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Danube S3 Cluster

Transnational Cluster Cooperation active on Agro-Food, based on Smart Specialization Approach in the Danube region

Output

Danube S3 Cluster Strategy

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Target group assessment

Has this deliverable addressed any of the target group indicated in the application form?

Yes / No

If yes, please describe the involvement of each individual target group in the table below.

Target group	Number reached by the deliverable	Description of target group involvement
SME		
Business support organization, Cluster, NGO		Working group Clusters and Regional development PA8
Higher education and research		
Regional and national authority		
Civil society, general public		

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List of Abbreviations

DTP	Danube Transnational Programme
EC	European Commission
ECA	European Clusters Alliance
ECCP	European Cluster Collaboration Platform
EDP	Entrepreneurial Discovery Process
EEN	European Enterprise Network
ESCA	European Secretariat for Cluster Analysis
EU	European Union
EUSDR	European Union Strategy for the Danube Region
HER	Higher Education and Research institution
ICT	Information and Communication Technology
IPR	Intellectual Property Right
JRC	Joint Research Center
NGO	Non-governmental Organization
P	Priority
PA	Priority Area
R&D	Research & Development
RIS3	Research and Innovation Strategy for Smart Specialization
S3	Smart Specialization Strategy
SME	Small- and Medium-sized Enterprise

1 Executive summary

The **Danube S3 Cluster project** aims to **foster transnational cluster cooperation in the agro-Food sector, enhance innovation management knowledge and skills of cluster managers and members** but also to **leverage the innovation-driven entrepreneurial ecosystem in the Danube area by developing smart and coordinated cluster policies in the context of Research and Innovation Strategies for Smart Specialization (RIS3)**.

The Danube S3 Cluster Strategy specifically targets clusters active in the agro-food sector given the potential of this sector to trigger growth by facilitating cross-sectoral fertilization. The Danube S3 Cluster strategy aims at providing a **transnational coordinated cluster strategy with recommendations for policy interventions in order to support the development of a sustainable, resource efficient agro-food sector in the Danube region and strengthen the role and market efficiency of clusters**.

The main sections of the strategy concern the priorities, strategic objectives and recommendations for actions. The **recommendations** provided in Section 8 are **structured along five intervention areas** (mapping and visibility; internationalization and cooperation; cluster policy and supporting schemes; monitoring benchmarking and accreditation; and cluster management support programmes). For each intervention area, several recommendations are made.

This **strategy will be tested in five pilot initiatives** – in Croatia, Bosnia-Herzegovina, Romania, Serbia and Slovakia – **in three cross-cutting themes** (healthy food, business models for circular economy and open innovation) that are interconnected and able to generate new innovative project ideas and feeding into the European Union Strategy for the Danube Region (EUSDR).

The **Danube S3 Cluster Strategy** represents a **major milestone** of the project Danube S3 Cluster and corresponds to a project output (Output 3.3). This document directly contributes to the achievement of the first specific objective of the Danube S3 Cluster project: “Develop smart and coordinated cluster policies and related implementing instruments in the Danube region, using smart specialization approach”. The strategy was jointly prepared based on the results of different project activities, outputs and deliverables. **This output mainly addresses clusters (both members and managers) and policy makers**. Given the diverse composition of clusters, the strategy indirectly targets Higher Education and Research institutions (HER), companies and notably small- and medium-sized enterprises (SMEs) as well as business support organizations and non-governmental organizations (NGOs).

2 Introduction

The **Danube S3 Cluster project** aims to **foster transnational cluster cooperation in the agro-Food sector, enhance innovation management knowledge and skills of cluster managers and members** but also to **leverage the innovation-driven entrepreneurial ecosystem in the Danube area by developing smart and coordinated cluster policies in the context of Research and Innovation Strategies for Smart Specialization (RIS3)**.

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The document is structured as follows: after shortly presenting the methodology and design (3) of the strategy, the framework conditions (4) are detailed. A SWOT analysis (5) summarizes the strengths, weaknesses, opportunities and threats as regards agro-food clusters.

The description of the mission and vision of the strategy (6) is followed by the description of the S3 Cluster priorities (7). The following section on recommendations for action (8), which constitutes the main part of the strategy, addresses five intervention areas:

- 1- Improve framework conditions for cluster policy
- 2- Increase cluster mapping and visibility
- 3- Monitoring, accreditation and benchmarking
- 4- Cluster management and excellence support programmes
- 5- Increase transsectoral cooperation and internationalization

This **strategy will be tested in five pilot initiatives** – in Croatia, Bosnia-Herzegovina, Romania, Serbia and Slovakia – **in three cross-cutting themes** (healthy food, business models for circular economy and open innovation) that are interconnected and able to generate new innovative project ideas and feeding into the European Union Strategy for the Danube Region (EUSDR) (9). Finally, dissemination and exploitation measures (9) will be detailed before turning to the concluding section (10).

3 Methodology and design

The **Danube S3 Cluster Strategy was developed in three stages**. The first stage consisted in the preparation of an analysis of the regional context and cluster innovation potential in the Danube region (Output 3.1).¹ This analysis was presented during a transnational workshop with external stakeholders in Sárvár (Hungary) on 22 January 2020. During this workshop, project partners and stakeholders discussed and agreed on a vision, mission and strategic objectives that laid the ground for the second development stage of the strategy. This document represents the third and final stage of the strategy development.

