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D.3.1.

Multi-actor process and validation framework

DALIA
DANUBE REGION
WATER LIGHTHOUSE ACTION

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LIST OF ABBREVIATIONS

Abbreviation	Full name
DS	Demonstrator site
MAA	Multi-actor approach
CP	Consultation Panel
CG	Consultation Group

1. EXECUTIVE SUMMARY

Danube Region Water Lighthouse Innovation Action (DALIA) is an innovative project which includes within its architecture the implementation of solutions for the improvement of the Danube River catchment ecosystems and the transition of the implemented innovative methodologies and solutions towards the development of sustainable business and social frameworks in alignment with the EU Green Deal and the UN COP15 targets for biodiversity and ecosystem services.
The aim of WP3(Socio-Economic Transition Towards Sustainability) is to better understand the role and optimal use of citizens and the involvement of stakeholders in the processes of Socio-Economic Transition Towards Sustainability.

DALIA follows an iterative innovation model and fosters the development of research and innovation into practical applications and the creation of new ideas thanks to interactions between actors ("cross-fertilization") and the sharing of knowledge.

The Danube Region Water Lighthouse Innovation Action (DALIA) project WP3(Socio-Economic Transition Towards Sustainability) deliverables include the establishment of a multi-actor process and validation framework which will feed into the long-term sustainability and business continuity of the project beyond its initial stages of implementation and towards the development of potential spin off business, project, and initiative opportunities.

2. INTRODUCTION TO DEMONSTRATOR SITES

The DALIA project has 9 lighthouse sites in 6 countries covering the entire Danube River catchment within a variety of water management and ecosystem management scenarios. There are several specific ecosystem solutions which will be implemented throughout the project aim to resolve local challenges and improve on the overall ecosystem services in the areas.
The Demonstrator Sites involved in the DALIA project are of a various nature and impact. During the initial months of the project the team identified several local stakeholder groups and interested parties, who would expand on the initial project targets and will be fundamental for the establishment of a validation framework, which will feed into the local action plans and replicators.
To analyze the specific impacts a more general profiling of the territories around the economic segments and interest groups was necessary. Additional profiling will be performed to track the impact of the individual DSs and the connected multi-actor process and validation framework will be iterated upon to produce the necessary outcomes.

1.1 Hungary Szigetköz region-revitalization of ecological system

Szigetköz, a low-lying watery flatland with scattered villages that is historically noted for fishing and wildfowl. Water management actions carried out for navigation, flood protection and later hydropower generation, transformed the area, creating spatially separated waterbodies, making agricultural production the dominant land use, however through floodplain rehabilitation activities the active floodplain's natural beauty was restored and it now attracts more and more people for ecotourism and sports tourism (kayaking). Szigetköz is a Natura 2000 site protected based on both the Birds (SPA) and the Habitats Directives (SCI).

Geographic scope

"Szigetköz" is a large island on the Danube in Western Hungary. Szigetköz is situated between the Danube (Old Danube) and the Mosoni-Danube, extending to an area of 375 km2 and can be divided into two parts in terms of the slope conditions of Upper and Lower Szigetköz. Szigetköz is situated in the central part of the Little Hungarian Plain, which is the closest impacted geographic scope by the activities of DS1. The plain is roughly cut in half by the Danube

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which is split up into many river branches between Bratislava and Komárno, forming a vast number of smaller and larger islands. Its main tributaries in the region are the Leitha, the Rába, the Rábca, the Marcal and the Váh rivers.
The Little Hungarian Plain *(Hungarian: Kisalföld, Slovak: Malá dunajská kotlina, German: Kleine Ungarische Tiefebene)* is a plain (*tectonic basin*) area **of approximately 8,000 km² stretching across (1) northwestern Hungary** and south-western Slovakia (Podunajská nížina – Danubian Lowland).

Population

The region forms a coherent unit of the Little Plain from a natural geographic, floristic and socio-geographic aspect, however it is a cross-border area, with a mixed population and multiple nationalities. The cross-border region has a total population of 235,000 inhabitants, 68,000 on the Slovakian side and 167,000 on the Hungarian side. The largest settlement in this area is the Hungarian county seat of Győr, making up seventy-three percent of the region's total population. The smallest settlement is Vének with 207 permanent residents. On the Slovakian side, the center of the region is Dunajská Streda, which is home to one-third of the population of the study area. The economically important town of Šamorín and the settlement of Gabčíkovo, with a population of 5300 inhabitants, is an important port on the Danube. Interestingly, 86% of the total population of Szigetköz is concentrated in the two major cities of Győr and Mosonmagyaróvár and only 14% reside in rural settlements.

Szigetköz is currently categorized as a developed area relative to the average economic development of the country and the Western Transdanubia region and shows a dynamic upward trend. Industrial firms in the region are concentrated in two cities: Mosonmagyaróvár and Győr. The dominance of the mechanical engineering industry is a defining feature of both Győr and Mosonmagyaróvár, and the food industry is a key economic sector. The presence of complex innovation, incubator and productivity-enhancing services of business centers and industrial parks characterizes the area.

The structure of the settlements is divergent with some being more focused on transport and logistics – largest site Győr leading in that aspect. **The others focused on traditional rural economic segments – agriculture and tourism.**

1.2 Germany Reconnected floodplains of the Upper Danube

The Danube floodplains between Ingolstadt and Neuburg are a biosphere reserve full of oxbow lakes inhabited by animals and plants that have become rare and protected.

Neuburg and Ingolstadt

Geographic scope

Neuburg an der Donau (Central Bavarian: Neiburg and a Donau, population 29,830) is a town which is the capital of the Neuburg-Schrobenhausen district in the state of Bavaria in Germany. **Ingolstadt** is an independent city on the Danube in Upper Bavaria with 139,553 inhabitants (as of June 30, 2022). Around half a million people live in the metropolitan area. Ingolstadt is the second largest city in Upper Bavaria after Munich and the fifth largest city in Bavaria after Munich.
The DS2 will impact the area between those two metropolitan areas with diverse demographic and economic structure.

Economy

Agriculture

85 % of Bavaria are rural areas, it is the most important Federal State regarding agriculture and forestry. Together with the upstream and downstream sector of the agriculture and food industry, its more than 106,000 farms and diverse production facilities generate around 121 bn € in sales and employ around 900,000 people.

Industry

The engine of the economy is the automotive industry, especially the Audi AG with its headquarters on the Danube and its suppliers, as well as many powerful medium-sized businesses that invest in this production and logistics center. Just over half of gross added value comes from the manufacturing industry.

There are four water supply systems in the municipal area located in Marxheim, Graisbach, Gansheim and Übersfeld. The district of Burgmannshofen is connected to the Ammerfeld water supply. Independent sewage treatment plants exist in Gansheim (also for Übersfeld) and Burgmannshofen. The other places are connected to the Marxheim sewage disposal system.

In 2016, 2553 residents were connected to water supply, 2539 to sewerage and 2539 to sewage treatment plants. There is a recycling center on the territory of the municipality, which belongs to the Waste Management Association of North Swabia. There is also a green waste dump in the Graisbach district.

