Interreg CENTRAL EUROPE
European Union
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Transfarm4.0

SCREENING SURVEY OF FURTHER CE INNOVATION PLAYERS & CLUSTERS OPERATING IN ADV-MANUFACTURING

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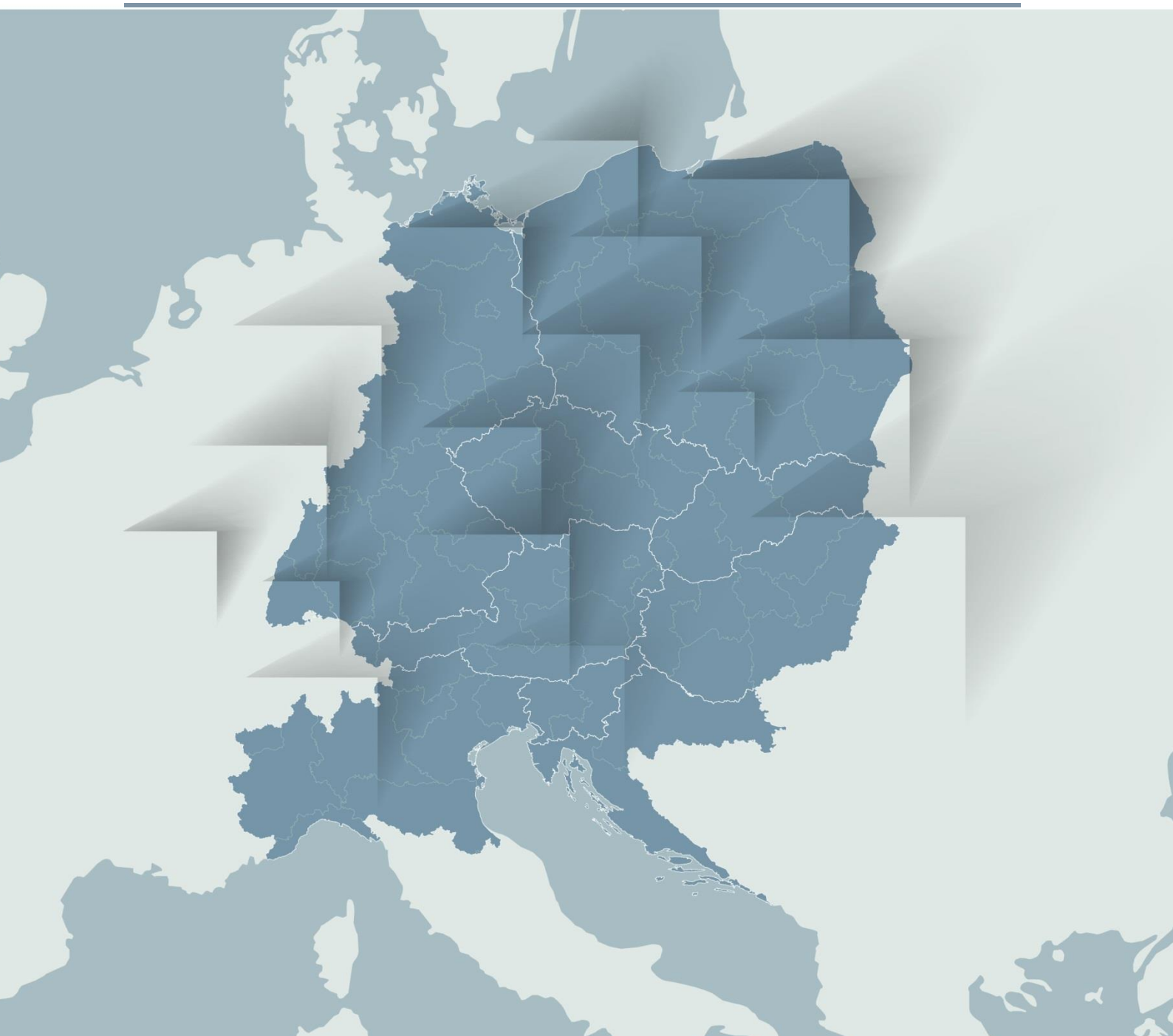

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A. Introduction

The Transfarm4.0 project aims to increase the uptake of the PF technologies, for this purpose the project partners initiated 3 pilot actions in cross-border collaboration:

-test of new ISOBUS applications;

-remote and proximal sensing;

-smart and big data management.

The business plan of the Transfarm4.0 provided by the WP1 explaining the innovation of these pilot actions, in the same time further extension of the open innovation organizational model is required.

The goal of this deliverable is to extend the open innovation organizational model to other business support organization to increase the uptake of precision farming as S3 (Smart Specialisation Strategy) driving force (and related supporting schemes).

The target of the deliverable D.T3.4.1. is 1 screening and the identification of 5 new clusters across the Central-European region. Partners should identify the 5 new cluster (1 cluster in each region) and make a screening about their activity.

In this document, we are providing ideas for the screening of new Central-European innovation players and clusters operating in advanced manufacturing. We also provide questions serving as a base of the interviews.

B. Clusters

According to the Guidebook Series of the European Commission titled "Smart Guide to Cluster Policy" and Foray et al. 2012[1], **cluster** can be defined as **group of firms**, related economic actors and institutions, which are geographically located close to each other and have the experience, expertise, and skills in a particular field.

