Project Code:	DTP1-072-1.1	Document type:	Deliverable LAP
Project start date:	01/01/2017	Project end date:	30/06/2019

Made in Danube

Transnational Cooperation to transform knowledge into marketable products and services for the Danubian sustainable society of tomorrow

Deliverable

Local Action Plan for Smart and Innovative Precision Farming

Due date of deliverable: 31/12/2017 **Actual submission date: 29/12/2017**

Document Control Sheet

Work package Number	WP3
Work package Title	Framework Conditions
Activity Number	T3.3
Activity Title	Common Strategy for Local Action
Deliverable Number	D3.3.1
Deliverable Title	LAP for Smart and Innovative Precision Farming
Dissemination level	Restricted
Main author	Bernhard Koch (BOKU), Maria Schallar (BOKU)
Contributors	Daniel Acs (The Union of Slovak Clusters), Danka Moravčíková (Slovak University of Agriculture in Nitra) LVI (Baden-Württemberg Industry Association) Mihai Dragomir (Technical University of Cluj-Napoca) PBN (Pannon Business Network Association)
Quality Assurance	Miljana Cosic (SIG/SEZ)

Versioning and Contribution History

Version	Date	Author/Editor /Reviewer	Contributors	Description/Comments
_v01	07.08.2017	Koch	Acs, Moravčíková	August: First Draft
_v02	12.10.2017	Koch, Schallar	Acs, Moravčíková	Version "Budapest"
_v03	06.11.2017	Koch, Schallar	Acs, Moravčíková	"Version with Input from local initiative"
_04	23.11.2017	Koch, Schallar	Acs, Moravčíková, Dragomir, PBN, LVI	Version to be sent to Quality Control (1st draft)
_05	18.12.2017	Review: SEZ	Miljana Cosic Daniela Chiran	Minor recommendations for the content improvement
_06	19.12.2017	Koch, Schallar		2nd draft
_final	29.12.2017			

Document last saved on	29.12.2017

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

1 Content

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

List of Tables

List of Figures

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

List of Abbreviations

ABT RC	AgroBioTech Research Centre
AF	Application Form
AIOTI	Alliance for the Internet of Things Innovation
AKIS	Agricultural knowledge and innovation systems in transition
AN	Activity Number
BEC	Bioeconomy Cluster
BOKU	University of Natural Resources and Life Sciences, Vienna
CAP	Common Agricultural Policy
CIP	Continous Improvement Process
CSA	Climate-smart agriculture
DTC	Danube Transfer Centre
DTP	Danube Transnational Programme
EIP	European Innovation Partnership
EIP-AGRI	European Innovation Partnership for Agricultural productivity and sustainability
EIT	European Institute for Innovation and Technology
EPO	European Patent Office
FAO (UN)	Food and Agriculture Organisation (United Nations)
FG	Focus Group
ICT	Information and Communication Technologies
IoT	Internet of Things
JRC	Joint Research Centre
LAP	Local Action Plan
PA	Priority Area
PCT	Patent Cooperation Treaty
MiD	Made in Danube
NRN	National Rural Network
RDP	Rural Development Programme
RIS3	Research and Innovation Strategy for Smart Specialisation
SA/SF, PA/PF	Smart/precision agriculture/farming
SME	Small and medium enterprises
SFT	Smart Farming Technology
SUA	Slovak University of Agriculture in Nitra
TC	Transfer Centre
UAVs	Unmanned aerial vehicles
VET	Vocational Education and Training
WP	Work Package

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

2 Executive Summary

This local action plan is one of the deliverables in the project “Made in Danube”, part of the Interreg Danube Transnational Programme. Goal of the project is to improve framework conditions for the cooperation of SMEs and research organisations (RTO) in order to develop marketable products and services in the Danube region.

The European Commission’s Joint Research Centre has identified bio-economy as an innovation-driven part of society which could have positive impact on many other areas too. In specific forestry, sustainable agriculture and bioenergy were identified as priority areas. This is why the “Made in Danube Project” chose in each of these priority areas one local initiative as pilot action. They should serve as test areas and develop into innovation hubs, generating know-how that can be transferred to other parts of the Danube region too.

Nitra was chosen as one of the pilot action areas because two relevant entities in the field of smart an innovative precision farming are located in Nitra and joined forces for this project. One of them is the Slovak University of Agriculture. The university has both, a strong research based knowledge base in the field and a stable place in the Slovak society. The other being the Union of Slovak Clusters, that is very well integrated in relevant networks, has numerous experts in agriculture and is very experienced in technology transfer issues.

The chapter “Introduction” of the local action plan explains the relevant terms, such as Smart Farming, and gives an overview what are the most important EU institutions operating in this field. Then the local initiative is presented and those EU policies that are relevant to the initiative. The introduction concludes with a short statement about the vision for the future of the initiative.

The whole local action plan is based on a process called “continuous improvement process”. Central steps within the process are the planning of tasks, Implementation of tasks and the reflection on results. A peer consultation and feedback step supports the following step of the adaptation of tasks. By this a continuous cycle of tasks definition and adaptation is installed in order to lead to improved results.

The current task list for the local initiative comprises fourteen tasks. For each of them a brief description is given, the expected results are laid out, the responsible body and a deadline are defined. The tasks cover a wide field of activities, ranging from steps of analysis to the strengthening of different networks in order to promote knowledge exchange or to establishing new platforms in order to enhance innovation research results uptake. Also funding questions in the form of the identification of financial instruments are covered in the task list.

In chapter 6.4. the supporting tool for the Local Action Plan is presented: The TIN e-tool is developed within the “Made in Danube Project” in order to install a platform for companies and research institutions where technology offers are posted and cooperation partners can be found.

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

Conclusion and recommendations state how important it is that the different stakeholders work closely together and that activities of all partners involved are well coordinated in order to make the successful implementation of the local action plan possible. Setting up of supporting institutions such as clusters and platforms will ensure sustainability and stability of processes and results.

Target group of the plan is the local initiative, which should use it as a working instrument (introduction of continuous improvement process, task list). Apart from that the local action plan plays an important role within the "Made in Danube" project: Together with the results of the questionnaire it serves as basis for elaborating a roadmap related to improved framework conditions. Based on the roadmapping and the policy dialogue results a common strategy will be developed which has the goal to bring R&D results on the market. To relevant stakeholders in the region the LAP will serve as an information source, where they will find a concise overview of the initiative's activities, it's goals and it's environment.

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

3 Introduction

3.1 Project "Made in Danube"

The project "Made in Danube" aims to improve framework conditions for innovation in the Danube region. It hereby focuses on the capabilities of the regions' SMEs and the collaboration of research organisations and these companies.

Within the project 3 regional initiatives where chosen as pilot areas in order to develop innovation hubs in bio-economy in three different fields: sustainable forestry, smart agriculture and bioenergy.

3.2 Project context

In this chapter the relevant terms are introduced and defined. Besides, those EU institutions and programmes dealing with agriculture, that are relevant for the local initiative, are presented.

3.2.1 Definitions, characteristics and benefits

Smart/precision agriculture/farming (SA/SF, PA/PF) is a farming management concept based upon observing, measuring and responding to inter and intra-field variability in crops or in aspects of animal rearing. It is also related to more recent approaches linked to climate change resilience, such as climate-smart agriculture (CSA) and it is linked to key drivers directly related to worldwide issues such as sustainable agriculture & food security.

Smart Farming represents the application of modern information and communication technologies (ICT) including robotics in agriculture, leading to what can be called a "Third Green Revolution".

Following the plant breeding and genetics revolutions, this Third Green Revolution is taking over the agricultural world based upon the combined application of ICT solutions such as precision equipment, the "Internet of Things" (IoT), sensors and actuators, geo-positioning systems, Big Data, unmanned aerial vehicles (UAVs, drones), robotics, etc.

Smart Farming has a real potential to deliver a more productive and sustainable agricultural production, based on a more precise and resource-efficient approach. However, while in the USA possibly up to 80% of farmers use some kind of SFT, in Europe it is no more than 24%.

From the farmer's point of view, Smart Farming should provide the farmer with added value in the form of better decision making or more efficient exploitation operations and management. In this sense, Smart Farming is strongly related, to three interconnected technology fields addressed by the Smart AKIS Network:

Management Information Systems: Planned systems for collecting, processing, storing, and disseminating data in the form needed to carry out a farm's operations and functions.

Precision Agriculture: Management of spatial and temporal variability to improve economic returns following the use of inputs and reduce environmental impact. It includes Decision Support Systems (DSS) for the whole farm management with the goal of optimizing returns on inputs while preserving resources, enabled by the widespread use of GPS, GNSS, aerial images by drones and the latest

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

generation of hyperspectral images provided by Sentinel satellites, allowing the creation of maps of the spatial variability of as many variables as can be measured (e.g. crop yield, terrain features/topography, organic matter content, moisture levels, nitrogen levels, etc).

Agricultural automation and robotics: The process of applying robotics, automatic control and artificial intelligence techniques at all levels of agricultural production, including farmbots and farmdrones.

Smart Farming technology (SFT) has a real potential to deliver a more productive and sustainable agricultural production, based on a more precise and resource-efficient approach. Smart Farming can also provide great benefits in terms of environmental issues. Smart Farming applications do not target only large, conventional farming exploitations, but could also be new levers to boost other common or growing trends in agricultural exploitations, such as family farming (small or complex spaces, specific cultures and/or cattle, preservation of high quality or particular varieties,…), organic farming, and enhance a very respected and transparent farming according to European consumer, society and market consciousness. However, while in the USA possibly up to 80% of farmers use some kind of SFT, in Europe it is no more than 24%.

