

# D3.2. Smart-AKIS Regional Report

Serbian Innovation Hub



## Document Summary

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## Abstract

This report presents the results derived by the 3 Regional Innovation Workshops organised in Serbia.

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## 1. Executive Summary

### *Description of the partners involved in the process at regional innovation hub level*

**BioSense Institute** was in charge for organization of all three regional workshops as well as for organization of transnational workshop. BioSense Institute is an internationally recognized multi-disciplinary scientific research institute and a regional provider of advanced information and communication technologies (ICT) in agriculture and environmental monitoring.

### *Short description of the findings on the use of SFTs at regional level resulting from WP2 survey*

During the interview process, we noticed that farmers can objectively assess the weaknesses in their production and segments for improvement. Despite, farmers showed medium level of understanding which technologies can address their issues, due to their non-technical education and mindset that is *a priori* against changes in working routine. Table below presents statistics from WP2 (extracted just results from Serbia):

SFT group (as described and used in WP2)	% of interested interviewees
<b>Robots and autonomous machines</b>	32.4%
<b>Drones and their data</b>	5.4%
<b>Connected tools (data acquisition and automatic upload)</b>	27%
<b>Combination of GPS, setting data, and attached machines</b>	10.8%
<b>Agricultural apps</b>	24.3%

*Table 1: Preferences of farmers (on interview, related to WP2)*

Most farmers are owners of small parcels (in the survey 54.1% were farmers who held parcels between 2 and 10 ha). Regarding technologies, the majority stated that they are using old farm machinery. When we were discussing about barriers, farmers highlighted the price of the technologies as the biggest obstacle, followed by small size of parcels and level of complexity for adoption of SFTs, respectively: 81.3% ; 18.8% and 9.4%.

### *Short description of SFTs selected from WP1 inventory*

**IrrigNET:** The main purpose of the service is to provide information on when and how to irrigate monitored fields. It takes field measurements (soil moisture), specific needs of the plant, type of the soil, type of the irrigation system used and the local weather forecast (forecasted rainfall) to produce instructions on whether or not to irrigate and if yes how to do it.

**Calibration free microwave soil moisture sensor** - Sensor is intended for in situ measurements and it can provide ground truth data for remote soil moisture measurement methods

**Remotely Operated Mobile Robotics System for Irrigation and Management of NATural Resources in Smart Farming** - Mobile robotic solar electric generator MobiSun is a modern, automated device for the production of electricity (power) using the inexhaustible solar light energy. Basically, it is a two-axis robotic mechanism which is used to rotate the three light-sensitive photovoltaic panels, which are mounted on a standard passenger car trailer that allows easy mobility and quick change of location.

**AgroDrone, Velaware** - The main objective of AgroDrone system is to produce more and better quality products with less resource investment.

**Agriculture Remote Aerial Sensing, Logit** - AREAS (Agriculture Remote Aerial Sensing) is part of Precision Agriculture that uses remote sensing for surveying large farm areas, gathering large amount of data in near real-time manner, and processing and analysing data using statistical methods and machine learning algorithms. The results produced from data provide to end users (farmers) explained basis for timely decision making.

**Advisory platform for small farms based on earth observation, H2020** - Earth Observation (EO) refers the collection of information about our planet, using remote sensing technologies such as sensors mounted on satellites or drones. The European Union's Copernicus programme provides EO data freely and openly for use by policy-makers, citizens and businesses alike. APOLLO makes full use of this invaluable resource, as well as drawing on other sources of globally available data.

Remote sensing data from sensors on Earth Observation satellites have demonstrated their potential to measure soil moisture quantitatively on bare surfaces and those covered by short vegetation. Thanks to their ability to operate in all weather conditions and to wide coverage, data from Synthetic Aperture Radar (SAR) offer the opportunity to monitor large areas with a high spatial resolution. The use of SAR images, such as those captured by the Copernicus programme's Sentinel-1, can provide a precise estimation of the surface soil moisture.

**Crops mapping using electro-magnetic probe** - EM is a measure of the ability of the soil to conduct electricity. An electrical current may be conducted through the soil via three pathways: the pore-connected soil solution of water and ions, the captions that are bound of the surface of the clay particles, connected solid soil particles. Because of these three pathways, there are a number of soil attributes that will affect the soil's ability to conduct electricity. These are: soil texture, soil moisture, soil cation, ions in the soil solution, soil temperature.

**alertNET** - The main purpose of the alertNET service is to help farmers to prevent plant diseases and hence protect the yields and the profit. It takes field measurements (air temperature and humidity, leaf wetness and precipitation) as the input to specific prediction models of pest and disease appearance and generates instructions on when and what type of pesticides to use.

**trapNET** - The aim of the service is to help farmers in managing the population of insect in order to avoid their overpopulation, thus protecting the quality of the crops and increasing the yields. It combines automatic acquisition of images taken in pheromone traps deployed in the fields with the advance image processing algorithms to count the number of insects caught. trapNET uses pheromone strips and cameras embedded into traps. Each trap can cover up to 5 hectares of the field.

**boxNET** - is a comprehensive solution for asset management optimized for use in agriculture. It enables real-time asset control and management and thus enables process improvement and reduction of costs.

**DroneAgro toolbox, IN2** - Sample planner is mobile application that enables collection of geo-referenced visual data. (pictures). Based on activities defined in other tools (ie. NDVI report) it's easy to collect visual data based on predefined task list related to critical area. Also it could be done just by scouting thru the field and identifying critical areas that needs to be collected/recorded by the Sample planner app. Once collected the data could be presented on the map with the right coordinates that gives better insight on the inspected plant.

#### *Short description of the communication strategy followed to engage target groups*

BioSense Institute used its well-developed and proved to be successful channels for events promotion, namely its social media channels, newsletter and mailing list. In addition, the institute developed a strategy for sending personalized emails to relevant stakeholders and make phone calls to target groups and citizens that are more familiar with this type of communication (e.g. farmers).

#### *Summary of main findings from RIWs*

The conclusions from D2.2 in WP2 and in RIWs in Novi Sad were confirmed. The additional needs of farmers' community in Serbia that emerged were regarding the lack of information and the need for trainings. During the panel discussion, farmers expressed the lack of source of information on technologies that could improve their work routine. The information they would like to have can be divided in two big groups: Group 1 – financial issues (e.g. implementation cost, ROI, potential subsidies...) and Group 2 – technical issues (e.g. the level of complexity, needed time for adjustments, needed trainings/instructions).

When it comes to trainings, farmers expressed the willingness to take part in various trainings organized both by advisory services (state owned) and by private multinational companies that are providing machinery to our market. Another possible solution is to establish a demonstration farm(s) that will serve as an open air show-room for ag technologies.

#### *Summary of main recommendations*

If stakeholders' needs and expectations are analysed and results are transferred into potential action which will address those needs, we can extract two main recommendations:

- to establish demonstration farms where people will be able to see/touch/explore technologies in their real environment. The technology experts (SFT providers / importers / distributors) must be at disposal for explanations and clarifications. Some free testing (or similar freemium models) were also discussed.
- in Vojvodina region it was stressed that more workshops like Smart-AKIS RIWs are needed, where both research community as well as commercial companies will present their work and initiate collaboration with agricultural producers.

#### **Dates and attendance of target groups to the three Regional Innovation Workshops:**

Regional Innovation Workshops	Place and date	Nº of participants (and type)
1 <sup>st</sup> RIW	Novi Sad, 14.03.2017.	47 (Industry: 10, research: 10, farmers:23; extension services: 4)
2 <sup>nd</sup> RIW	Novi Sad, 17.05.2017.	52 (farmers: 24; Industry: 7; Extension services: 6; R&D: 4; Policy: 11)
3 <sup>rd</sup> RIW	Novi Sad, 01.03.2018.	22 (farmers: 11; Industry: 2; extension services: 1; R&D: 2; Policy/Funding provides: 6)

#### **Summary of the results of the Regional Innovation Workshops, following this table:**

KPI	Result
Nº of stakeholders participating in RIWs	121
Nº of SFT solutions presented in RIWs	15
Nº of SFT solutions adopted by practitioners	0*
Nº of project ideas captured	21
<i>Nº of INNOVATION project ideas</i>	<i>11</i>
<i>Nº of TECHNOLOGY TRANSFER project ideas</i>	<i>4</i>
<i>Nº of MARKET UPTAKE project ideas</i>	<i>7</i>
Nº of multi-actor projects funded	0
Nº of multi-actor cross-border projects started	0*

\* - no information

## 2. Innovation Process

### Communication Strategy

- Description of communication channels mix used to disseminate call to Regional Innovation Workshops:
  - Website: official Smart-AKIS web site; official BioSense Institute web site
  - Newsletter: /
  - Magazine: /
  - Social media: Facebook and Twitter of BioSense Institute (example: <https://www.facebook.com/biosense.institute/posts/1437257849713525>  
<https://www.facebook.com/biosense.institute/posts/1118978921541421>  
<https://www.facebook.com/biosense.institute/posts/1179997188772927> )
  - Presentation at other events: Drone Fest, demonstration days of Delta Agrar company (spring 2017)
  - Other organisation channels: /
  - Telephone calls to key target groups: conducted, no physical evidence

- Registration tools used to register in advance participants to workshops (email, telephone, Google Form, etc).

BioSense used Eventbrite software (for example: [https://www.eventbrite.com/e/poljoteh-inovacijom-ka-odrzivoj-poljoprivredi-tickets-32180504756?utm\\_source=eb\\_email&utm\\_medium=email&utm\\_campaign=order\\_confirmation\\_email&utm\\_term=eventname&ref=eemailordconf#](https://www.eventbrite.com/e/poljoteh-inovacijom-ka-odrzivoj-poljoprivredi-tickets-32180504756?utm_source=eb_email&utm_medium=email&utm_campaign=order_confirmation_email&utm_term=eventname&ref=eemailordconf#) )

In addition, we used our email database for personal invitations.

- Additional communication activities carried out in order to ensure a high level of participation. Personalized email to farmers, farm cooperatives and IT community – invitations to register and be actively involved in Platform.

- Calendar of RIWs and number of participants.

Regional Innovation Workshops	Place and date	Nº of participants per group: users (farmers, coops and agrifood industry), SFT industry, research, advisors & others (policy, etc.)
1 <sup>st</sup> RIW	Novi Sad, 14.03.2017.	47 (Industry: 10, research: 10, farmers:23; extension services: 4)
2 <sup>nd</sup> RIW	Novi Sad, 17.05.2017.	52 (farmers: 24; Industry: 7; Extension services: 6; R&D: 4; Policy: 11)
3 <sup>rd</sup> RIW	Novi Sad, 01.03.2018.	22 (farmers: 11; Industry: 2; extension services: 1; R&D: 2; Policy/Funding provides: 6)

### Target Groups needs and expectations

- Findings from regional farmers' needs surveyed in WP2 that have been taking into consideration for:
  - The selection of the SFTs to be showcased in the RIWs: On the first Regional Innovation Workshop, we have presented four out of five technology groups. We decided to present three groups which were most interesting to farmers (according to WP2 report) and one that Hub considered to be very helpful and with high potential to simplify their working procedures. Namely, presented technologies belong to following groups (as described and used during the interviews with farmers): Robots and autonomous machines, Connected tools, Agricultural apps, and Drones.

- The definition of the target groups to address on RIWs: Serbia Hub decided to invite agricultural producers regardless on their production type (conventional / organic), and regardless on their farm size. Additionally, we wanted to involve all cropping systems covered by Smart-AKIS project.
- The definition of the programme or agenda of RIWs: We followed provided inputs and guidelines for RIWs. Therefore, first two RIWs were focused on SFTs, introduction of different technologies to farmers and fostering innovation among invited groups, while the third one was dedicated to funding schemes that are available to farmers. Beside this, the third workshop was dedicated finalization of ideas generated in previous iterations of Smart-AKIS workshops.