Since the introduction of the business cluster concept by Michael Porter (1994)[2] clusters are present worldwide. With the help of the clusters companies and SMEs can increase the productivity and competitiveness in both national and international level, and can enter to the global value chain. Besides increasing the productivity clusters can help the innovations and stimulating new businesses according to the horizontal and vertical connections of the members.

Quantitative identification and profiling the clusters are usually referred as **cluster mapping** (Ketels, 2004)[3]. Based on the mapping the cluster strength can also be calculated according to the size, specialization, productivity, SME performance and innovation leaders, as: high-performing clusters, medium-performing clusters, and basic-performing clusters.

According to the mapping provided by Hollanders and Merkelbach (2020)[4] which analysed 51 exporting industry sectors in Europe they identified 2.950 regional industrial clusters. Based on their calculation it account for almost every fourth job in Europe and 50% of the employment in the industries of export. The authors found that there is a large difference among the sectors concerning the employment shares, where leather and related products have the highest share. Related to the agricultural sector livestock processing (57.0%), **agricultural inputs and services** (47.5%), forestry (46%), environmental services (39.0%), fishing and fishing products (39.0%), and food processing and manufacturing (33.0%) share employment (% of all employment is based in clusters).

The authors found 55 clusters in the sector of **agricultural inputs and services**, within this one high-performing cluster, 11 medium and 43 basic-performing clusters. The high-performing cluster was located in the UK, while the medium-performing clusters in Germany, Spain, France, and Norway. Basic-performing clusters in: Belgium, Czechia, Denmark, Germany, Greece, Spain,

[1] European Commission, Directorate-General for Regional and Urban Policy, 2012, prepared by Dominique Foray et al., guide available at: http://ec.europa.eu/regional_

policy/sources/docgener/presenta/smart_specialisation/smart_ris3_2012.pdf.

[2] Porter, M. (1990): The competitive advantage of nations. New York: The Free Press. 857.

[3] Ketels, Christian H.M. "European Clusters." In Innovative City and Business Regions. Vol. 3, edited by Thomas Mentzel. Structural Change in Europe. Bollschweil, Germany: Hagbarth Publications, 2004.

[4] Hollanders, H. and Merkelbach. (2020). European Panorama of Clusters and Industrial Change, The European Observatory for Clusters and Industrial Change, UNU-MERIT

France, Italy, Hungary, Poland, Portugal, Romania, Slocakia, Sweden, UK, Switzerland and Norway.

Authors noted that: "*Overall, one can observe a tendency that the cluster effect is stronger in complex technology dependent industries while being weaker in those industries, which depend on natural resources or that are related to agriculture.*"

This statement is verified in the "Agro-based clusters in developing countries: staying competitive in a globalized economy" by Gálvez-Nogales[5] who mentioned that: "*Although there is a wealth of research and initiatives relating to clusters in general, remarkably little attention has been paid to clusters in the agricultural sector* (agricultural sector in this case means extended agriculture, including forward linkages to food and non-food agro-industries in the study). According to the author, it is possibly caused by that clusters are related to competitiveness and innovation, and those sectors are more linked to this where the innovation is a core value. There are serval sectors of agriculture where clusters are existing for example: wine clusters, fruit clusters, coffee cluster or cut-flower clusters.

Databases are available to get information about existing clusters, but using the platforms in this deliverable is optional. European Cluster Collaboration Platform (ECCP) provides valuable information about existing clusters, in the same time if any of the partners have other solution to find new clusters that is also perfect.

[5] Gálvez-Nogales, É. (2010): Agro-based clusters in developing countries: staying competitive in a globalized economy. FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS Rome, 2010

European Cluster Collaboration Platform (ECCP)

The mission of the ECCP is to be an online hub for cluster stakeholders, and help start new collaborations. With the help of the network clusters can be identified in Europe or beyond it. Map helps to find cluster organizations, cluster organization members, European cluster partnership & initiative, national association of clusters, meta-cluster & cluster network, policy or public institution, resource efficiency support provider and training provider.

Enter the site: https://clustercollaboration.eu/ , and go to "Find partners".

There is the possibility to filter the results to:

- location:
  - country/territory
  - region
- industry:
  - sectoral industry
  - cross-sectoral industry
  - alliance/ecosystem
  - technology field
  - S3 EU priority area
- characteristics of the organization:
  - number of members
  - cluster excellence label
  - number of staff
  - collaboration interest
  - services provided to members
- green:
  - work in green sectors and/or technologies
  - support companies to be green/resource efficient
- internationalization:
  - support internationalization
- digitalization:
  - work in digital sectors and/or technologies
- social economy:
  - work in social economy sectors and/or technologies

    - supporting social innovation or engaged in social economy development
- training services:
    - offering training services for cluster organisations/policy makers
    - offering training services for companies' workforce

Digital Innovation Hub on Innovation Portal

Digital Innovation Hub is a portal where more than 155 digital innovation hubs, 9 regional clusters from 7 sectors are introduced with 28 flagship innovation experiments. The regional sectors are Central Europe, France, Iberia, Ireland and UK, Italy and Malta, North-East Europe, North-West Europe, Scandinavia and South-East Europe. Within these regional clusters represent a group of agricultural Digital Innovation Hubs, Competence Centres and Innovation Experiments. The platform gives the possibility to get knowledge about the innovation experiments for example in aquaculture, animal health assessment sensors or robotics in viticulture. Each experiments are introduced and detailed concerning the location, sector and contact person.

https://smartagrihubs.**eu/**

C. Screening survey

The aim of this survey to get information about the clusters in the Central-European region and during the D.T3.4.2 (Knowledge vouchering consisting in specialistic training to export the open innovation organizational model) extending the open innovation model of the Transfarm4.0.