Benefits of Smart Farming are:

- optimization of production efficiency
- increase of quality
- minimization of environmental impact and risk
- economic profitability
- achievement of best - in terms of quality, quantity and financial return.

(Source: smart AKIS, 2017)

3.2.2 Relevant EU institutions

The following chapter introduces the relevant EU institutions in the field of Smart and Innovative Precision Farming.

3.2.2.1 CAP (Common Agricultural Policy)

Common agricultural policy as one of the oldest policies of the EU is oriented on providing stable, sustainably produced supply of safe food at affordable prices.

Several reforms of the CAP were conducted, whereby the latest one is focused especially on smart farming. In the era of digitisation, the modern CAP should encourage and help farmers to adapt to precision farming methods and digitalised agriculture.

As a result, digitisation of agriculture could help address food security, optimisation, positive environmental impact and also better quality of food.

LAP for Smart and Innovative Precision Farming is fully in line with CAP objectives and bringing added value for the reform of post-2020 CAP.

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

3.2.2.2 European Innovation Partnership (EIP) on Agricultural Sustainability and Productivity

EIP represents a new approach to research and innovation in the EU, focused on rapid modernisation and societal benefits. It helps to coordinate existing initiatives and instruments and complement them, when it is necessary. One of the areas, where the EIP was established is related to the Agricultural Sustainability and Productivity (EIP-AGRI).

EIP-AGRI partnership works to foster competitive and sustainable farming and forestry that "achieves more and better form less" (EIP, 2017). It was established in 2012 with aim to help agricultural and forestry sectors to become more productive and sustainable. EIP-AGRI is administered by EIP-AGRI Service Point and is part of the European Rural Networks Assembly. It provides and/or enables several useful and very practical instruments: EIP Network, Subgroup for Innovation, EIP Focus Groups (FG), Rural Development Programme (RDP), H2020, Thematic networks, Multiplier tool-kit, etc. .
Therefore, EIP-AGRI is one of the most important initiatives to strongly support individual actions within the LAP.

"Shaping the digital (r)evolution in agriculture"

Within the European Innovation Partnership on Agricultural Sustainability and Productivity was developed a document "Shaping the digital (r)evolution in agriculture" (EIP-AGRI, 2017) that is focused on the issue of Smart Farming. The document highlights key areas of action, where digital technologies may support farmers, whereby taking into consideration also the existence of barriers across Europe. Hence, the Local Action Plan of Nitra should benefit from the given document and consider the issues and the importance of them.

3.2.2.3 EIP Network

The EIP-AGRI connects various innovation actors (farmers, advisers, researchers, businesses, NGOs and others) at EU level and within the rural development programmes (RDPs). Together they form an EU-wide EIP network.

In terms of the LAP, it is very important to have access to the EIP Network in order to search for the relevant information, recommendations and creating networking possibilities as well as to benefit from shared ideas and innovative solutions that are put into the practice through it.

In addition, relevant results and outputs of the LAP should be transferred to the members of EIP Network.

European Rural Networks Assembly

The European Rural Networks Assembly (ENRD, 2017) is one of the key bodies of EIP-AGRI that guides, advices and provides recommendations to European Rural Networks.

All member states are represented in the assembly, particularly in the following bodies: Management Authority, Paying Agency, Local Action Group, National Rural Network, Research organisation, and Advisory body.

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

Since it is planned that the local initiative has to report to external stakeholders, such groupings of stakeholders of each Member State should be used to disseminate results and impacts of the LAP and the whole project “Made in Danube”.

Nowadays, the European Rural Networks Assembly consists of two sub-groups that deals with the Innovation for agricultural productivity and sustainability and with the Leader and Community-Led Local Development.

The **Sub-group on Innovation** is focused on supporting the implementation of the EIP-AGRI in Rural Development Programmes, identifying the issues and problems that are common for the actors, while presenting the good practices and also on supporting the networking between EIP-AGRI Operational Groups. The main objectives of the Subgroup on Innovation are to:

- support the implementation of the EIP-AGRI in Rural Development Programmes
- identify common issues, problems and good practices
- support networking between EIP-AGRI Operational Groups
- provide input for the work programme of the EIP-AGRI Network
- cooperate with the National Rural Networks to support innovation.

EIP Focus Groups

EIP-AGRI consists of thematic groups, so-called Focus Groups that involve experts in specific areas with aim to share the knowledge and information. The EIP-AGRI Focus Groups deal with different topics, such as: benchmarking farm performance, dairy production systems, diseases and pests in viticulture, high nature value, new entrants into farming, etc., whereby one of the Focus Groups is associated directly with the topic of **precision farming.**
FG on precision farming consists of 19 experts, including scientists, farmers, advisers, and agribusiness. The tasks of given focus group were as follows:

- Identifying and assessing the different systems and use of data handling in precision arable farming and precision livestock farming.
- Looking at where compatibility issues need to be resolved as well as potential solutions.
- Collecting existing or potential solutions to processing large volumes of data from different types of precision farming sensors as well as existing or potential solutions to integrating these data into user-friendly farm management support systems.
- Collecting existing or potential solutions to integrating precision farming systems into small and medium-sized holdings.
- Listing fail factors that limit the use of the identified techniques/systems by farmers and summarise how to address these factors as well as explore the role of innovation and knowledge transfer in addressing these fail factors.

FG brings specific recommendations that should be studied and considered within LAP:

- developing farm management solutions for the majority of farmers
- collaborative effort involving several EU countries
- appropriate analytical support tools and focused training packages

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

- validated decision support models and analysis tools
- tools designed for small and medium-sized farms
- major role of farmers and cooperatives in innovation and in research of technical solutions
- new business models for data management
- creation of 'PF living labs' and development of networks of all stakeholders

(Source: EIP FG, 2017)

3.2.2.4 Rural Development Programme (RDP)

The main aim of rural development policy of the EU is to help rural areas face current economic, social and environmental challenges. There are 118 different rural development programmes in 28 Member States in the period 2014-2020 (RDP, 2017).

Rural Development Programme provides opportunities to establish Operational Groups (OG) within EIP. OGs deal with a certain issue that may lead to an innovation, whereby the approach of OG makes the best use of different types of knowledge (practical, scientific, technical, organizational, etc.) in an interactive way.

Rural Development Programme and its specific measure "Cooperation" has to be strongly considered within the LAP and its activities, since it is a very practical tool that may support the innovation of ideas.

H2020 offers various specific opportunities to support EIP-AGRI thematic networks, multi-actor projects and partnerships incorporating in particular Operational Groups.

3.2.2.5 LEADER/ELER/EFRE/ESF

For the current funding period 2014-2020 European Comission initiated the creation of a Common Strategic Framework (CSF) which seeks to enhance the coordination and complementarity between the EU's main funding instruments.

The CSF comprises the:

- European Regional Development Fund (ERDF)
- European Agricultural Fund for Rural Development (EAFRD)
- European Social Fund (ESF)
- Cohesion Fund and European Maritime and Fisheries Fund (EMFF)

As a consequence EU funding programme should all head in the same direction. Together with the partnership contracts on the national level it serves as framework for funding strategies, securing that policies implementing Europe 2020 are all well coordinated and integrated.

(Source: https://www.netzwerk-laendlicher-raum.de/leader/leader-2014-2020/)

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

3.2.2.6 European Institute of Innovation and Technology (EIT) FOOD

European Institute of Innovation and Technology is an initiative that foster the innovation activities across the Europe. Within EIT, there are six Knowledge Innovation Communities (KIC) that are focused on different issues, whereby one of the youngest one is EIT FOOD.

EIT FOOD brings future opportunities the local initiative in order to enhance their portfolio of activities further. The representatives of the LAP should get in touch with the EIT Food consortium since innovative ideas and relevant information may be exploited within the LAP.

3.2.2.7 Smart AKIS Network

Smart-AKIS is a European network mainstreaming Smart Farming Technologies among the European farmer community and bridging the gap between practitioners and research on the identification and delivery of new Smart Farming solutions to fit the farmers' needs.

Specific objectives of the network are, to:

- Create an inventory of direct applicable solutions from the large stock of research results and commercial applications.
- Assess end-user needs and interests, and identify factors influencing adoption taking into account regional/national specificities.
- Generate multi-actor, innovation-based collaborations among different stakeholders.
- Set up an ICT tool for the on-line assessment of the Smart Farming Technology solutions and the crowdsourcing of grassroots-level ideas and needs.
- Liaise with EIP-AGRI and its structures.

It crucial for the local initiative to interlink with the Smart AKIS Network and its activities in order to tap the full potential of its planned tasks.

(Source: smart AKIS 2, 2017)

3.2.2.8 EU's Alliance for the Internet of Things Innovation (AIOTI)

The Alliance for Internet of Things Innovation (AIOTI) was initiated by the European Commission in 2015, with the aim to strengthen the dialogue and interaction among Internet of Things (IoT) players in Europe, and to contribute to the creation of a dynamic European IoT ecosystem to speed up the take up of IoT.

European Commission has identified Smart Farming as one of the areas where IoT could contribute to bring great benefits for users, in this case, farmers as well as to all actors involved along the agri-food chain.

