COBRAMAN project website: <http://www.cobraman-ce.eu/>

TRANSWASTE project - Formalisation of informal sector activities in collection and trans-boundary shipment of wastes in and to CEE

The TransWaste project was implemented between January 2009 and September 2012 and aimed at gaining and providing information about informal waste collection and trans-boundary shipment of waste, as well as implementing possible solutions for environmental, social and economic problems. Seven partners were involved in the project, coming from Austria, Germany, Hungary, Poland and Slovakia.

The main goal of the TransWaste project is to fill an information gap regarding informal waste collection, which is a highly transnational issue because those involved in informal collection of waste move across borders, which impacts formal waste collection and recycling levels in the target countries. The project investigates the informal waste collection sector and has economic, social and environmental impacts on the participating countries. Based on the results of the analysis, a Transnational Action Plan has been developed, providing step-by-step guidance for the procedures necessary to formalise the informal waste collection sector in an environmentally and socially beneficial manner.



Informal waste collection activities addressed by the project. *Source: www.transwaste.eu*

The project partners have developed three formalisation scenarios that have been tested through three pilot actions implemented in four countries. In Hungary, an 'International Second Hand Service' (ISHS) association was registered in December 2011 in order to provide training to informal waste collectors on relevant waste and transportation issues. The Austrian and Hungarian partners developed the training materials, which were then

reviewed by the Austrian Environmental Ministry and the Division for Environmental Crime of the Federal Police of Austria. So far, 72 people have passed the final examination of the training and received a membership card from the association. The second pilot action aimed to establish a business cooperation between the Austrian social enterprise BAN and the Hungarian City of Devecser. According to the Memorandum of Understanding signed by the parties, BAN established its second branch in Hungary with 10 transit workers and eight key workers. Finally, the project promotes the inclusion of 're-use corners' into the Regional Waste Management Plan (WMP) for Lower Silesia, Poland as a possible means of reducing the amount of landfilled waste and promoting re-use. In Slovakia, the Retourette idea has turned out to be an effective solution for the formalised collection of waste electrical and electronic equipment (WEEE). Informal collectors can receive a certain amount of money upon the delivery of complete appliances to the waste collection centres. The idea has been implemented by the Slovakian partner Repanet, which deals with WEEE organisation.

The project proves that formalisation of the informal waste collection sector has positive environmental impacts, as formal re-use has, in nearly all cases, lowered impacts compared to informal re-use or recycling. In addition to the environmental benefits, the project has also resulted in economic and social benefits, as it focuses on and supports less advantaged social groups. Because the project addresses a problem that is trans-boundary in nature, there is potential for stronger cooperation between stakeholders and relevant institutions in the central European region on this subject. The project proves that the transnational cooperation between participating authorities can support the legitimisation of waste collectors. Additional benefits will come after the project ends, as the implemented pilot actions will continue to operate.

Transwaste project website: <http://www.transwaste.eu/>

4. Conclusions and Recommendations

This chapter summarises project results achieved within the theme ‘Environmental risk management and climate change’ in terms of their sustainability and impact on policies. The chapter also focuses on the use of project achievements, the effects of pilot actions, the niche of transnational cooperation, and added value created for the territories involved. Finally, the chapter includes recommendations for this thematic field in terms of types of interventions, actions and themes to be supported, and types of partners to be involved in projects.

4.1. Conclusions

Analysing the breakdown of individual projects per sub-theme as presented in Chapter 3, Sub-theme 1 ‘Cooperating to prevent environmental hazards and reduce the negative effects of climate change’ contains most of the projects, i.e. 19 out of 26 in total. 5 projects are assigned to Sub-theme 2, ‘Cooperating to protect and preserve nature and landscapes’ which is comparatively lower than the number of projects assigned to Sub-theme 1.

The remarkably higher number of projects supported under Sub-theme 1 could be due to the fact that some socio-economic needs and environmental challenges are more pressing in central Europe, and therefore the regions tend to focus on these environmental issues. The issues in question jeopardise health, life and well-being, and require immediate policy actions. As a result, the majority of projects address topics like water management and flood protection, followed by waste management, soil protection, biodiversity and landscape protection.