Main topics of the survey would be (optional):

- Which industrial sector the cluster operates in?
- Which field of agriculture the cluster specialized in?
- Have the cluster any member from the precision agriculture sector (technology provider, machinery etc.)?
    - If yes, from which sector?
- How many members/SMEs they are representing?
- What kind of services they offer to the members?
- Are they working in national or international level?
- What is their opinion about the cross-border collaborations?
- If they have cross-border collaboration do they think that it is more effective than national collaborations?

D. Austria[6]

Austrian Agricultural Cluster (ACC)

A central cluster for agriculture in Austria is the Austrian Agricultural Cluster (ACC, https://www.aac.or.at/) located in Vienna. The cluster was founded in 1999, within the Export Promotion Program of the Austrian Ministry of Agriculture, Forestry, Environment and Water Management and of the Federal chamber of Commerce. Since then they have been working together. The current focus of the ACC is in livestock farming & veterinary, agricultural equipment and food processing. The Cluster provides information about 19 companies. Each of these 19 brings valuable knowledge and expertise. Six of these members are specially highlighted for smart farming solutions. There are two for Livestock Farming, three for Crop Farming and one for Farm Resource Planning. So the ACC is a competent partner for integrated agricultural projects with the main competence in providing know-how of leading Austrian companies. Working worldwide the cluster has projects in Croatia, Serbia, Ukraine, Romania, Russia, Turkey and Iran. With the statement from Elisabeth Köstinger (Austrian Minister for Agriculture, Regions and Tourism) it is hard to say if national collaborations are more effective than international ones, but in a globalizing world it is even more important than ever to promote supra-regional linkages.

GMAR

A supporter of the Austrian Tech Industry is the GMAR (Austrian Association for Measurement, Automation and Robotics, http://www.gmar.at/). The Association works in the area of robotics, sensor engineering and control engineering. GMAR works close with international partners like the International Federation of Automatic (IFAC) and the International Measurement Confederation (IMEKO). With this and about 120 other partner they work on key technologies like the nanotech, microelectronics and artificial intelligence. Their main work is it to connect institutions from all over the world and help them with their know-how of robotic and mechatronic.

[6] Authors: Reinhard Streimelweger, Helmut Steinkellner (HBLFA Francisco Josephinum - Josephinum Research); Martin Scherhäufl (Linz Center of Mechatronics)

Mechatronics-Cluster

The Mechatronics-Cluster (MC, https://www.mechatronik-cluster.at/en/mechatronics-cluster) is a cross-regional initiative supported by Lower Austria and Upper Austria. The MC is a cross-industry network for companies working in the fields of mechanical engineering and plant construction as well as related business sectors such as apparatus and equipment manufacturing, technology component supply, research and development as well as educational institutions.
In Lower Austria the focus is in the area of Cross-Sectoral Industry "Digital Industries". The Cluster represents in total 310 members (Large firms: 40, SMEs: 260, Research Organisations: 10).

In Upper Austria the focus of the cluster is in the sectoral industry of "Manufacture of fabricated metal products, except machinery and equipment", "Manufacture of computer, electronic and optical products" and "Manufacture of machinery and equipment" and also in the Cross-Sectoral Industry and there for "Digital Industries".
The priority areas of the cluster are Artificial intelligence, cognitive systems, augmented and virtual reality, visualisation, simulation, gamification & interaction technologies, Digitising Industry (Industry 4.0, smart and additive manufacturing).
The cluster support internationalization and transnational cooperation, especially to countries like Czech Republic, Germany, Italy, Hungary, Slovenia.

Services and expertise are provided:

- Facilitation of collaboration between members (within the cluster)
- Training services for cluster organisations/policy makers: Facilitation of collaboration between members (eg. joint training programs)
- Training services for upskilling and reskilling of companies' workforce: Labeling
- Support Services: Cooperation with companies and research institutions
- Areas of Expertise: Materials and Waste
- Digitalisation expertise: Definition of members' digital strategies and new business models, Identifying and promotion of digital collaborative projects

Machinery Ring-Cluster

The Machinery Ring is a company which was found in 1960. Back then the idea of this association was, that farmers should work for each other to reduce labor peaks. In 2019 a new cluster was found (https://www.maschinenring.at/cluster). 15 projects are supported in this cluster which, have the target to improve food security by supporting farmers working together, increasing the biodiversity and prevent erosion. The MR-Cluster assists the projects with the needed know-how and establish contact to companies they work close with. With MR International the cluster has also the opportunity to support projects beyond the national border. Especially in Germany, Czech Republic, Slovakia, Hungary and Slovenia.

Food-Cluster

The Food-Cluster (LC, https://www.lebensmittel-cluster.at/en/) is an Upper Austrian initiative to support partners in the food industry. The cluster represents in total 252 members (large companies: 187, SME's: 35, research organizations: 30).
A focus is in cross-sectoral industries on "advanced packaging". They have a strategy focus on internationalization and formalized strategy, and they support in increasing the competitive position of the Upper Austrian Food Clusters partners, strengthening the economic power of Upper Austria, intensification of relations within the food industry, and projects of the topics of technology, qualification and organization
The Food Cluster supports cooperations activities. Regarding international cooperation a targeted country is China, and regarding transnational cooperation targeted countries are the Czech Republic, Germany, Italy, Slovakia, and Slovenia.