(Source: AOTI, 2017)

3.2.2.9 Joint Research Centre (JRC)

Joint Research Centre of the EC supports the issue of Smart Farming through various initiatives and tools, which from a larger perspective could also be relevant for the local initiative. As far as Smart Farming and the Danube region are concerned, the relevant initiatives of JRC are as follows:

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

- Danube Reference Data and Service Infrastructure (DRDSI)
- Smart Specialisation Platform supporting Regional Innovation Strategies for Smart specialisation (RIS3)
- European network of Technology Transfer Offices
- Bioeconomy Knowledge Centre
- Scientific Support to Danube Strategy in four thematic clusters:
    - Danube Water Nexus (DWN)
    - Danube Land and Soil Nexus (DLSN)
    - Danube Air Nexus (DAN)
    - Danube Bio-energy Nexus (DBN)

(Source: JRC, 2017)

3.2.2.10 European Union Strategy for Danube Region (EUSDR)

The EU Strategy for the Danube Region (EUSDR) is a macro-regional strategy adopted by the European Commission in December 2010. The strategy was jointly developed by the Commission, together with the Danube region countries and stakeholders, in order to address common challenges together. The strategy seeks to create synergies and coordination between existing policies and initiatives taking place across the Danube region.

The following LAP is directly targeting three **Priority Areas and is fully in line with the Action Plan of the Danube Strategy:**

PA8 – "To support the competitiveness of enterprises including clusters"

The targets of PA8 relevant to this LAP:

- Improvement of the innovations and new technologies transfers through establishing measures like consulting services by chambers and other institutions or organizations, in cooperation with other actions relevant to Priority Areas of the EUSDR
- Establishing a cluster network with focus on connecting companies in bio-based industries and analysis of smart specialization strategies for the bio-based industry within the Danube region.
- Improvement of framework conditions, support programs and capacity building of stakeholders, to enhance competitiveness and added value in rural areas and in particular in the agricultural sector.
- Improvement of business support in particular to strengthen the competitiveness of SMEs for international cooperation and trade.

LAP related activities of the action plan of Danube Strategy of PA8:

- "To foster cooperation and exchange of knowledge between SMEs, academia and the public sector in areas of competence in the Danube Region"
- "To improve business support to strengthen the capacities of SMEs for cooperation and trade"
- "To support enterprises through high performing training and qualification schemes"

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

- "To prioritise the effective implementation of measures provided for under the Small Business Act for Europe"
- "To improve the competitiveness of rural areas and in particular of the agricultural sector"
- "To improve framework conditions for SMEs in areas where competitive infrastructure is missing"

PA7 – "To develop the Knowledge Society (research, education and ICT)"

The targets of PA7 relevant to this LAP:

- To increase the effectiveness of investment in R&I through establishment of a funding coordination network aiming to initiate a minimum of 2 dedicated EUSDR activities each year (e.g. joint calls; joint strategic project proposals (within a multilateral framework)).
- To increase the number of EPO and PCT patent applications filed from the Danube Region by 20% by 2020
- To enhance regional research and education co-operation to reach 20% of academic mobility within the region by 2020.
- To increase the annual output of co-publications in the region by 15 % by 2020
- To develop RIS3 in all Danube countries (or their regions) by 2020.

LAP related activities of the action plan of Danube Strategy of PA7:

- "To cooperate in implementing the flagship initiative "Innovation Union of the Europe 2020 Strategy" in the Danube Region countries
- "To coordinate better national, regional and EU funds to stimulate excellence in research and development, in research areas specific for the Danube Region"
- "To strengthen the capacities of research infrastructure"
- "To strengthen cooperation among universities and research facilities and to upgrade research and education outcomes by focusing on unique selling points"
- "To develop and implement strategies to improve the provision and uptake of Information and Communication Technologies in the Danube Region".
- "To draw up internet strategies"
- "To use e-content and e-services to improve the efficiency and effectiveness of public and private services"
- "To stimulate the emergence of innovative ideas for products and services and their wide validation in the field of the Information Society, using the concept of Living Labs"

PA6 – "To preserve biodiversity, landscapes and the quality of air and soils"

LAP related activities of the action plan of Danube Strategy of PA6:

- "To decrease the input of pesticides into the environment of the Danube Region"
- "To create standardised and compatible information on land cover on transnational basis"
- "To raise awareness about soil protection"

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

(Source: EUSDR, 2017)

3.2.2.11 Danube Transnational Programme (DTP)

The Danube Transnational Programme is a financing instrument of the European Territorial Cooperation that promotes economic, social and territorial cohesion in the Danube Region through policy integration in selected fields. The programme should complement the objectives of the EU Strategy for the Danube Region.

The LAP on Smart and Innovative Precision Farming can directly benefit from the DTP as an important source of funding for international cooperation, networking, development and practical implementation of policy frameworks, tools and services including specific small-scale pilot initiatives.

3.3 Background information on the local initiative of Nitra

The initiative "Smart and Innovative Precision Farming" is managed by the Slovak University of Agriculture in Nitra and the Union of Slovak Clusters. Nitra has a strong research background in modern farming methods and is working in close interaction with other research institutions and the Bioeconomy Cluster supporting mainly SMEs. Aim of the project is to establish the university as a strong regional partner in the field of smart farming and to increase the competitiveness of farmers and SMEs in the Danube region.

The AgroBioTech Research Centre (ABT RC) of the Slovak University of Agriculture in Nitra is a university-wide, specialized facility which performs concentrated innovative research in the relevant fields aimed at conducting new methods and procedures in research, especially within applied research, with the express goal of transferring its results into practice.

It was established in 2015 under the project "Creation of the AgroBioTech Research Centre", the Research and Development operational programme, priority axis 2 Support to Research and Development, measure Knowledge and Technology Transfer from Research and Development into Practice.

The ABT RC is equipped with state-of-the-art research infrastructure, thereby enabling the centre to conduct research at the highest level, applicable in practice, and consistent with the core needs of the priorities of agrobiology, the processing technology of agricultural products and the agri-food industry, biotechnology, genetic technologies, agroecology, bioenergetics, and bioeconomy.

The creation of the AgroBioTech RC became a stimulus for carrying out scientific research and development activities of the highest quality with excellent instrumental equipment in a collegial, interdisciplinary, and teamwork-based environment.

The ABT RC is an open workplace. Its infrastructure, i.e. the equipment and personnel of the ABT RC, can be used for research by different departments of the Slovak University of Agriculture as well as by other research and development institutions.

Within the ABT RC a Transfer Centre (TC) has been developed in order to assist researchers and SMEs to cooperate on product, technology and service innovation as well as protection of intellectual rights

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

and further education for professional public. TC has been initiated by Steinbeis Europa Zentrum and was supported with 2 international projects (DTC and NoGAP). Since December 2015 the activities of DTC are coordinated by TC and SUA is co-founder (in partnership with other 8 top scientific institutions) of National Centre for TT (officially established in October 2015). TC/DTC offers services for the whole university, as well as supporting and advisory services for project partners.

DTC Nitra Slovakia was established in 2012 as one of the four pilot centres. Since 2012 its representatives participated in workshops, meetings and trainings which were organized in Stuttgart, Budapest, Nitra and Karlsruhe. They participated also in EUSDR events (Annual Forums, Meetings of the Steering Group of PA8 and Working Group on Innovation and Technology transfer of PA8.

TC was awarded a national prize for the best realized technology transfer in 2016 and a researcher from ABT RC was awarded the national award as a best innovator in 2017.

(Source: NPTT, 2017)

3.4 Relevant policies, stakeholders and initiatives related to this LAP

In 2015 the Slovak Republic has adopted the **Research and Innovation Strategy for Smart and Specialisation Strategy (RIS3)**, whereby one of the priorities is focused on agriculture and food industry. Currently, action plan of the RIS3 is being prepared with strong support of Slovak Agricultural University and Bioeconomy Cluster. The following local action plan could contribute to strengthen the area of smart farming within RIS3.

Implementation of RIS3 in Slovakia is supported mainly by the **Operational programme Research and Innovations (OP R&I)**. It is a joint programme of the Ministry of Education, Science, Research and Sport of the Slovak Republic and the Ministry of Economy of the Slovak Republic for the aid from the European Structural and Investment Funds (ESIF) in the programme period 2014-2020 in the area focused on creating a stable environment favourable to innovation for all relevant actors and to help increasing the efficiency and performance of research, development and innovation system as an essential pillar to boost competitiveness, sustainable economic growth and employment. Priority: Healthy Food and Environment is specifically supporting activities which are relevant for this LAP. (Source: Výskumná agentúra, 2017).

Slovak **Rural Development Programme 2014-2020** (described before) is another essential funding source of Smart Farming practical projects relevant for the LAP.

Bioeconomy Cluster (BEC) is actively engaged in European and national policies, but mainly in networking and supporting the SMEs. The members of the BEC are research centres, the university and SMEs operating in the sector of agriculture, food and also in more sophisticated areas, such as eco-construction, phytopharmaceuticals and bio-polymers.

BEC is active in the Standing Committee of Agricultural Research (SCAR) Strategic Working Group (SWG) for Sustainable Bio-resources for growing bioeconomy and also in the SWG on Agricultural Knowledge and Innovation Systems (AKIS) of the SCAR.

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

In addition, the Bioeconomy Cluster is a member of European Rural Network Assembly – Subgroup on Innovation for agricultural productivity and sustainability, which supports the implementation of the EIP-AGRI in Rural Development Programmes.

At Danube region level, BEC is a member of the Union of Slovak Clusters (UKS) that is a Steering Committee member of PA8 Support of the competitiveness of enterprises, including cluster development.

The local initiative can strongly benefit from all these activities of BEC at the policy level but also from the support for innovative SMEs in Slovakia and internationally.

National Rural Network (NRN) - groups the organizations and authorities involved in rural development. It is focused on the monitoring, analyzing and disseminating of data in the field of rural development, providing information and trainings, etc. In Slovakia, regional offices were established to be closer to the farming and rural community.