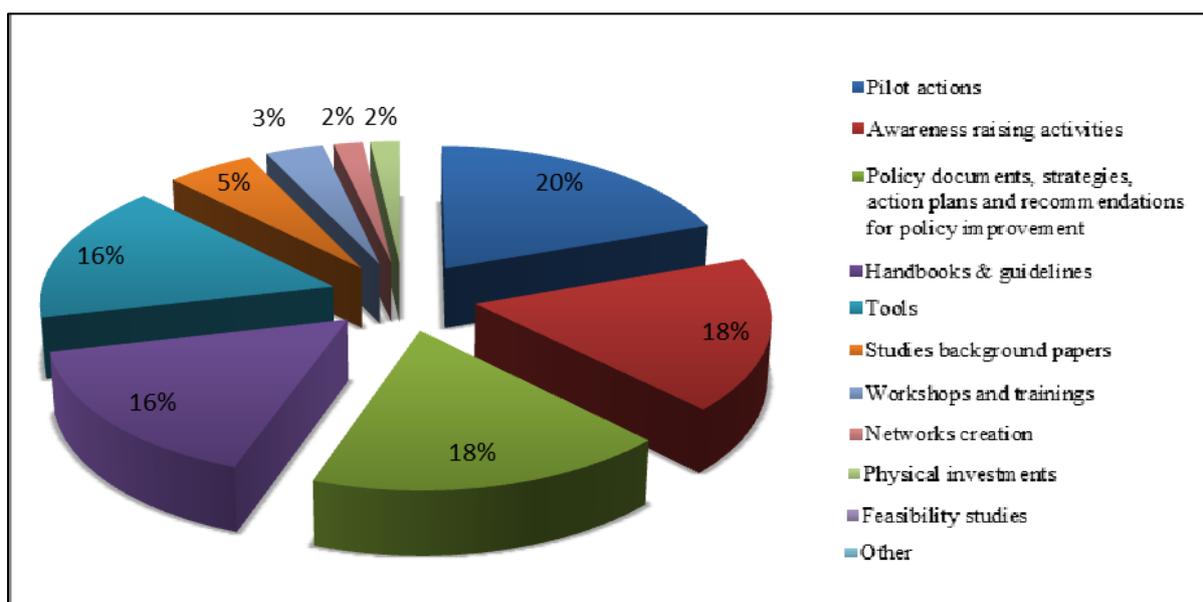
Fewer projects focus on risk prevention, climate change or reduction of air pollution. Adaptation to climate change and building disaster resilience are issues of critical importance for central Europe, and regional responses are required in the near future. The CENTRAL EUROPE Programme provides a flexible framework for addressing those complex and multi-sectoral issues in a transnational context, however not all relevant stakeholders in central Europe are fully aware of the potential and opportunities that the Programme offers in this regard. Nevertheless, the projects do take the issues of risk prevention and climate change into due account, as the interactions between climate change and water management are tackled extensively under the topic Water management and flood protection of Sub-theme 1.

Reduction of air pollution is another environmental topic that has direct links with climate change, specifically in terms of efforts to reduce greenhouse gas emissions: this is a critical issue for many urban areas in central Europe suffering from ultrafine particle pollution and other types of air pollution. Because many of these pollutants have trans-boundary effects, there is strong rationale for addressing this issue in a transnational context. The low number of projects related to this issue could be related to the fact that there is not enough experience in addressing air pollution in an integrated way and in a trans-boundary context. Nevertheless, this topic is likely to command more attention from policy actors in the near future. In the meantime, it should be noted that projects on air pollution will need to adopt a cross-sectoral approach and ensure strong coordination between different levels of governance in order to be successful.

Project achievements

The analysis has shown the wide variety of project achievements produced. Different target groups have different needs, and the project holders are aware that these groups can be reached most effectively through different types of outputs. Project achievements include handbooks and guidance documents, pilot actions, tools, studies, policy documents, awareness raising activities. As shown in Figure 14 the three most useful types of outputs, as indicated by Lead Partners, are: pilot actions; awareness-raising activities; and the development of policy documents, strategies, action plans and recommendations for policy improvement.

Figure 14: Most useful types of achievements, as indicated by Lead Partners⁶⁷



Target groups are using the project achievements in different ways. Those have most frequently become a basis or a part of further activities as good practise examples, or as contributions to the knowledge base of stakeholders. Other achievements have resulted in tools that improve the functioning of organisations or support the implementation of environmental strategies and policies. Workshops and trainings, as well as data collection, analysis and visualisation methods have added to the knowledge base of local, regional and, in some cases, national policy- and decision makers. Handbooks and guidelines support policy- and decision makers in the preparation and implementation of climate change and natural risk management policies, plans, programmes and strategies. Methodologies for preparing strategic policy documents at local level have also proven useful in addressing insufficient knowledge during efforts to mainstream climate change and environmental issues into local and regional policies.