Services and expertise are provided:

- Information
    - Latest news from the food industry
    - Organisation of events, business visits, workshops, experience exchange groups
    - Presentation of Upper Austrian Food Cluster partners on the internet
    - Public relations activities for the Upper Austrian Food Cluster, its partners and the food industry in Upper Austria
- Cooperation
    - Initiation, support and promotion of cooperation projects between businesses, research and qualification facilities

- Supporting you in your search for partners and implementing your project idea
- Developing solutions for your project idea
- Consultation on suitable funding and support facilities

- Regionality
  - Increasing the presence of regional products in marketing (OÖ Genussbox)
  - Cooperating with OÖ Tourismus and Genussland OÖ (Genussreisen)
  - Organisation of product awards with respect to Upper Austrian specialities under the heading of CULINARIX
- Internationalisation
  - Analysis of potential export markets
  - Information service for export
  - Visiting international trade fairs
  - Taking part in and initialising international projects

E. Hungary[7]

Screening for new clusters in Hungary was carried out according to the European Cluster Collaboration Platform (ECCP) and Cluster development (Klaszterfejlesztés[8]) run by the Ministry of Finance, Hungary (Pénzügyminisztérium, Európai Uniós Források Felhasználásáért Felelős Államtitkárság, Gazdaságfejlesztési Programok Végrehajtásáért Felelős Helyettes Államtitkárság, GFP Program Stratégiai Főosztály - Nemzetközi és Klaszter Osztály).

This on-line platform - similar to ECCP - provides information about the Hungarian clusters, visualized on map, and divide the clusters as if those are 'starting' or 'developed'. With the help of the logo (Figure 1) accredited clusters are possible to be found. Accreditation is based on: cooperation within the cluster, cluster management and cluster compositions, international focus, innovation. Beside the clusters other business support organizations and representative organizations were included.

Figure: Logo, indicating accredited clusters in the Klaszterfejlesztés platform

Association of Hungarian Farmers' Clubs and Farmers' Cooperatives (Magosz-Magyar Gazdakörök és Gazdaszövetkezetek Országos Szövetsége)

The aim of the association is to protect and represent the interests of Hungarian farmers and their members, ie Hungarian farmers and their cooperatives, to support and coordinate their activities supporting farming and professional development, and to creating and facilitating the flow of information. The association represents Hungarian farmers in the national conciliation. Represents the members of the Association facing the state organizations, authorities, courts, institutions. It presents and represents the resolutions, proposals and applications of Hungarian farmers in national political and economic decision-making organizations. It helps the members of the association to acquire knowledge and information about the European Union, to organize professional and scientific lectures, exchanges of experience, meetings and study trips. It keeps members informed of changes in European Union and national legislation.

South West Hungarian Engineering Cluster (Dél-Dunántúli Gépipari Klaszter)

[7] Authors: Péter Bodor-Pesti, Tamás Deák, István Fazekas, Zsuzsanna Varga -Hungarian University of Agriculture and Life Sciences,

[8] http://klaszterfejlesztes.hu/index.php

The main aim of the South West Hungarian Engineering Cluster is to promote the economic and innovation potential of the region. The Cluster has been collaborating for over 10 years for the achievement of collectively determined goals. The goals of the region's leading machinery industry organization include: market cooperation, strengthening the internal market of the cluster, joint capacity utilization, establishing and operating a platform for the exchange of experience and information. The South West Hungarian Engineering Cluster (DDGK), was founded in 2011 and currently holding 31 member companies, with the international ESCA SILVER Label qualification and the "Accredited Cluster Title", which has been awarded several times, is the largest cluster in the region. With a turnover of approximately 120 billion HUF and 5,000 employees in its member companies. Cooperation activities contains International cooperation (Russian Federation, Canada, China, USA, Switzerland) and Transnational cooperation (Austria, Italy, Czech Republic, Germany, Poland).

Eger Winery Cluster (Egri Borászati Klaszter)

The Eger Winery Cluster (www.egriboraszatiklaszter.hu) is a local cluster of over 25 wineries in the Eger wine region, Hungary. The cluster has been founded in 2011. The cluster aims primly to help winemaking SMEs of the region by developing capacities, harmonizing the regional development of the sector, exploint potential financing resources, coordinating regional marketing and product development functions of the sector, developing common product and service development, develop common market actions. As such, they introduced a brand of blended wine "Egri csillag" which is the white wine counterpart of the flagship blended wine of the region the "Bulls blood". The cluster grew quickly over 25 members. Coordinating organization of the cluster is the Eszterházy Károly University in Eger. Additionally to the above aims the cluster has a strong interest in tourism, especially wine-related gastrotourism. As the cluster is mainly a local organization, transnational cooperation is out of the cluster's scope. Activities of the Eger Winery Cluster is of interest for Transfarm4.0 in the field of precision viticulture.