The floodplain between Marxheim and Stepperg has been impacted by human interaction with the landscape and the construction of the hydropower plants, which have disrupted the natural conditions in the plain – ecosystems and nature habitats.

Tourism

Medieval castles, small towns, magnificent palaces, Baroque churches, and Bavaria's urban hubs provide the backdrop for traditional events and opera festivals and attract significant tourist influx.

1.3 Czech Republic Dyje sub-catchment

The Věstonická reservoir is a nature reserve in the district of Břeclav in the South Moravian Region. It was declared in 1994 within the boundaries of the reservoir of the same name to maintain the water and wetland ecosystem for the protection of specially protected species of plants and animals. In 2005, it was declared a bird area in the Natura 2000 system with the main goal of protecting rare species of birds. It is surrounded by the villages of Dolní Věstonice, Horní Věstonice, Strachotín and Pasohlávky. It is one of the three reservoirs of the Nové Mlýny Water Works. However, only the middle reservoir was left to natural processes. Dolní (Novomlýnská) and the upper one (Mušovská) is used for recreation and electricity generation.

Geographic scope

The Dyje–Svratka Valley has been a natural pass between the Vienna Basin (Carpathians) and the Vyškov Gate, the Upper Morava Valley, Moravian Gate and later, the North European Plain (Poland - Lower Silesia - Galicia) since ancient times. It served as an arm of several important trade routes from southern Europe to the Baltic Sea such as the Amber Road, as well as routes from Moravia to Upper Silesia and Lesser Poland.

Dyje (German: Mühlfraun) is a municipality and village in Znojmo District in the South Moravian Region of the Czech Republic. **It has about 500 inhabitants.**

Dyje lies approximately 7 kilometres (4 mi) east of Znojmo, 53 km (33 mi) south-west of Brno, and 185 km (115 mi) south-east of Prague.

The largest impacted city is Brno. Brno has about 380,000 inhabitants, making it the second-largest city in the Czech Republic after the capital, Prague, and one of the 100 largest cities of the EU. The Brno metropolitan area has almost 700,000 inhabitants. Nové Mlýny reservoir is a significant environmental site on the river.

Znojmo is the closest (Czech pronunciation: [ˈ znoimo]; German: Znaim). Znojmo is a town in the South Moravian Region of the Czech Republic. Population - 33,000. Znojmo is famous for local production of cucumbers, pickled in the original sweet-sour and spicy pickle, whose cultivation in the Znojmo region was introduced in 1571. Thanks to the favorable climatic conditions, the town is also successful in winery and fruit growing. It is the center of viticulture of the Znojmo wine sub-region.

Along the river there are smaller settlements which focus on traditional rural vocation – agriculture and tourism.

Economy

Agriculture

The lowlands are poorly forested, mostly by riparian forest (oaks, populus and willows), with higher areas forested by false acacia (Robinia pseudoacacia). **The lowlands are intensively farmed, with significant numbers of orchards (peaches, walnuts, apricots, and almonds), vineyards and small woods.** Only a few small sections are still covered by natural vegetation.

Agriculture segments and stakeholders will be significant to this DS as well, considering the chernozem soil type which is conducive to highly productive agriculture.

Industry

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Brno is a significant industrial center with a long history in production and transport/logistics center, which is reliant on water resources for a significant percentage of its production.

Tourism

Tourism is a flourishing sector for the region of the DS due to wine production and beer production, rural attractions, and historic and environmental sites. This will provide an opportunity for the further monetization of the available ecosystem services down the line.

1.4 Slovakia Upper Catchment of Vah River Rehydration

Váh River, tributary of the Danube River in Slovakia. Rising in the Tatra Mountains as the Biely Váh (in the High Tatras) and Čierny Váh (in the Low Tatras), the river describes a long arc to the west and south. The Váh has many tributaries, many of which fall steeply off the Tatras and the outer ranges of the Carpathians. The east-west valley formed by its upper course provides a natural transportation route across Slovakia that is followed by major road and rail arteries; the river's north-south valley between Žilina and Bratislava similarly serves as a corridor. The river flows rapidly—particularly when swollen by seasonal meltwater, since the Tatras have few storage lakes—through a picturesque valley. There are numerous small hydroelectric-power stations along the Váh.

The small flows of Váh river are significantly improved, especially by the largest dams Liptovská Mara build up on Váh river and Oravská priehrada on Orava river. The rivers Kysuca, Turiec, Rajčianka, Revúca, Belá and Varínka also form the river network.

Geographic scope

Upper Váh region (Slovak: Horné Považie) is the tourism region in the north-west of Slovakia, because of its beautiful countryside it is one of the most visited regions in Slovakia. In the past it was part of Trencsén County. The Upper Vah regions connects Bytča District, Považská Bystrica District, Žilina District, Púchov District

The Žilina Region (Slovak: Žilinský kraj; Polish: Kraj żyliński; Hungarian: Zsolnai kerület) is one of the eight Slovak administrative regions and consists of 11 districts (okresy) and 315 municipalities, from which 18 have a town status.

Žilinský kraj reached 689 525 persons as of December 31, 2021, and its share in the Slovak population was 12.7%. The population density per 1 km2 was 101 inhabitants. The districts with the highest population density were Žilina district with 198 inhabitants per km2. The smallest density, only 40 inhabitants per 1 km2, was in Turčianske Teplice district.

The northern districts and settlements will be most concerned with the outcomes of the DALIA DS.

Economy

While in the other regions agriculture/tourism is the main segment within this DS we have hydropower and energy generation as a major stakeholder due to the 16 dams situated on the river.

Artificial dams (Čierny Váh, Liptovská Mara, Bešeňová, Krpeľany, Žilina, Hričov, Nosice, Sĺňava, Madunice, Kráľová and Selice) **and 16 hydropower stations, whose construction started in the 1930s and increased after World War II.**

The main Slovak limited-access motorway is along the Váh (Bratislava – Trenčín – Považská Bystrica – Žilina and Ružomberok – Poprad), as well as the main railway Bratislava – Žilina – Košice.

Agriculture

The agriculture element for this DS concerns arable lands and biomass. It is significant for business considerations, but it needs to be approached differently than agriculture in the other DS.

In crop production, the region is characterized by the cultivation of cereals, potatoes, and fodder. In livestock production, compared to other regions, the breeding of sheep and cattle is more prominent.

Industry

The largest industrial company in the region is the automobile plant KIA near Žilina town. The production of machines is developed in Považie area and Turiec area, the production of iron and electronics in Orava area, and the production of paper in towns Žilina and Ružomberok. **Hydroelectric power plants in Váh river are also of great importance.** The industrial subjects of the region achieved turnover at the value of EUR 17.4 bill. and employed 67.6 thous. persons.