Ranging from practical testing of tools and methods to small-scale investments, a number of pilot actions are implemented within the CENTRAL EUROPE projects. Many pilot actions have provided the opportunity to apply innovative solutions or test new tools and

⁶⁷ Based on the results of a survey carried out amongst Lead Partners of the analysed projects. The purpose of the survey was to gain a further understanding of the added value derived from transnational cooperation activities. The information was gathered via a questionnaire filled in by the project Lead Partners (see Annex).

technologies in the fields of resource efficiency, biodiversity protection, or surface water and groundwater management. Small-scale pilot investments have been implemented to carry out remediation works in degraded former industrial sites, testing innovative approaches for remediation in cases of groundwater contamination and restoration of river spaces in urban areas. Apart from immediate impacts in terms of managing climate change and natural risks, these pilot investments also provide stimulus for decision makers and wider stakeholder groups to identify or prepare additional actions and leverage the required funds. Although the pilot actions vary in terms of focus and content, in most cases the project partners understand that they play a major role in mitigating natural environmental or climate change-related risks, and that they support policy planning by bringing knowledge and guidance into the decision-making process.

Many project achievements are also important for creating conditions for spin-off activities. These will be used to leverage funds for follow-up activities, such as further development and implementation of action plans, application of developed tools by new institutions, trainings, awareness-raising seminars, stakeholder events, annual expert meetings as well as extension of pilot investments, leverage of funds etc.

Relevance of project achievements and their contribution to policies

The analysis shows that the project achievements have special relevance for addressing a variety of issues related to climate change and environmental risks in central Europe. If efforts to adapt to climate change or to minimise and prevent environmental risks are to be effective, they cannot be undertaken by countries or regions working in isolation. Integrated and coordinated transnational actions are essential in helping regions to combine resources and develop specific approaches to address common challenges within a given thematic area. These common challenges include minimising water pollution, flood risk prevention, biodiversity conservation, reducing air pollution in urban areas, etc.

Project achievements have contributed to the improvement of local and regional policies with regard to the topics tackled. Specifically, many partners have taken concrete concepts, approaches, methods and recommendations from transnational projects and integrated them into their local or regional policies. The development of climate adapted management plans for protected areas is an example of how transnational cooperation activities have stimulated locally-driven policy planning process with regards to climate change adaptation. A further example is the integration of the implementation model of re-use corners at waste collection centres as piloted within the project in the regional waste management plan for Lower Silesia contributing to reduce the amount of landfilled waste and promote reuse.

Sustainability of project results

An important aspect of the projects supported by CENTRAL EUROPE Programme is their focus on ensuring sustainability and long-term impacts of project results. Specifically, many of the project achievements will continue to play a major role in effective policy planning and implementation beyond the project lifetime. Using innovative approaches, several projects have addressed the problems of inadequate and insufficient environmental data and information in the areas of waste management, extreme weather events resulting from changing climate conditions, air and soil pollution, water management, flood protection and biodiversity. After the project closure, many of the involved partners will continue to carry out further data collection and processing in order to contribute to better informed decision making and policy actions on environmental issues. Web portals, measurement systems and laboratories for collecting and sharing

scientific environmental information will continue to operate and remain accessible after the project's end. Amongst those actors and stakeholders that will take the project results forward, regional authorities are expected to take a leading role, followed by local and national authorities as well as universities and research institutions.

The achievements of the projects supported by CENTRAL EUROPE Programme are especially relevant for improving knowledge and capacity of beneficiaries to address environmental risk management and climate change issues in the region. An important result of project activities has been the uptake of accumulated knowledge and experience in the preparation and implementation of policies, plans, programmes or strategies – for example, the development of management plans for lakes, or climate change adaptation plans for natural sites. Regions and local authorities have indicated that the knowledge acquired during the project activities on various environmental issues will help policymakers to formulate more effective policies and strategies for the future and to implement them more successfully.