Pharmapolis Debrecen Innovative Pharmaceutial Cluster (Pharmapolis Innovatív Élelmiszeripari Klaszter)

PIÉK (www.innofoodcluster.hu) has been established by its founders in 2008 with the aim of creating a network of individuals and businesses that are striving for the fullest utilisation of research and development and innovation potential, and for the increasing of added value, on a for-profit or non-profit basis, in the value chain of the food industry and functional food products. These individuals and businesses carry out activities that are either in direct

involvement or closely tied to the industry, entities that aim to increase their competitiveness by utilising synergy, available resources, unified communication and effective fundraising. Key philosophy of the cluster is "What tastes good should be healthy". Clinically tested products that were produced using a combination of science and tradition give us the opportunity to live a healthier life, prevent illnesses and recover faster. The cluster realised that, by pooling the food innovation potential of Hungary through developing high quality food products that contribute to maintaining our health, and by utilising the results, it is possible to enhance the efficiency of introducing new products in the market while increasing exports. With 59 members including research organizations, SMEs and large companies, the cluster is a successful example of common development. The cluster manages currently three projects predominantly with national cooperation. Activities of Pharmapolis Debrecen Innovative Pharmaceutial Cluster is of interest for Transfarm4.0 because the close relations between agriculture and food safety.

ECOpolis (Ökopolisz klaszter)

The ECOPolis Cluster (http://okopoliszklaszter.hu), as a knowledge-based, open initiative with information flow, experience and knowledge exchange in its focus, was established to reduce industrial and agricultural environmental load. The cluster was established in 2008. The ECOPolis Cluster was awarded the 'Accredited Innovation Cluster' title in 2010. The cluster has currently 43 members. An excellent example to show the competencies of the cluster is that during the disaster relief and the remediation process of the red sludge catastrophe some ECOPolis Cluster members participated as an expert and put their innovative products into practice (for example: AVITAR Accreditable Water QualityRemote Measurer System, HUMANIT NPK environment friendly mixed fertilizer). The cross-industrial membership of the cluster, the ability of giving complex solution for the problems occuring in the environmental industry, its wide range of partnership make the cluster unique at national level in many fields and as a result we have become one of the best performing clusters in Hungary. Although the cluster involves currently Hungarian members and the project are mainly Hungarian, according to András Farkas, president of the cluster, the main goal set for the near future is to build and broaden their international relations. Activities of ECOpolis might be interesting for Transfarm4.0 because of the renewable energy sources and solar panels applied in sensors and precision farming equipments.

South West Hungarian Engineering Cluster (Dél-Dunántúli Gépipari Klaszter)

The South West Hungarian Engineering Cluster (www.ddgk.hu) was established in 2011. The cluster portfolio encapsulates the entire spectrum with regards to contemporary forms of the engineering industry, spanning from metal processing and production, mechanical engineering

through machine production, vehicle superstructure manufacturing, cutting components production, on-site commissioning, maintenance of complete technological mechanical system to automation services, industry 4.0 solutions, sensor technology and education. The main aim of the South West Hungarian Engineering Cluster is to promote the economic and innovation potential of the region. At present, the cluster consists of 32 members from the South West Hungarian region. The cluster has transnational connections to several related clusters and associations. Activities of the South West Hungarian Engineering Cluster is of interest for Transfarm4.0 in the field of sensor and machine development.

Cluster of Applied Earth Sciences, CAPES (Alkalmazott Földtudományi Klaszter)

The Cluster of Applied Earth Sciences (http://capes.hu) is a hub in Central Europe for high tech companies and earth science laboratories offering state of the art services and solutions. CAPES uniquely delivers integrated expertise based on the knowledge pull of our member companies representing the highest standards of geoscience discipline and well established practice. The organization is a client oriented and inspiring hub of innovation driven companies, laboratories, universities and R&D&I centers. The overarching vision of the Cluster of Applied Earth Sciences is to provide comprehensive, fast and tailored services. They are participating in international cooperations like the GEO-ENERGY Europe International Cluster Cooperation. Activities of CAPES might be interesting for Transfarm4.0 because of the exceptional importance of soil characteristics in precision farming.

National Council of the Wine Communities (Hegyközségek Nemzeti Tanácsa):

The organization is the top authority of all the wine communities of Hungary. NCWC keep records of all grape growing areas, wine production, import and export and supply statistics. This is an interprofessional organisation, represents all the needs winemakers. “The objective of the NCWC is the assertion of the interests of the Hungarian grape and wine growers, the upgrade of the level of wine production, and the improvement of the marketability and competitiveness of the products through all available legal means, the protection of the reputation of Hungarian wines, the assertion of modern protection means of origin and quality, the promotion of establishing new vineyards, the upgrade of their quality level, and the undertaking of market organization tasks.”[9] NCWC would be a MATE’s main partner in the Tranfarm4.0 as the organization aims to “developing methods and instruments for improving products quality at all

[9] Brazsil, D. (2017): Information on the activity and tasks of the National Counchil of Wine Communities. http://hnt.hu/wp-content/uploads/2017/09/HNT-tev%C3%A9kenys%C3%A9gek-%C3%A9s-feladatok-angol.pdf

stages of production and where applicable of processing and marketing" and " taking all possible actions to uphold, protect and promote organic farming and designation of origin, quality labels and geographical indications", which aims are in parallel with the project.

F. Italy

RIBES-NEST NETWORK

Companies and Knowledge Subjects (Universities and Research Bodies) that adopt the model of innovative networks participate in RIBES-NEST. The Regional Innovative Network, RIR RIBES-NEST, was created to facilitate growth and development through the interaction between traditional sectors and emerging sectors that gravitate around the Ecosystem of Health and Smart Food. The activities proposed by the RIBES-NEST Regional Innovative Network for the Health Ecosystem and Smart Food are part of the Smart Agrifood and Sustainable living areas of specialization.