The LAP counts on using NRN and their regional offices for further dissemination of its initiatives, projects and results.

Slovak Centre of Scientific and Technical Information (SCSTI) is a national information centre and specialised scientific library of the SR focused on natural, technical, economic and social sciences. The SCSTI is a subsidiary organization (public body) of the Ministry of Education, Science, Research and Sport of the Slovak Republic. It coordinates activities and ensures the operation of interdisciplinary R&D centres and national infrastructures for research, development, innovation and education. It is the host institution of the National Contact Points for HORIZON 2020 and ensures operation of the Slovak Liaison Office for R&D in Brussels. The SCSTI also manages the depository library for the OECD (Organisation for Economic Co-operation and Development), EBRD (European Bank for Reconstruction and Development) and WIPO (World Intellectual Property Organization) and the Centre of Patent Information of the SR – PATLIB.

This institution can contribute to several types of activities relevant for the LAP, particularly in the field of project work.

3.5 Vision of the local initiative

Our mission is to act as a regional centre for applied research, integrating crucial research activities that will allow the centre to achieve a synergetic effect in using and enhancing the research potential of the Slovak University of Agriculture and partner institutions.

The role of the local initiative is to carry out state-of-the-art research, and especially research with a direct impact on social practices, in order to create innovation, develop modern technologies and consulting services for the implementation of academic research, and put development results into practice.

The project can help to achieve several targets identified as urgently needed areas for society, particularly mobilising local actors and answer selected societal challenges, and integrating various

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

stakeholders. It could also address environmental trends and trends of ethical goods and services related to fair trade and food production within the wide scope of social innovation in general.

The pilot initiative will reflect and follow defined thematic objectives that cover the structured approach to social innovation – mostly research, technological development and innovation and education, and partially also employment - by supporting business creation and innovative start-ups in the food incubator, as well as administrative capacity building.

"Our dreams for the future" ☺?

- …to have a national strategy on sustainability of academic research and research centres established with EF contribution…
- …to have real regional and local contribution and interest (not only declared in formal documents)…
- …to be helpful to our agrifood SMEs – they have demonstrated the needs, but "stupid" legal and bureaucracy norms do not enable us to help them!…
- …to act, NOT to survive!...

4 Local Action Plan

4.1 Objective of the Local Action Plan (LAP)

The LAP is one of the instruments to improve framework conditions. It offers a structure to the relevant stakeholders involved and foresees a process of continuous improvement (CIP). As the project evolves, the tasks will be adapted according to the current needs as well as further tasks defined in order to lead to an improved result.

Besides being an instrument for the local initiative the LAP has a central role within the "Made in Danube" project: together with the results of the questionnaire it serves as basis for elaborating a roadmap related to framework conditions. Based on the roadmapping and the policy dialogue results a common strategy will be developed which has the goal to bring R&D results on the market.

4.2 Elements of the Continuous Improvement Process (CIP)

The different steps as shown in Table 1 comprise the following:

1. The process starts with the **definition** of the initiative and its goals. This definition should include the local goals that go in line with the overall goals of the project „Made in Danube".

2. Based on the initiative definition an in - depth **analysis** is made

3. Definition of tasks for local action

4. **Implementation** of tasks for local action

5.**Reflection** on generated results: What are the lessons learned? Where does the initiative need amendments in order to reach the goals?

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

6. **Peer consultation:** Reflection on results is supported by a peer partner. Each of the three local initiatives get support of one of the other local initiatives (on a yearly rotating basis). This support should comprise the discussion of the results, challenges met and innovative solutions found and therefore constitutes an **interdisciplinary learning** process in both directions. Regular meetings within the **DTC network** could serve an opportunity to present and reflect on experiences.

7. **Adaptation**: Based on the results of 5. and 6. a revised and extended tasklist is drawn up. These adaptations could also be a consequence of changes in EU policies.

8. **Reporting:** Local initiatives are often dependent on external support such as financial funding and/ or political support. Hence the report to political decision makers and other support institutions (such as clusters or partner initiatives) is foreseen as part of the process. This step is important to ensure that the legal framework is supportive and sufficient funding is secured, stakeholders are kept informed and the multiplying effect of the initiative is safe-guarded.

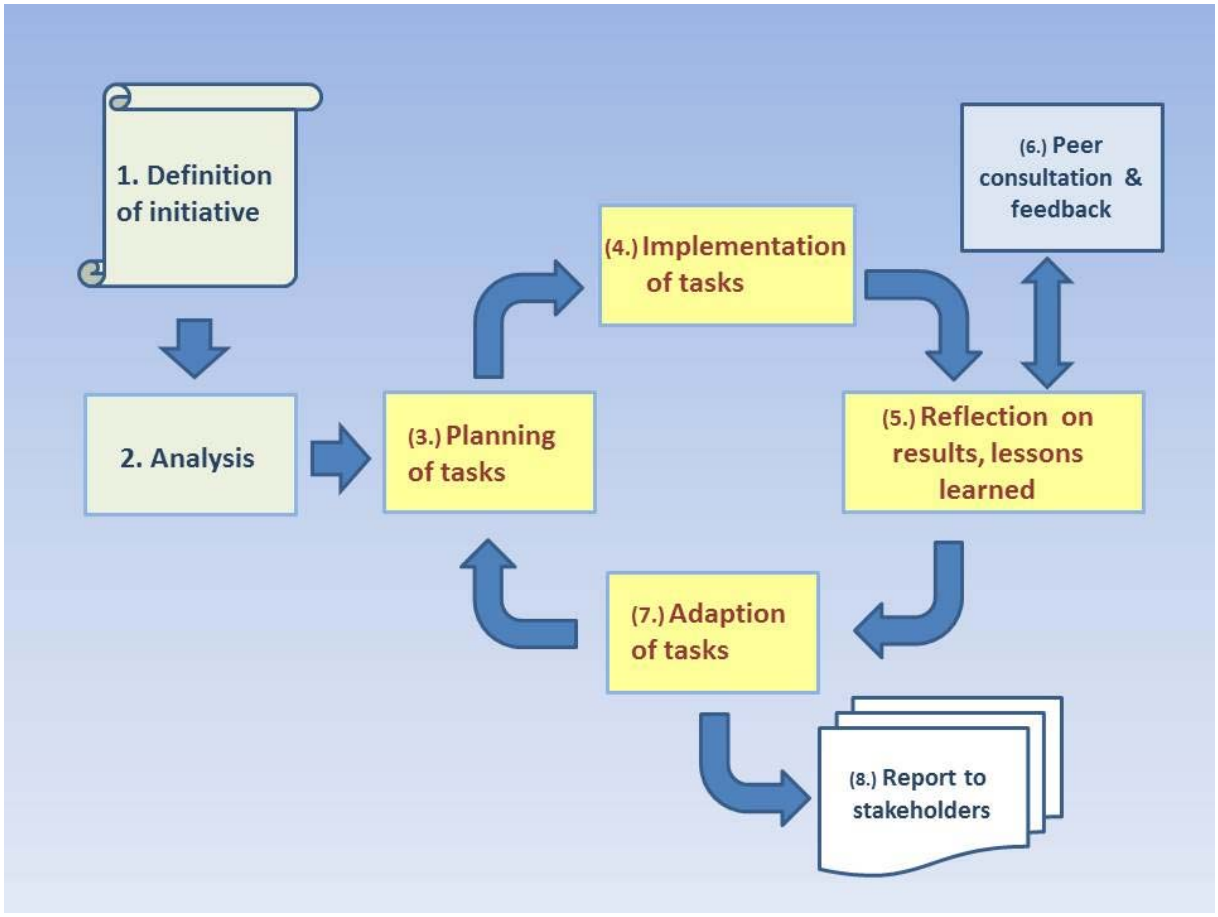

Table 1: Overview Continuous Improvement Process (CIP)

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

In order to ensure a continuous and therefore sustainable process it is crucial to fix the following parameter in each step:

- what should be done
- who should do it
- until when
- which resources are necessary, which are available

4.3 Durability & transferability

As a continuing planning and implementation instrument the process does not end with the report to stakeholders (8.), but goes on with the planning of new and improved tasks (3.). This introduced process strengthens durability and quality standards. Experiences gained in the three local initiatives which serve as pilot areas will serve as basis to develop implementation plans for other initiatives in the Danube region.

4.4 Local Action Plan – Region Nitra

4.4.1 First summary of local situation

During the working meetings with the representative of the local initiative of Nitra the following opportunities, challenges and threats have been identified:

4.4.1.1 Strengths & Opportunities

- strong research background in Smart and Innovative Precision Farming, wide range of practical expertise
- high reputation in the field – accepted partner in cooperation
- know-how of bioeconomy cluster
- highly skilled workforce available

4.4.1.2 Threats

- size of farms differ widely outside of Slovakia
- limited internet access in some regions: approaches have to be adapted accordingly
- agricultural sector is traditionally sceptic to innovations
- relevant forecast models do not exist for agriculture
- farmers often lack budget for bigger investments (for innovative methods)

4.4.1.3 Challenges

- find technological partners that support research projects
- increase competiveness of farmers (SMEs) by:
    - getting new methods known
    - raising awareness about increased profitability of advanced farming methods
    - initiating partnerships and cooperation
- pushing research in the field by winning partners for testing in the field
- data collection and exchange for future development of forecast models

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

4.4.2 Task list Nitra

In order to successfully implement the Local Action Plan for Smart and Innovative Precision Farming the following structure of the tasks have been identified:

During implementation of the local action plan, the most important aspect is of what **nature the task is**. Accordingly **practical actions** with innovative solutions, **human resource and capacity development** actions, **funding opportunities** (schemes), **networking**, and even **strategic/policy documents** will be attributed to it**.**

Second aspect of a task is on **what level it will be performed**. The most of the tasks will be carried out at a local or regional level, however it is important to put the LAP into wider context, also considering the national level, the whole Danube region, EU and for some tasks to even think beyond the EU territory. In general, the tasks performed at the local and regional level should dominate. However, spillover effects to a more international environment should be achieved. Moreover, it is important to follow national, macro-regional, and international policies, apply their instruments and use the networks.