Various cooperation mechanisms (such as memoranda of understanding, charters, business cooperatives, institutional networks, and educational or training programmes) have been established to ensure the continuation of climate change and natural risk management activities already implemented within the project. These mechanisms provide platforms for future cooperation activities in the fields of flood protection, waste management and resource efficiency, biodiversity protection. Examples of innovative practises and mechanisms include the foundation of an European School for Brownfield Redevelopment, the creation of a transnational network with permanent national contact points in the field of cleaner production, the establishment of Regional Re-use Centres, etc. In addition, a Memorandum on flood protection concluded by the high level policy representatives of four CE countries, facilitates the cooperation between the participating countries and helps trans-boundary water commissions to implement more effective flood-protection measures.

In addition, small-scale pilot investments – for example, to revitalise urban river courses or remediate brownfield sites – have not only brought concrete and immediate benefits to the regions, but also serve as examples for similar future investments.

Most of these pilot investments have been extended to a larger scale using complementary funds.

The niche of transnational cooperation and territorial relevance

The main niche of transnational cooperation in the CENTRAL EUROPE Programme area lies in its territorial focus. As a result, the Programme has the ability to address climate change and environmental issues that are specific to its geographic area and which cannot be addressed with the same effectiveness if different national and regional actors act alone, even if national and regional resources available are much higher than those available for transnational cooperation. Challenges related to resource efficiency, climate change mitigation and adaptation, groundwater and flood management, brownfield remediation and biodiversity protection have in many cases not been sufficiently tackled by transnational cooperation even if this has been identified as a beneficial approach.

Therefore, the added value of transnational cooperation for the central Europe area lies in its potential to deal adequately with climate change and natural risks by providing a platform on which mutual learning, exchanges of experience and common solutions can be developed. At local and regional levels, transnational cooperation helps to increase the understanding of climate change and environmental risks as policy issues and in a

transnational context; and transnational cooperation encourages local, regional and national actors to work together to develop joint strategies, solutions, tools and monitoring systems. It has aided local, regional and national efforts in contributing to the achievement of EU strategic objectives in the thematic field. Another essential feature of transnational cooperation is its ability to promote territorial integration and foster the creation of critical mass for tackling various environmental issues. Critical mass is important as it brings credibility and combines different resources, knowledge and experience from a wide spectrum of stakeholder groups to form synergies and added value. Transnational cooperation also provides opportunities for mutual learning and exchange of experience between Member States with specific and diverse territorial characteristics and at different development stage to address environmental problems. Finally, tackling a common problem in a transnational context not only has beneficial environmental consequences: there are positive social and economic impacts as well.

Taken as a whole, the project achievements demonstrate successfully the benefits of transnational cooperation in providing a necessary platform for taking action where environmental risk management and climate change are concerned. The results of the analysis also prove that the framework offered by CENTRAL EUROPE Programme - in spite of its limited resources - is essential for strengthening the capacity for adequate policy response to these challenges, and especially for those areas in which extant knowledge and experience is insufficient. In addition, the CENTRAL EUROPE Programme brings a specific territorial dimension for addressing a variety of environmental challenges of transnational character that otherwise cannot be tackled successfully.

4.2. Recommendations

Based on the analysis of project achievements, it is clear that policy actors from central Europe can build on the favourable aspects of the CENTRAL EUROPE Programme and transnational cooperation. These include the possibility for creation of synergies, complementarities and spill-over effects, for mobilising critical mass, for identifying and developing tools, methods and guidance to support policy planning and implementation, and for involving a wide group of stakeholders in tackling environmental problems of transnational character. With this in mind, recommendations for the future focus of CENTRAL EUROPE Programme are made with regard to:

- types of interventions to be supported;
- actions and themes to be addressed; and
- actors to be involved.

Types of interventions

Further support is recommended for projects delivering achievements with a high spin-off potential. These include, amongst others, elaboration of policy documents leading to policy improvement, establishing networks, implementing small-scale physical pilot investments, and preparing tools and guidelines. Innovative initiatives that bring substantial benefits to communities after the project lifetime are to be further stimulated. Peer reviews and the development of new tools, strategies and action plans could continue to be useful activities for addressing the identified problems. Issues such as the assessment of a territory's vulnerability to climate change and designing appropriate adaptation measures are relatively new at local and regional level; thus demonstration

actions or small-scale investments can help to boost the capacity and knowledge of stakeholders.