Industrial production is represented by wood processing, furniture production (Turzovská drevárska fabrika Turzovka), textile production, food production (Kysucké pekárne Čadca, Tvrdošínska mliekareň), non-alcoholic beverage production (Kofola a.s.). AVC Čadca deals with the production of remedies.
Production of machines and production of bearings (INA Kysuce - Kysucké Nové Mesto, Kinex - KLF Kysucké Nové Mesto). The production of metal products (ZVL Kováčňa Kysucké Nové Mesto) has a smaller presence. Wood processing (Fracho Kysucké Nové Mesto, Oščadnica plant)
Production of electrical machines and devices (XPS Slovakia, s. r. o., HS electronic spol. s. r. o. Nižná). Chemical industry (Paderteg Slovakia Nižná).

Tourism

Not only a number of cultural and historical monuments, but especially the natural beauty of the north Slovakia mountains, caused the highest number of visitors in comparison with other regions. **More than 632.8 thous. guests visited the region in 2021**. For tourists was available the highest number of accommodation facilities (1 211) within regions.

1.5 Serbia Begečka jama

Begečka jama is about 16 kilometers from Novi Sad, on the way to Backa Palanka. Jama is a natural lake and river spawning and dwelling fish, the most common are carp, pike, catfish, and other freshwater fish.
On one part of the Begečka jama are arranged beaches and various recreational facilities, and excellent fish restaurants.

Geographic scope

Begečka jama is a nature park and popular picnic resort created on the old Danube riverbed. It spreads across the surface of 379 hectares. The place is known for its fishing sites, beach, weekend resort, fishermen's centre, and catering facilities.
Novi Sad (Serbian Cyrillic: Нови Сад) is the second largest city in Serbia and the capital of the autonomous province of Vojvodina. Novi Sad is home for 367,121 inhabitants.

Economy

This demonstrator is situated in a protected site, which means collaborations will be with stakeholders primarily on the public side of things local governments and the tourist business.

Agriculture

Novi Sad is the economic center of Vojvodina, the most fertile agricultural region in Serbia. The city also represents one of the largest economic and cultural hubs in Serbia.

Industry

The economy of Novi Sad has mostly recovered from that period and grown strongly since 2001, shifting from an industry-driven economy to the tertiary sector. The processes involved in privatizing state and society-owned enterprises, as well as strong private incentives, have increased the share of privately owned companies to over 95% in the district, with small and medium-size enterprises dominating the city's economic development.

Tourism

Main segment of concern for this demonstrator. Due to the ecosystem value component, DS being situated in a protected area and the implicit economic value of ecosystem services.
The Danube with its backwaters creates a unique natural environment on the edge of which there are numerous cultural values, which are easily accessible thanks to the marina in Apatin. Navigating the river will be more interesting if you visit the nature reserves and parks on its banks, in a series from Apatin to Novi Sad (Upper Podunavlje, Karađorđevo, Tikvara, Begečka jama, Koviljsko-Petrovaradinski rit).

1.6 Romania Sturgeon migration by-pass Iron Gates I and II

Located just below the Iron Gates gorge (Djerdap) between Romania and Serbia, **Iron Gates is the largest hydropower dam and reservoir system along the entire Danube.**

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The system consists of two main dams, Iron Gates I and II, built in 1972 and 1985 respectively. The dams are constructed at river km 942 and river km 863 upstream of the Danube delta, in effect confining migratory sturgeons to 863 km of the river and cutting off important spawning sites in the Middle Danube. Iron Gates is jointly operated by Romania and Serbia.

Geographic scope

This DS includes two technical facilities covering a scope between Drobeta Turnu Severin(Ro), Izvoru Frumos (Ro) and ending north of Prahovo, Negotin(Sb). As this demonstrator impacts a wider geographic scope it is necessary to analyze potential impacts upstream and downstream on the Danube.

Drobeta-Turnu Severin, colloquially Severin, is a city in Mehedinți County, Oltenia, Romania, on the northern bank of the Danube, close to the Iron Gates.

The city administers three villages: Dudașu Schelei, Gura Văii, and Schela Cladovei. The city's population is 92,617 (2011). The region's climate gives Severin warm summers and mild winters, meaning the city is home to magnolia trees, Caucasian nut trees, and ginkgo biloba as well as the almond trees, figs, lilacs, lindens, and chestnut trees more common throughout Europe.

Negotin is a town and municipality located in the Bor District of eastern Serbia. It is situated near the borders between Serbia, Romania, and Bulgaria. It is the judicial center of the Bor District. The population of the town is 16,882, while the municipality has a population of 35,000.

Economy

The balance between the energy industry and the ecosystem services will be of fundamental importance for this DS. The collaboration between various stakeholder segments to secure both economic and ecosystem services will be pursued throughout the project.

Agriculture

While Caras-**Severin County** is the third largest in Romania, in terms of agricultural area, being 396.915 ha, it occupies only 13th place thanks to its mostly mountainous relief. The traditional agriculture element is not heavily present in this DS and if to be analyzed it should be from the Serbian side.

Industry

The energy and hydropower industry are significantly covered in this demonstrator due to the technical components of the facilities.

Tourism

Most of the territories between the two gates are rural tourism sites, which can potentially be explored in that aspect but the solutions to be deployed within the DS will have little to no impact on the tourism industry.

1.7 Romania Danube Delta

The Sulina branch of the Danube is the shortest branch that lies between the two other branches. It starts in Tulcea and flows all the way to Sulina and eventually the Black Sea. Along the Sulina branch there are several villages and tourist resorts that can be visited only by boat. Some of those villages are Partizani, Vulturu, Maliuc, Gorgova and Crisan. Another well-known village along the Sulina Branch is Mila 23.

Geographic scope

Tulcea is a city in Northern Dobruja, Romania. It is the administrative center of Tulcea County and had a population of 73,707 as of 2011. One village, Tudor Vladimirescu, is administered by the city.

Sulina is a town and free port in Tulcea County, Northern Dobruja, Romania, at the mouth of the Sulina branch of the Danube. It is the easternmost point of Romania.

The waters of the Danube, which flow into the Black Sea, form the largest and best preserved of Europe's river deltas. The Danube delta hosts over 300 species of birds as well as 45 freshwater fish species in its numerous lakes and marshes.

Economy

Although it carries only 18% of the Delta's total water flow, Sulina is the main navigation route for passenger and commercial traffic. A canal was dug between 1880 and 1902 to facilitate river traffic, shortening the natural course of the Sulina Branch and allowing for easier access to villages in the Delta.

Agriculture

Anthropogenic activities (e.g. agricultural and fish farms), including tourism and fish poaching, frequently involve some discharges (in terms of deter-gents, domestic waste, agricultural fertilizer, animal manure, and oil products) in the water of Sulina Channel, which lead to the enrichment of its content with dissolved nutrients.

Industry

This is the endpoint of the meeting between the Danube River waters and the waters of the Black Sea. Additional examination of the river endpoint might turn out beneficial for the ESG analytics of the companies situated along the entire Danube River catchment.