The Danube S3 Cluster Strategy combines desk research and primary data gathered during the project. Project partners carried out **201 innovation audits with cluster managers and cluster members**. The **innovation audits** helped to have an idea of the innovation capacities and weaknesses of clusters in the agro-food sector in the Danube region.²

In addition, **11 regional reports** provided substantial information regarding the innovation landscape, the agro-food sector and the situation of clusters (including cluster policies) in the different partner regions: Baden-Württemberg (Germany), Bosnia-Herzegovina, Bulgaria, Croatia, Hungary, Moldova, Romania, Serbia, Slovakia, Slovenia, and Ukraine.

This strategy also integrates the results of a policy dialogue workshop with local and regional stakeholders³ as well as the results of **4 Entrepreneurial Discovery Process (EDP) focus groups** organized in Romania, Ukraine, Moldova and Bosnia-Herzegovina in 2019 with cluster actors, which helped identify needs, share knowledge and launch project ideas.

The Danube S3 Cluster Strategy, which is in line with strategies and policies of the European Union (EU), takes stock of the latest findings and trends regarding clusters and cluster policies and capitalizes results of other Interreg projects including DanuBioValNet,⁴ Made in Danube,⁵ MOVECO,⁶ KnowING IPR⁷ (Danube Transnational Programme – DTP) and ClusterFY (Interreg Europe).⁸ It also integrates the findings of the *White Paper on the Capacities of Strengthening Clusters* (2019) and the *Initiative* (2019) for the *Strategy for Strengthening the Role of the Clusters in the Danube Region* from the Working Group on Clusters and Regional development of Priority Area (PA) 8. The strategy developed in the frame of the Danube S3 Cluster project shall contribute to increase the visibility and raise awareness about the role of clusters – in the agro-food sector but also in general – for regional development.

This document targets primarily clusters (in the agro-food sector) who were involved in the drafting process. However, it will also target policymakers and government agencies (e.g. Priority Area coordinators, steering group members, national and regional public authorities).

¹ This document is available on the project website: www.interreg-danube.eu/danube-s3-cluster/outputs

² The report on the innovation audits is available on the project website: www.interreg-danube.eu/danube-s3-cluster/outputs

³ A second policy dialogue workshop was planned to take place in Bratislava on 7 April 2020 but had to be postponed due to the COVID-19 pandemic.

⁴ www.interreg-danube.eu/danubiovalnet

⁵ www.interreg-danube.eu/made-in-danube

⁶ www.interreg-danube.eu/moveco

⁷ www.interreg-danube.eu/knowning-ipr

⁸ www.interregeurope.eu/clusterfy/

This strategy will be tested in 5 pilot initiatives in 3 cross-cutting themes (open innovation, business models for circular economy and healthy food) that are interconnected and able to generate new innovative project ideas and feeding into the EUSDR.⁹

4 Framework conditions, challenges and alignment with EU strategies and policies

The agro-food sector is at the heart of the environmental, economic and social challenges involved in a sustainable transition and thus key to solving them. Current food production patterns have contributed to air, water and soil pollution as well as to the loss of biodiversity and rely on vast amounts of resources. Soil degradation has become a major problem in the agro-food sector and is usually connected to unsustainable farming methods such as the excessive use of fertilizers, herbicides, pesticides, and heavy machinery. Changes in climate and weather conditions have further fueled processes of soil erosion. In addition, urbanization has resulted in a twofold decline, the amount of arable land on the one hand and the number of people living and working in rural areas on the other. Regarding climate change, the need to establish more sustainable and resource-efficient patterns of food production is highly relevant as the agro-food sector is a major global emitter of greenhouse gas emissions. At the same time, a growing world population has increased the demand for food and drinking water supplies, challenging both, the resource-efficiency, and the productivity of food production.

Yet, global trends do not only pose a threat to the agro-food sector, they may also offer opportunities for an ecological transition. Consumers have developed an awareness on ecological and health issues and there is a growing demand for sustainable food, bioeconomy and circular economy. These behavioral changes, together with research findings and new technologies are promising developments in making the agro-food sector more **sustainable, resilient, resource-efficient and productive**.

Recent EU strategies and proposed policies have put a carbon-neutral Europe at the centre of EU activities and highlighted that the path to carbon neutrality requires “to change the way we produce, consume and trade” across a number of sectors and policy areas, including the agro-food sector.¹⁰ The *European Green Deal* has been created by the European Commission (EC) as a cross-cutting strategy setting out the main objectives on the way to a sustainable transformation of economy and society. Fighting climate change and fostering sustainable development are also among the main objectives of other major strategies, including the *EU Strategy for the Danube Region (EUSDR)*, particularly Pillar 2 “Protecting the Environment”, and among the *Priorities of the Croatian Presidency of the EU Council 2020*.

A major area of policy action is dedicated to the prevention of environmental degradation and fighting climate change. Actions include:

⁹ Originally, a fourth topic was to be covered: market intelligence in clusters. This however had to be cancelled due to unsolved issues at the program level hindering the smooth participation of our Ukrainian partner.

¹⁰ Von der Leyen (2019): *A Union that strives for more. My Agenda for Europe*. Political Guidelines for the next European Commission 2019-2024, p.6-7.