### **Selection of Smart Farming Technologies**

- Description of the method followed to select Smart Farming Technologies (SFTs) of interest to the regional stakeholders.
  - On the first Regional Innovation Workshop, we have presented four out of five technology groups. We decided to present three groups which were most interesting to farmers (according to WP2 report) and one that Hub considered to be very helpful and with high potential to simplify their working procedures. Namely, presented technologies belong to following groups (as described and used during the interviews with farmers): Robots and autonomous machines, Connected tools, Agricultural apps, and Drones.
  - Based on our experience gained through RIW1, for RIW2 we decided to give a short overview on all technologies and to introduce farmers with as many different types of technologies as possible. The root for this decision can be found in fact that farmers' community in Serbia is familiar just with several types of technologies, mainly through promotions made by commercial companies. We noticed that farmers can identify their problems and needs very precisely but cannot find the solutions that can address those needs. Therefore, after introductory presentations we organized a panel discussion where representatives of academia, government (both regional as well as state) and industry gave their opinion regarding the adoption of advanced technologies in agriculture. This was of great importance for our participants because they heard first-hand information regarding state-of-the-art technologies, research results and State plans for support agricultural production
- Listing of SFTs presented at the workshops:

Nº	Name of SFT	SFT Category	Cropping system	Purpose
1	IrrigNET	• Product	<ul style="list-style-type: none"> <li>• Arable</li> <li>• Tree</li> <li>• Vegetables</li> <li>• Vineyards</li> </ul>	• Farm management information system
2	Calibration free microwave soil moisture sensor	• Research result	<ul style="list-style-type: none"> <li>• Arable</li> <li>• Tree</li> <li>• Vegetables</li> <li>• Vineyards</li> </ul>	• Mapping/recording
3	Remotely Operated Mobile Robotics System for Irrigation and Management of NATural Resources in Smart Farming	• Research result	<ul style="list-style-type: none"> <li>• Arable</li> </ul>	• Robot or smart machine
4	AgroDrone, Velaware	• Product	<ul style="list-style-type: none"> <li>• Arable</li> <li>• Tree</li> <li>• Vegetables</li> <li>• Vineyards</li> </ul>	• Mapping/recording



Nº	Name of SFT	SFT Category	Cropping system	Purpose
5	Agriculture Remote Aerial Sensing, Logit	• Product	<ul style="list-style-type: none"> <li>• Arable</li> <li>• Tree</li> <li>• Vegetables</li> <li>• Vineyards</li> </ul>	• Mapping/recording
6	Advisory platform for small farms based on earth observation - APOLLO	• Project	<ul style="list-style-type: none"> <li>• Arable</li> <li>• Tree</li> <li>• Vegetables</li> <li>• Vineyards</li> <li>• Grassland</li> </ul>	• Mapping/recording
7	Optical Methods for plant health status	• Research result	<ul style="list-style-type: none"> <li>• Arable</li> <li>• Tree</li> <li>• Vegetables</li> <li>• Vineyards</li> <li>• Grassland</li> </ul>	• Mapping/recording
8	AlertNET	• Product	<ul style="list-style-type: none"> <li>• Arable</li> <li>• Tree</li> <li>• Vineyards</li> </ul>	• Farm management information system
9	TrapNET	• Product	<ul style="list-style-type: none"> <li>• Arable</li> <li>• Tree</li> <li>• Vegetables</li> <li>• Vineyards</li> </ul>	• Farm management information system
10	BoxNET	• Product	<ul style="list-style-type: none"> <li>• Arable</li> <li>• Tree</li> <li>• Vegetables</li> <li>• Vineyards</li> <li>• Grassland</li> </ul>	• Farm management information system
11	Crops mapping using electro-magnetic probe	• Research result	<ul style="list-style-type: none"> <li>• Arable</li> <li>• Tree</li> <li>• Vegetables</li> <li>• Vineyards</li> </ul>	• Mapping/recording
12	Selection of adequate seeds	• Research result	<ul style="list-style-type: none"> <li>• Arable</li> </ul>	• -
13	DroneAgro toolbox – IN2	• Product	<ul style="list-style-type: none"> <li>• Arable</li> <li>• Tree</li> <li>• Vegetables</li> <li>• Vineyards</li> <li>• Grassland</li> </ul>	• Mapping/recording
14	BioSense Institute (description of all 5 groups of technologies)	• Products / research results	<ul style="list-style-type: none"> <li>• Arable</li> <li>• Tree</li> <li>• Vegetables</li> <li>• Vineyards</li> <li>• Grassland</li> </ul>	• -
15	South Hansa – presentations of solutions available in Serbia (Crop Recording, Disease	• Products	<ul style="list-style-type: none"> <li>• Arable</li> <li>• Tree</li> <li>• Vegetables</li> <li>• Vineyards</li> <li>• Grassland</li> </ul>	• -

Nº	Name of SFT	SFT Category	Cropping system	Purpose
	management, TerraSen and Irrigation management)			

### **Sources of funding for Project Ideas**

Description of the sources of funding identified at regional and national level for the potential funding of multi-actor collaborative projects to be listed on the following tables:

## Funding source – grants and open calls

N <sup>o</sup>	Name of grant (and link)	Funding body	Geographical scope	Eligible projects*	Eligible beneficiaries	Eligible expenses	Aid intensity (%)	Coming deadlines	Other info
1	IPARD <a href="https://ec.europa.eu/agriculture/enlargement/assistance/ipard_en">https://ec.europa.eu/agriculture/enlargement/assistance/ipard_en</a> <a href="https://ipard.co.rs/index-l.html">https://ipard.co.rs/index-l.html</a>	European commission - Instrument for Pre-Accession Assistance in Rural Development.	National	Investment grant for equipment modernisation	Agricultural holdings from Serbia	<ul style="list-style-type: none"> <li>Construction works</li> <li>Craft works</li> <li>Equipment and machinery</li> </ul>	Up to 70%	<ul style="list-style-type: none"> <li>28.05.2018.</li> <li>August 2018</li> </ul>	-

\*General individual and collaborative R&D&I projects, agri-food specific R&D&I grants programmes, Operational Groups Calls under RDPs, Innovation vouchers for the purchase of external expertise, Proof of concept support for research results, Investment grant for equipment modernisation, Public procurement process.

## Funding source – financial instruments

N <sup>o</sup>	Name of programme (and link)	Funding body	Geographical scope	Instrument category*	Eligible beneficiaries	Financial aid support	Coming deadlines	Other info
1	KATANA <a href="https://katanaproject.eu/">https://katanaproject.eu/</a> <a href="https://katanareward.opencircleproject.com/">https://katanareward.opencircleproject.com/</a>	EC (through BioSense Institute)	International	Crowdfunding platform	SMEs	2000€ travel voucher - 100.000€ prize for 10 winning consortia	Finished	-
2	DIATOMIC <a href="https://diatomic.eu/">https://diatomic.eu/</a>	EC (through BioSense Institute)	International	Incubation service for start-up	SMEs, Mid-caps and Competence centres	Up to 200.000€ per project	15.06.2018.	-
3	IoF2020	EC (through	International	Acceleration	IoT technology	Up to	30.09.2018.	-

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	<a href="https://www.iof2020.eu/opencall">https://www.iof2020.eu/opencall</a>	BioSense Institute)	national	incubation service for, spin-off and entrepreneurs on agri-food sector	providers, service integrators, end-users	500.000€ per project/consortia	018.	
4	Development Fund of Vojvodina <a href="http://www.rfapv.rs/">http://www.rfapv.rs/</a>	Government of AP Vojvodina	Local	loans	Agricultural households	800€ - 42000€ (in RSD)	Constantly opened	-
5	Guarantee Fund of the Autonomous Province of Vojvodina <a href="http://garfond.rs/%D0%BA%D0%BE%D0%BD%D0%BA%D1%83%D1%80%D1%81%D0%B8/">http://garfond.rs/%D0%BA%D0%BE%D0%BD%D0%BA%D1%83%D1%80%D1%81%D0%B8/</a>	Government of AP Vojvodina	Local	warranties	SMEs, agricultural cooperative, entrepreneurs in the field of agriculture – all operation in Vojvodina	3000€ - 150.000€	Constantly opened	-

\*Acceleration/incubation service for start-up, spin-off and entrepreneurs on agri-food sector, financial instruments: equity (seed capital), loans, warranties; crowdfunding platform, prize/challenge contest.

### Funding source – other instruments and tools for supporting multi-actor collaboration

Nº	Name of programme (and link)	Promoter body	Geographical scope	Eligible collaborations *	Eligible beneficiaries	Eligible expenses (if any)	Aid intensity (%)	Coming deadlines (if any)	Other info
			National, regional, local			• %			

\*Own experimental programmes from advisory services, technical institutes, agricultural departments or farmers associations, coops or unions; agreements between advisors/technical institutes or farmers/coops and private companies to develop/demonstrate/test SFTs; peer-to-peer learning: early adopters support laggards in SFT uptake.

### 3. Findings

*<Please, conduct a joint analysis of the outcomes of the three RIWs on the following points>.*

#### 3.1. Identification of barriers and incentives for adoption of SFTs

During RIWs in Serbia a number of barriers that disable adoption of SFTs in Vojvodina, Serbia were identified. For easier analysis, we have divided them in two main groups, based on group of stakeholders that indicated barriers.

**From farmers point of view:** Most of barriers for adoption of SFTs are related to size of agricultural parcels. One of the eye-catching characteristics of Serbian agriculture are small parcels and very noticeable fragmentation of agricultural land. The consequences can easily be seen in the low level of technologies adoption and advanced solutions, due to small production volume. Another important barrier is an insecurity in land lease process, which has its implications on machinery usage, plans for rent and investment strategy of agricultural producers. In addition, farmers pointed out the lack of information regarding smart technologies they could use in their practice.

**From SFTs' provider point of view:** Farmers are very rigid to new technologies and reluctantly agree on any kind of changes. According to SFT providers, farmers have a lot of prejudices about technologies, on the first place that they are expressive and complicated for use. Providers of agricultural solutions agreed that farmers are unwilling to participate in pilot-projects where their only input would be in providing fields for testing of the equipment (free of charge).

The comment that both groups agreed on is that Serbia needs **more demonstration activities** during the winter period (end November – end of January) where smart solutions for agricultural production can be presented in a way appropriate to end-users.

#### 3.2. Interest on existing SFTs – most demanded SFTs

Technology that provokes intensive dialogue was weather stations adjusted for use in vineyards and orchards. Farmers were very interested in implementation of the stations that can measure and track all the important meteorological parameters affecting plant development, yield, and disease prevention. Ideally, solution, beside early warning system, should include smart irrigation management, disease models and notifications and field book diary.

In addition, the technology that provoked most interest was on drones and its use in vineyards. The features farmers explained already exist in the market (TRL9), but the cost is too high (farmers that were interested in these solutions participated in the demonstration day of one of the leading companies in this field, and presented prices were inconvenient, even though companies proposed some discounts and special offers.

#### 3.3. Research needs in Smart Farming

The Serbian Hub identified several needs that will be addressed by research community:

Namely, two issues that can be addressed by research are sensors for soil moisture that will not depend on the type of soil. At the same time, the need for cheap sensors is still very urgent to farmers. Researchers from BioSense Institute were involved in this idea articulation and confirmed that there is possibility for such developments. In addition, this idea evolved into a project which will be presented in Transnational Innovation Workshop.

Another topic that was discussed was regarding drones and its usage in pest control (in vineyards, according to farmers, it will be very useful to detect the level of pests on the edges, where one vineyard borders

another. This might be done by implementation of different sensors on drone, but further research is needed.

The third need that will be addressed by the Institute will involve FMIS (AgroSens platform) and drone technology. The idea is to integrate two systems, so farmer can receive processed information through platform and, potentially, ready-to-use advice based on provided information to FMIS platform and pictures taken by drones.

### 3.4. Other relevant findings

### 3.5. Potential collaborations identified

No.	Category of collaboration (Innovation, uptake or transfer: see definition in guidelines)	Related SFT	Cropping system	Short description of potential collaboration	Funding source matched with	Are you bringing this idea to Serbia?
1	Innovation	Soil moisture sensor	Arable	Farmers who use sensors in their fields need to use different types of sensors for each crop type. The need for identification of soil moisture level brought farmers to think about one type of sensor that can be installed in their vineyard, orchard, and other fields, regardless on soil type. This issue will be addressed by research group of BioSense Institute. Presented in RIW3.	EC – H2020 programme	Yes
2	Innovation	FMIS	Arable Tree Vegetables Vineyards	Decision support tool that will allow farmers to calculate the economic benefit of specific seed variety usage and appropriate SFT adoption. Presented in RIW3.	EC – H2020 programme + national funds (Ministry of Agriculture)	Yes
3	Innovation/Market uptake	all	-	SFT trainings to agricultural journalists - The idea behind this project is to organize comprehensive trainings regarding SFTs and their potential impact in agriculture to journalists who are following agricultural topics. The need for this idea comes from inadequate reporting and misleading articles regarding presented technologies, their adoption, how complex they are for	EC – H2020 programme + national funds (Ministry of Agriculture; Regional Ministry of Culture and Information)	No

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No.	Category of collaboration (Innovation, uptake or transfer: see definition in guidelines)	Related SFT	Cropping system	Short description of potential collaboration	Funding source matched with	Are you bringing this idea to Serbia?
				implementation, and direct benefits that farmers gained. These trainings should be provided by research institutes (e.g. BioSense Institute) and SFT providers. The topics should be broad enough to cover all important aspects, but at the same time to be concise in order to keep journalists' attention and to assure the uptake of presented knowledge. The cross-border potential is very high due to already established connections. In addition, there is already developed plan for attracting more foreign journalists.		
4	Innovation/Market uptake	FMIS	Arable Tree Vegetables Vineyards	The goal of the project is to upgrade the currently existing platform, so it can absorb, and process drone data and provide advices to agricultural producers. For the beginning, the platform will be fully interoperable just with project partner's system (Agremo), but further upgrades and developments are foreseen. After second iteration, the platform will be compatible with main drone systems. Presented in RIW3.	National (next iteration: H2020 programme)	No
5	Innovation	FMIS	Arable Tree Vegetables	The goal of this project is to get closer organic agricultural producers and end-user (buyers). The idea behind the project is to turn the	National (Development Found of	No



## Smart AKIS Report

No.	Category of collaboration (Innovation, uptake or transfer: see definition in guidelines)	Related SFT	Cropping system	Short description of potential collaboration	Funding source matched with	Are you bringing this idea to Serbia?
			Vineyards	smart phone into ultimate tool for running business – an instant messaging application for ordering and selling.	Vojvodina) In next iteration: H2020 programme	

## 4. Recommendations

### 4.1. Sustainability and mainstreaming of Smart-AKIS results

One of the strategic goals of BioSense Institute is to bring advanced technologies close to end-users – farmers, cooperatives and other agricultural producers. Therefore, the AgroSense platform was developed – to help farmers monitor their fields. AgroSense is a digital platform that provides support to farmers and agricultural companies in monitoring the growth of crops and planning of the agricultural activities. The platform represents an important step in digitisation of agriculture and increase in efficiency and competitiveness of Serbian producers.