Timing of the tasks is crucial element for its realisation. Tasks will be realised with a short-term, mid-term and long term timeline. Short-term will be mostly within one year and during the "Made in Danube" project duration. Mid-term tasks are considered those planned for the next 2-5 years and are usually linked with EU funding opportunities (projects). Long-term tasks with duration lasting over 5 years will be very likely related to long-term goal of the LAP as well as future policies and strategic documents.
Responsibility is another aspect of successful implementation of the LAP. Specific stakeholders have to be appointed to carry out the task and report to the relevant authority/other stakeholders.

The definition of tasks and responsible persons has to be carried out on a local level in order to ensure that local know-how and expertise is fully taken advantage of. The discussion of tasks and results should involve different stakeholders, such as project and network partners to make the process as efficient and results as sustainable as possible.

Therefore, the task list is not a stand-alone work tool, but one element within the project's activities that serve the overall project goal. When fulfilling a task during the implementation phase, it is important to bear in mind which of the objective(s) should be reached by it.

4.4.2.1 Task 1: Identification of key stakeholders

Brief description: Identification of key stakeholders will be done by conducting interviews with small and medium sized businesses (mainly farmers), regional authorities and research organisations within the "Made in Danube" project as well as outside the project. These activities will be performed in cooperation with National Agricultural and Food Centre, the Bioeconomy cluster and other relevant partner organisations in the Nitra region.

Results expected: Identification of the most relevant stakeholders for the LAP, mainly in Nitra region, Slovakia.

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

Responsible bodies: SUA, UKS
Deadline: 06/2018 and continuous

4.4.2.2 Task 2: Analysis of the regional SME`s innovation capability

Brief description: Once the main actors have been identified, analysis of innovation capabilities of SMEs will be performed through the collection of technology requests, technology offers, and conducting their innovation audits. This will enable the identification of innovation related problems and the needs of the agri-food sector to be further explored. Most of the task will be done within the Made in Danube project.
However, SUA and UKS will benefit also from their own internal databases, previous monitoring and analysis of innovation potential of SMEs done by ABT TC and ongoing questionnaire survey of agri-food SMEs.
Similar task will be performed in other Made in Danube partner countries. Results of those analyses in Danube Region will be compared with results in Slovakia.

Results expected: Innovation potential has been identified at SME level including very specific and practical innovation needs, requests and/or project ideas.
Responsible bodies: SUA, UKS
Deadline: 06/2018 and continuous

4.4.2.3 Task 3: Innovation capability analysis of regional R&D

Brief description: When innovation needs are known (Task 2) it is crucial to search for R&D partners that are able and willing to solve an identified problem. This will be done first on a regional level and then at an international level (if no suitable partner at the regional/national level has been identified). SMEs needs will be matched with identified R&D Technology Offers. DTC TIN-eTool will be used for the international matchmaking of members of the farming community with suitable researchers. During this stage also experts for external consultations of the pilot initiatives shall be identified.

Results expected: Capacities of R&D will identified and matched to the SME needs at the regional level as well as internationally using TIN-etool
Responsible bodies: SUA, UKS
Deadline: 12/2018 and continuous

4.4.2.4 Task 4: Growth of business network of regional players in the Danube Region

Brief description: Strengthening of the cooperation between science and business stakeholders will be managed by the establishment of partnerships with the aim to help solve identified problems of farmers. This task will intensify cooperations within the DTC network in the Danube region and the exchange of know-how and experiences through initiation of new innovation partnership agreements (IPA) and new co-operation agreements (CA). The “Made in Danube” project can benefit from an existing network by bringing the results and outputs of the local action plan to the DTC Network, while the network will help to solve the current problems.

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

Results expected: 5 signed innovation partnership agreements (IPA) + 20 co-operation agreements (CA)
Responsible bodies: SUA, UKS and all "Made in Danube" partners
Deadline: 06/2019

4.4.2.5 Task 5: Identification of the most relevant financial instruments

Brief description: Funding opportunities will be explored: 1) at national level, 2) in the Danube region and 3) at EU level:

1) National level: **Slovak programmes** for Research and Innovation (ESIF) and Rural Development 2014-2020 offer certain possibilities to finance identified projects. **Research and Innovation Programme** (ESIF) will be explored mainly in the areas of voucher schemes, clusters or innovation partnership projects. **RDP** will be monitored with the main focus on the "Co-operation" measure and the operational group establishment within EIP where such projects are expected to be supported.
2) Danube region: Exploitation of **Danube Transnational Programme** – search of international projects that have potential in the relevant area including Seed Money Facility Instrument – the financial supporting scheme provides the support for the development of complex strategic transnational projects. The representatives of LAP should exploit given financial instruments for the development of new projects.
3) EU leve: Exploitation of **EU instruments: COSME, H2020** – representatives of LAP should search not only for the active and future calls but should also look at the running projects with mini-grant schemes within those projects.

As an example: SuperBIO - the innovation project of Horizon 2020, which aims to develop and support at least 10 new, innovative, cross-border and cross-sectorial industrial value chains in the bio-based economy. The project is oriented towards SMEs that want to build innovative value chains and that are interested in innovation services to bring the value chains closer to the market. After the validation of the value chain, SMEs can receive various innovation services with a maximal total value of 60 000€, whereby they need to co-finance 25% themselves (http://www.h2020-superbio.eu/).

Results expected: Identified programmes, specific calls and grant schemes including relevant conditions tailored for the participation of the identified stakeholders.
Responsible bodies: SUA, UKS
Deadline: 06/2018 and continuous

4.4.2.6 Task 6: Pilot implementation of the LAP for Smart and Innovative Precision Farming

Brief description: Pilot project implementation will support raising competitiveness of regional companies, development of products with high added value and development of new technologies. Implementation of identified needs of farmers in smart and innovative precision farming with international expertise should be further disseminated through various means.
The final report on the implementation of the LAP may be the final point of the official "Made in Danube" project, but should serve as a boost for the future activities of the initiative. So, at this stage

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

also new research, development and innovation project ideas could be generated and further explored.

Results expected: Final report on performed activities. New innovative products, technologies or services in place as a result of using smart and innovative precision farming.
Responsible bodies: SUA, UKS
Deadline: 06/2019 and continuous

4.4.2.7 Task 7: Support DTC Network through a follow-up international project

Brief description: In order to support further institutional development of DTC Network (Task 4) analysis of the most relevant financial instruments was conducted under Task 5. Identification of the international programme (COSME, H2020, INTERREG EUROPE or DTP) and specific call should lead to preparation and drafting of a new follow-up project to strengthen and intensify existing partnerships and further exchange know-how and experiences. A Seed Money Facility may be used to prepare a professional proposal.

Results expected: New proposal submitted within an international programme (COSME, H2020, INTERREG EUROPE or DTP).
Responsible body: SUA, UKS
Deadline: 12/2018 and continuous

4.4.2.8 Task 8: Dissemination of knowledge and promotion of actions

Brief description: Dissemination of pilot project results as well as knowledge is an important aspect of the whole project cycle. Dissemination of best practices, information and activities will be done by: 1) **organised events** (workshops and working meetings within the project "Made in Danube" as well as outside), 2) **via the regional office of the Slovak National Rural Network,** and if relevant 3) through the **EIP Network** which would create added value for the entire EU.

Results expected: organised events, presentations, newsletters, other types of dissemination
Responsible bodies: SUA, UKS
Deadline: 06/2019 and continuous

4.4.2.9 Task 9: Strengthening of the Bioeconomy Cluster

Brief description: The Bioeconomy cluster will be closely linked to almost all the project activities and will strongly benefit from the pilot initiative as well as other related activities. This should lead to a strengthening of the Bioeconomy Cluster in various aspects: memberships, national projects, improved benchmarking and certification of the cluster, joining of international partnerships, and enhanced position at the European Cluster Collaboration Platform

Results expected: increasing number of members, new projects, bronze label certification
Responsible bodies: UKS, BEC

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

Deadline: 06/2019 and continuous

4.4.2.10 Task 10: Establishment of AgroBioFood platform

Brief description: "Made in Danube" activities along side with other initiatives in Slovakia should lead to the establishment of the Slovak AgriBioFood Platform with the aim to strengthen the RIS3 strategy and subsequent active participation of LAP stakeholders. Currently, there is no such expert platform in Slovakia, focused on innovative approaches and international co-operation in agri-business sector.

Results expected: Established AgriBioFood Platform active mainly in smart policy issues, international co-operation, bringing business and research together and enhance innovation research results uptake.

Responsible bodies: SUA, UKS

Deadline: 06/2018 and continuous

4.4.2.11 Task 11: To strengthen position of Smart Farming and Bio-economy within the Slovak Smart Strategy (RIS3)

Brief description: Currently a new Action Plan of the RIS3 strategy for Slovakia is being developed. SUA and Bioeconomy Cluster are members of the working group responsible for preparation and commenting a domain "Healthy Food and Environment". It is a great opportunity to include the most progressive ideas and approaches into the most important document for implementation of the OP Research and Innovation. Following the approval of the document specific calls will be launched focused on each domain. This will create a new opportunity for the LAP stakeholders to benefit from the Smart strategy.