- more ambitious and effective climate targets, e.g. in the form of a *Climate Law*, efforts towards stimulating behavioral change as foreseen in the *Europe Climate Pact*,
- the protection of biodiversity as outlined in the EC's recently proposed *Biodiversity Strategy 2030*,
- the preservation and restoration of forest ecosystems which are vital for achieving climate neutrality, e.g. through the planned *EU forest strategy* which will be developed based on the on the *Biodiversity Strategy 2030*,
- the protection and enhancement of water, air and soil quality, e.g. detailed in the EC's upcoming *zero-pollution action plan* on water, soil and air, and in Pillar 2, PA 4 "Water Quality" of the EUSDR Action Plan,
- an efficient water and waste management ,
- protection from pesticides and hazardous chemicals.

In terms of an economic transformation, policies and strategies are focusing on:

- a low-carbon economy which is competitive and resource-efficient,
- fostering a sustainable product lifecycle within a circular economy, e.g. to be outlined in the EC's *Circular Economy Action Plan*,
- developing and commercializing green technologies.

Furthermore, it has been acknowledged that education in environmental subjects is an indispensable condition for a sustainable transformation. Policy actions thus address the need for information, exchange of experience, education, and training. Among the proposed measures are:

- Fostering the exchange of experiences in the areas of sustainable development and climate change in European networks of teacher-training programs.
- Re-skilling and up-skilling of the European workforce to facilitate the transition to growing sectors. On a more general level, the EUSDR Action plan addresses the need to match educational outcomes with the skills and knowledge required by the labor market under Pillar 3 "Building Prosperity".
- Awareness-raising and knowledge building activities on key issues such as water resource protection or adaptation to climate change.
- Capacity building of national and local authorities, Non-Governmental Organizations (NGOs) and experts in environmental-related subjects.

In its commitment to an ecological transition, the EU also seeks cooperation with its neighboring countries, as "Europe can only be fully effective if the EU's immediate neighborhood also takes effective action".¹¹ In this spirit, partnerships are sought with the Southern neighborhood countries as well as within the Eastern Partnership. With the Western Balkans, efforts are currently made towards a green agenda. As regards the countries of the Danube region, the *EUSDR Action Plan* likewise suggests a close cooperation and exchange on environmental subjects, particularly between macro-regional strategies.

¹¹ European Commission (2019): *The European Green Deal*, p. 20.

The importance of the agro-food sector for a more sustainable economic and social development and the challenges this sector faces have been acknowledged by the EU with a dedicated *Farm to Fork strategy*. It aims at:

- working towards a fair, healthy and environmentally friendly food system,
- promoting sustainable farming practices, e.g. organic farming,
- establishing a broad stakeholder dialogue to develop a more sustainable food policy,
- reducing the use of fertilizers and pesticides,
- contributing to a circular economy by reducing the environmental degradation caused by food processing and retail,
- stimulating sustainable food consumption by providing consumers with more information,
- improving the position of farmers in food value chain.

In addition, the *EUSDR Action plan* focuses on preventing brain drain, thus also addressing the migration from rural areas to cities in the country or abroad and the resulting shortage of workforce in agriculture.

The transition to carbon neutrality requires a joint effort across different policy areas, industrial sectors, and regional and national levels. In this context, clusters can play a major role: In bringing together a broad range of stakeholders under a subject of common interest, pushing for innovation and regional development, establishing cooperation from the regional to the international level as well as across different sectors, clusters contribute to the policy objectives summarized above.

The key role of clusters is confirmed by the *EUSDR Action plan* and the *Initiative* of the Working Group on Clusters and Regional Development which underlines them as efficient instruments for increasing the competitiveness and innovative strength of the regional industry, specifically SMEs, and for carrying and fostering transnational exchange and reform processes. Therefore, the action plan addresses the need for a closer cooperation between cluster initiatives and regional political authorities, in order to align cluster strategies with regional innovation strategies, particularly in rural areas. Furthermore, clusters can contribute to the following policy objectives:

- fostering reforms in South East Europe (*Priorities of the Croatian Presidency of the European Council*),
- closing the gap in regional development between EU member states (*Priorities of the Croatian Presidency of the European Council*),
- strengthening the cooperation and exchange of information and experiences between SMEs, academia, the creative industry, the public sector, and civil society in the Danube region (*EUSDR Action Plan*),
- further implementation of S3 strategies (*EUSDR Action Plan*),
- support SMEs in becoming innovators (*Political Guidelines for the next European Commission*).

The *Initiative* also points at the potential of clusters to “resolve the misbalance and increase regional competitiveness” and act as “agents of transformation to implement higher policy priorities, particularly concerning region-specific transformation processes”.¹²

Focusing on the potential of agro-food clusters in the Danube region is thus in line with the economic and social transition the EU seeks to achieve in the years to come and the strategic role of clusters in reform processes, particularly in the Danube countries.

5 SWOT Analysis

This section provides a SWOT analysis of agro-food clusters (SWOT refers to Strengths, Weaknesses, Opportunities and Threats). The recommendations developed in a later section aim at tackling the weaknesses and making use of the strengths and opportunities.

Strengths

When looking at the strengths and weaknesses of countries in the Danube region it is important to underline their heterogeneity in terms of economic development. Findings of the transnational analysis confirm that the level of public support for innovation, private and public Research and development (R&D) investment, cooperation, knowledge transfer as well as innovation processes and capacity strongly vary between different countries.