AgroSense digital platform, through a single user profile, allows the access to the whole system: AgroSense web application intended for comfortable work on a PC and AgroSense Android application that turns a mobile phone into a new useful tool for farmers. AgroSense web application is designed for visualisation and in-depth analysis of data, while AgroSense Android application, besides giving instantaneous insight into all data, on the field, allows for a quick and easy input of data to the system.

The following basic services are available to users of AgroSense digital platform:

- Diary of agricultural activities
- Weather forecast for the location of the parcel
- Satellite indices of crops that describe plant growth, photosynthesis intensity and the availability of water and nutrients
- Overview of soil analysis
- Overview of photographs of crops
- **Information about smart technologies used in agriculture (embedded form Smart-AKIS platform)**
- Latest information about the occurrence of pests and plant diseases

Basic services are completely **free of charge**.

This way, the information gathered in course of Smart-AKIS project will be promoted through this platform as well and the data-base will continue to be alive even after the Smart-AKIS project ends.

### 4.2. Adoption of Smart Farming Technologies

As described in 3.1 chapter of this report, Serbia needs **more demonstration activities** during the winter period (end November – end of January) where smart solutions for agricultural production can be presented in a way appropriate to end-users. In line with this, BioSense Institute has established the first Digital Farm in Serbia.

The Digital Farm is an innovative and unique facility which aims to support the digital transformation of agriculture in Serbia, the region and in Europe. BioSense Institute, the European Center of Excellence for advanced technologies in sustainable agriculture and food safety, has created the Digital Farm as an open-air show-room where innovative AgTech solutions will be presented and implemented on a real-life production farm, to allow farmers to see, test and assess them in real-world settings.

The digital farm will allow farmers from Serbia to learn more first-hand about the opportunities provided by digitization and new technologies in every segment of crop production: from soil preparation, management zones, sowing, irrigation, fertilization and protection of plants, to the crop harvest and preparatory activities for the next season.

At the same time, this is general suggestion for fostering adoption of SFTs across Europe – to provide more physical meeting-points between farmers and technology adopters, where non-adopters will be able to

test/touch/explore technologies before making decision on buying it or not.

### 4.3. Strengthening Innovation in Agriculture

BioSense's Digital Farm will organize Open Days from April to October, where will be presented main agricultural topics. Beside farmers that work in the Digital Farm, highly competent experts from BioSense Institute (academia) and industry (AgTech sector) will be present. The environment will foster cross-fertilization between these groups and further development of solutions for agriculture. The exchange of experiences between producers who use precision agriculture in everyday work is envisioned and will be highly supported. The Open Days meetings' topics can be seen below:

April 27, 2018: LoRa system for communication with sensors and meteorological stations – continuous monitoring of the field conditions

May 25, 2018: Variable fertilizer – reducing fertilizer consumption and increasing crop yield

June 29, 2018: Satellite images in agriculture – detailed insight into the crops' wellbeing

July 27, 2018: Soil moisture sensors and irrigation systems – choosing the right moment for irrigation

August 31, 2018: Drones in agriculture – maps for variable fertilization and yield assessment

September 28, 2018: Yield monitors and grain moisture sensor – yield mapping, performance evaluation and recommendations for the next season

October 26, 2018: Probe for measuring electromagnetic conductivity of the soil – management zone

### 4.4. Smart Farming R&D agenda

When considered short-term, BioSense Institute researchers will be focused on cheap soil moisture sensors that can be applied to all soil types. Regarding long-term activities, the advancements of AgroSense platform (which has adopted part of Smart-AKIS platform) are foreseen. Both activities, at first iteration, will be covered by national funds. In the second stage, internationalization of project (both in terms of actors, stakeholders as well as funding sources) is planned.

## 5. Annexes

### 5.1. Minutes of the Regional Innovation Workshops

#### 5.1.1. RIW1

### SMART AKIS 1<sup>st</sup> REGIONAL INNOVATION WORKSHOP SERBIA

Novi Sad, 14.03.2017.

#### RIW1 Programme

THIS PROJECT HAS RECEIVED FUNDING FROM  
THE EUROPEAN UNION'S HORIZON 2020 RESEARCH  
AND INNOVATION PROGRAMME UNDER PROJECT  
AGREEMENT N° 10101916

# SMART AKIS

## REGIONAL INNOVATION WORKSHOP

Serbia  
Novi Sad, 14.03.2017.  
AGENDA


Time	Activity				
10:00 – 10:30	Welcoming speech by BioSense Institute representative				
10:30 – 12:00	General presentation of the Smart Farming Technologies (SFT) and solutions available in the market.				
	<b>Group 1 – Irrigation management</b>				
	IrrigNET – DunavNET Miniature Soil Moisture Sensor – BioSense Institute Remotely Operated Mobile Robotic System for Irrigation and Management of Natural Resources in Smart Farming - Institute Mihajlo Pupin				
	<b>Group 2 – Remote Sensing</b>				
	Velaware solution AgriSens – LOGIT H2020 APOLLO Optical methods for plant health status – BioSense Institute				
	<b>Group 3 – Crop Protection management</b>				
	alertNET – DunavNET trapNET – DunavNET				
	<b>Group 4 – Farm management</b>				
	BoxNET – DunavNET Crops mapping using electro-magnetic probe – BioSense Institute Selection of adequate seeds, Syngenta case – BioSense Institute DroneAgro toolbox - IN2				
12:00 – 12:15	Coffee Break				
12:15 – 12:30	Presentation of work groups method				
	Parallel work groups				
12:30 – 13:45	<table> <tr> <td>Group 1 - Irrigation management</td> <td>Group 2 - Remote Sensing</td> <td>Group 3 - Crop protection management</td> <td>Group 4 - Farm management</td> </tr> </table>	Group 1 - Irrigation management	Group 2 - Remote Sensing	Group 3 - Crop protection management	Group 4 - Farm management
Group 1 - Irrigation management	Group 2 - Remote Sensing	Group 3 - Crop protection management	Group 4 - Farm management		
13:45 – 14:45	Lunch Break				
14:45 – 15:15	Plenary of thematic work groups findings				
15:15 – 16:00	Wrap up and next steps				

SMART AKIS PARTNERS:

Figure 1: Agenda of RIW1 in Serbia


## RIW1 Power Point presentations

This paragraph presents the PowerPoint presentations of the selected SFTs. We have selected 13 solutions, according to farmers' needs discovered within the WP2. Since three solutions are products of the same company, we have merged their presentations in one presentation.



**agroNET**  
www.agronet.solutions

**agroNET**  
Set rešenja/servisa namenjenih unapređenju poljoprivredne proizvodnje.  
Kombinacija ekspertskog znanja i različitih parametara merenih u realnom vremenu.



**Trenutno dostupna rešenja...**

**agroNET**

- irrigNET - optimizacija navodnjavanja
- trapNET - praćenje populacije životnih insekata
- alarmNET - prognoza pojave bolesti i štetočina
- boomNET - upravljanje osnovnim sredstvima
- fieldNET - knjiga polja
- fleetNET - upravljanje vozilima i vozilima
- growNET - monitoring parcela upotrebom dronova
- marketNET - digitalna prodaja pesticida

**agroNET services**

**irrigNET** RACIONALNO NAVODNJAVANJE

**BENEFITI:**

- Povećanje prinosa, 20%
- Optimizacija troškova
- Održavanje zemljišta

**irrigNET - Reference**

- Srbija
- kukuruz
- soja
- šećerna repa





**agroNET services**

**boxNET** UPRAVLJANJE OSNOVNIM SREDSTVIMA  
(POSREDOVANJE U PROMETU)

**BENEFITI:**

- Optimizacija poslovnih procesa
- Optimizacija troškova poslovanja
- Kontrola kvaliteta

Expert Data Analytics  
Microsoft Azure




**boxNET**

**POSREDOVANJE U PROMETU**

Posle, Alat, Mašina, Jedinstveni identifikator

**INSTALACIJA**

RFID tag, RFID čitač

**BENEFITI:**

- Kontrola kvaliteta
- Optimizacija troškova poslovanja
- Kontrola kvaliteta
- Optimizacija troškova poslovanja
- Kontrola kvaliteta
- Optimizacija troškova poslovanja

**boxNET**

Upravljanje osnovnim sredstvima

Upravljanje osnovnim sredstvima

Upravljanje osnovnim sredstvima

Upravljanje osnovnim sredstvima

Upravljanje osnovnim sredstvima

Upravljanje osnovnim sredstvima

**agroNET services**

**KNJIGA POLJA** JEDNOSTAVNO PRATENJE SVAKODNEVNIH AKTIVNOSTI

**BENEFITS:**

- Jednostavna analiza
- Bolje planiranje
- Iznajni zvid u probleme

Microsoft Azure




**KNJIGA POLJA**

**POSREDOVANJE U PROMETU**

Jednostavna analiza

Jednostavna analiza

Jednostavna analiza

Jednostavna analiza

Jednostavna analiza

Jednostavna analiza

**Knjiga polja**

Matrica knjiga

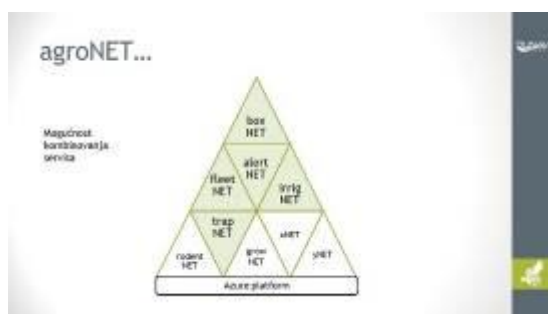
Matrica knjiga

Matrica knjiga

Matrica knjiga

Matrica knjiga

Matrica knjiga



**agroNET**

donatnet.eu

agro.net.solutions

agro@agro.net.solutions

Microsoft Partner

IoT-Forum

Figure 2: SFT solutions from DunavNET



## Senzor vlažnosti zemljišta koji ne zahteva kalibraciju

14.03.2017.  
Novi Sad, Srbija

dr Goran Klitić  
Institut BioSens



## Pregled

Motivacija



Metode merenja



Rezultati merenja



Projektovanje i izrada senzora

BioSense Institute



## Motivacija

- Svetska populacija se uvećava za 79 miliona ljudi godišnje
- Poljoprivreda predstavlja rešenje povećane potrebe za hranom
- Efikasna upotreba vode može uvećati prinose za u proseku 79%
- Efikasna upotreba vode se oslanja na senzore vlažnosti zemljišta
- Kalibraciona merenja za daljinske metode detekcije

BioSense Institute



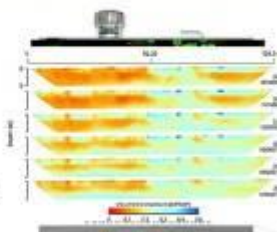
## Metode merenja vlažnosti

### Direktne metode

- Vizuelna
- Gravimetrijska

### Indirektne metode

- Neutronska metoda
- Slabljenje gama zraka
- Tenziometri
- EM metode (rezistivni i dielektrični senzori)
- Daljinska detekcija (satelitski snimci, SAR, GPR)



BioSense Institute



## Phase shift method

- Relies on the fact that the water content strongly affects the permittivity of soil
- Phase shift is determined by phase velocity and physical properties of the transmission line

$$\Delta\varphi = \frac{\omega L \pi}{v_p}$$

- The phase velocity

$$v_p = \frac{\sqrt{2}}{\sqrt{\mu\epsilon}} \frac{1}{\sqrt{1 + \frac{\sigma^2}{\omega^2 \epsilon^2}}}$$

- Sufficiently high frequency:  $(\sigma / \omega \epsilon)^2 \ll 1 \Rightarrow v_p = (\sqrt{\mu\epsilon})^{-1}$

BioSense Institute

IBSC 2016



## Koncept senzora

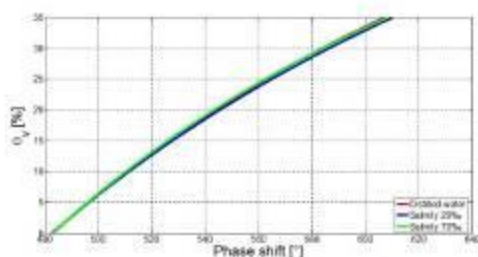


- Sonda je smeštena u zemljište
- Vlažnost utiče na brzinu prostiranja signala kroz sondu
- Rezultati se šalju baznoj stanici i pohranjuju na server

BioSense Institute



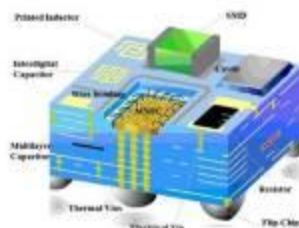
## Princip rada



BioSense Institute



## Projektovanje i izrada senzora



### LTCC technology

Advantages over:

- PCB
  - Thick film
  - HTCC
- Possibilities:
- Outdoor sensing
  - Microwave
  - Microfluidics
  - Packaging

BioSense Institute

IBSC 2016

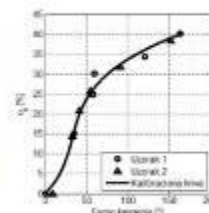


## Projekovanje i izrada senzora



BioSense Institute

## Rezultati merenja



Apolutna greška iznosi 0.01 g/g što iznosi 5.36% merenog opsega.