Tourism

Tourism is the most interesting segment in the conservation of the Danube River flow at the very delta as the tourist sector depends on the ecosystem value of the tourist experience in the delta.

1.8 HUNGARY BODROG RIVER

The Bodrog is a river in eastern Slovakia and north-eastern Hungary. It is a tributary to the river Tisza. The Bodrog is formed by the confluence of the rivers Ondava and Latorica near Zemplín in eastern Slovakia. *It crosses the Slovak–Hungarian border at the village of Felsőberecki (near Sátoraljaújhely) in Hungary, and Streda nad Bodrogom in Slovakia, where it is also the lowest point in Slovakia (94.3 m AMSL) and continues its flow through the Hungarian county Borsod-Abaúj-Zemplén, until it meets the river Tisza, in Tokaj.* A town along its course is Sárospatak, in Hungary.

Its length is 67 km (15 in Slovakia, 52 in Hungary). Its watershed area is 13,579 km2 of which 972 km2 is in Hungary. ***The river is rich in fish.***

Geographic scope

Sárospatak (Hungarian: Sárospataki járás) is a district in north-eastern part of Borsod-Abaúj-Zemplén County. Sárospatak is also the name of the town where the district seat is found. The district is in the Northern Hungary Statistical Region.

Sárospatak (German: Potok am Bodroch; Latin: Potamopolis; Slovak: Šarišský Potok or Blatný Potok; lit. 'Muddy Stream or Muddy Brook on the Bodrog') is a town in Borsod-Abaúj-Zemplén County, northern Hungary. It lies 70 kilometers (43 miles) northeast from Miskolc, in the Bodrog river valley. The town, often called simply Patak, is a cultural center, a historical town, and a popular tourist destination. The population of the town is 11,886(2017)

Economy

While the economic importance of the river cannot be understated there is a significant education value in the activities conducted as part of this DS.

Agriculture

The Tokaj wine region organizes an annual Starospatak wine conference. The presence of the large floodplain, Bodrogzug, is responsible for holding a lot of water which creates a humid climate during autumn morning (which is a beautiful view from the hills) this humidity is necessary for the fungus working on the grapes for the production.

Industry

Unlike the other demonstrator sites, this one is not connected with large industrial towns and cities, which can supply additional segments for analytics. Tourism and conservation appear to be the initial adopters of business cases for this demonstrator context.

Tourism

The Bodrog river and the Bodrogzug protected area and floodplain also attract a lot of tourists on water by canoes or other boats. **Plastic Cup is also committed to promote outdoor water activities and natural values, while making everything to clean up the area.**

1.9 Romania Aba Crisuri

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Crisuri basin (and its main watercourses Barcau, Ier, Crișul Repede, Crisul Negru), including 3 experimental sites: at Barcau, Crisul Repede and Crisul Negru.

The "Crișuri" hydrographic basin in the public domain and the infrastructure of the Water Management System consisting of reservoirs, flood defense dams, canals, inter-basin derivations, water intakes and other specific works , as well as the infrastructure of the hydrological, hydrogeological, and monitoring systems of the quality of water resources in its scope. Barcau, Crisul Repede and Crisul Negru.

The Barcău or Bereteu (Romanian or Berettyó in Hungarian) is a river which has its origin in Sălaj County, Romania. It is about 167 kilometers (104 mi) long with a watershed area of 5,812 km2. After crossing Bihor County in Romania and Hajdú-Bihar and Békés County in Hungary, it flows into the Sebes-Körös (Romanian: Crișul Repede) near Szeghalom. Its length in Romania is 134 km (83 mi).

Crișul Repede (in Hungarian Sebes-Körös) is a river that rises in the northeast of the Apuseni Mountains (Gilău Mountains), crosses the Huedin depression, the Ciucea pass, the Vad-Borod depression, the Western Hills, the Western **Plain, crosses the cities of Huedin and Ciucea, Cluj county, Alesd and Oradea, Bihor county and flows into the Tisa on the territory of Hungary**. It runs through a gorge with sections of gorges, caves, and rocky cliffs between the towns of Huedin and Vadu Crișului (Plopiș Mountains and Craiului Forest). Together with the Crișul Alb and Crișul Negru rivers, they form the three Crișuris, the most important rivers in the Crișana region.

Crișul Negru is one of the three Crișuris (from north to south Repede , Negru and Alb) that flows under the name of Criș (Körös) into Tisza (Tisza) on the territory of Hungary with a length of 560 km. This region being also called the Land of the Crișurilor.

This Demonstrator site covers a wide range of the country of Romania – North-West.

Geographic scope

Crișana is a geographical and historical region in north-western Romania, named after the Criș (Körös) River and its three tributaries: the Crișul Alb, Crișul Negru, and Crișul Repede. In Romania, the term is sometimes extended to include areas beyond the border, in Hungary; in this interpretation, the region is bounded to the east by the Apuseni Mountains, to the south by the Mureș River, to the north by the Someș River, and to the west by the Tisza River, the Romanian-Hungarian border cutting it in two. However, in Hungary, the area between the Tisza River and the Romanian border is usually known as Tiszántúl.

Oradea is a city in Romania, located in Crișana. The seat of Bihor County, Oradea is one of the most important economic, social, and cultural centers in the western part of Romania. The city is in the north-west of the country, nestled between hills on the Crișana plain, on the banks of the river Crișul Repede, that divides the city into almost equal halves. The population is 196,367 (2017)

Economy

The wide geographic coverage of the DS provides an interesting case for further business analysis and measurements of the impact of the activities targeted at freshwater ecosystem restoration.

Agriculture

Additional analysis needs to be performed to capture the overall impact of the Demonstrator – irrigation and connection with produce as well as local ecosystems/ecosystem services.

Industry

Oradea's economy is sustained largely by small and medium businesses and the property taxes paid by citizens.

Its main industries are furniture, textiles and clothing, footwear, and food processing.

Oradea is using geothermal electricity from water two kilometers below ground, which provides 7% of the energy for its district heating system. That system serves 70% of the city's population with heat and hot water.

Tourism

Significant tourism impact for the city of Oradea as a key point in the Demonstrator geographic coverage.

Dubbed “Little Paris” for its architecture and its capacity to attract tourists.

Additional analysis needs to be performed to capture the overall impact of the Demonstrator – rural tourism and connectivity with the surrounding villages.

3. MULTI-ACTOR PROCESS

The engagement of various actors in the DALIA project is a key condition for the success of the project. Those actors will be is integrated in the implementation framework and execution of the project in the various stages of its implementation and will ensure the validation and valuation of the **process through a set of feedback loops specifically designed to support the gathering of timely and impactful information, to ensure the impact of the DS activities and to contribute to the development of the business framework and scenarios to be delivered by the end of the project.**

The impact of the activities undertaken by each demo site have been analyzed with an outlook on the most significantly impacted economic and social segments, which will require further analysis and validation with local stakeholder and advisors external to the consortium, which will be appointed to the regional expert boards of DALIA.