VENETO ORGANIC CLUSTER NETWORK:

It is an innovative regional network that includes various subjects representing producers, processing and distribution companies, suppliers of technical means, territorial biodistricts, research bodies / education system, and public bodies, representative of the organic sector regional. Veneto Organic Cluster is positioned in the "Smart Agrifood" area, with the involvement of transversal sectors such as agricultural mechanics, and intends to follow the following development trajectories concerning sustainable agri-food:

- development of precision agriculture and animal husbandry;
- development of more efficient products and equipment and enabling technologies for production in organic farming
- innovations and resources for the optimization of the nutritional status and the eco-sustainable phytosanitary defense of crops;
- development of methods and technologies in favor of integrated systems between agri-food, tourism and ecology.

INNOSAP NETWORK:

The “INNOSAP” RIR was created with the aim of grouping and representing the qualifying production systems of the primary Veneto sector: viticulture, enology, olive growing, fruit-growing, dairy. The mission interprets the values of the Intelligent Strategies for Research and Innovation in the Smart Agrifood macro-area through:

- The development of production systems through methodologies, technologies and best practices to accelerate the transition to an advanced European Bioeconomy;

- The identification of new skills and a system of knowledge deriving from the introduction of innovation through constant comparison with the world of Research;
- Growth of the Veneto economic system through the dissemination of results as an essential contribution of "INNOSAP".

INNOVATIVE FOOD NETWORK VENETO RIAV:

The Veneto Innovative Food Network (RIAV) is a system of companies and public and private entities that operate in several sectors and are able to develop a set of initiatives and projects relevant to the regional economy. The companies are part of the agrifood chain and cover every step from production to marketing. RIAV's innovative approach is realized in the use of latest generation technologies, aimed at improving the quality of the product and packaging, certifying traceability and safety, and increasing energy and environmental sustainability.

Aerospace Innovation and Research - AIR:

The regional innovative network “Aerospace Innovation and Research - AIR”, implements a vision based on the cultural multidisciplinary nature of the aerospace sector, understood as a hub of skills and technologies capable of enhancing multiple areas of the economy. AIR interprets aerospace as a set of opportunities for businesses and society, as an innovation driver for telecommunications, navigation, Earth observation and meteorology, suitable for stimulating new paths of technological development, for encouraging innovative applications oriented to the market by exploiting the wide possibilities of use in a multisectoral key of the knowledge and solutions generated, even in completely different sectors (for example in the fields of agriculture and health, up to the prevention and reduction of natural or anthropogenic risks , including terrorist incidents).

IMPROVENET - ICT for Smart Manufacturing:

IMPROVENET is made up of a group of manufacturing companies, service providers with a high content of knowledge and research subjects who intend to tackle this path of innovation together by investing in information technologies (ICT - Information & Communication Technologies). The mission is to increase the penetration of ICT technologies in the regional industrial fabric, to allow companies to be more competitive, productive and responsive to market needs, enriching the processes and instrumental products of services, to ensure maximum efficiency and production quality.

M3-Net:

The RIR “M3-NET Precision mechanics, Micro-technologies and Additive manufacturing” is an aggregation born on the impulse of the University of Padua and Confindustria Venezia Rovigo; at the moment it has about fifty subjects including companies, organizations, associations and research bodies with highly specialized skills in the study, design, implementation and application of advanced technologies in the field of Precision Manufacturing Engineering. The technological domain of reference is focused on technologies and systems for the realization of products on a micro and nano scale, additive manufacturing (materials, processes and systems) and related process-chains, laser processing and hybrid type manufacturing processes, manufacturing with innovative materials, etc. It therefore addresses the most varied industrial sector.

Coldiretti Verona:

Local branches of the largest national association of agricultural entrepreneurs. They are the reference of the absolute majority of agricultural enterprises in Verona province. A social force present throughout the territory with 15 offices in the area and more than 60 contact details. Coldiretti's project is to regenerate the agricultural sector by promoting the economic and sustainable growth of the company and at the same time the food security of consumer citizens.

G.Poland

AGRO CLUSTER KUJAWY - ASSOCIATION FOR INNOVATION AND DEVELOPMENT

85-029 Bydgoszcz, ul. Bernardyńska 6-8
www.agroklaster.pl e-mail: biuro@agroklaster.pl

- **Which industrial sector the cluster operates in?**

Agro Klaster Kujawy is an association of related enterprises, specialized suppliers, service units, companies operating in related sectors and related institutions, who compete but also cooperate with each other.

Member entrepreneurs of the Agro Cluster Kujawy operate in the broadly defined agribusiness sector, including, among others: food industry, machine industry for agriculture and food industries, agriculture, services related to the functioning of these entrepreneurs.

The role of the cluster is to shape the economic situation of the region in which it operates. It allows companies to face increasing competition and enables joint undertaking of investments, lowering costs of the undertaking and its risk.

- **Which field of agriculture the cluster specialized in?**

The vision of Agro Kujawy Cluster is to be a modern business environment organisation, integrating business and scientific environments, with the support of administration and non-governmental organisations from the agribusiness sector.