Demonstration and pilot actions focused on technologies and systems development and application can help to raise levels of knowledge and awareness amongst decision makers and businesses. Such demonstration actions can help to bridge the gap between the scientific knowledge on climate change, and other environmental issues and their uptake into policies and plans; they can also improve environmental management practises in urban areas. Follow-up activities focusing on building the capacity of SMEs to invest in cleaner production, improve waste management practises and create green jobs can be especially beneficial. Follow-up work and cooperation between institutions beyond the project lifetime is also essential for flood management and other risk prevention measures in a transnational context.

Actions and themes

With regard to waste management and resource efficiency, there is considerable potential for further exchanges of experience and the adoption of novel practises that can be used to alter (for the better) behavioural patterns related to consumption and production. Other areas in this topic with potential for transnational cooperation are: waste prevention; creating incentives to increase re-use and repair; stimulating recycling and recovery; and transfer of waste management practices.

Adaptation to climate change, as well as disaster prevention and management is an issue of particular relevance for transnational cooperation. Specifically, local and regional authorities can benefit from transnational cooperation in areas like development of monitoring methodologies, early warning systems, information exchange related to natural disaster situations and mainstreaming adaptation issues in sector-specific plans. At the same time, cross-territorial impacts must also be taken into consideration. The role of transnational cooperation to address these challenges can be essential, especially for those regions in central Europe which lack sufficient capacity, knowledge and tools to adequately address adaptation to climate change, and at the same time face a high likelihood of severe impacts (e.g. in mountain areas, densely populated floodplains, coastal zones).

Concerning water management and flood protection, proper flood management schemes will require ecosystem-based solutions. Transnational cooperation can be a platform for generating ideas and producing tools and methodologies to facilitate this shift. Besides, EU Member States are obliged to carry out a preliminary assessment to identify areas of potential flood risk, to establish and publish flood hazard and risk maps, and to develop and implement Flood Risk Management Plans. These are challenging tasks for many of the regions involved, and transnational cooperation can greatly assist these efforts by providing a stronger focus on implementing demonstration and pilot actions, facilitating knowledge transfer, and mutual development of new solutions and approaches.

There is also a need for policies that encourage water demand management, such as the use of economic instruments, water-loss controls, water re-use and recycling. Increased efficiency in domestic, agricultural and industrial water use is also needed, and transnational cooperation can be valuable as a platform for awareness raising and educational activities, development of strategies and plans, as well as tools and guidance documents.

Air pollution remains an issue to be addressed, as high levels of harmful substances have adverse effects on human health and the environment in many areas throughout central Europe. Through joint work and cooperation, authorities can improve their capacity to design and implement measures that help to reduce harmful emissions from industry, traffic, energy plants and agriculture.

Regarding land use, transnational cooperation opens up opportunities for sharing best practises and innovative approaches towards increasing the attractiveness of urban areas through revitalisation efforts and improved urban environmental management. There is potential for the exchange of best practises related to tools and technologies for cost-effective assessment and decontamination of brownfield sites, and also to the development of new tools and approaches for designing economic and social incentives for brownfield rehabilitation.

Central Europe is rich in biodiversity, and the effective protection and sustainable management of its ecosystems requires joint efforts and cooperation between its regions. Transnational cooperation can continue to play a strong role in integrated development in the coming years, while also helping to preserve natural and cultural heritage.

As the efficient protection of landscapes is a transboundary issue, there is a need to further build the capacities of local, regional and national actors in order to: integrate landscapes into planning; raise awareness of the value of landscapes and their role; and promote training and education in landscape policy, management and planning. The preparation and use of methodological tools for identifying and assessing landscapes is also essential for more effective policy planning.

Actors to be involved

The long-term success of the projects depends very much on the follow-up activities, and it is therefore important to involve actors during project implementation that can carry the work forward after the project draws to an official close. The potential for capitalisation can be further improved when decision-making partners play a greater role, whether or not these are the actors the project is directly targeting. Decision makers can play an essential role in placing the project in the context of already existing initiatives and in expediting planning for further activities beyond the project's lifetime.

It is also important that academia and research institutes continue to be involved in the projects, as they bring theme-specific knowledge and expertise. These stakeholders also play an important role in the capacity-building process and contribute substantially to the achievement of high-quality achievements and adopting new approaches. The actions to be undertaken under the analysed thematic field rely a great deal on the quality of information that goes into planning and implementation. Both the policy-making and scientific and research communities need to focus on mechanisms for sharing information in this regard.