BioSense Institute

## Zaključak

- Senzor je izrađen od keramičkih elemenata – ekološko i robustno rešenje
- Tačno merenje manje osetljivo na šum (apsolutna greška 0.01 g/g)
- Ne zahteva kalibraciju i ne zavisi od saliniteta zemljišta
- Pogodan za integraciju u bežične senzorske mreže
- Budući rad

BioSense Institute

Figure 3: Miniature Soil Moisture Sensor – BioSense Institute


**smartAKIS – Regional Innovation Workshop**

**Tema:**  
**Mobilni robotizovani solarni sistem s daljinskim komandovanjem namenjen za navodnjavanje i upravljanje prirodnim resursima u poljoprivrednoj proizvodnji**

Predavači: Prof. dr Aleksandar Rodić, dipl. inž.  
 Institut „MILAJLO PUPIN“ doc. Beograd  
 Univerzitet u Beogradu  
 Laboratorija za robotiku  
 Beograd, Srbija

Beo Grad  
 29. Feb. 2017.


**Problemi u ratarskoj/voćarskoj poljoprivrednoj proizvodnji**

- Velika usitnjenost i distribuiranost poseda
- Klimatske promene i njene posledice
- Nizak stepen, često nekontrolisan, primene agro-tehničkih mera
- Dominantna ekstenzivna proizvodnja
- Nizak nivo automatizacije i primenen naprednih, čistih tehnologija



**Načini prevazilaženja problema u ratarskoj/voćarskoj poljoprivrednoj proizvodnji**

- Primena OIE za navodnjavanje
- Viši stepen pokrivenosti teritorije sistemima za navodnjavanje
- Kontrolisana (integralna) proizvodnja i primena manjih, efikasnih agro-tehničkih sistema
- Viša ekološka svest proizvođača
- Spremnost prihvatanja čistih, naprednih tehnologija u proizvodnji



**Optimalno korišćenje prirodnih resursa – zemljišta, vode i energije**





Figure 4: Remotely Operated Mobile Robotic System for Irrigation and Management of Natural Resources in Smart Farming - Institute Mihajlo Pupin





### Agro Drone

AgroDrone je platforma za:

- Praćenje razvoja biljaka i useva
- Skeniranje reljefa terena
- Provera rada mehanizacije

Osnovne funkcije AgroDrone sistema su:

- Ortofoto, DEM, NDVI
- Detaljni izveštaji o stanju parcele i useva



VELAWARE

### Veći prinosi uz manja ulaganja



VELAWARE

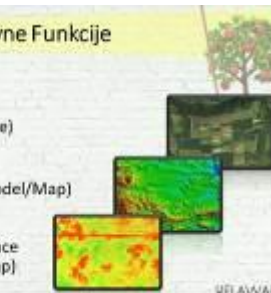
### Ciklus nadzora stanja useva i zasada



VELAWARE

### Osnovne Funkcije

- Ortofoto mapa (Orthorectified image)
- DEM (Digital Elevation Model/Map)
- NDVI Mapa (Normalized Difference Vegetation Index Map)



VELAWARE

### Napredne Funkcije

- Praćenje stanja biljaka i useva
- Rane detekcije poremećaja u razvoju biljaka
- Problemi sa dreniranjem i navodnjavanjem
- Detekcija grešaka mehanizacije (oranje, sejanje...)
- Detekcija pojave biljnih bolesti
- Problemi erozije zemljišta i nagiba terena



VELAWARE

### Napredne Funkcije

- Održavanje vitalne vegetacije
- Nadzor iz vazduha i detekcija neovlašćenog pristupa
- Vizuelna inspekcija useva ili zasada
- Prebrojavanje biljaka
- Procena prinosa i uticaja resursa
- Otkrivanje štetočina

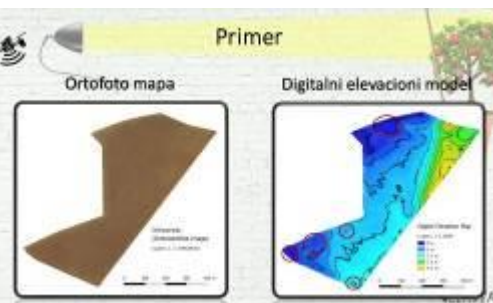


VELAWARE

### Primer

Ortofoto mapa

Digitalni elevacioni model

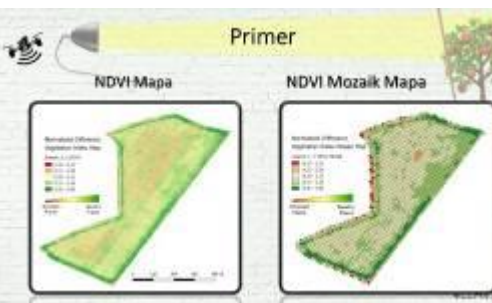


VELAWARE

### Primer

NDVI Mapa

NDVI Mozaik Mapa



VELAWARE

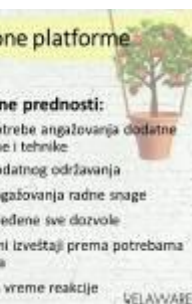
### Prednosti primene AgroDrone platforme

**Tehničke prednosti:**

- Ušteda resursa
  - Vreme, Radna snaga, Masla, Dubrivo, Pesticidi, Gorivo
- Povećanje kvaliteta useva i prinosa

**Operativne prednosti:**

- Bez potrebe angažovanja dodatne opreme i tehnike
- Bez dodatnog održavanja
- Bez angažovanja radne snage
- Obezbeđene sve dozvole
- Detaljni izveštaji prema potrebama klijenta
- Kratko vreme reakcije



VELAWARE

### Hvala na pažnji

AgroDrone

**VELAWARE**

www.velaware.net

info@velaware.net



Figure 5: Velaware SFT solution



## AGRIKULTURNE INFORMACIJE PUTEM ANALIZE FOTOGRAFIJA IZ VAZDUHA



**JOVAN PARUŠIĆ**  
 Razvoj poljoprivrede &  
 Upravljanje poslovnim sistemima

## REŠENJE



**AGRISENS REŠAVA PROBLEME MANJKA PRECIZNIH I  
PRAVOVREMENIH INFORMACIJA**  
 O SEZONSKIM SADNICAMA I PRECIZNOG UPRAVLJANJA  
 VIŠEGODIŠNIM BILJKAMA, PUTEM AUTOMATIZOVANE  
 ANALIZE SLIKA PRIKUPLJENIH IZ VAZDUHA.



## KOMERCIJALNI DRONOWI



Hobi  
Open - source  
Masovna proizvodnja  
Cheap



Komercijalna primena  
**Uredaj za prikupljanje podataka**  
Široka upotreba  
Brz povrat investicije



Specijalizovana  
upotreba  
Pravljen po meri  
Skupi



## NAČIN UPOTREBE



**AgriSens**  
 SISTEM ZA PODRŠKU  
 ODLUČIVANJU U POLJOPRIVREDI



**MAPIRANJE**  
 Prikupljanje  
 podataka iz zraka



**ANALIZA I DETEKCIJA**  
 Komputerska obrada slika iz  
 zraka  
 AgriSens PLATFORMA



**PRIBIENJA**  
 Navigacija do cilja od  
 interneta i direktno iz letjelice



## PRIMERI IZ PRAKSE - PARADAJZ



**ANALIZA: UTVREĐIVANJE BROJA BILJAKA**  
**POVRŠINA: 30 HA**  
**POPULACIJA: 439.806**  
**ODSTUPANJE: 26% III 154.690**

"... Želeli smo da uporedimo stvarni broj biljaka sa  
 brojem koji nam je napravljen. Rezultat je bio jasan –  
 umesto da 2% površine biljaka smo našli, analiza je  
 pokazala 26% manje površine od onoga što nam je  
 napravljen od firme koja je sadila..." rekao je Toshio.



## PROBLEM

### MANJAK PRECIZNIH I PRAVOVREMENIH INFORMACIJA



KADA, GDE I  
 KAKO  
 TRETIRATI  
 STRES KOD  
 BILJAKA?



KADA, KOLIKO I  
 GDE  
 UPOTREBITI  
 DUBRIVOT?



KOLIKO IMAMO  
 BILJAKA? DA LI  
 JE SETVA BILA  
 USPEŠNA?

"... Kako bi dobili koristi od podrške, agrikultori moraju da  
 dobiju tačne, pravovremene podatke u vezi sa svojim poljima, kako povećaju svoju  
 produktivnost..."  
 Džon M. H. H. H.



## UVOD

Dr. M. H. H. H.



## PRIMENA AGRISENS-a



## AGRISENS KORISNICI



## PRIMERI IZ PRAKSE - KUKURUZ



**KORISNIK:**  
 Andrew McInnes, Usa

**USEV:**  
 PŠENICA

**ANALIZA:**  
 DETEKCIJA KOROVA





### PRIMERI IZ PRAKSE – BANANA I MANGO



**KORISNIK:**  
Caribe Drones, Puerto Rico

**USEV:**  
BANANA, MANGO

**ANALIZA:**  
PRAĆENJE SEZONE

### JOŠ PRIMERA IZ PRAKSE



**KUKURUZ:**  
DETEKCIJA KOROVA  
24.71% POVRŠINE



**GROŽĐE:**  
BROJANJE BILJAKA  
POPULACIJA: 28.155



## HVALA NA PAŽNJI



jparusic@agrisens.com  
www.agrisens.com

**JOVAN PARUŠIĆ**  
AgriSens | Marketing & SD Manager

Figure 6: AgriSens LOGIT

### Razvoj APOLLO servisa



OSLO, LABORATORIJ ZA DECODIRANJE I DEINFORMATIZACIJU GANGLIOVNIH FAKULTET U BEOGRADU

### APOLLO PROJEKAT

- APOLLO – Platforma za savete farmerima zasnovana na podacima sa satelita
- Evropski projekat (Horizon 2020)
- Partneri iz Grčke, Srbije, Španje, Austrije i Belgije

### APOLLO PROJEKAT





La Mancha (Španja)    Pola (Grčka)    Rama (Srbija)

### SATELITSKI SNIMCI U SLUŽBI POLJOPRIVREDE



- Copernicus sateliti – podaci su otvoreni i besplatni
- Značajno pojednostavljuju servise za pomoć poljoprivrednicima
- Daju informacije o: stanju i napredovanju useva, vlažnosti zemljišta, biomasi, proceni prinosa, itd.

### APOLLO SERVISI

- RASPORED ORANJA

Usluga rasporeda oranja može da pruži informacije u vezi sa oranjem zemljišta na osnovu sadržaja vode u zemljištu. Poljoprivrednik može da proceni da li je moguće primeniti oranje zemljišta i može da identifikuje tačke gde se zemljište ne može tretirati (npr. tačke gde ima blata).



Degradacija zemljišta kao rezultat nepravilnog oranja je mala; vlažnost zemljišta



Tretiranje zemljišta blata zbog visoke vlažnosti zemljišta

### APOLLO SERVISI

- RASPORED NAVODNJAVANJA

Raspored navodnjavanja određuje tačnu učestalost i trajanje navodnjavanja kako bi se izbegli problemi koji su rezultat prekomerne ili nedovoljne primene vode.



Uvremeni uslovi zbog nepravilne vode



Pravilno navodnjavanje uslovi

### APOLLO SERVISI

- **PRAĆENJE RASTA USEVA**
- Monitoring rasta useva je proces praćenja rasta i razvoja useva od setve do žetve. Na ovaj način, poljoprivrednici mogu biti na vreme upozoreni u slučaju pojave štetočina i nedostataka u ishrani.



Plavica na pravilnom razvoju

Plavica varijeteta gljivične infekcije

### APOLLO SERVISI

- **PROCENA PRINOSA**
- Procena prinosa useva je proces procene parametara prinosa useva pre žetve. Mogu se proceniti očekivani prinos i udapljivost raznih vanjeteta useva.