Results expected: Approved RIS3 with strong emphasis on smart farming and bioeconomy under the domain "Healthy Food and Environment". Specific calls will be launched under this domain. LAP stakeholders will be actively engagement in the calls and new projects.

Responsible bodies: SUA, BEC

Deadline: 12/2022 and continuous

4.4.2.12 Task 12: Engagement of LAP stakeholders in two National projects of OP R&I

Brief description: National Agricultural and Food Research Centre (NAFC) has prepared two large national projects within OP Research and Innovation with a total amount of 70M EUR. Implementation of the projects "Economically effective and environmentally acceptable agriculture" and "Modernization of the National Centre of agricultural research's infrastructure" offers a great opportunity to LAP stakeholders to create synergies with other activities/ tasks of the project. The projects will be complementary to AgroBioTech Centre which in the medium-term may result in another DTC office. Implementation of most of the project activities will take place in NAFC headquarters which is about 10km from AgroBioTech Centre. This brings an opportunity to form a very strong Agriculture and Food Research Base - not only for the region and country of Slovakia - but for the whole Danube Region. Other tasks of the LAP should link this activities more with relevant partners from the Danube region.

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

Results expected: Improved networking within the country, more efficient use of research infrastructure, mutual exchange of knowledge and enhanced cooperation in Smart and innovative precision farming.
Responsible bodies: SUA, UKS, BEC, AgroBioFood Platform
Deadline: 12/2022 and continuous

4.4.2.13 Task 13: Strengthening of the local capacities in the international environment

Brief description: Strengthening of the local capacities in the international environment and gaining additional international recognition through engagement in international steering committees, working groups, and other relevant bodies:

1) Strengthening of the active participation in PA7 and PA8 of the Danube Strategy
2) Active participation of LAP representatives in SCAR AKIS Network
3) EIP Network, EIP-AGRI, European Rural Networks Assembly Sub-group on Innovation - concrete cooperation at EU level, transfer of knowledge from LAP to EIP network and vice versa, cooperation with other relevant stakeholders, potentially also participation in the project in the area of Smart Farming
4) EIT FOOD – active participation of LAP stakeholders within AgroBioFood platform and subsequent engagement in the RIS3 strategy

Results expected: Membership in various international organisations or bodies, access to information, policy documents, partnerships, etc.
Responsible bodies: SUA, UKS, BEC, AgriBioFood Platform
Deadline: 06/2019 and continuous

4.4.2.14 Task 14: Farmers as a part of European Network of Demonstration Farms

Brief description: PLAID (Peer-to-peer learning: Accessing innovation through demonstration) – the project under Horizon 2020 is designed to encourage farmers and farm employees to embrace innovations in agriculture, leading to greater sustainability of European agriculture, by accessing high quality demonstration activities on commercial farms (http://www.plaid-h2020.eu/).

During the implementation of LAP, the project PLAID that maps and creates a databases of the demonstration farms may be exploited – the local innovative farmers engaged in the pilot initiative will have a chance to become a part of the European Network of Demonstration Farms.

Results expected: Members of the European Network of Demonstration Farms, benefiting from the EU-wide innovation knowledge exchange, possibility to get into a new partnership and project.
Responsible bodies: UKS
Deadline: 06/2018

4.4.2.15 Impact on society – social innovations initiated by the LAP

The various activities realized within the pilot initiative offer possibilities and opportunities for new programmes and projects to be started – especially in the following areas relevant to society:

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

- Social economy: by mixed fundraising (grants, contracts, sales of goods and services) and by creating conditions for new forms of community based services (e.g. the model CSA/Community supported agriculture) and using financial support from ERDF for business advisory services and guidance, premises for start-up centres and incubators (food incubator), and innovations to develop new products and/or services.
- Microfinance: by providing new schemes and instruments for supporting microfinance (in cooperation and collaboration with regional/local government and NGOs (e.g. seed funding, crowdfunding etc.) thus supporting and developing innovative approaches to self-employment and SMEs, particularly those operating in agribusiness.
- Incubation: by establishing the food incubator focused on sustainable innovations in the agrifood sector and on support for start-up companies of young people.
- Workplace innovation: by stimulating results based entrepreneurship and organising round-tables with different stakeholders.
- Regional strategies: by bringing together other actors identified in regional RIS3 strategy (the SUA and its Research Centre ABT are declared as one of key actors in this document) and by linking innovation to the regional innovation strategy.

4.4.3 Peer consultation

First consultation partner for the initiative of Nitra will be the initiative of Vukovar-Srijem County (LAP Sustainable Forestry). In return Nitra will act as consultation partner for the initiative in Novi Sad (LAP Biofuels).

Consultation should take place once a year, the first to be carried out in March 2018, at the occasion of the DTC Meeting in Nitra. A guideline for the consultation and feedback process will be provided by the BOKU beginning of 2018.

4.4.4 Reporting to stakeholders

A regular reporting to external stakeholders is recommended. This reporting serves the initiative to be known, appreciated and supported by local decision makers. Besides it can be seen as a door opener to additional funding and a strengthening of the regional network.

In the case of the LAP on Smart and innovative precision farming in the Nitra Region reporting and dissemination will be done at four levels:

National Rural Network and its regional offices will take care of dissemination of outcomes, results, and impacts of the LAP in the region to the most relevant stakeholders - **farming community and SMEs**.

Nitra Region Authority will be informed through the University Board (SUA) where the chairman of the Nitra Region is a member and vice-chairman of the Board.

The Slovak **Ministry of Agriculture and Rural Development** and the **Ministry of Education, Science, Research and Sport** will be informed by individual partners (SUA, UKS and BEC) and newly formed AgroBioFood Platform.

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

Currently there are several active means to inform the top representatives of both Ministries: a) the rector of the SUA is an advisor to the Prime Minister in Agricultural matters,
b) UKS member is an evaluator at the Slovak RDP, its responsibility is to monitor but also bring recommendations to the RDP,
c) UKS is a member of the Monitoring Committee for OP Research and Innovation,
d) SUA and BEC are members of the working group for RIS3 domain Healthy Food and Environment.

At the Danube region level, representatives of the Priority areas (mainly PA8, PA7 and PA6) will be informed during the Steering Committee meetings, working group meetings, or Danube Annual Forum where future international cooperation will be discussed, too.

The **European Rural Network Assembly** is also a great opportunity to inform relevant external stakeholders internationally as well as at the national level, since all member states are represented in the assembly, covering broad spectrum of relevant bodies: Management Authority, Paying Agency, Local Action Group, National Rural Network, Research organisation, and Advisory body.

4.5 Supporting Tools to the Local Action Plan

The realisation of the local action plan can be supported by numerous activities and instruments. In the following two of them are listed:

4.5.1 Innovative financial instruments

Prerequisite for the development and implementation of new and innovative methods is the funding of such activities. Information on innovative financial instruments and possibilities of their use in the transfer of knowledge and technology transfer can be found in more detail in this paper:

Moravčíková, D., Ilková, Z. & Štefeková, P. (2017). Legal and Financial Instruments Supporting the Innovation and Technology Transfer. EU agrarian Law, 6(1), pp. 18-28. (https://www.degruyter.com/view/j/eual.2017.6.issue-1/issue-files/eual.2017.6.issue-1.xml)

4.5.2 TIN eTool

The DTIC (Danube Transnational Innovation Cooperation) e-tool is a specialized online platform that can be used by actors operating in bio-economy in the Danube Region, interested in converting research and innovation into applicable and market successful solutions. The instrument is available to any interested potential user under the following link:

http://www.muri.utcluj.ro/tin-etool/index.php?page=login

Here users can create an account and start exploring its functions, on an individual scale or as a group of potentially related organizations, such as the LAPs.