The multi-actor process of the DALIA project has been in execution since the start of the project and consists of the following steps:

Define Objectives and Scope

The objectives and the scope of the multi-actor process and validation framework of the DALIA project is definite within the scope of the project proposal and the methodologies for the individual activities and solutions deployed within the individual demonstrator sites.

Each DS will have its own measures and metrics and will allow for the further engagement of the stakeholders who would be most impacted by the activities of the demonstrators.

Identify Stakeholders

Each demonstrator site will engage within itself a different number of stakeholders including local communities, environmental agencies, researchers, government bodies, and industry representatives.

The stakeholders in the demonstrators will be categorized as primary and secondary. The primary stakeholders will be those most impacted by the implementation of the DALIA solutions, the secondary stakeholders will include entities only partially impacted by the activities.

Stakeholder Engagement Strategy

The Stakeholder engagement strategy of DALIA is inextricably linked to its communication strategy and the direct communication between the DS actors and local communities. The channels of communication, gathering of feedback and collaboration are specifically outlined in the dissemination, communication, and exploitation strategy of the project. Throughout the project lifecycle the WP3 collaborates extensively with the WP1, WP2 and WP5 to ensure the impact of the execution and the timely and effective engagement of the most impacted economic segments and stakeholders in the validation of the DS outcome and the long-term impact of the project.

Data Collection and Metrics.

The key performance indicators (KPIs) and metrics for each demosite will be based on not only the quantitative but qualitative assessment of the engaged ecosystems. These assessments will be furthered and additionally validated in collaboration with external experts to the consortium - engaged in the envisaged regional expert panels within D3.2. Further the outcomes of each DS which have a significant impact on NBS, and the local climate could be monitored and validated by the extensive set of GIS procedures, IoT and in situ monitoring processes.

Validation Protocols

The specific validation protocols for each demosites are based on its unique characteristics and include standardized methods for data collection, sampling, and analysis. They will be reflected in the outcomes of the discussions with the regional experts' boards, which are described in the linked deliverable for WP3. The profile of each DS will be analyzed based on its area of impact, coverage, capacity to be spun off into added value initiatives in local policy, business creation, biodiversity valuation and ecosystem services.

Cross-Country Coordination

The various missions within the EU Horizon framework are currently operating in disjointed fashion which will be address in the clustering of Missions Water, Climate and Soils under the business model framework to be delivered

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by DALIA in M48. The knowledge hub of the project already envisages improvements in the pipeline of collaborations between the various countries in the Danube river catchment. The collaboration mechanisms are not specifically described as a deliverable of DALIA but are a necessary component for the robustness of the project beyond its completion.

WP1 and WP2 ensure the consistency in data collection methods and validation protocols across demosites. The collaboration between the various actors involved in the project including but not limited to national and regional authorities, environmental and governance entities, environmental and education NGOs and experts engaged in the improvement of ecosystem services.

Adaptive Management Approach

The current framework will establish regular review periods for stakeholders to provide feedback and suggest improvements. This will be possible due to regional expert panels which are already envisaged within the project. Those will meet on a regular basis and provide feedback on the elements of the demonstrator sites with an objective overview of ecosystem service impact, biodiversity valuation, capacity to innovate and spin off the solutions.

The feedback will be integrated within the actions plans of the initial sites and their replicators/followers (WP2) and will allow the space for the adaptive and co-creative approach, which is a value added for DALIA.

Capacity Building

Training and capacity-building programs for local stakeholders are envisaged within the communications package to ensure effective participation in the validation process. Knowledge exchange between countries and demosites will be promoted throughout the following months and years of the DALIA implementation and leading into the successful delivery of its business model development framework and scenarios.

Ethical Considerations

Ethical considerations are integrated within the validation framework which address issues such as community consent, data privacy, and cultural sensitivity. In compliance with the GDPR rules and the EU data regulations, where possible feedback from local stakeholders will be anonymized. Additional guardrails will be placed in the rules of engagement to preserve the high ethics standard and values of the DALIA project. Findable, Accessible, Interoperable, and Reusable (FAIR) principle will be applied in all phases of the project lifecycle.

Communication and Reporting

The WP3 will follow the clear communication and reporting plan by distribution the feedback gathered by the regional experts' boards and working in cohesion with WP1 and WP2 stakeholders to ensure the long-term and sustained impact of DALIA activities. The communications will be performed in two tiers - internal (within the DALIA consortium and the regional expert panels) and external (towards actors and entities who can benefit and/or will benefit the specific activities within the demonstrator sites.

The regional expert boards will be used for the creation of user-friendly reports that convey the impact of the project on the Danube River ecosystem. The engagements of varied stakeholders within Europe in the DALIA processes will validate the co-creative elements of the project and will additionally amplify its impact across Europe.

Collaboration with missions beyond Oceans and Waters is envisaged within the core elements of this framework.

Risk Management

The risks to the implementation of the project are already analyzed within the core management activities of DALIA. WP3 will regularly assess, and update the risk assessments based on project developments and will integrate those alleviation measures in the multi-actor engagement framework via the utilization of:

- consistent communication rules
- provision of additional expertise
- gathering of timely and constructive feedback
- furthering of the DALIA offering beyond its initial impact scope

These collaborative elements within the project implementation are a testament of the robust impact of the project towards the M48 business framework and will allow for its continuation beyond completion.

12. Continuous Improvement

The multi-actor engagement framework of DALIA is based on an iterative process and feedback loops which will be integrated in the project with the gathering of feedback from the regional experts' boards and representatives of the most impacted economic and social segments.
Therefore, the current document will be regularly reviewed, and it will update the validation framework to incorporate lessons learned and inputs from the core stakeholders engaged in the implementation and impact of the DSs.

Legal and Regulatory Compliance

The validation framework adheres to local and international legal and regulatory standards. It envisages cohesion with the rules and regulation on data gathering, environmental laws within the Danube river catchment and allowances for the social and economic impact of the activities.
Relevant environmental and governance bodies will be further included in the regional expert board to ensure the cohesion between the high innovation approach of DALIA and the long-term strategies of the member and associated states.

Monitoring and Evaluation

The monitoring and evaluation system to assess the overall effectiveness of the validation framework itself will be performed constantly by WP3 partners and will allow for the collaboration with value added actors to be utilized for the development of business scenario and frameworks as well as the exploration of opportunities to further the project and spin it off into additional HE projects, EU and UN initiatives.

The core elements and steps of the multi-actor process in the DALIA project are already in implementation in parallel to the development of the DSs. It will be further utilized and cemented with the gathering of the regional expert boards in 2024 and furthering of the communication strategy of the project which is envisaged under the WP2 replicator framework.

The initial analysis of the targets of the individual demonstrator sites suggests that the impacts of the DSs are varied and should allow for the engagement of a wide group of segments and stakeholders in the impact framework of the project.