### APOLLO SERVISI

- **METEOLOGIŠKI PODACI**
- Dnevne minimalne, maksimalne i srednje temperature na parceli
- Dnevna količina padavina na parceli

### PRAĆENJE RAZVOJA USEVA



**MOGU DA SE DOBIJU INFORMACIJE:**

- Nedostatak azota/hlorofila u biljkama
- Gustina zelenog lišća (smrtnje ukazuje na štetočine ili bolesti)
- Biomasa

### PRAĆENJE RAZVOJA USEVA



0.00000  
1.00000  
2.00000  
3.00000  
4.00000

### PRAĆENJE RAZVOJA USEVA



0.00000  
1.00000  
2.00000  
3.00000  
4.00000

### PRIKAZ INFORMACIJA

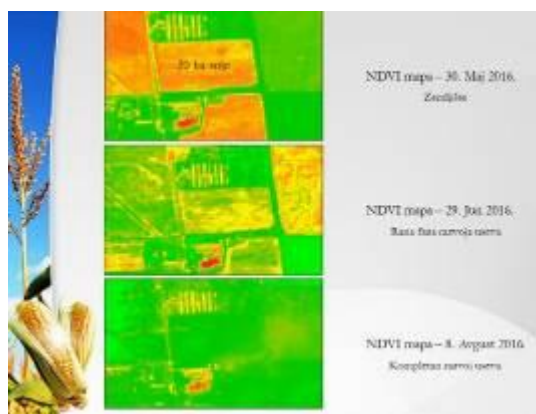
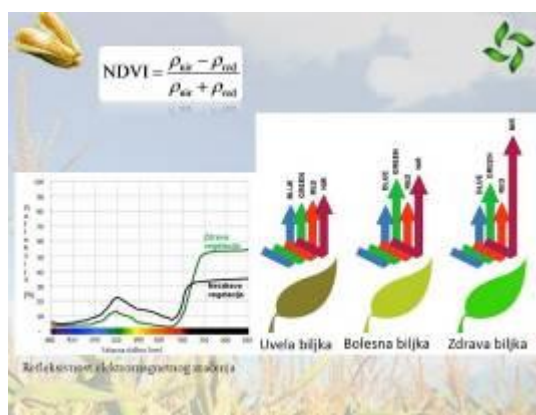


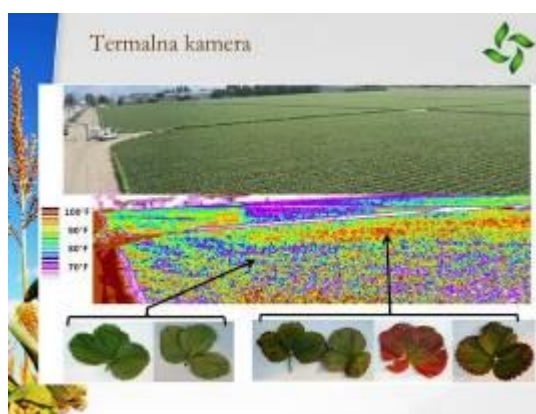
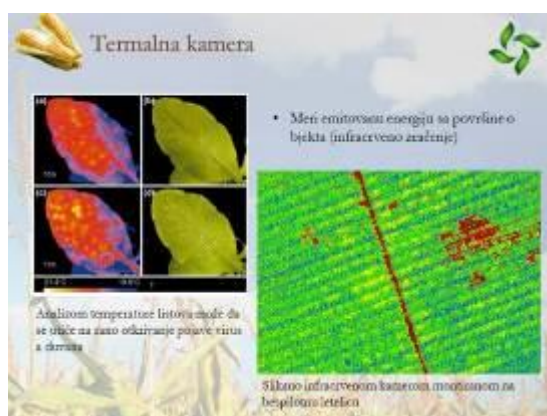
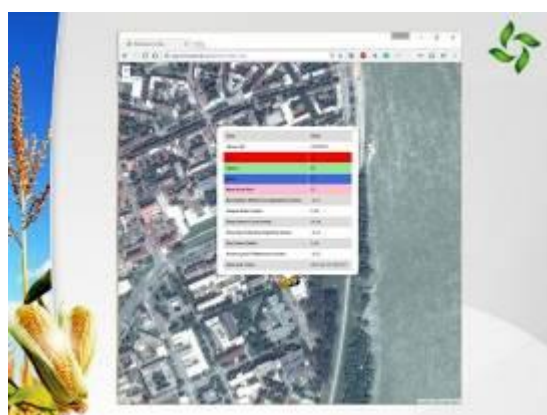
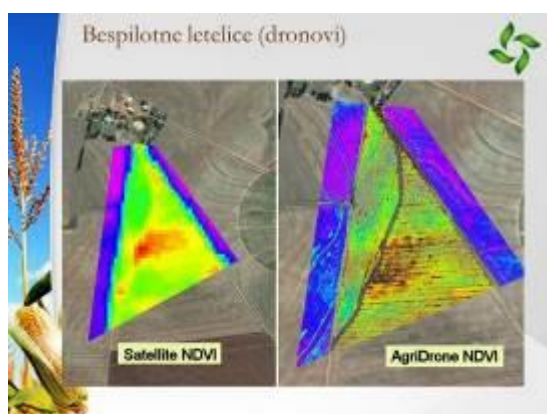
### APOLLO TIM



Figure 7: H2020 APOLLO Project









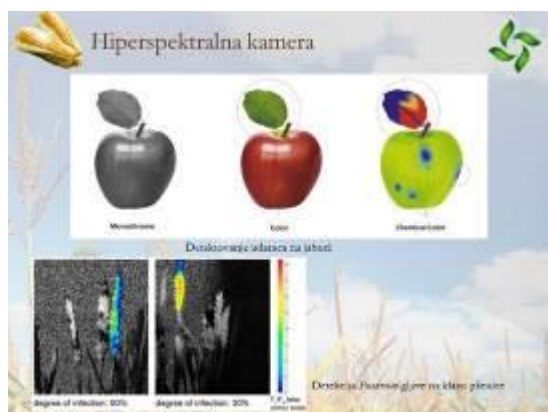


Figure 8: Optical methods for plant health status – BioSense Institute



### ELEKTROMAGNETNA PROVODLJIVOST

Geonics EM38 MK2

Mjeri se elektromagnetna provodljivost (EP)

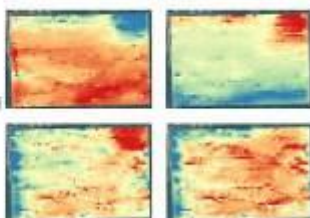
EP zavisi od:

1. Sadržaj zemljišta (metali, mineralne materije, mehanički sastav...)
2. Kompaktnost
3. Vlažnost zemljišta



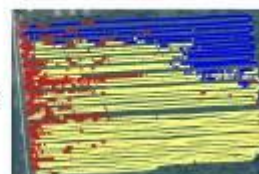
### EM38 MK2

Mjeri se faza i amplituda primljenog signala  
istovremeno se skeniraju gornji sloj (30cm) i donji sloj zemljišta (100cm)  
2x2=4 merenja



### ZONIRANJE

Naprednom analizom moguće formirati zone unutar njive  
+ Šelevacija terena  
+ Mapa prošlogodišnjeg prinosa  
Broj zona – veličina njive



### ZONIRANJE

5 zona:

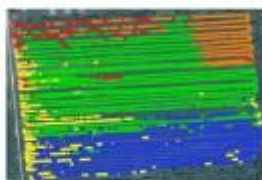
Crvena – blato

Žuta – kompaktno zemljište, čest prolazak traktora i kombajna

Narandžasto – breg

Zelena – zemljište tipa 1

Plova – zemljište tipa 2



### ANALIZA ZONA

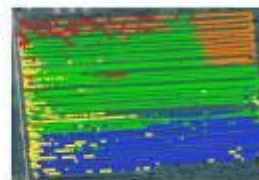
Po čemu se razlikuju tipovi 1 i 2?

Laboratorijska analiza

Manji broj uzoraka (5)

Jednak broj uzoraka (reprezentativni uzorci)

Rezultat: mape za varijabilno đubrenje



### SKENIRANJE

Šandvi na senkama vuče traktor,  
 džep, kvad, motor...  
 Veza sa računarom i GPS-om  
 Nijava bez useva  
 Razmak između linija skeniranja 10m  
 10ha/h  
 Dovoljno jedno skeniranje za 5-6  
 godina



### FUZIJA PODATAKA ZA PRECIZNU POLJOPRIVREDU

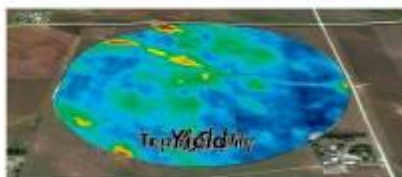


Figure 9: Crops mapping using electro-magnetic probe – BioSense Institute



**SMART AKIS  
REGIONAL INNOVATION WORKSHOP**

Sample planner - mobilna aplikacija  
 (prikupljanje vizualnih podataka i poljoprivrednog zemljišta)


Tihomir Šačić  
 Voditelj programa, Poslovna rešenja i bespilotnim letelicama IN2 d.o.o.  
 14.03.2017, Novi Sad  
 tihomir.sacic@in2.eu



**KO SMO MI?**

- Jedna od 50 najvećih softverskih kompanija u Japotskoj Evropi
- veliki repozitarij IT usluga za javni i privatni sektor u Evropi

<b>25</b> godine postojanja	<b>600+</b> zaposlenih	<b>250+</b> klijenata	<b>450+</b> projekata
-----------------------------------	---------------------------	--------------------------	--------------------------




**„Sample planner“,  
mobilna aplikacija**

Mobilna aplikacija koja omogućuje sakupljanje geo-referenciranih vizualnih podataka.

**Primena:**

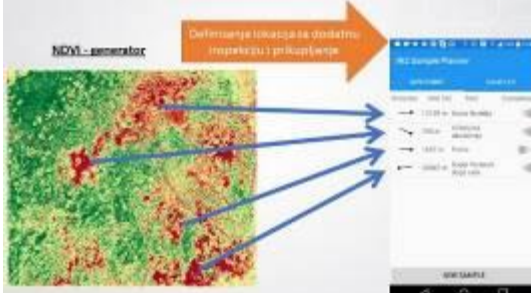
- Generisanje liste zadataka za inspekciju useva nakon generisanja NDVI indeksa;
- Samostalno prikupljanje podataka prolaskom kroz polje i detektovanjem potencijalnih problema na zasađenoj kulturi;
- Automatsko navođenje do lokacije koja je detektovana kao problematična;
- Prezentovanje prikupljenih podataka (slika/video) na mapi (NDVI mapa, Mapa terena i sl.);
- Svi podaci su geo-referencirani u tačno određenom vremenu – moguće praćenje kroz vreme.



**Što nam govori NDVI?  
Interpretacija!**

NDVI - generator

Definisanje lokacija za dodatnu inspekciju i prikupljanje



**Prikupljanje podataka s GPS  
definisanih lokacija**



Navigation on the terrain?







Figure 10: DroneAgro toolbox - IN2





This paragraph brings the attendance sheets that are made on official Smart-AKIS template. Total, RIW1 in Serbia had 47 attendants, without organization team from BIOS and APV. The list is not provided due to confidentiality reasons.



## RIW1 Pictures



Figure 12: Smart AKIS 1<sup>st</sup> Regional Innovative Workshop in Novi Sad – attendants (1/2)



Figure 13: Smart AKIS 1<sup>st</sup> Regional Innovative Workshop in Novi Sad – attendants (2/2)



Figure 14: Senka Gajinov from DunavNET presenting IrrigNET application



Figure 15: PhD Goran Kitic from BioSense Institute presenting Miniature Soil Moisture Sensor



Figure 16: PhD Aleksandar Rodic from Institute Mihajlo Pupin presenting their SFT solution



Figure 17:Mr Marko Purar from Velaware showing their AgroDrone solution



Figure 18:Mr Milan Dobrota from LOGIT presenting AgriSens solution



Figure 19:PhD Dragutin Protic presenting H2020 APOLLO project



Figure 20: M.Sc. Bojana Ivosevic presenting Optical methods developed in BioSense Institute



Figure 21: Mr. Tihomir Sasic from IN2 company presenting their drone applications for agriculture



Figure 22: PhD Sanja Brdar from BioSense Institute presenting electro-magnetic probe





Figure 23: PhD Sanja Brdar from BioSense Institute presenting the solution that was awarded on Syngenta Challenge 2016



Figure 24: Wrap up of work groups findings

## RIW1 Findings

This chapter brings main findings from RIW1 held in Serbia, Novi Sad on March 14, 2017.

### Findings from the discussion vis a vis the needs and ideas identified on WP2

Innovation Hub in Serbia wanted to confirm the findings from interviews held during summer and autumn 2016. Therefore, we didn't invite the same group of agricultural producers to RIW1. Nevertheless, we have confirmed our findings.

Most farmers are owners of small parcels (in the survey 54.1% were farmers who held parcels between 2 and 10 ha). Regarding technologies, the majority stated that they are using old farm machinery (in survey, 16% was using machinery older than 5 years). When we were discussing about barriers, the results we collected in 2016 are similar to the ones we heard on RIW1 – farmers highlighted the price of the technologies as the biggest obstacle, followed by small size of parcels and level of complexity for adoption of SFTs. Interviewees stated the same reasons, respectively: 81.3% ; 18.8% and 9.4%.

When it comes to needs and ideas, both groups were very homogenous. Namely, their peak was on small, cheap sensors connected with mobile phones which will present them advices related to the crops, plants, disease, and irrigation needed in specific time slot.