Nevertheless, the transnational analysis showed a number of strengths for the Danube region, both, in terms of innovation governance and in terms of clusters more specifically.

Governments of partner countries in the Danube region offer innovation support to key stakeholders, namely enterprises, research institutions and clusters. R&D support programs provide financial support and counselling services, often carried out by intermediaries established to that purpose. R&D is thus embedded firmly in the governance structures and political priorities of partner countries.

Smart specialization has been widely embraced as a tool for identifying and fostering regional and national economic strengths and the majority of partners has developed a smart specialization strategy in cooperation with regional stakeholders albeit some partners are more advanced in that process while others are currently in the initiation phase (Bosnia-Herzegovina, Moldova and Ukraine). **Agro-food and related fields have been included as priorities by most partner countries / regions in their smart specialization strategies, underlining agriculture as a central economic sector and strength in the Danube region.**

Clusters in the Danube region have progressed considerably over the past years, which has been confirmed in the innovation audits. **Agro-food clusters mostly have an innovation vision and can benefit from a supportive environment in the development and implementation of ideas.** They have **incorporated agricultural trends such as organic farming and sustainable agricultural practices and engage in the promotion of organic food, bioeconomy, local products, circular economy and a**

¹² Working Group “Clusters and Regional Development” (Priority Area 8 – Competitiveness of Enterprises) (2019). *Initiative: The Strategy for Strengthening the Role of the Clusters in the Danube Region*, p. 3.

sustainable lifestyle. It is also noteworthy, that clusters in some countries / regions are very active in participating in transnational projects, which provides them with additional funding resources.

Weaknesses

Apart from strengths, the transnational analysis also suggests shortcomings of the public sector in building a long-term and regionally suitable R&D strategy, frequent changes in the governmental personnel responsible for R&D, insufficient R&D funding, a weak innovation infrastructure, and a discouraging legal environment for innovation.

Technology transfer has been identified as a major challenge and several other weaknesses can be considered reinforcing factors:

- Public R&D support programs have a scientific focus rather than market orientation,
- There is a mismatch between knowledge and skills conveyed through the education system and labor market needs,
- There is likewise a mismatch between basic and applied research,
- Insufficient cooperation between stakeholders, for instance between industry and academia, research-institutes and academia and public authorities and the private sector.

In addition, there is not only a **gap in economic development and innovation between countries but also within countries**, usually between the capital region and other regions. This results in an asymmetrical distribution of innovation potential and capacities. In some countries, business and innovation capacity is likewise asymmetrically distributed between large, foreign-owned enterprises and SMEs.

Regarding cluster activity and services, the transnational analysis confirms the findings of the *White Paper on Strengthening the Capacities of Cluster in the Danube Region (2019)* that points at the **varying maturity of clusters between countries and regions**. This reflects the general heterogeneity of the Danube region.

A major weakness of clusters is the lack of systemic government support: Although clusters have partially received public support and funding, this kind of support is usually inconsistent. Increasingly, clusters have become **disconnected from regional development processes** and **often even lack a legal status**. Clusters thus face the challenge of finding alternative funding resources and have not yet achieved to secure a more sustainable mixed funding (e.g. project involvement, membership fees).

The transnational analysis has also found that registered clusters have in some cases been created „artificially“, only being active within the time frame of a project, and not necessarily responding to market needs.

As regards cluster management, many clusters lack systematic innovation and improvement mechanisms and processes as well as a proper communication with their members. The following shortcomings have been identified:

- Innovation vision / strategy is often not communicated to members,
- Lack of long-term strategy,
- Lack of awareness on members' needs,
- Lack of evaluation of activities / services,

- Non-systematic innovation process, communication, networking, promotion.

In addition, **most clusters do not have an internationalization strategy** and are **not yet registered on the European Cluster Collaboration Platform (ECCP)**.

Opportunities

With consumers' growing awareness of food safety, health and sustainable and local food products, the agro-food sector has moved increasingly towards sustainable farming practices such as organic farming and circular (bio)economy. To push innovation in the agro-food sector, organic farming and bioeconomy could be major fields of cross-border cooperation in education, both in vocational education, and in academic education and research. This would complement and extend existing cooperation in education between Danube countries.

Furthermore, international cooperation of clusters, not only in agro-food, but also in associated technological fields including biotechnology, food processing industry, industry of agricultural machinery and cross-cutting technological trends such as digitalization, agriculture 4.0 and industry 4.0 could be intensified. If circular economy is an opportunity to achieve the intended carbon neutrality, this objective can only be achieved if stakeholders in the agro-food sector cooperate more actively – since agriculture, transport are amongst the largest CO₂ emitters – and if some systemic changes are made, which notably require innovation and digitization.

Participation in existing platforms on the regional, national, and international level, for instance the European Enterprise Network (EEN), the European Clusters Alliance (ECA) and the ECCP likewise open opportunities for cooperation and networking.

The coronavirus pandemic shows the need of innovative approaches and cooperation. The current situation provides a great opportunity for clusters: To increase cluster collaboration, show their potential to overcome new emergency situations, and demonstrate their role in regional development.

Threats

As described in Section 4, challenges to the agro-food sector are mainly of two kinds, namely demographic and environment-related.