The mission of Agro Cluster Kujawy is:

- conducting activities that will serve the development of associated companies;

- initiating cooperation between companies from the agribusiness sector, administration, industry associations, educational and R&D institutions and other interested entities;

- as a result, stimulating economic growth in the region.

The cluster does not have a strict specialisation, but observes some focus on orcharding and organic farming.

TARGET SCOPE OF CLUSTER ACTIVITIES:

- Basic plant and animal production (raw material supplier)

- Agro-food processing:

  - meat
  - fruits and vegetables
  - milk
  - cereals
  - sugar
  - confectionery
  - food concentrates
  - beverages
  - manufacture of oils and fats, etc...

- Production of and trade in fodder

- Production of and trade in fertilizers

- Production of and trade in plant protection products

- Production of and trade in agricultural machinery

- Manufacture of and trade in food-processing machinery

- Production and trade in packaging materials

- Agrenergetics

- Biofuel production

- Scientific institutions

- Banks and other financing institutions

- Insurance companies

- Agricultural advisory bodies

- Business environment institutions

- Public administration institutions

- Recycling and waste management

- Training and courses

- Promotion, advertising, public relations
- Transport, logistics, storage
- Wholesale and retail network
- Gastronomy and hospitality

- **Have the cluster any member from the precision agriculture sector (technology provider, machinery etc.)?**

The cluster does not have members strictly from the precision agriculture sector. However, about half of the companies associated in the Agro Kujawy Cluster conduct cooperation in the field of R&D with the universities associated in the cluster (including University of Economy, Bydgoszcz University of Technology), which develop innovations in the field of precision agriculture.

- **How many members/SMEs they are representing?**

The cluster represents members from 8 SMEs, 4 Large Enterprises, 5 research units, 1 Agricultural Advisory Centre and other institutions related to agriculture - total 19.

Cluster members:

1. Agroklaster Combi Line sp. z o.o. - Toruń - comprehensive technological solutions for meat production - breeding, slaughter and transport, industrial and municipal sewage treatment plants

2. Bank BNP Paribas SME Business Centre Branch in Bydgoszcz

3. Bank Zachodni WBK SA Corporate Centre in Bydgoszcz

4. Biogas plant Rypin sp. z o.o. - Starorypin Prywatny - production of electricity from renewable sources

5. Centrum Kreatywności - Bydgoszcz - assistance in implementation of innovations in companies, promotional events, conferences, seminars, trainings

6. Drobex sp. z o.o. - Solec Kujawski - meat processing plant, one of the leading domestic producers of top quality meat and meat products

7. Gagner sp. z o.o. - Bożejewice, commune of Strzelno - technological solutions for food and agricultural production

8. The Institute of Forensic Genetics - Bydgoszcz - modern laboratory of molecular genetics, examination of biological traces of humans, plants, animals and microorganisms

9. MULTIPAK S.A. - Małe Czyste, Stolno commune - manufacturer of automatic film packaging machines, feeders, receivers, dispensers and cartoners, as well as complete automated packaging lines

10. Niewieścin sp. z o.o. - Niewieścin, Pruszcz commune - meat processing plant operating mainly in the fresh meat and processed meat market

11. Wiatrak sp. z o.o. - Sadłowo, Rypin commune - production of electricity from renewable sources

12. Wosana SA - Andrychów - production of juices, drinks, spring and mineral waters

13. University of Technology and Life Sciences in Bydgoszcz

14. Kazimierz Wielki University in Bydgoszcz

15. Nicolaus Copernicus University in Toruń, Interdisciplinary Centre of Modern Technologies

16. Higher School of Economy in Bydgoszcz

17. Institute of Technology and Life Sciences in Falenty

18. The Kuyavian-Pomeranian Centre for Agricultural Consultancy in Minikowo

19. The AMICUS Association for Education and Development in Kruszwica

- **What kind of services they offer to the members?**

The activities of Agro Cluster Kujawy include:

- Supporting innovativeness of companies through research and development works;

- Organizing trips to international fairs and foreign trade missions;

- Representing the position of agribusiness sector entrepreneurs in relation to governmental and self-governmental administration in matters important to the economy;

- Informing cluster members about the possibilities of obtaining support for development undertakings from external resources (subsidies, loans, credits, etc.).

The cluster also deals with networking, creation of consortiums for innovative projects. Before the pandemic, it also undertook networking in order to jointly expand abroad.

- **Are they working in national or international level?**

At the moment the cluster operates on a national level. However, some of our companies operate on an international level. The cluster is interested in undertaking activities also on an international level.

- **What is their opinion about the cross-border collaborations?**

In the opinion of the Cluster, cross-border cooperation enables further development and exchange of experiences. Agro Klaster Kujawy would like to cooperate with a more experienced cluster from a similar sector from another EU country and together prepare projects, especially innovative ones on an EU and global scale.

- **If they have cross-border collaboration do they think that it is more effective than national collaborations?**

The cluster does not have a regular international cooperation, but as a regional organization of entrepreneurs from the agro-food sector it shows readiness to expand its activities to new directions and new partners.

Companies that are members of the Cluster used to operate in CIS countries (Commonwealth of Independent States), in India, in Great Britain. However, this cooperation was suspended due to the COVID-19 pandemic. Currently, actions are being taken to rebuild business ties and their return to foreign markets.