Based on above presented, we can say that both groups had similar background and expressed similar needs. Therefore, we can say that our findings in interview process were confirmed in RIW1 event.

### Relevance of SFTs regarding needs and ideas identified in WP2

During the interview process, we noticed that farmers can objectively assess the weaknesses in their production and segments for improvement. Despite, farmers showed medium level of understanding which technologies can address their issues, due to their non-technical education and mindset that is *a priori* against changes in working routine. Therefore, Serbian Hub has deeply analyzed their needs and problems, and decided to introduce technologies that could address identified problems. Table below presents statistics from WP2 (extracted just results from Serbia):

SFT group (as described and used in WP2)	% of interested interviewees
<b>Robots and autonomous machines</b>	32.4%
<b>Drones and their data</b>	5.4%
<b>Connected tools (data acquisition and automatic upload)</b>	27%
<b>Combination of GPS, setting data, and attached machines</b>	10.8%
<b>Agricultural apps</b>	24.3%

*Table 2: Preferences of farmers (on interview, related to WP2)*

On the first Regional Innovation Workshop, we have presented four out of five technology groups. We decided to present three groups which were most interesting to farmers and one that Hub considered to be very helpful and simplify their working procedures. Namely, presented technologies belong to following groups (as described and used during the interviews with farmers): Robots and autonomous machines, Connected tools, Agricultural apps, and Drones.

## Interest on adopting or transferring proposed SFTs with a ranking of the highest scored SFTs

Agricultural producers confirmed the findings from WP2 saying that the adoption level of smart farming technologies is very low. Just one farmer in RIW1 was using some smart solution in everyday practice. Nevertheless, all present farmers showed an interest in adoption of solutions in near future. One of the topics that we proposed was prejudice that farmers have regarding implementation of SFTs. Farmers' main concern was the price of technologies and if they need extensive training courses in order to be able to work on a daily basis with advanced solutions. The representatives of advisory services said that, from their experience, the vast majority of agricultural producers who adopted technologies found them easy to use. In addition, they briefly presented some possibilities regarding financial support that state is offering to farmers.

After presentations of SFT solutions and discussion, participants were asked to give marks to all presented solutions according to their relevance in production process, and impact it targets (marks from 1-5 are used). Following our four groups of technologies, we can extract the solutions that are marked as the most promising for adoption. Table below respectively presents technology group, solution, and the score.

SFT group	SFT solution	Average score
<b>Irrigation management</b>	Miniature Soil Moisture Sensor – BioSense Institute	4.43
<b>Remote Sensing</b>	DroneAgro toolbox - IN2	4.21
<b>Crop Protection management</b>	alertNET – DunavNET	4.36
<b>Farm management</b>	Crops mapping using electro-magnetic probe – BioSense Institute	4.07

*Table 3: Ranking of the highest ranked SFTs*

On the other hand, on question regarding the quality of presentations, the level of complexity and the approach that speakers had, we can highlight presentations made by: Institute Mihajlo Pupin, Velaware company, DunavNET company and BioSense Institute for presentation regarding Miniature Soil Moisture Sensor. The common characteristics of those presentations were interactivity, plain language adjusted to farmers, 3D animations and video, although 50% of the solutions are still in development phase in research institutes. This leads us to conclusion that no matter how technology can be practical, close to market, and resource-saving, the way used for presentation is of vital importance.

## Identification of barriers and incentives for adoption of SFTs.

At RIW1 it was identified a number of barriers that disable adoption of SFTs in Vojvodina, Serbia. For easier analysis, we have divided them in two main groups, based on group of stakeholders that indicated barriers.

**From farmers point of view:** Most of barriers for adoption of SFTs are related to size of agricultural parcels. One of the eye-catching characteristics of Serbian agriculture are small parcels and very noticeable fragmentation of agricultural land. The consequences can easily be seen in the low level of technologies adoption and advanced solutions, due to small production volume. Another important barrier is insecurity in land lease process, which has its implications on machinery usage,

plans for rent and investment strategy of agricultural producers. In addition, farmers pointed out the lack of information regarding smart technologies they could use in their practice.

**From SFT provider point of view:** Farmers are very rigid to new technologies and reluctantly agree on any kind of changes. According to SFT providers, farmers have a lot of prejudices about technologies, on the first place that they are expressive and complicated for use. Providers of agricultural solutions agreed that farmers are unwilling to participate in pilot-projects where their only input would be in providing fields for testing of the equipment (free of charge).

The comment that both groups agreed on is that Serbia needs more demonstration activities during the winter period (end November – end of January) where smart solutions for agricultural production can be presented in a way appropriate to end-users.

## Potential new uses for existing SFTs.

Hub in Serbia noticed that farmers that attended the RIW1 needed a lot of empowerment in order to express their ideas and needs. Even harder task was to encourage them to think creatively and came up with innovative ideas. Nevertheless, the idea that caught most attention is adjustment of traditional agricultural machinery (e.g. harvesters, tractors...) to fit to small agricultural parcels. In addition, we had several ideas for measurement of moisture levels in soil, and leaves; modification of usage of drones for detection of sugar level in grapes. All ideas are presented in tables in chapter 6.

## RIW1 Project Ideas

### Project Idea 1

Category of project	Smart Farming Technology	Crop system
<i>Technology transfer</i>	<i>Electromagnetic conductivity of the soil – BioSense Institute</i>	<i>Arable Tree Vegetables Vineyards</i>
<b>Promoter/s name/s</b>		
Jan Ondrejov (farmer)		
<b>Short description of project</b>		
With the help of remote sensing methods (from air e.g. satellites, drones...) to choose the amount and type of fertilizers needed in certain parcel. The idea is made based on Electro-Magnetic probe, presented by BioSense Institute.		
<b>Expected benefits</b>		
The new solution is supposed to have some impact on productivity, Revenue, profit, farm income and to decrease the usage of pesticides and fertilizers. Consequently, it will decrease the input costs.		
<b>Multi-actor collaboration needed</b>		
<i>Farmer – testing and validation</i>		
<i>Research – development of solution in close collaboration with farmers</i>		
<i>Advisory – connecting tool between end-users and providers of the solution</i>		

## Project idea 2

Category of project	Smart Farming Technology	Crop system
<i>Technology transfer</i>	<i>Miniature Soil Moisture Sensor</i>	<i>Arable Tree Vegetables Vineyards</i>
<b>Promoter/s name/s</b>		
Djordje Krkljus (farmer)		
<b>Short description of project</b>		
Farmers were very interested in possibility to have information about the moisture level in soil, but even more interested to know precise information regarding every plant – namely, to <u>detect the moisture level in leaves</u> .		
<b>Expected benefits</b>		
This sensor will decrease input costs regarding irrigation and diseases		
<b>Multi-actor collaboration needed</b>		
<i>Farmers - testing and validation</i> <i>Research - development of solution in close collaboration with farmers</i> <i>Advisory - connecting tool between end-users and providers of the solution</i>		

## Project idea 3

Category of project	Smart Farming Technology	Crop system
<i>Technology transfer</i>	<i>Miniature Soil Moisture Sensor</i>	<i>Arable Tree Vegetables Vineyards</i>
<b>Promoter/s name/s</b>		
Dejan Ristivojevic (farmer)		
<b>Short description of project</b>		
Sensor for nutrients in soil (but to be cheap, affordable to the majority of farmers in Serbia and to be made of materials that will not have an effect on soil).		
<b>Expected benefits</b>		
Decrease in input costs and timely reaction on deviations		
<b>Multi-actor collaboration needed</b>		
<i>Farmers - testing and validation</i> <i>Research - development of solution in close collaboration with farmers</i> <i>Advisory - connecting tool between end-users and providers of the solution</i>		

## Project idea 4

Category of project	Smart Farming Technology	Crop system
<i>Innovation</i>	<i>Sample planner drone -IN2</i>	<i>Vineyards</i>
<b>Promoter/s name/s</b>		
Djordje Šivoljski, Dragomir Mikalački (farmers)		
<b>Short description of project</b>		
Farmers were inspired by the possibilities of drones so they suggested to modify drone system that regional company IN2 has and to make a drone that would detect a sugar level in grapes and indicate if the grapes are ready for harvesting. Grape maturation detection with drones will allow farmers to define and decide the optimal maturity which vary depending upon the style of wine being made. Sugar is a component often used		

to assess ripeness therefore with drones carrying sensor that can detect sugar level which will highly automatized this process.

Researchers said that it might be done by measuring light reflection.

#### Expected benefits

Timely information regarding grape maturity. Consequently, the labour costs and stress or fatigue for farmers would be decreased and revenue, profit, and income, would be increased. In addition, the final product quality would be improved.

#### Multi-actor collaboration needed

*Farmers – winegrowers – for testing and validation*

*Industry – drone producers (e.g. IN2)*

## Project idea 5

Category of project	Smart Farming Technology	Crop system
Market uptake	/	Arable Tree Vegetables Vineyards
<b>Promoter/s name/s</b>		
Stefan Manja (farmer)		
<b>Short description of project</b>		
The most common reason for refusing SFT adaption among small agricultural producers are big initial investment, long returning period and the most important – uncertainty of economic viability. Therefore, calculation of relation between the size of agricultural parcel and SFT investment in correlation with RIO is essential in decision making process. Therefore, some new project (e.g. mathematical algorithm) should be developed. It should be available to all farmers (ideally free of charge).		
<b>Expected benefits</b>		
Farmers will have a support during the decision making based on proved mathematical calculation and predictions based on comprehensive data base.		
<b>Multi-actor collaboration needed</b>		
<i>Indication of the profile of partners sought after:</i> <i>Farmer – provision of historical data, experiences and needs</i> <i>Research – development of mathematical model</i> <i>Industry – development of mathematical model and its commercialization</i> <i>Advisory – historical data from agricultural producers</i>		

## Project idea 6

Category of project	Smart Farming Technology	Crop system
Market uptake	Smart-AKIS	Arable Tree Vegetables Vineyards
<b>Promoter/s name/s</b>		
IN2 Group (Tihomir Sasic, Miroslav Savanovic)		
<b>Short description of project</b>		
Representative of IN2 company from Croatia explained that situation in Serbia, Croatia and entire Balkan is similar. Therefore, it would bring benefit to entire region if projects such Smart-AKIS were focused just on		

Balkans. In addition, this new project should be focused on:

- Development of SFTs in close collaboration with farmers,
- Fostering SFTs adoption among farmer's community
- Clustering producers and adopters of SFTs in entire Balkan region.

#### Expected benefits

Better uptake of SFTs in Balkans, which can be considered as white spot when it comes to adoption of smart technologies by small agricultural producers.

#### Multi-actor collaboration needed

*Farmers community*

*Research institutes*

*Industry*

*Advisory services*

## Project idea 7

Category of project	Smart Farming Technology	Crop system
Market uptake	/	Arable Tree Vegetables Vineyards
<b>Promoter/s name/s</b>		
Farmers and representatives of advisory services (Stefan Manja, Dragana Kljajic, Ugljesa Trkulja, Milan Pelic)		
<b>Short description of project</b>		
One of the biggest problems that Serbian agricultural producers are facing with is the lack of system approach and institutional assistance regarding technologies that can be used in farmers' every day routine. This is due to lack of knowledge and experience of advisory services. The future project is supposed to provide trainings to advisory services and to reinforce their capacity for transferring the knowledge and possibilities to farmers in order to help them in day-to-day decision making.		
<b>Expected benefits</b>		
More farmers will be encouraged to adopt SFTs		
<b>Multi-actor collaboration needed</b>		
<i>Farmers community – end-users of technologies and community that will “receive” the advices</i> <i>Research institutes – to work with advisory services on knowledge transfer</i> <i>Industry – to work provide the solutions available on the market that can bring benefit to farmers</i> <i>Advisory services (accompanied with regional and national authorities, Forecasting and reporting services) – to make a systematic plan of assistance in SFTs adoption</i>		



## RIW1 Evaluation

During the RIW1, we have used the proposed template and questions for evaluation, but Serbian Hub has translated all questions in Serbian. All farmers answered the questionnaire. Main findings are presented in table below.