4. VALIDATION FRAMEWORK

The DS outcomes will be validated in a set of dimensions, which reflect the impact framework of DALIA and its stakeholder coverage.
As the added value input of the project is focused on several dimensions, spanning from the scientific to the business side, all of them need to be reflected in the collaborative and co-creative process with the local, national, regional, and European stakeholders.
The DALIA project will be validated through its execution in the following iterative ways:

1.1. Scientific validation

Publication of the research in SCOPUS publication which will be facilitated by the Communications package. As noted in the project proposal the peer review process within the publications post the execution of the project will serve as a part of the validation framework for the implementation of the project. Innovations in the ecological

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conditions of the demonstrator sites will be analyzed in specialized scientific journals throughout and after the execution of the project. The understanding that the Danube river represents a major connecting tissue, between the countries in its catchment will allow for the exploitation of the results within the interlinked ecosystem services and spatial connections.
The publication of SCOPUS referential and scientifically sound results after their significant peer review and analysis will validate the outcomes of the pure scientific impact.

1.2. Climate modelling and systems validation

The participation of meteoblue in the project will allow for the climate model and impact validation and will provide before and after pictures of the area which will support the outcomes of the project. Geographic information systems and analytics which will be implemented throughout the execution of each demo site will allow for the proper monitoring of the impact concrete measures have on the local ecosystems and the immediate environment.
GIS allows for the constant monitoring of the elements of the physical world and the analysis of the impact of certain measures across the various KPIs of the demonstrator sites. It also allows for the unification of the frameworks, where the engagement of local stakeholders is concerned.

1.3. Local stakeholder engagement

The regional expert boards which are described in detail in the connected deliverable represent the first and core step of the engagement of local stakeholders in the project. The agreed upon requirements of the expert boards is that the representatives elected to them include experts with local knowledge and domain expertise, which can benefit the demonstrator site. Additional experts are envisaged to be engaged for the benefit of further business continuation and spin off activities with the individual demonstrator site stakeholders and actors.
The Demonstrator Sites partners will play a fundamental role in the engagement of the local stakeholders in the co-creative process of the DALIA demonstrations. They will participate in the definition of the requested feedback (e.g. the questions to ask to improve the DS impact, the suggestions to gather from the representatives of the most impacted economic segments, the outputs to develop spin off solutions and further projects and initiatives).

1.4. Business model framework and scenarios

The business model framework and scenarios of the monetization of the project will be provided at the very end of DALIA and will supply the analysis of the outcomes of DSs with the co-creative input from the regional expert boards and local stakeholder groups.
Due to the varied nature of the demonstrators, each suggested model will provide support to the specific challenges resolved in the demonstrator side, their monetization and valuation along the ecosystem supply chain.

5. INITIAL DEMONSTRATOR IMPACT, STAKEHOLDER AND VALIDATION FRAMEWORK

The initial stages of the demonstration site analysis provide the following impact analysis, which require further validation with the regional expert panels:

Initial Impact Analysis per Demonstrator Site

Demonstrator Site	Initial Impact Analysis
DS1Szigetköz, Hungary	**Impact on Ecology**: The revitalization of the ecological system focuses on restoring floodplain ecosystems, which were fragmented due to previous water management actions. It will enhance local biodiversity and support natural processes, particularly benefiting bird populations as part of the Natura 2000 site. **Tourism**: The region's natural beauty attracts ecotourism and sports tourism, especially kayaking. Restoration will further boost these sectors by improving the landscape and habitat quality. **Agriculture**: While agriculture remains dominant in the area, the project will balance the restoration with agricultural needs, ensuring that ecosystems and farming practices can coexist

DS2 Germany Reconnected floodplains of the Upper Danube	**Ecology**: The reconnection of oxbow lakes in the floodplain supports rare and protected species, contributing to biodiversity. **Tourism**: The area is a biosphere reserve and is expected to see increased ecotourism, particularly among birdwatchers, cyclists, and walkers. **Industry**: While not directly impacted by water use, local industries (especially Audi) indirectly benefit from improved environmental conditions and ecosystem services
DS3 Czech Republic Dyje sub-catchment	**Ecology**: Restoration focuses on maintaining the wetland and water ecosystems, particularly for rare bird species, due to its designation as a Natura 2000 site. **Tourism**: Wine production and rural tourism are significant in the region, and the project will likely enhance these by improving local environmental conditions. **Agriculture**: The fertile chernozem soils in the region are highly productive. The project will impact these agricultural areas by managing water flows and ensuring that ecosystem services support local farming
DS4 Slovakia Upper Catchment of Vah River Rehydration	**Hydropower**: The Vah River is heavily dammed, and the project focuses on rehydrating the upper catchment, which will improve water availability for energy production. **Industry and Tourism**: The project will impact industrial regions (e.g., KIA automotive plant) and support tourism by maintaining scenic landscapes and increasing visitor numbers. **Agriculture**: The rehydration will help enhance biomass production and improve conditions for cereal and fodder crop cultivation
DS5 Serbia Begečka jama	**Tourism**: The region's primary economic driver is tourism. The project will improve the ecological health of the Begečka Jama, which is popular for fishing, recreation, and ecotourism. **Ecology**: Restoration efforts will focus on enhancing habitats for native fish species and preserving the natural lake system
DS6 Romania Sturgeon migration by-pass Iron Gates I and II	**Ecology and Fisheries**: The bypass aims to restore sturgeon migration, which has been blocked by dams. This will significantly impact fisheries along the Danube by improving fish stocks. **Energy**: The hydropower sector is a major stakeholder, and balancing energy production with ecosystem restoration is key
DS7 Romania Danube Delta	**Ecology**: The restoration will support over 300 species of birds and 45 freshwater fish species by preserving Europe's largest river delta. **Tourism**: As a major tourist destination, improving the Delta's health will benefit ecotourism and contribute to the region's economic sustainability
DS8 Hungary BODROG RIVER	**Ecology**: This project supports river health by managing floodplain water retention, improving conditions for biodiversity. **Tourism**: Like other sites, this project will boost tourism through enhanced natural landscapes, attracting visitors for canoeing and nature observation
DS9 Romania Aba Crisuri	**Agriculture and Water Management**: Restoration efforts in this area will focus on improving water management systems, benefiting local agriculture and ecosystems. **Tourism**: The economic impact will also extend to tourism, with a focus on natural and rural attractions

Each demonstrator site requires a tailored approach considering its unique characteristics, challenges, and opportunities. Balancing economic development with environmental conservation and sustainable practices is crucial for the overall well-being of the Danube River region.

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The regional expert panels will provide validation of the initial valuation of the demonstrator sites and will be utilized for the development of detailed profiles, which will be used for the buildup of business scenarios.
The inputs received from the initial WP1 activities include the following validation parameters, which will be presented to regional expert boards in Q4 of 2024(M24 of the project) and will be utilized to gather feedback from the variety of stakeholders which have been identified as highly impacted and necessary for the successful implementation of DALIA activities.