Environmental challenges are:

- Impacts of climate change such as changing weather conditions and soil erosion which lead to a reduction of soil fertility and important resources
- Further reduction of arable land due to urbanization (e.g. construction and transport infrastructure),
- Greenhouse gas intensity of the global food system reinforcing climate change.

Demographic challenges are:

- As the population is growing, so is the demand for food and drinking water,
- Migration, both, within the country from rural to urban areas, and international migration linked to a brain drain lead to a reduction of qualified workforce,
- An ageing population contributes to the shortage of workforce in the agricultural sector as finding young farmers / entrepreneurs is a challenge.

6 Mission and vision

The objective and mission of the Danube S3 Cluster project is to **support the development of a sustainable, resource efficient agro-food sector within the Danube Region by strengthening the role and the market efficiency of clusters through enhanced cooperation, visibility and recognition.**

Based on the results of various project activities, outputs and deliverables – especially the transnational analysis of regional context and innovation potential of clusters, the innovation audits with cluster managers and members, the EDP focus groups and exchanges with local stakeholders, the Danube S3 Cluster consortium has developed a strategic vision, forming the core of its strategy.

The strategic objectives and recommendations for action shall help achieve this vision. The strategic vision has a 10-year horizon (2030) to give enough time to carry out and achieve the envisaged changes. In addition, we want to contribute to the development and implementation of the redesigned European Union Strategy for the Danube Region (EUSDR) for the Programming Period 2021-2027.

The ultimate goal of the developed strategic vision is to catalyze structural change and the emergence of critical clusters so that agglomeration externalities, economies of scale, economies of scope and local spillovers can be fully realized in the process of knowledge generation and transfer.

In 2030, we envision a sustainable, resource efficient agro-food sector will be developed in the Danube Region:

- that is able to meet the challenges ahead like increased productivity, sustainability, resilience and innovation;
- in which the role of clusters is acknowledged and realized resulting in:
 - increased efficiency and visibility on the market
 - advanced level of cooperation – both regionally and internationally – to strengthen the capacity for research & innovation
 - access to a broader spectrum of market opportunities, business development services, financial resources and supportive networks
 - increased policy level and legislative recognition
 - enhanced recognition and integration in regional development.

7 Priorities

Based on the results of previous project activities¹³, the *White Paper on Strengthening the Capacities of Clusters in the Danube Region*, the *Initiative* as well as on exchanges with external stakeholders, the Danube S3 Cluster Consortium defined the following five priorities:¹⁴

- **Priority 1 (P1)** – Improve framework conditions for cluster policy
- **Priority 2 (P2)** – Increase cluster mapping and visibility
- **Priority 3 (P3)** – Monitoring, accreditation and benchmarking
- **Priority 4 (P4)** – Cluster management and excellence support programmes
- **Priority 5 (P5)** – Increase transsectoral cooperation and internationalization

Priority 1 (P1) – Improve framework conditions for cluster policy

Objective: Creating a clear legislative definition and a stable, predictable supporting scheme for clusters that enhances their market efficiency

An **absence of legal status** and definition of clusters and the **need for cluster definition in legislation** characterize some countries of the Danube Region (such as Bosnia-Herzegovina, Serbia, Slovakia). Our transnational analysis shows that what makes a cluster does not only depend on its official status but far more on its activities. Hence, some clusters bear the name but are not active whereas other organization forms such as cooperatives, associations are acting as clusters without bearing the name.¹⁵ Cluster policy should therefore also address these informal clusters.

Supporting schemes for clusters should help **strengthen and increase the efficiency of clusters on the market. Clusters should have a market and respond to a need** – as opposed to “artificial” clusters created in the frame of a given project for instance and whose activities cease once the project is completed. The Danube region does not need more clusters but “a more consistent and transparent way how the regions support cluster development”.¹⁶ **Clusters need both enhanced financial and political support to be able to act as agents of transformation.**

While in some European countries, clusters are strongly supported by public funds, it is less the case in the Danube region where public support is mostly limited in time.¹⁷ A **mixed funding** (combining public funds, membership fee, payment for services, project participation, etc.) is therefore **essential for clusters to ensure a sustainable financial model.**

¹³ These activities include a transnational analysis of regional reports on regional context and cluster innovation potential, 201 innovation audits but also a Policy learning dialogue and transnational workshop organized in Sárvár, Hungary in January 2020. See www.interreg-danube.eu/danube-s3-cluster/outputs

¹⁴ These priorities are in line with the six priorities defined in the *Initiative* are: 1) Further development of regional and national cluster policies and related strategies; 2) Collaboration with regional development actors; 3) framework conditions for cluster development; 4) Trans-sectoral and transregional collaboration; 5) cluster management excellence; and 6) visibility and promotion.

¹⁵ *Transnational Analysis of Danube Regional Context and Cluster Innovation Potential* (2020), O3.1, Danube S3 Cluster project: www.interreg-danube.eu/danube-s3-cluster/outputs

¹⁶ Working Group “Clusters and Regional Development” (Priority Area 8 – Competitiveness of Enterprises) (2019). *Initiative: The Strategy for Strengthening the Role of the Clusters in the Danube Region*, p. 4.

¹⁷ Schneider, K., Ziegler, O., Meier zu Köcker, G. (January 2020). *White Paper on the Capacities of Strengthening Clusters*, p. 36.