H.Slovenia

ITC – Innovation Technology Cluster (SLOVENIA, Murska Sobota)

https://itc-cluster.com/

Non-profit Business Support Organization located in North-Eastern part of Slovenia, with a vision to foster cross-sectoral innovation and implementation of novel technologies and ICT in rural-based sectors. Aiming at bringing together target groups (such as SMEs, food system actors, farmers and other rural actors) and turn them into being ''Smart'', thus creating a unique Europe-wide innovation-based eco-system, supporting the shift towards more resilient, healthy and environmentally, socially, economically sustainable rural areas. Operated by group of interdisciplinary professionals, having strong international references, network of institutions and extensive experience in conducting EU funded projects and other projects focused on rural development.

1. Which industrial sector the cluster operates in?

Our cluster works in the Agriculture sector.

2. Which field of agriculture the cluster specialized in?

Our cluster does not have a specific specialisation, but instead tries to cover the whole agricultural sector horizontally. Through the cluster, we try to help actors to digitise and innovate.

3. Have the cluster any member from the precision agriculture sector (technology provider, machinery etc.)? If yes, from which sector?

In the precision agriculture sector, we could highlight Termodron d.o.o., a company that is the result of local know-how and cooperation.

Termodron focuses mainly on agriculture.

4. How many members/SMEs you are representing?

As mentioned above, the cluster itself is not based on membership, but cooperation within the cluster is primarily voluntary. In parallel with the cluster, we are also developing the Digital Innovation Hub (DIH AGRIFOOD) story, which brings together all actors around food production and processing, not only in Slovenia but also more widely (mainly Europe, but also Africa and Asia). Within DIH AGRIFOOD, we have also set up the AGRIFOOD COOPERATION PLATFORM, allowing the presentation of members and cooperation between them based on supply and demand. At present, nearly 900 organizations are registered on the platform, with an even wider reach, as some organizations are membership-based and we can reach over 7000 organizations through them.

5. What kind of services you offer to the members?

ITC as a cluster acts as a knowledge transfer office and brings new technologies and knowledge to Slovenia by participating in various projects, at the same time trying to promote Slovenian knowledge on the foreign market. Within DIH AGRIFOOD, we focus on 7 services:

Raising awareness: this is about raising awareness of digital technologies, what they bring to agriculture and food production and where farmers can find them, with their advantages, disadvantages and challenges.

- Monitoring innovation and technology transfer: finding and identifying digital service providers on the one hand and farmers' needs on the other is one of the most important services. The challenge is how to bring existing technologies efficiently to farm use.

- Cooperation with other DIHs: cooperation with DIHs is crucial for effective technology transfer, especially in terms of adapting international solutions to Slovenian needs.

- Financing: farmers, food producers and solution providers need financial support for digital transformation and the development of innovative digital products and services. The biggest challenge is to motivate farmers to move faster towards digitalisation.

- Developing strategies and business models: farmers need to understand the technology and how it works in order to adopt it. The biggest challenge here is choosing the right technology and its economic benefits, while on the other hand solution providers need business models and support in developing services to meet all needs.

- Mentoring and training: farmers need innovative ways of mentoring and training on how new technologies will change their lives and work. In particular, a "see it, try it" approach is important.

- "Living lab" approach allows them to do this, as it tries to bring together in one place information on living labs in Slovenia and Europe, showing real technologies on farms and how they work, which interested people can see and try out.

6. Are you working in national or international level?

We work internationally, through various collaborative projects (mainly the Horizon 2020 research programme) to help develop agriculture and introduce new technologies in the Slovenian environment.

What is your opinion about the cross-border collaborations?

Cross-border cooperation is well received here, we have many partners all over the world. There are advantages and disadvantages to both. It is sad to see that in Slovenia we are still very much in competition with each other, rather than joining

ranks and starting to work together. In the field of agriculture, we can add that we are moving in the right direction and we can see a lot of cooperation on domestic soil, which is also somewhat the wish of DIH AGRIFOOD. On the other hand, there is also the Food SRIP, which involves many players in this field.

SRIP – Circular Economy (SLOVENIA, Maribor)

https://srip-circular-economy.eu/

The Strategic Research and Innovation Partnership – Networks for the transition into circular economy (SRIP – Circular economy) is a connection of Slovenian business subjects, educational and research institutions (RRI), non-governmental organisations and other interested parties, in collaboration with the state, into new value chains according to the economic principles of closed material flows. The vision of the SRIP – Circular economy is to sustainably increase the efficiency and competitiveness of the domestic economy in the transition into circular economy. The long-term effect of the SRIP – Circular economy involves contributing to the recognisability of Slovenia as a circular economy hub that will set the reference standard for top professionals and foreign investors through its knowledge, R&D infrastructure, breakthrough technologies and services, as well as its regulatory support environment.

1. Which industrial sector the cluster operates in?

SRIP - Circular Economy: economy, energy, food, industry, waste, chemical etc.

2. Which field of agriculture the cluster specialized in?

Food, company Perutnina Ptuj - feathers for processing and circular economy.

3. Have the cluster any member from the precision agriculture sector (technology provider, machinery etc.)? If yes, from which sector?

No, not at the moment. But we would also like to work together on something in this area in the near future.

4.How many members/SMEs they are representing?

More companies, approximately 10.

5. What kind of services you offer to the members?

We organise events. We help with legal advice. We are also active in policy making.

Are they working in national or international level?

At both national and international levels.

What is their opinion about the cross-border collaborations?

Both are the same and similar. It's good to work at home and abroad.