<b>Interest</b>	Average score	3.86
	Most interesting presentations: – Remotely Operated Mobile Robotic System for Irrigation and Management of Natural Resources in Smart Farming – Institute Mihajlo Pupin; – H2020 APOLLO – Dragutin Protic; – Miniature Soil Moisture Sensor – BioSense Institute	
<b>Organization</b>	Average score	4.86
	Improvement areas: – RIW1 participants would like to have more events like this throughout entire region; – Venue needs to have better screen and projector (the letters were small)	
<b>Methodology</b>	Average score	4.29
	Improvement areas – RIW1 participants would like to have to see more video materials of presented SFTs; – RIW1 participants suggested that it should be presented less SFTs, so the focus is not dispersed	
<b>Smart Farming Technologies</b>	Average score	4
	Top Smart Farming Technologies: – AgroDrone system - Velaware; – Remotely Operated Mobile Robotic System for Irrigation and Management of Natural Resources in Smart Farming – Institute Mihajlo Pupin; – Miniature Soil Moisture Sensor – BioSense Institute; – H2020 APOLLO; – alertNET - DunavNET; – Crops mapping using electro-magnetic probe – BioSense Institute	
	Average rate of intended use of Smart AKIS database	92.86%
<b>Project Ideas</b>		4.14

	Average score	
	Top Project Ideas: Remotely Operated Mobile Robotic System for Irrigation and Management of Natural Resources in Smart Farming – Institute Mihajlo Pupin Apollo project Miniature Soil Moisture Sensor – BioSense Institute Crops mapping using electro-magnetic probe – BioSense Institute AlertNET – DunavNET	
	Average rate of participants planning to take part on projects	92.86%
<b>Open suggestions</b>	<ul style="list-style-type: none"> <li>- Promote SFTs and Smart AKIS project on national TV station (in the show about farming practice);</li> <li>- Participants want more governmental support via extension services in terms of legislation, funding and promotion of SFTs;</li> <li>- More workshops like this</li> </ul>	

## 5.1.2. RIW2

## SMART AKIS 2<sup>nd</sup> REGIONAL INNOVATION WORKSHOP

### Novi Sad, 17.05.2017

## RIW2 Programme



THE EUROPEAN UNION HAS FUNDED THIS PROJECT IF EUROPEAN UNION'S HORIZON 2020 RESEARCH AND INNOVATION PROGRAMME UNDER GRANT 101014-M-RIW-2017-0001



## Smart-AKIS

Second Innovative Workshop - Application of advanced ICT  
in day-to-day outdoor farming activities

Agricultural Fair, Novi Sad  
17.05.2017.

## AGENDA

Time	Activity
10:00 – 10:30	Registration
10:30 – 11:00	<b>Velimir Stanojević</b> , State secretary, Ministry, of Agriculture and environmental protection <b>Maarten Wegen</b> , Agricultural Attaché at Netherlands Embassy Belgrade, Serbia
11:00 – 11:45	General presentation of the Smart Farming Technologies (SFT) ideas and solutions available on Balkan market <b>Nemanja Ignjatov</b> – SouthHansa <b>Milica Trajković</b> – BioSense Institute
11:45 – 13:00	Panel discussion <ol style="list-style-type: none"> <li>1. <b>Damir Dedić</b>, Advisor of the Minister for ICT, Ministry of agriculture and environmental protection</li> <li>2. <b>Borislav Brunet</b>, Provincial Secretariat for Agriculture, Water, and Forestry</li> <li>3. <b>Vladimir Crnojević</b>, Director, BioSense Institute</li> <li>4. <b>Žarko Kobilarov</b>, Vice President, Association of Farmers 100P+</li> <li>5. <b>Nemanja Ignjatov</b>, Partner, SouthHansa</li> </ol>
13:00 – 13:15	Coffee break
13:15 – 15:15	Collaborative work session
15:15 – 15:45	Plenary of thematic work groups ideas and project ideas
15:45 – 16:15	Networking and next steps

## SMART AKIS PARTNERS:



## RIW2 Power Point presentations



Kingdom of the Netherlands

The opening speech was done by **Mr. Maarten Wegen**, Agriculture Attaché, Embassy of the Kingdom of the Netherlands in Serbia and Montenegro. Mr. Wegen expressed his deep assuredness that the topic and work that is done in Novi Sad in course of Smart-AKIS project is very important for sustainable development of agriculture in the region. He said that governmental bodies need to be aware of the fact that policy areas such as agriculture cannot be approached in an isolated manner. Today's agriculture is about rural development, economics, natural resources and about respect for the environment, public health as well as about food safety and food security. After this, Mr. Wegen presented three conditions for having a successful business in agri-food domain. Namely, those are:

1. Having a certain level of knowledge of core business;
2. Being a cost-effective (this is particularly important in the world of great volatility in prices);
3. Deep understanding of value chain and supply chain when it comes to competitiveness of agricultural sector;
4. Implementation of new technologies.

When talking about new technologies, Mr. Wegen is convinced that ICT has a lot to offer to precision farming and precision food production.



*Figure 25: Mr. Maarten Wegen, Agriculture Attaché, Embassy of the Kingdom of the Netherlands in Serbia and Montenegro*

After the welcome speech, two presentations were held. The powerpoint slides are presented below:



H2020 Smart-AKIS

## Tehnologije u službi poljoprivrede

Milica Trajković  
*Institut BioSens*

Novi Sad, 17.05.2017.

1



### Agenda

1. Ukratko o Institutu BioSens
2. Projekat Smart-AKIS
3. Pet osnovnih grupa tehnologija u poljoprivredi

2



**Institut BioSens**

3



Ne možemo da nahranimo današnji svet sa zastarelom poljoprivredom!



Vizija Instituta BioSens – poljoprivreda budućnosti







Antares

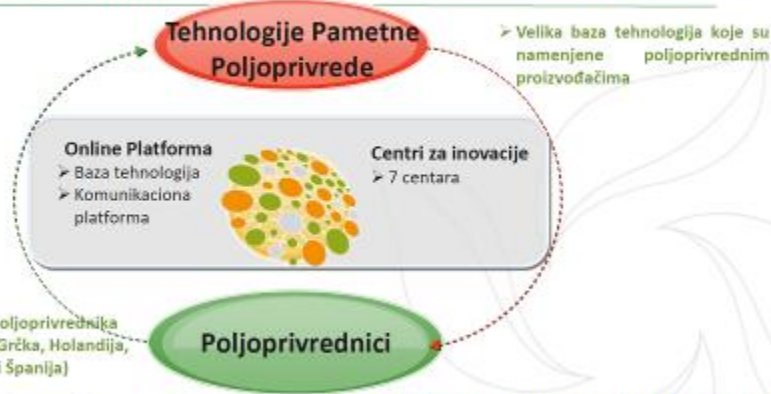


smartAKIS  
Smart Farming Thematic Network

## H2020 Smart-AKIS



## Ukratko o Smart-AKIS projektu



- Izveštaj o potrebama poljoprivrednika (Francuska, Nemačka, Grčka, Holandija, Srbija, Velika Britanija i Španija)
- Izveštaj o faktorima koji usporavaju prihvatanje novih tehnologija u poljoprivredi

<https://smart-akis.com/SFCPPortal>





## Smart-AKIS platforma



## Pet osnovnih grupa tehnologija



## Pet osnovnih grupa tehnologija



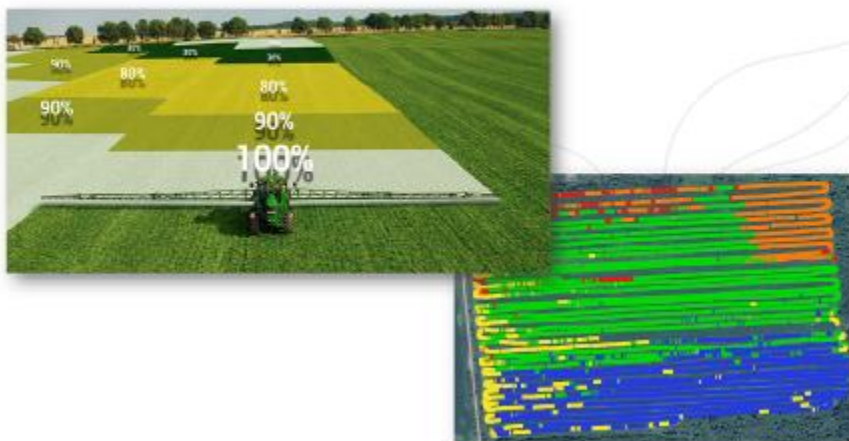
- Senzorske tehnologije i tehnologije mapiranja
- Tehnologije promenljivog intenziteta delovanja
- Tehnologije navođenja i kontrolisanog saobraćaja u poljoprivredi
- Sistemi za upravljanje gazdinstvima i aplikacije za pametne telefone
- Robotski sistemi i pametne mašine



## Senzorske tehnologije i tehnologije mapiranja



## Tehnologije promenljivog intenziteta delovanja



## Tehnologije navođenja i kontrolisanog saobraćaja u poljoprivredi





## Sistemi za upravljanje gazdinstvima i aplikacije za pametne telefone



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## Robotski sistemi i pametne mašine



17



**Hvala na pažnji!**

Milica Tarajković

BioSense Institute  
[trajkovic@biosense.rs](mailto:trajkovic@biosense.rs)  
<http://www.biosens.rs/>

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Figure 26 – Presentation: BioSense Institute



“Upotreba savremenih informacionih tehnologija (IT) u redovnim poljskim aktivnostima poljoprivrednika ”



Zastupništvo inovativnih Holandskih kompanija na teritoriji jugozapadne Evrope



Najznačajniji projekti koje smo do sada realizovali





Need assessment plan early warning system for field crop diseases and crop protection, Republika Srpska



## Uspostavljanje efikasnije savetodavne službe u Republici Srpskoj

- Ciljevi projekta
- Izazovi projekta
- Planovi
- Benefiti korišćenja Dacom early warning systema (GLOBALG.A.P. , edukacija, efikasnost u proizvodnji, kontrola i optimalizacija upotrebe pesticida,... )



## Integracija sistema unutar savetodavne službe

- Dugoročno planiranje aktivnosti unutar službe
- Edukacija proizvođača
- Edukacija savetodavaca radi lakseg i efikasnijeg korišćenja sistema
- Uspostavljanje sistema po fazama



## Bolesti i insekti ne poznaju granice



## HVALA NA PAŽNJI

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 Nederland Pavilion



Figure 27 – Presentation: South Hansa

## RIW2 Panel discussion

After successful RIW1, the Hub in Serbia wanted to continue with engagement of wide range of stakeholders, with special focus on agricultural producers. In that course, we decided to include a panel discussion between presentations of technology trends and interactive work in small groups. High-level representatives of the industry, government, academia, and farmers' community were invited in order to attract as much as possible attendees and to add value to entire RIW2 discussion. The following table summarizes invited panellists. All speakers are presented in order they appear in the agenda of the event.

Name and Surname	Position and Institution	Logo of the organization
------------------	--------------------------	--------------------------






Name and Surname	Position and Institution	Logo of the organization
Damir Dedić	Adviser to the Minister for IT, Ministry of Agriculture, and Environmental Protection	
Borislav Brunet	An independent expert for application of geoinformation systems and technologies in agriculture, Provincial Secretary for agriculture	 РЕПУБЛИКА СРБИЈА АУТОНОМНА ПОКРАЈИНА ВОЈВОДИНА ПОКРАЈИНСКА ВЛАДА
Vladimir Crnojević	Director, BioSense Institute	
Žarko Kobilarov	Farmers' Association 100P +	
Nemanja Ignjatov	Partner, South Hansa	

Table 4: List of panellists

The moderator of the panel discussion was Ms. Ljubica Gojgić, prominent Serbian journalist.



Figure 28: Panellists

She opened the panel by presenting a fact that in 1900 one farmer was feeding 10 people, and now one farmer has to feed more than 120 people.

**Mr. DeliĆ** from the Ministry of Agriculture said that it is noticeable how one of the oldest industrial sectors (agriculture) is merging with one of the newest – IT. Mr. DeliĆ said that the Ministry recognized the potential of the synergetic effect that this cooperation can have on development of entire Serbia. In addition he confirmed that in future, the state will support implementation of ICT technologies in agriculture by subsidizing it.

**Dr Crnojević** from BioSense Institute explained that 100 years ago the revolution in agriculture was brought by machinery, 50 years ago it happened by chemicals and now the revolution in agriculture is brought by information technologies. In addition, according to latest FAO report, by 2050 we will need to produce 70% more food for growing society, taking in consideration the same area that can be cultivated. Therefore, there is no option for society of 21<sup>st</sup> century not to apply IT in agriculture.

*Moderator invited Mr. Kobilarov from the Farmers' Association 100P + to break the stereotype regarding low willingness of farmers to implement IT in their working routine.*

**Mr. Kobilarov** stated that for the last five years the Association is constantly negotiating with the Ministry of Agriculture of the Republic of Serbia to introduce the special subsidies for implementation of advanced technologies in agriculture. According to Mr. Kobilarov, this year the State approved subventions up to 50% for purchasing new advanced equipment (e.g. GPRS systems). He personally uses GPS system in his fields, which he finds extremely helpful during the seeding (more precise, easier, faster...). The next step will be mapping of yield, after which “smart” fertilization can be implemented. He shares the opinion that we need to increase food production, but it has to preserve (or improve) the quality of food. Mr. Kobilarov presented the good practice from Wisconsin, USA – in 2009 they had a system which connected metro-stations and sensors on the field with information system. Based on information received, they were providing accurate and timely information to farmers regarding needed steps, e.g. spraying *Phytophthora infestans*. Every farmer in the region was linked with advisory service and received via SMS ready-to-use advices and recommendations – when to spray, what chemicals to use, needed quantity, and the expected results of the action. The statistics showed that by using this methods 12M€ was saved and the number of spraying was decreased (from 12 to 9).