Priority 2 (P2) – Increase cluster mapping and visibility

Objective: Identify the already existing players on the market and make them visible for the interested stakeholders

Clusters are key players in the agro-food sector as they manage to bring together different stakeholders. Clusters' profile, activities and achievements should be **accessible, visible and known** both locally and regionally.¹⁸ In other words, mapping is needed. Mapping is indispensable to identify:

- who the players in the market are
- what associated / complementary clusters could be found in a given country
- what clusters exist in other countries to foster international cooperation

Higher visibility can strengthen the position of a cluster: first by helping reach out and potentially attract new cluster members and second by making it an acknowledged stakeholder including at the political level.

Local, regional, national and EU-wide mapping is needed in order to broaden the opportunities for cooperation. **Such databases** are highly needed in order to be aware of what exist in given territories – also bearing in mind that they should be **updated regularly**. The minimum information should contain the name of the clusters, activities and services they offer, projects (both domestic and international) they are involved in, and contact information – link to their website.

It is also important to **communicate success stories** loudly and widely to acknowledge the performance of the given clusters but also to provide guidance and ideas to other clusters regarding what can be implemented successfully.

Priority 3 (P3) – Monitoring, accreditation and benchmarking

Objective: Promoting the continuous monitoring of the clusters' activities and boosting their performance through accreditation and benchmarking models

There is a widespread agreement among the involved project partners and stakeholders on the **importance of improving the system of monitoring and accreditation**. Monitoring the performance of clusters should be a continuous work by a designated organization as is the case of the European Secretariat for Cluster Analysis (ESCA).¹⁹ This can also be done at a national level: There are for instance quality labels in Baden-Württemberg ("Cluster-Excellence Baden-Württemberg") and in Hungary ("accredited innovation cluster"). If both **accreditation systems** are working in parallel to the ESCA accreditation system, the national labels are linked to ESCA labels. It makes sense to ensure interoperability of the different accreditation, monitoring and benchmarking systems to support transferability (of the systems) and comparability (of the results) across countries. **Benchmarking systems** should measure and support **the market efficiency** of clusters and account for the contribution to the **innovation potentials**. An issue to address regards how to integrate informal clusters into these monitoring systems.

¹⁸ See Schneider, K., Ziegler, O., Meier zu Köcker, G. (January 2020). *White Paper on the Capacities of Strengthening Clusters*, pp. 36-7.

¹⁹ www.cluster-analysis.org/

External recognition and acknowledgement of a cluster's work and performance – through monitoring and benchmarking – increases both its credibility and visibility. Accreditation, which **acknowledges expertise and quality** (as opposed to self-declared expertise), contributes to **build trust**.

Priority 4 (P4) – Cluster management and excellence support programmes

Objective: Supporting the professionalism and competences of cluster management

Cluster managers play a key role in the development of their clusters. It is crucial to help them identify and implement **advanced management patterns and solutions** but also to increase their competences in a number of areas including **innovation management**. In addition, the exchange of management experience can stimulate mutual learning and foster cluster management excellence.²⁰

Priority 5 (P5) – Increase transsectoral cooperation and internationalization

Objective: Strengthening the clusters' embeddedness in various economic environments, facilitating the internationalization of their business activities and transsectoral as well as transregional cooperation

The global challenges laying ahead in the agro-food sector compel an advanced need for more cooperation and innovation on different levels: local, national, regional and international.

Local level: there is a local need for enhanced **intra-cluster cooperation** on the one hand side (e.g. increase interactions between cluster members, notably between SMEs and big companies but also between Higher Education and Research institutions (HER) and industry) & for enhanced local **inter-cluster cooperation** on the other (e.g. between clusters in a region).²¹ The cooperation between clusters should foster transversal or transsectoral cooperation such as between agro-food and ICT clusters to support digitization and new technologies as for example smart farming.

National level: Inter-cluster cooperation at the national level (between clusters in a country) remains limited. This lack of cooperation prevents clusters to create synergies, increase their visibility and strengthen their position vis-à-vis public authorities (e.g. inclusion in the preparation of national priorities, programmes). Clusters can and should be tools for regional economic development. Especially in the context of the smart specialization process, their transregional cooperation (e.g. between regions that have Agri-Food as major specialization sector, as South Muntenia in Romania and Ruse in Bulgaria) is very important. Yet, regional developers still do not enough integrate clusters in the preparation and implementation of regional innovation strategies (RIS3) or macro-regional strategies.²² Furthermore, there is a need for more cooperation and coordination between ministries especially between ministries of economy that are most often in charge of cluster policy and ministries of agriculture. There is also much room for improvement as regards cooperation between HER and industry in general in the following fields: applied research, dissemination of research results to

²⁰ See Working Group "Clusters and Regional Development" (Priority Area 8 – Competitiveness of Enterprises) (2019). *Initiative: The Strategy for Strengthening the Role of the Clusters in the Danube Region*, p.5.

²¹ The project ClusterFY shows a number of good practices. One particularly relevant concerns IND-AGRO-POL (in Romania) and its model of collaboration between companies towards innovative value chains: www.interregeurope.eu/policylearning/good-practices/item/3066/the-ind-agro-pol-cluster-model-of-collaboration-between-companies-towards-innovative-value-chains/

²² See Schneider, K., Ziegler, O., Meier zu Köcker, G. (January 2020). *White Paper on the Capacities of Strengthening Clusters*, p.8.

industry, creation of spin-offs, development of mobility schemes between industry and HER, co-creation processes for new products and services on all Technology Readiness Levels (TRL) but also creation of industry liaison offices and/or Technology Transfer offices in universities and research institutes. Greater benefits could emerge from sharing work but also from sharing research infrastructures and facilities (between HER and industry).