Initial stakeholder engagement based on impact analysis

The multi-actor framework of the project will be directed at the initial validation of the impact points summarized in the table below:
Table 1. Stakeholder engagement based on impact analysis

DEMONSTRATOR SITE	STAKEHOLDER ENGAGEMENT APPROACH
DS1 Szigetköz, Hungary	**Local Communities:** Engage with the diverse population residing near the Szigetköz island. Consider the interests of both Hungarians and minority groups. **Tourism Industry:** Collaborate with businesses and organizations involved in ecotourism and sports tourism. **Agricultural Sector:** Involve stakeholders from agriculture and tourism sectors, considering the divergent structures of settlements. **Forestry and Nature protection:** The active floodplain forests are part of the Natura 2000 network and at the same time partially managed forests by the forestry industry. ***Specific Stakeholders Groups Identified:*** • Public Works (Győr region, Mosonmagyaróvár region) • Szigetköz Natural Park • Fertő-Hanság National Park • VTK Innosystem • Municipalities • Tourist Organizations • Water Authority
DS2 Germany Reconnected floodplains of the Upper Danube	**Agricultural Sector:** Work closely with farmers in the floodplain region impacted by the project. **Automotive Industry:** Engage with representatives from the automotive industry, particularly those connected with manufacturing in the region. **Local Communities:** Consider the impact on both urban centers (Ingolstadt) and smaller rural settlements. ***Specific Stakeholders Groups Identified:*** • Landowners • Forestry • Fishers (no commercial fishing) • Nature Conservation Agency • Ingolstadt Water Management Authority • General Public / Recreation • Cycling Tourists
DS3 Czech Republic Dyje sub-catchment	**Agricultural Sector:** Collaborate with farmers, given the significance of agriculture in the lowlands.

	Water Management Sector: Engage with representatives from the Morava River basin management. **Tourism Industry:** Work with stakeholders from municipality and rural attractions. ***Specific Stakeholders Groups Identified:*** • Water Authorities (Czech Republic and Austria) • Ministry of the Environment • Ministry of Agriculture • Lesy ČR (Forests of the Czech Republic) • AOPK (Nature Conservation Agency of the Czech Republic) • UBA Austria (Environmental Protection Agency)
DS4 Slovakia Upper Catchment of Vah River Rehydration	**Hydropower and Energy Sector:** Engage with stakeholders from the energy and hydropower industry due to the presence of dams. **Agricultural Sector:** Consider the impact on arable lands and biomass production. **Tourism Industry:** Explore the potential impact on tourism due to natural beauty and historical sites. ***Specific Stakeholders Groups Identified:*** • Local Authorities • Forest Owners • Farmers • Hospitality and Tourism Industry • Regional Authorities • Water Authorities • General Public • Hydropower Industry (16 dams along the Váh River)
DS5 Serbia Begečka jama	**Local Governments:** Collaborate with local governments in Novi Sad due to the site's protected nature. **Tourism Industry:** Work closely with stakeholders in the tourism sector given the site's unique natural environment. **Agricultural Sector:** Consider collaborations with local farmers for sustainable practices. ***Specific Stakeholders Groups Identified:*** • Public Water Management Company • Ministry of Agriculture, Forestry, and Water Management • Water Management Company "Dunav" • Public Forest Management Company • Institute for Nature Conservation • City of Novi Sad • Municipality of Begeč • Touristic Organizations • Hunting Organization • The Regional Development Agency Backa • Landowners • Fishers • General Public / Recreation

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DS6 Romania Sturgeon migration by-pass Iron Gates I and II	**Environmental Organizations:** Collaborate with organizations focused on river conservation and sturgeon migration. **Local Communities:** Engage with communities near Drobeta Turnu Severin and Negotin. **Hydropower Sector:** Work closely with stakeholders in the hydropower and energy sector. ***Specific Stakeholders Groups Identified:*** • National Institute for Research and Development in Environmental Protection (INCDPM) • Energy Sector (related to the operation of hydropower dams) • Fisheries (particularly affected by sturgeon migration) • Government and Environmental Agencies
DS7 Romania Danube Delta	**Tourism Industry:** Collaborate with stakeholders in the tourism sector due to the delta's significance for tourists. **Environmental Organizations:** Engage with organizations focused on the conservation of the Danube delta. **Local Communities:** Consider the impact on communities along the Sulina branch. ***Specific Stakeholders Groups Identified:*** • Tourist Operators • Conservation Organizations • Local Communities • Navigation and Passenger Traffic Operators • Agriculture Sector (affected by water quality issues)
DS8 Hungary BODROG RIVER	**Wine Industry:** Engage with stakeholders in the Tokaj wine region. **Tourism Sector:** Collaborate with stakeholders in the tourism industry due to historical and cultural significance of the region. **Environmental Organizations:** Consider collaborations with organizations focused on river ecosystem conservation. **Raising Awareness:** Including in schools (awareness raising actions about importance of rivers and keeping them clean), agencies organizing outdoor water sport activities (such as canoeing). ***Specific Stakeholders Groups Identified:*** • Local Municipalities • Tokaj Wine Region Stakeholders • Tourism Operators (outdoor activities such as canoeing) • Plastic Cup Initiative (involved in outdoor activities and environmental clean-up)
DS9 Romania Aba Crisuri	**Agricultural Sector:** Collaborate with local farmers and analyze the impact on irrigation practices. **Local Governments:** Engage with local governments in Oradea and other relevant areas. **Tourism Industry:** Consider the potential impact on tourism in Oradea and surrounding villages. ***Specific Stakeholders Groups Identified:*** • Water Management Authorities • Agricultural Stakeholders • Local Governments • Tourism Operators • Environmental Monitoring Organizations

These initial analyses are based on the profiles of the demonstrators and their implied impact on the variety of segments already present in the regions. Those will be considered and amplified with the involvement of the regional expert groups in the project. The feedback on the implications of the various elements of the demonstrators for the conditions of the ecosystems and social-economic architectures will be detailed and tailored in profile annexes to the business framework deliverable to be presented in the very end of the project implementation.

DALIA SSH Validation Framework

The **iterative process** outlined in Deliverable 3.1 of the DALIA project, the **Multi-Actor Process and Validation Framework**, is designed to ensure continuous improvement and adaptation throughout the project by engaging stakeholders and refining actions based on real-time data and feedback. Here's a detailed description of this process:

Data Collection and Stakeholder Engagement (Initial Phase)

- **Quantitative and Qualitative Metrics**: Data collection begins at each demonstrator site (DS), using tools like Geographic Information Systems (GIS), Internet of Things (IoT) devices, and **in situ** monitoring. These tools provide real-time environmental and socio-economic data.
- **Stakeholder Identification**: At this stage, relevant stakeholders—including local communities, environmental agencies, and industry—are engaged to ensure the project is aligned with local needs and realities. Their involvement helps in gathering feedback on key issues and potential project impacts.
- **Multi-Actor Approach (MAA)**: This stage marks the initial interaction between stakeholders through consultations and feedback loops, which are central to ensuring the multi-actor process is effective. Stakeholders are not only passive participants but are actively involved in shaping the direction of the project.