It is essential that the problems addressed by the projects are tackled in an integrated way, and that a wider group of relevant stakeholders becomes involved in project implementation. The profiles of these institutions may vary, and will depend in any case on a project's specific focus. For example, to address climate change issues successfully there is the need for a robust exchange of ideas and collaborative working across sectors involving a wide group of stakeholders, such as businesses, housing associations, NGOs, technical advice bodies, etc. Transnational cooperation can serve as a collaborative platform and thus help to ensure transparency and a serious commitment to developing

and implementing policies that address environmental risk management and climate change.

Cohesion Policy 2014-2020

The CENTRAL EUROPE Programme needs to evolve together with the Cohesion Policy during the 2014-2020 programming period. The Programme could play a substantial role in strengthening climate change adaptation in the EU and promoting resource efficiency during this timeframe. Cohesion Policy regulations for the 2014-2020 ⁶⁸period place stronger emphasis on avoiding damage and adding resilience capability to the built environment and other infrastructure; protecting human health; decreasing future pressure on water resources; investing in flood and coastal defences; and decreasing the vulnerability of ecosystems.

The CENTRAL EUROPE Programme can contribute significantly to the achievement of Thematic Objective 6, 'Environmental protection and resource efficiency,' during the 2014-2020 programming period. This thematic objective includes actions to improve water quality, protect biodiversity and soil, promote ecosystem services (including NATURA 2000 and green infrastructures), improve the urban environment (including regeneration of brownfield sites), and reduce air pollution. The CENTRAL EUROPE Programme (2007-2013) has already supported projects which are contributing to topics as included in all investment priorities linked to Thematic Objectives 5 and 6. The adopted 2014-2020 Cohesion Policy regulations also mention 'green infrastructure investment' for the first time in the history of the policy. The current CENTRAL EUROPE Programme is already investing in green infrastructure through projects such as TransEcoNet and Greenet.

Finally, it is important to mention that the focus on 'Investing in the low carbon economy' (Thematic Objective 4) has also been strengthened. This is apparent from Cohesion Policy alignment with Europe 2020 headline targets, and also due to the fact that the theme has been highlighted as a separate thematic objective. The current focus of the CENTRAL EUROPE Programme on the low carbon economy falls outside the scope of the 'Environment' theme, and is therefore not discussed in detail in this report (being subject to a separate dedicated thematic study). However, it may be useful in future for the CENTRAL EUROPE Programme to take into account the links between the topics of low-carbon development and the environment. On a final note, environmental sustainability will be a horizontal issue during the 2014-2020 programming period.

⁶⁸ <http://eur-lex.europa.eu/legal-content/EN/ALL/?jsessionid=1Dw2TMfJkwLX2yHJ7Vf9z8z268jK8jJwBFkZTlpmK6CqzWIC40cN!-1974337789?uri=OJ:L:2013:347:TOC>

Literature

Brochure: Cooperating on Environment in Central Europe (March 2013)

http://www.central2013.eu/fileadmin/tmpl/images/pdf/central_europe_infographic_environment_WITHOUT_RGB.pdf

CENTRAL EUROPE Programme 2007-2013 (2011), Operational Programme Central Europe

Colomb, C. (2007), 'The added value of transnational cooperation: towards a new framework for evaluating learning and policy change. *Planning Practice and Research*', 22 (3) pp. 347-372.

Commission Staff Working Document SWD (2013) 136, final: Adaptation to climate change impacts on human, animal and plant health

European Commission (2010), *A Synopsis of the Approaches of Member States to Promote Transnationality and Innovation within the ESF*,

http://www.czecheval.cz/fileadmin/user_upload/docs/Library/S2-2012.pdf

European Commission: Eurostat - Environmental Statistics.