Regional & international level: greater inter-cluster cooperation across borders should be fostered as well. The ECA and the ECCP provide great tools that just wait to be better used. Currently, the COVID-19 forum not only provides a direct example of the use of the ECCP but also demonstrate the benefits of regional cluster cooperation to face international challenges. The COVID-19 is as a great response of industrial clusters that pool and coordinate their efforts against the pandemic.²³ Currently, most clusters still lack an internationalization strategy, which is however crucial to be able to target and structure development and cooperation with external partners.

8 Recommendations and actions to take

For each of these five priorities, the Danube S3 consortium envisaged a number of actions to take in order to fulfill its shared vision. Some actions will be carried out within the framework of the Danube S3 Cluster project while other recommended actions require coordination and cooperation with different actors.

Priority 1 (P1) – Improve framework conditions for cluster policy

Recommendations for action:

- Finance (the update of) cluster mapping
- Launch calls open to clusters
 - Promote and finance eco-innovation in agro-food (emerging priority in the EU 28)
- Define a legal status of clusters / Support legislation to clarify and define properly the notion „cluster“
- Elaborate and implement a program for increasing the economic competitiveness of clusters
 - Support the sustainability of mature clusters
 - Upgrade successful associations into clusters (or make them eligible for calls and funds)
- When possible, favor decentralized approach with regional action plans for tailored / specific support
- Encourage enhanced cooperation between ministry of economy, regional development agencies, chambers of commerce and industry to identify potential of innovation at local/regional level

²³ www.clustercollaboration.eu/coronavirus

Priority 2 (P2) – Increase cluster mapping and visibility

The concept of clusters/clustering as well as the activities of the existing clusters can and should be more visible. Here are a few recommendations to allow a better mapping and enhance the visibility of clusters:

Actions within Danube S3 Cluster project:

- Encourage and support clusters to join the already existing international schemes
 - European Cluster Cooperation Platform (ECCP) → The consortium prepared guidelines explaining how to create an ECCP profile and will bring at least 10 clusters to register (www.clustercollaboration.eu/)
 - DIH AGRIFOOD (<https://itc-cluster.com/dih-agrifood/>)

Recommendations for action:

- Promote the award system of the ECCP: the “EU Cluster Manager of the Year”, the “European Strategic Cluster Partnerships of the Year”.
- Encourage the introduction of national awards to acknowledge clusters’ achievements and boost the competition amongst the clusters
- Identify and spread success stories and results of clusters (awareness raising and dissemination among policy makers, entrepreneurs and civil society)
- Encourage and support clusters to increase their media presence (print and digital media, social networks, forums) through
 - having a website – not only in the original language but also in English
 - having a communication strategy
 - increasing their public presence through more frequent communication in (social) media
- Increase awareness about cluster mapping tools (e.g. ECCP, DIH AGRIFOOD, Cluster Atlas in Baden-Württemberg) as mean to raise the visibility of clusters and their activities
- Support the setup of local / national-regional cluster mapping (with regular update)

Priority 3 (P3) – Monitoring, accreditation and benchmarking

Recommendations for action:

- Encourage and support clusters to apply for accreditation and certification (ESCA labels and/or national certification)
 - ESCA certification can be a real asset given that some calls for proposals favour clusters with ESCA label. Besides, such certification can increase the chances of clusters when applying for international projects.
- Support development of national accreditation systems for clusters (in line with ESCA certification)

Priority 4 (P4) – Cluster management and excellence support programmes

Actions within Danube S3 Cluster project:

- Increase the innovation knowledge and skills on innovation management, business models for self-sustainable clusters, internationalization and business scale up for cluster managers: three trainings and the accompanying materials (available through an online platform) on “Innovation management dimensions”, “Business models for self-sustainable clusters” and “Business internationalization and scale up” will build the capacity of cluster managers.

Recommendations for action:

- Establish regional mentoring system for cluster managers
- Provide cluster management trainings
 - e.g. as precondition to receive development funds
 - technical trainings (e.g. on innovation and internationalization strategies, patenting procedure / IPR)²⁴
 - Thematic trainings (e.g. on smart specialization, circular economy)
- Support identification and exchange of good practices for cluster managers (through regular conferences, newsletter – notably ECCP)
- Support innovation, knowledge and technology transfer
- Encourage cluster managers to develop an internationalization strategy
- Support cluster managers to assess cluster activities and services and member needs

Priority 5 (P5) – Increase transsectoral cooperation and internationalization

Actions within Danube S3 Cluster project:

- Capacity-building regarding cooperation, internationalization and scale up of clusters through handbook and trainings: The aforementioned trainings and training materials (i.e. training handbooks) on “Innovation management dimensions” and “Business internationalization and scale up” prepared by Steinbeis 2i GmbH both encourage clusters and their member to cooperate transnationally and transsectorally.
- Support the registration of 10 agro-food clusters on ECCP
- Organization of 2 brokerage events
- Establishment of the Danube S3 Cluster Transnational Network. This network, which will include the participation of all relevant stakeholder groups, shall contribute to increased cooperation between agro-food clusters and address the challenges and innovation needs.
- Signature of 15 innovation partnerships between cluster managers and relevant actors of the Quadruple Helix model (HER, other clusters, policy developers) supporting increased international cooperation.