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

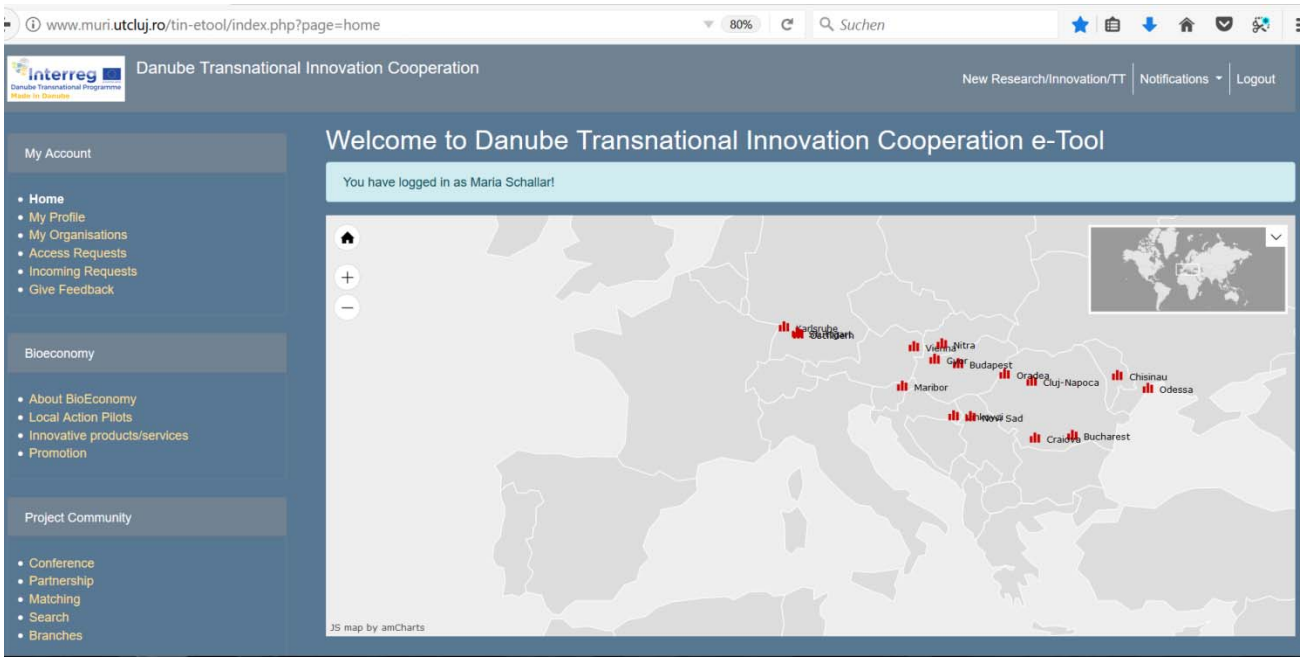

Figure 1: Screenshot TIN eTool: Welcome page

Among the most important features of the platform, the users will be able to present their knowledge offer and search for requests that match their interests and capabilities. They will be able to establish partnerships online and initiate direct collaboration or common involvement in project consortia. Also, within the platform there will be available instruments to help strengthen cooperation within the LAP, such as audio conferencing and project monitoring.

For a better connection to the developments in the field of bio-economy, the platform has a specialized section with information about the project, the LAPs, the specific tools developed by the "Made in Danube" project as well as a promotion and dissemination outlet. Also, the DTC is connected to relevant European data streams that provide useful news with applicability in their own settings. With continuous update and consistent use, the platform will offer the user organizations a quick and effective connection to a network of partners and knowledge that could help them be more competitive and achieve their missions better and have more impact.

Figure 1 and the following images show how the Tin eTool will look like:

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

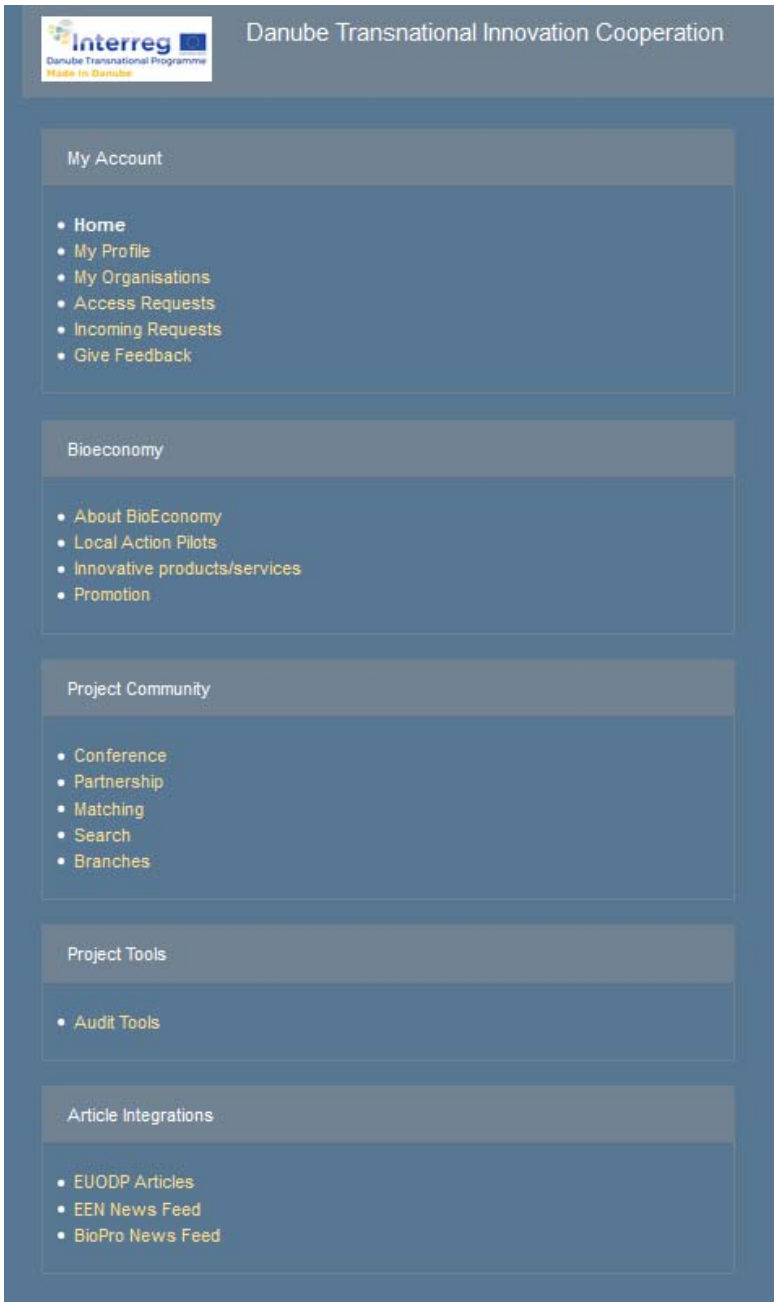

Figure 2: Screenshot TIN eTool: Menu sidebar

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

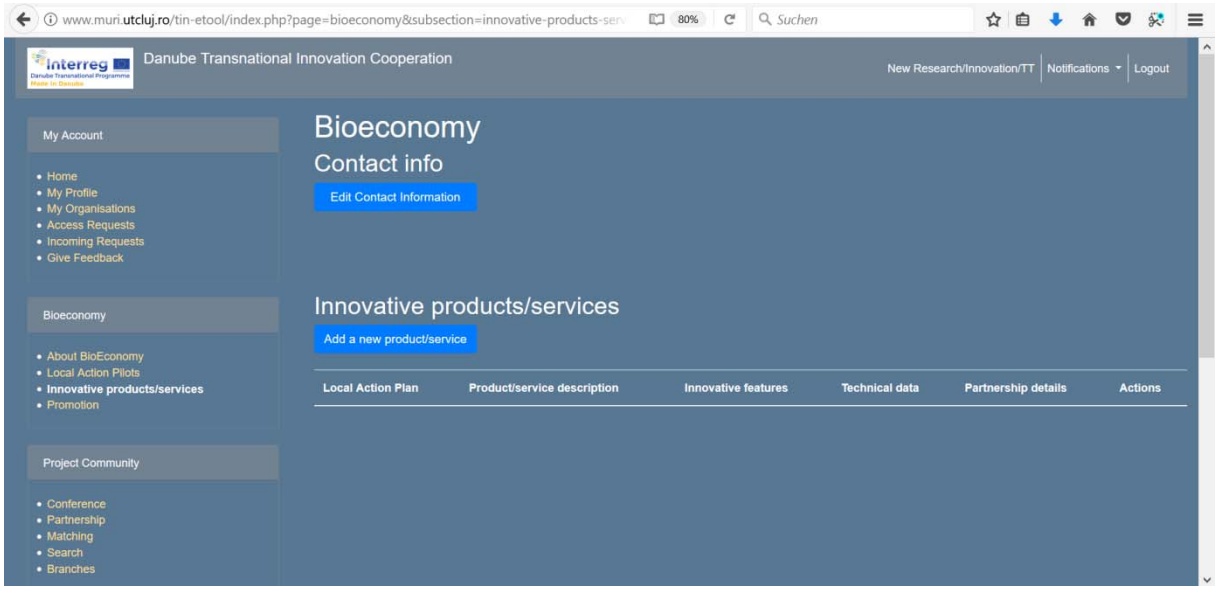

Figure 3: Screenshot TIN eTool: Offering innovative products/services

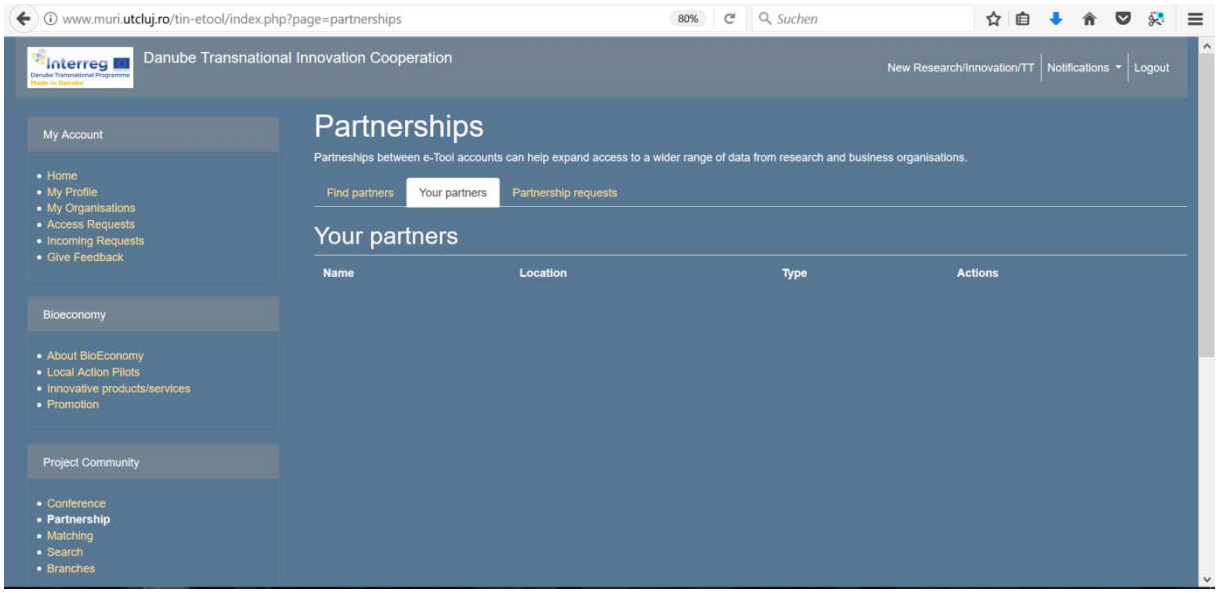

Figure 4: Screenshot TIN eTool: Searching for partners, building partnerships

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

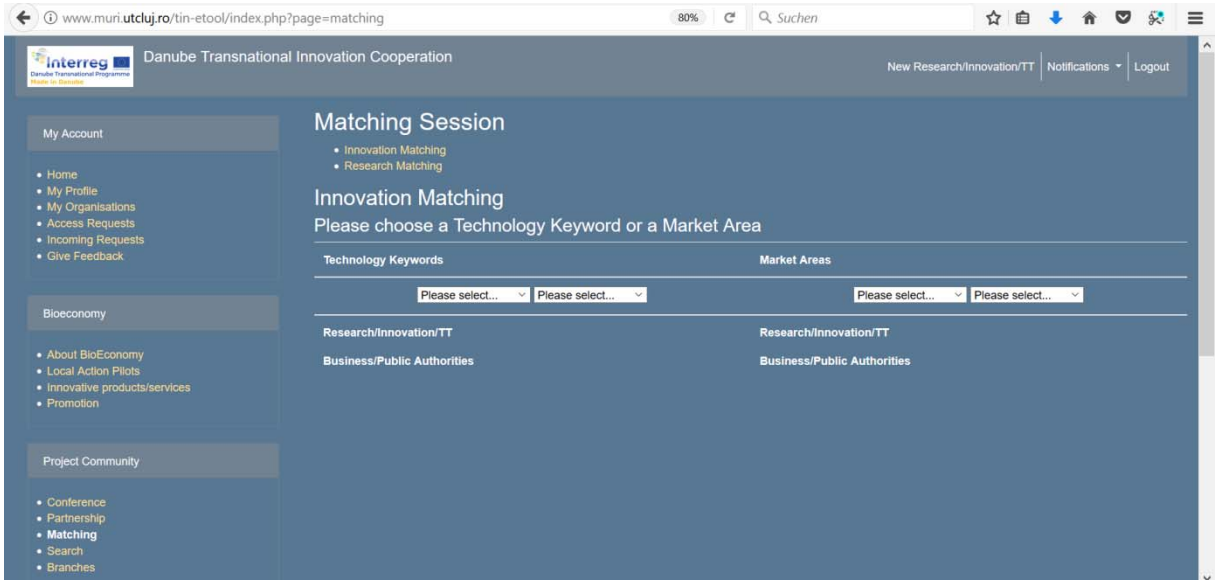

Figure 5: Screenshot TIN eTool: Innovation Matching

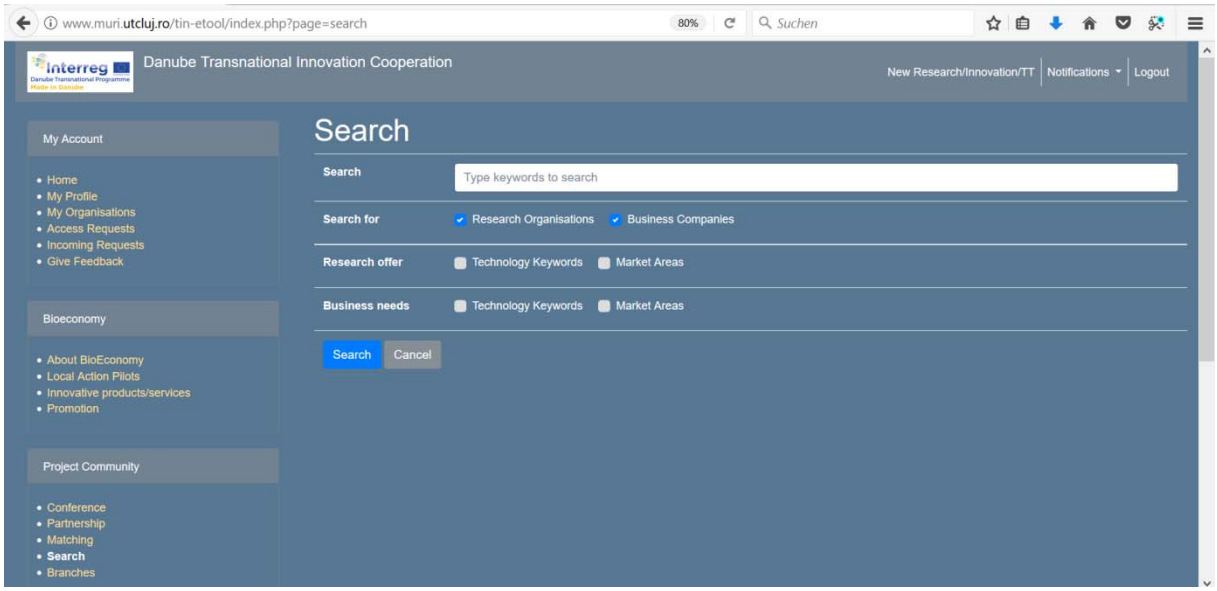

Figure 6: Screenshot TIN eTool: Search function

The DTIC platform is available to all potential stakeholders of the project within the Danube Region and the bio-economy field. The foreseen dissemination is to start with the project consortium members and then their collaborators within and outside of the project and to move outwards in concentric circles for the future use of the e-tool.

Any company, university, research institution, technology transfer office, public authority or other stakeholder in the area will have the possibility to access the tool and create profile, offers or requests for knowledge. Based on these and on their partnership and confidentiality preferences they will have

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

the capability to initiate new partnerships, projects, and contracts. These collaborations can be made either for research, innovation, product development or capacity building purposes. In this case this refers directly to the collaboration in the sector of the Precision farming, but this also refers to the other LAPs as well.

5 Conclusions and Recommendations

The LAP for Smart and Innovative Precision Farming comes with many opportunities to strengthen innovative approaches at the farm level, to enhance cooperation between the research and the farming community, to improve national (smart) policies and to encourage international cooperation.

Engagement and close **cooperation** of the most relevant stakeholders at regional, national and international level will be crucial and is needed to achieve expected results.

It is obvious from the document that there are **many financial possibilities** to support individual tasks and projects. However, only optimal **coordination of the partners** and their activities may lead to a successful implementation.

Moreover, commitment is not needed not only in drafting new projects. Assistance in **improving policies, strategies and programs** is needed, too.

Development of **institutionalization and capacity buildings** through the Bioeconomy Cluster and the AgriBioFood Platform will help to ensure the **sustainability** of the LAP activities. Added value can be gained by active participation in the European Rural Network Assembly, SCAR AKIS strategic working groups and PA8, 7 and 6 of the Danube Strategy.

The LAP offers number of opportunities for **transferability** of individual actions or systematic approaches not only to other Slovak regions but to the whole Danube Region and even beyond.

Dissemination of the LAP results will be crucial, going from local level, through reporting to national level in policy issues, up to the international level, to cooperations in the Danube region and the whole EU.

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube

6 Bibliography

AIOTI (2017): The Alliance for Internet of Things Innovation. https://aioti.eu/.

CSF (2017): LEADER 2014-2020. https://www.netzwerk-laendlicher-raum.de/leader/leader-2014-2020/.

EIP (2017): European Innovation Partnership 'Agricultural Productivity and Sustainability' . https://ec.europa.eu/eip/agriculture/en/european-innovation-partnership-agricultural.

EIP-AGRI (2017): Shaping the digital (r)evolution in agriculture. (https://ec.europa.eu/eip/agriculture/sites/agri-eip/files/eip-agri_brochure_digital_revolution_2017_en_web.pdf.

EIP FG (2017): EIP Focus Groups. https://ec.europa.eu/eip/agriculture/en/focus-groups/mainstreaming-precision-farming.

ENRD (2017): European Rural Networks Assembly. https://enrd.ec.europa.eu/about/european-rural-networks-governance/european-rural-networks-assembly_en.

EUSDR (2017): Action Plan. Accompanying document to theEuropean Union Strategy for the Danube Region. https://www.danube-region.eu/component/edocman/action-plan-eusdr-pdf.

JRC (2017): Joint Research Centre of the European Commission: Scientific support to Danube strategy. https://ec.europa.eu/jrc/en/research/crosscutting-activities/danube-strategy.

RDP (2017): Rural Development Programme. https://ec.europa.eu/agriculture/rural-development-2014-2020_en.

MiD (2016): “Made in Danube: Project Proposal” Interreg Danube Transnational Programme

NPTT (2017): National technology transer portal (Information available only in Slovak language). http://nptt.cvtisr.sk/sk/podujatia/cena-za-transfer-technologii-na-slovensku.html?page_id=1259

smart AKIS (2017): What is smart farming?. https://www.smart-akis.com/index.php/network/what-is-smart-farming/.

smart AKIS 2 (2017): https://www.smart-akis.com.

Výskumná agentúra (2017): Operational Programme Research and Innovation. http://www.vyskumnaagentura.sk/en/opvai.

Project co-funded by European Union funds (ERDF, IPA)
Project webpage: www.interreg-danube.eu/made-in-danube