Validation and Feedback Loop

- **Validation Protocols**: As data is collected, **validation protocols** are applied. These standardized methods ensure the data's accuracy and relevance to the specific needs of each DS. External experts from the **Consultation Expert Panel (Deliverable 3.2)** participate in validating the data to ensure that all information aligns with scientific standards and stakeholder expectations.
- **Feedback Integration**: After initial validation, the **feedback loop** allows stakeholders and experts to offer suggestions for improvement or identify challenges. This feedback is then integrated into the project's ongoing activities, ensuring that the project remains adaptive and responsive to real-time data and needs.

Refinement and Adjustment (Iterative Step)

- **Adaptive Management**: The iterative nature of the process ensures that new data and stakeholder feedback are continuously analyzed and integrated. This allows for the adjustment of methods, objectives, or project focus as necessary. Each iteration refines the project actions based on both technical data (e.g., environmental metrics) and stakeholder input (e.g., socio-economic impacts)
- **Cross-Site Learning**: Lessons learned at one DS are shared across other sites, fostering **cross-demonstrator learning**. This allows the project to adapt successful methodologies from one location to another, enhancing the overall impact and efficiency.

Regular Review and Continuous Improvement

- **Expert Panel Reviews**: The Consultation Expert Panel conducts regular reviews to assess the progress and impacts of each demonstrator site. Based on their assessments, the validation protocols and project approaches are updated to reflect new challenges or opportunities.

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- **Adaptive Reiteration**: The project is designed to remain flexible and iterative throughout its lifecycle, meaning that even after certain actions have been validated and implemented, new feedback or environmental changes could lead to further refinement. This ensures that the solutions are not static but are evolving to meet emerging needs and data.

Development of Business Models and Socio-Economic Impact

- **Business Models**: In later stages of the iterative process, validated data and stakeholder input contribute to developing sustainable business models. These models are based on the success and challenges identified during the implementation and validation phases.
- **Socio-Economic Framework**: The iterative process also informs the creation of socio-economic frameworks that ensure the project's long-term viability. This includes engaging businesses, local communities, and policymakers to embed the project outcomes into everyday socio-economic activities in the region.

Key Features of the Iterative Process:

- **Stakeholder-Centered**: The process is driven by continuous interaction with local stakeholders, ensuring that the project adapts to real-world needs and challenges.
- **Feedback Loops**: Regular feedback from experts and stakeholders is incorporated into the process, making it dynamic and responsive.
- **Cross-Demonstrator Learning**: Insights from one demonstrator site inform the others, allowing for improvements across the project.
- **Adaptive Management**: The process is flexible, allowing for modifications as new data is collected, ensuring that the project remains relevant and effective.

6. IMPACT ENHANCEMENT PROCESS FOR DALIA DELIVERABLE 3.1 (FOCUSED ON ECONOMIC AND SOCIAL IMPACTS)

The **impact enhancement process** for **Deliverable 3.1** of the DALIA project (Multi-Actor Process and Validation Framework) aims to recognize and address socio-economic impacts by involving stakeholders and experts in an iterative process. This ensures the project's outcomes align with regional economic and social needs while fostering long-term sustainability and collaboration across the Danube region.

Define Objectives and Scope

- **Objective Setting**: Begin by identifying specific socio-economic objectives. In DALIA's context, these include fostering sustainable development, improving livelihoods, and aligning local economies with environmental conservation efforts.
- **Scope Determination**: Establish the scope of the socio-economic impacts, focusing on how the project influences local industries (e.g., agriculture, tourism), job creation, community well-being, and regional development. Defining this scope ensures the identification process is tailored to each demonstrator site (DS), considering the distinct economic and social landscapes.

Stakeholder Consultation and Initial Impact Identification

- **Multi-Actor Engagement**: Initiate **stakeholder consultations** involving diverse actors such as government representatives, local business owners, civil society, and regional development experts. These consultations are crucial for understanding the local economy, community needs, and how the project affects jobs, incomes, and social well-being.
- **Identifying Initial Impacts**: Through stakeholder dialogues, identify potential socio-economic impacts. For instance, infrastructure improvements may open new avenues for **economic growth** through tourism or create job opportunities in ecosystem restoration projects. Stakeholders may highlight concerns, such as disruptions to agriculture or changes in property values, as areas requiring attention.

Validation through Expert Panels

- **Consultation Expert Panel**: Involve the **Consultation Expert Panel (Deliverable 3.2)** to validate the socio-economic impacts identified by stakeholders. The panel, composed of economists, social scientists, policy experts, and regional development specialists, assesses whether the initial impacts align with broader economic trends and social frameworks.
- **Contextual Analysis**: Experts provide insights into regional economic trends and socio-political conditions, ensuring that impacts like employment shifts or changes in economic productivity are properly contextualized and measured against long-term economic goals, such as resilience and sustainability.

Iterative Feedback and Refinement

- **Stakeholder Feedback Loops**: Establish continuous **feedback loops** with stakeholders, ensuring that economic and social impacts are regularly reassessed. For instance, if a project improves water management but negatively affects local agriculture, the feedback loop would identify this early on, allowing for adjustments in project activities to minimize adverse effects.
- **Cross-Site Learning**: **Cross-demonstrator learning** plays a vital role in refining impact identification. Socio-economic insights from one demonstrator site, such as improved community engagement strategies or successful economic models, are shared with other sites, enabling them to adapt and apply best practices. This enhances the overall economic impact across the region.

Prioritization of Socio-Economic Impacts

- **Categorize and Prioritize**: Impacts are categorized into key socio-economic areas such as job creation, income generation, tourism development, and community well-being. They are then prioritized based on significance, urgency, and stakeholder feedback. For example, if a floodplain restoration significantly boosts tourism and local business revenue, it would be prioritized as a positive economic driver, whereas disruptions to local farming might be flagged for mitigation efforts.
- **Balancing Trade-offs**: Ensure that positive and negative impacts are evaluated in a balanced way. For instance, while ecological restoration may attract eco-tourism, it might reduce arable land for farmers. The identification process must weigh such trade-offs to propose solutions that maximize overall economic and social benefits.

Continuous Stakeholder Re-Engagement

- **Engage Stakeholders Regularly**: Regular re-engagement ensures that newly emerging socio-economic impacts are captured. For instance, an unexpected increase in local tourism due to the project could require additional infrastructure development, while early identification of workforce displacement may require job retraining programs.
- **Community Ownership**: By frequently involving local stakeholders in discussions, the project fosters **community ownership** of the outcomes. This enhances trust and ensures that economic benefits such as job creation or improved infrastructure are sustained and embedded into local development strategies

The initial socio-economic profiles and validation frameworks developed through the DALIA project will directly feed into the creation of **specific business profiles** for each demonstrator site. By understanding the local economic landscape, stakeholder needs, and environmental conditions, these profiles will outline tailored business opportunities, such as ecotourism, sustainable agriculture, and renewable energy initiatives. This ensures that project outcomes not only enhance ecosystem services but also foster new business models that align with local development goals, driving long-term economic growth and sustainability.

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