²⁴ Synergies will the INTERREG project KnowING IPR should be sought since it focuses on enabling the pooling and exploitation of existing innovation knowledge and increased IPR-base cooperation opportunities through services and trainings for the management of IPR, for support to commercialization of research results and technology transfer. See: www.interreg-danube.eu/approved-projects/knowning-ipr/outputs

- Implementation of 5 local pilot projects in Croatia, Bosnia-Herzegovina, Romania, Serbia and Slovakia (on open innovation, business models that work in circular economy and healthy food) with the aim of deepening cooperation and innovation.

Recommendations for action:

- Encourage clusters and their members to use SME support networks for internationalization and innovation such as the Europe Enterprise Network (<https://een.ec.europa.eu/>)
 - the European Enterprise Network (EEN) represents a great opportunity for clusters to find new partners or members (partner search) to grow and expand abroad, develop their activities, products and services (through business, technology and research cooperation requests and offers).
- Support involvement of clusters in national and international projects (Horizon 2020 / Horizon Europe, COSME, Bio-**Based Industries Joint Undertaking**, etc.)
- Involve clusters as eligible applicants in upcoming calls (e.g. Operational Programme ‘Research & and Development for Innovations’, CAP Strategic Plans)
- Encourage share of infrastructures
- Organization of thematic international events (e.g. brokerage events, open innovation forums)
- Development of thematic online forums (listing needs and offers) to support cluster cooperation, cooperation between HER and industry,

9 Validation of strategy through pilot initiatives

The objective of the Danube S3 Cluster project is not restricted to the preparation of this strategy only. It also intends to test and validate it through the implementation of 5 regional pilot initiatives on 3 cross-cutting themes in the agro-food sector:

- **Open innovation** (Bosnia-Herzegovina)
- **Healthy food** (Romania and Slovakia)
- **Business models for circular economy** (Croatia and Serbia)

The pilot initiatives will aim at addressing the different priorities and implementing some of the recommendations. The topics were chosen for their transversal character, their relevance and their interconnectedness.

Healthy food is a priority of the European Commission (see *Farm to Fork Strategy*) and addresses the growing need and demand for functional food, organic food/farming and bioeconomy.

Developing **circular economy** is another priority of the European Commission (see *Circular Economy Action Plan: For a cleaner and more competitive Europe*). The Danube S3 Cluster project is keen on supporting the development of short local/regional supply circuits (circular bioeconomy).²⁵

²⁵ The INTERREG projects MOVECO, Made in Danube and DanuBioValNet are relevant here as they respectively addressed circular economy and bioeconomy. MOVECO gathered for instance a number of best practices regarding circular economy. See: www.interreg-danube.eu/approved-projects/moveco/section/best-practice
Made in Danube developed 3 local action plans on biofuel, precision farming, sustainable forestry. See: <http://www.interreg-danube.eu/approved-projects/made-in-danube/outputs>

Clusters and their members can tremendously profit from **open innovation**. This topic addresses important issues especially regarding digitalization and innovations (e.g. in agricultural hubs).

10 Dissemination and exploitation measures

In order to increase the visibility, range and impact of the strategy, different dissemination and exploitation measures are planned. A special effort of communication will be made towards policymakers at local, regional, national and transnational level (e.g. policymakers, public authorities, thematic pole members), the Joint Research Center (JRC) and clusters.

The Danube S3 Cluster Strategy is available on the project website (www.interreg-danube.eu/danube-s3-cluster). In addition, it will be spread via social media channels – especially LinkedIn, Facebook and Twitter – from the project and from the individual project partners. Of course, it will also be disseminated via the project newsletter.

The strategy will be presented during two policy dialogue workshops that should take place in Bratislava and Tuzla in the second half of 2020. These workshops will target local and national policymakers from the Danube region as well as priority area (PA) members. The final conference of the project planned in May/June 2021 in Stuttgart will be another occasion to raise awareness about the strategy.

Furthermore, project partners will communicate about and present the strategy during external events such as capitalization events or workshops. The Danube S3 Cluster consortium will also seek cooperation with the DTP thematic pole 1, priority area members and especially with the working group “clusters and regional development” of PA8.

Finally, we will use the momentum of the Croatian presidency (January-June 2020) and the expressed interest of the Ministry of Agriculture of Croatia to disseminate and discuss the strategy.

11 Conclusion

This document identified five priorities or intervention areas: cooperation and internationalization; monitoring benchmarking and accreditation; mapping and visibility; cluster policy and supporting schemes; and cluster management support programmes. These intervention areas are in line with the priorities defined in the *Initiative* of the Working Group on Clusters and Regional Cooperation of PA8. For each intervention area, the Danube S3 Cluster Consortium developed recommendations for actions to take in order to support the development of agro-food clusters. The overall objective of the Danube S3 Cluster strategy is to support clusters and the entrepreneurial economy to stimulate the creation and development of start-ups and spin-offs in the agro-food sector. The results of this strategy shall contribute to the preparation and definition of the next programming period (2021 – 2027).

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