<http://epp.eurostat.ec.europa.eu/portal/page/portal/environment/introduction>

European Commission (2013), Green Infrastructure (GI) (COM (2013) 249 final)

European Commission: Land cover/use statistics (LUCAS):

<http://epp.eurostat.ec.europa.eu/portal/page/portal/lucas/data/database>

European Commission (2008), Regions 2020 report

European Environment Agency (2009), Water resources across Europe: confronting water scarcity and drought

European Environment Agency (2012), European waters: current status and future challenges

European Environment Agency (2010), Air quality in Europe

European Environment Agency (2010), [Assessing biodiversity in Europe](#)

European Environment Agency (2012) Climate change, impacts and vulnerability in Europe

European Environment Agency (2010) State of the Environment Report: Land use

European Environment Agency (2010), State of Environment Report

European Environment Agency (2009), State of Environment Report

European Environment Agency (2011), Resource Efficiency in Europe

Italian Ministry of Environment (2009), State of Environment Report

Jackson, J. and Garb, Y. (2009), *Facilitating brownfield redevelopment in Central Europe: Overview and proposals*

Flash Eurobarometer 342, SMEs, Resource Efficiency and Green Markets, March 2012

Annex: Questionnaire to Lead Partners

1.a Why do you think that transnational cooperation is needed to address the issue your project is focused on? What was the added value of transnational cooperation for the targeted transnational area as a whole and the involved regions (preferably to be listed at NUTS II level)?

1.b What do you think would happen if Member States and regions attempted to address the issue separately, without transnational cooperation?

2.a What types of cooperation activities proved to be the most successful during project implementation? Please mark relevant activities with a 'yes' or 'no' (Y/N).

Meetings	
Conferences	
Capacity building events	
Peer review of the work of one partner by another	
Expert exchanges/ Study trips	
Other, please specify:	

2.b Please explain in what way you think they were useful for the project.

3.a Indicate which types of outputs were developed during the project implementation with Y/N and please provide relevant figures on the number of each output produced.

	Y/N	Number
Studies background papers		
Pilot actions		
Awareness raising events		
Workshops and trainings		
Feasibility studies		
Handbooks & guidelines		
Networks creation		
Policy documents, strategies, action plans and recommendations for policy improvement		
Physical investments		
Tools		
Other, please specify:		

3.b Please briefly describe the 3 most relevant outputs and how needs of target groups were addressed.

3.c In addition, briefly describe the most successful pilot actions at NUTS 2 level.



4.a Do you have any knowledge of policy initiatives or funding instruments other than transnational cooperation which can be used to address the issue that the project is addressing? Please specify.

National public funding, grants	
Regional - local public funding, grants	
Private funding, grants	
Public-private partnership constructions	
Other, please specify:	

4.b If funding would have been available from other sources, what do you think the added value of the Central Europe Programme is, how does it contribute to addressing the issue which is not being addressed by other instruments or programmes?

The programme has a specific geographic focus which other instruments do not	
By providing funding which is not available from another source	
By providing an opportunity to address the issue in an integrated way, together with non-environment issues	
Other, please specify:	

5.a Has your project created synergies with other funding instruments?

Transnational programmes	
Cross-border programmes	
National public funding, grants	
Regional - local public funding, grants	
Private funding, grants	
Public-private partnership constructions	
Other, please specify:	

5.b Please specify in what way synergies were exploited or can potentially be exploited.

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6 Do the activities and the outputs of the project build on the results of already existing initiatives which are available to address the issue?

Project is aimed at implementing existing environmental legislation	
Project builds on previous research done by research institutes/universities	
Project builds on existing cooperation activities between partners	
Other, please specify:	



7.a Who are the actors relevant to carrying further the work achieved by the project, beyond the project lifetime?

National institutions/ policy makers	
Regional authorities and agencies	
Universities, research institutes	
Private sector representatives	
NGOs	
Other, please specify:	

7.b Were the actors indicated in your answer to question 7.a involved in project implementation?

Yes	
No	

7.c Please describe in what way these actors were involved.

7.d Please briefly describe how your project results have been used or are planned to be used by the indicated target groups above?

8.a Do you have any evidence of improvement in environmental quality as a result of the project?

8.b Do you have any evidence of improvement in the policies related to the environmental issues as a result of the project?

9 Which of outputs mentioned in response to question 5 ensured or could ensure that the results of the project would make an impact beyond the lifetime of the project? Please elaborate in what way the impact is sustained after the lifetime of the project.

10 What activities are planned by the project to carry on the work of the project after the project is completed? Please mark relevant activities with a 'yes' or 'no' (Y/N).

Setting up networks or institutions which have a life after end of project	
Policies, plans, programmes or strategies approved for implementation	
Leveraged funds for follow up investments or continuation of activities	
Other, please specify:	