*Moderator concluded that usage of advanced technologies in agriculture brings benefit both to farmers (savings) as well as to consumers (less chemicals applied). Nevertheless, Vojvodina is not Wisconsin, so Mr. Brunet was invited to explain the role of IT sector in Provincial Secretary for agriculture.*

**Mr. Brunet** said that in 2005 the state has recognized the impact that advanced technologies can have on agricultural industry. Twelve years ago, Provincial secretariat for Agriculture introduced advisory services in Vojvodina with equipment and trainings for usage of GPS equipment In Vojvodina. After that, the State recognizes BioSense (in that period) Center and since 2013 they work together on generation and analysis of remote sensing data. By doing this, the State got precise details regarding five most widespread agricultural crops in Vojvodina. The phase that is currently in progress, envisions transferring the EU regulations in the field of remote sensing data to Serbian (Vojvodina's) legislation. That will bring following changes: 1) all agricultural subjects that are using and/or generating spatial data for agriculture will be listed; 2) Serbia will become part of Land Parcel Identification System (LPIS) – one of the mandatory steps during the EU accession.

*Moderator endorsed the State long-term planning, but she was interested in the process of preparation of small agricultural producers for implementation of IT in daily routine.*

**Mr. Ignjatov** from South Hansa presented their experience with agricultural producers in Balkan region with main conclusion that most of farmers are not focused on one or two crops, but rather are growing 5-6 different cultures. The specialization should be the first step in modernization. On the other hand, he said that farmers are willing to learn and test new technologies, but when it comes to purchasing, the biggest obstacle is money.

**Mr. Dedić** continued the discussion by saying that both Mr. Ignjatov and Mr. Kobilarov were focused on big farms. According to his opinion, agricultural parcels can be easily divided in two groups – the majority of small parcels and large parcels. He added that the focus in next period should be on attracting small householders to implement the IT in farming routine.

**Mr. Kobilarov** strongly disagreed by saying that it is not meaningful to make a segmentation on small and large farms. He explained that the same surface (e.g. 5ha) with different crops cannot be treated the same. For example, it is not the same if a farmer has 5ha of orchard or 5ha of corn crops.

*The next topic was regarding the return on investment. First, the moderator asked Mr. Brunet to express the point of view of the State.*

**Mr. Brunet** presented results of the research on the profitability rate of implementation of GPS systems in agricultural mechanization. The research was conducted in 2008-2009, all parcel sizes were considered (<100ha, 100ha-500ha and >500ha) and several different technologies were examined. All case scenarios showed that the return on investment is reached after the first year, although the market price of those technologies was far bigger then it is now.

**Mr. Kobilarov** continued by saying that every professional farmer follows cost-benefit analysis. One of the examples is that without the use of GPS in tractors, the income is just 10%. In other words, if the total cultivated area is 1000ha, the income is just on 100ha. In the 100P+ club around 20-25% of members are using GPS devices. When it comes to investment, the price of GPS systems is between 1.000€ and 40.000€.

*The moderator asked panellists to compare the situation in Serbia and in other European countries.*

**Mr. Ignjatov** said that dominant technologies used in Serbia are GPS systems, meteorological stations, and sensors, but overall, the percentage of farmers that use technologies is below 10%. When it comes to Netherlands, above 80% of agricultural producers are using advanced technologies in every day routine. In the Netherlands, the initial step was to install meteorological stations, smart irrigation, early detection of deceases, but in last years the dominant trend is to put everything on one online platform where farmer can monitor all those sensors, with automatically generated, but customized advices for the specific case of the farmer. The needs of farmers are generating the offer – that is why companies like DACOM are forced to establish a comprehensive system that are following entire farm production process and budget spending. With this type of comprehensive system farmers always knows what are their next steps, expenditures, and expected profit.

*One of the biggest obstacles for broader adoption of advanced technologies in Serbia is money. The moderator asked the State representatives about subventions or any other type of support.*

**Mr. Brunet** said that beside economic power of the farmer or subsidies provided by the State, the biggest obstacle for adoption of SFTs is traditional way of thinking. In other words, the lack of information and constant ignoring even to think about testing new technologies. They don't understand enough the impact of technologies, so the investment in SFTs seem to be unprofitable. That is the reason the State conducts constant education through extension services and tries to create a positive environment for adoption of SFTs. The main conclusion of this process is that

farmer needs to create its own calculation in order to see the impact technology might have on his/her farm. This cannot be done by anyone else but the farm owner itself. At the same time, farm owner needs to be aware on all technologies that can have positive impact on farm profitability.

**Dr Crnojevic** supported the discussion by reminding the audience on Smart-AKIS project that is aimed at bringing together farmers and SFTs. The root for poor adoption of SFTs in Europe is the lack of information regarding available solutions. Project will allow users to find all needed information at one place in their native language, explained in simple, non-academic, and non-marketing style.

**Mr. Brunet** continued by saying that very important role in widening this idea have extension services. Employees in these services need to have series of trainings on advanced technologies and their adoption. The State has made some initial steps, but the serious job is still in front of us.

**Dr Crnojevic** said that BioSense's goal is to merge areas such as science, economy, agriculture and to speed up the process of knowledge transfer from science to the practice. In that way, we see ourselves as a catalysator which should help in acceleration of that process, especially by joining agriculture and information technologies. Currently in Novi Sad, which is called Silicon Valley, there are around 10.000 individuals working in IT sector in approximately 250 companies. With a detailed analysis, it is obvious that only few of them are dealing with solutions applicable in agriculture. What we really want to see is that ideas and examples from science have their practical use in the agriculture, and by doing that having a domestic product.

*Moderator raised the question regarding the privacy of gained data.*

**Dr Crnojevic** confirmed that all images gained from satellites are publicly available, anyone can download data from USA NASA web page or European Space Agency, there are no restriction or limitations, and we are talking about whole planet not only Serbia. Regarding unmanned aircraft, legislation is set in whole Europe and Serbia. Legislation is strict, demanding announcements 60 days in advance, therefore one cluster is established to ease all these steps, keeping the track of all drones' flights, time of flights, what will be filmed.

At the end of the discussion, we left 15 minutes for one-to-one Q&A between panellists and audience.

## RIW2 Attendance Sheets

The list is not provided due to confidentiality reasons.



## RIW2 Pictures





## RIW2 Findings

On top of the multi-actor collaborations that are to emerge from the RIWs, other outputs are expected as a result of bringing together stakeholders into the RIWs. One of the overall objectives of Smart-AKIS is to capture these outputs in order to produce recommendations for fostering the penetration of SFT in Europe.

This section of the “minutes” document provides a number of headlines, covering different aspects that could emerge in the discussion in the RIWs (both in plenary but also in the Work Groups). **Hub partners are encouraged to pay careful attention to the discussions taking place in the RIWs in order to identify these “findings”.** As suggested in the Guidelines, the Work Groups can be tape recorded in order to better grasp the discussion taking place. These “findings” will be included on the “Smart AKIS Report” to be produced by each Hub partner after RIWs 1 and 2 and presented at the 1<sup>st</sup> Transnational Innovation Workshop.

### Findings regarding the needs and ideas identified in WP2

*Are the users’ needs identified in D2.2 confirmed by the RIW findings for your Hub? Can other needs regarding SFTs be identified from the discussions in the RIW? These can be technological needs, but also others, such as need for training, need for improved advisory, etc. Can these needs be addressed by setting up collaborations (for example, by a collaboration project) or are there to be addressed at the political level (for example, by setting up a subsidy for SFTs)? Do attendees have ideas regarding the use of SFT to your Hub?*

The conclusions from D2.2 and in RIW1 in Novi Sad were confirmed. The additional needs of farmers’ community in Serbia that emerged were regarding the lack of information and the need for trainings. During the panel discussion, farmers expressed the lack of source of information on technologies that could improve their work routine. The information they would like to have can be divided in two big groups: Group 1 – financial issues (e.g. implementation cost, ROI, potential subsidies...) and Group 2 – technical issues (e.g. the level of complexity, needed time for adjustments, needed trainings/instructions).

When it comes to trainings, farmers expressed the willingness to take part in various trainings organized both by advisory services (state owned) and by private multinational companies that are providing machinery to our market. This need can be addressed by a collaboration project (will be further elaborated in section 7 – projects ideas).

### Identification of barriers and incentives for adoption of SFTs.

*Are the barriers identified in D2.3 confirmed by the RIW findings for your Hub (i.e. farm size, cropping system, farmers’ age and education/training, etc)? Can other barriers for SFT adoption be identified that are specific to your Hub?*

During the RIW2 we haven’t caught any additional barriers, different from the ones identified in RIW1 and by interviews conducted under WP2.

### Relevance of SFTs regarding needs and ideas identified in WP2

*Are the barriers identified in D2.3 confirmed by the RIW findings for your Hub (i.e. farm size, cropping system, farmers’ age and education/training, etc)? Can other barriers for SFT adoption be identified that are specific to your Hub?*

Based on our experience gained through RIW1, we decided to give a short overview on all technologies and to introduce farmers with as many different types of technologies as possible. The root for this decision can be found in fact that farmers' community in Serbia is familiar just with several types of technologies, mainly through promotions made by commercial companies. We noticed that farmers can identify their problems and needs very precisely, but cannot find the solutions that can address those needs. Therefore, after introductory presentations we organized a panel discussion where representatives of academia, government (both regional as well as state) and industry gave their opinion regarding the adoption of advanced technologies in agriculture. This was of great importance for our participants because they heard first-hand information regarding state-of-the-art technologies, research results and State plans for support agricultural production.

### Relevance and interest on adoption and transfer of presented SFTs, ranking of the highest scored SFTs

*Do attendees show a special interest towards specific SFTs? Are these SFTs in the market yet or are they being developed (TRL<9)? Have attendees provided feedback to SFT industry in the RIW for improving the SFTs or adjusting them to the specific regional conditions so as to bring them into practice?*

Technology that provoke intensive dialogue was weather stations adjusted for use in vineyards and orchards. Farmers were very interested in implementation of the stations that can measure and track all the important meteorological parameters affecting plant development, yield, and disease prevention. Ideally, solution, beside early warning system, should include smart irrigation management, disease models and notifications and field book diary.

### Potential new uses for existing SFTs.

*Have new uses been identified for the SFTs presented (i.e. SFT presented for arable crops that can be adapted for vineyard).*

During the RIW2 in Serbia new uses for currently available SFTs haven't been captured.

### Potential inputs for research.

*Are there specific needs that can be addressed through research (it can be basic research on i.e. development of a new remote sensing index, but also applied research on, i.e. application of a specific SFT to a new environment)? Have attendees (SFT industry, farmers) provided feedback to research results regarding specific SFT?*

Specific farmers' needs that can be addressed by research work can be arranged in three groups:

- Sensors for soil moisture that will not depend on the type of soil (e.g. Sandy, Silty, Peaty...)
- Sensors need to be cheap in order to be available and affordable for mass implementation. In addition, the life time of these sensors should be one season.
- Internet in remote fields can be very expensive and data transfer can be difficult through wires can be practically impossible. Therefore, farmers need some system that will use other frequencies and will transfer data via several installed stations, without internet or mobile provider services.

All these three needs will be used in BioSense Institute as an inspiration for further research.



## RIW2 Project Ideas

### Project Idea 1

Category of project	Smart Farming Technology	Crop system
<i>Innovation</i>	<i>Soil moisture sensor</i>	<i>Tree</i> <i>Vegetables</i> <i>Vineyards</i> <i>Grasslands</i>
<b>Promoter/s name/s</b>		
Farmer: Milovan Pejic Researcher: Goran Kitic		
<b>Short description of project</b>		
Currently, farmers who use sensors in their fields need to use different types of sensors for each crop type. The need for identification of soil moisture level brought farmers to think about one type of sensor that can be installed in their vineyard, orchard, and other fields. Researchers from BioSense Institute confirmed that modification of currently existing technology can address this need.		
<b>Expected benefits</b>		
Increase of yield, decrease of input costs		
<b>Multi-actor collaboration needed</b>		
<i>Farmers</i> <i>Researchers</i>		

### Project Idea 2

Category of project	Smart Farming Technology	Crop system
<i>Innovation</i>	<i>Sensors Data transfer</i>	<i>Arable</i> <i>Tree</i> <i>Vegetables</i> <i>Vineyards</i> <i>Grasslands</i>
<b>Promoter/s name/s</b>		
Farmer: Miroslav Vukcevic Researcher: Vladan Minic		
<b>Short description of project</b>		
One working group identified the need for different type of data transfer received from sensors installed in remote fields. Currently, the data gained through sensors are transferred by internet connection (wired, GPRS). The idea is to provide system that will transmit data without internet, by using different frequencies (for long range). The researchers from BioSense Institute confirmed that they have already started with development of such system.		
<b>Expected benefits</b>		
Decrease of input costs		
<b>Multi-actor collaboration needed</b>		
<i>Farmers</i> <i>Researches</i>		

### Project Idea 3

Category of project	Smart Farming Technology	Crop system
<i>Innovation/ Market uptake</i>	<i>/</i>	<i>Arable</i>



<i>SFT trainings to agricultural journalists</i>	<i>Tree</i> <i>Vegetables</i> <i>Vineyards</i>
<b>Promoter/s name/s</b>	
Journalists (Ljubica Gojgić, Dejan Budić, Ivana Kožlović), SFT providers (Nemanja Ignjatov) , State representatives (Borislav Brunet)	
<b>Short description of project</b>	
The idea behind this project is to organize comprehensive trainings regarding SFTs and their potential impact in agriculture to journalists who are following agricultural topics. The need for this idea comes from inadequate reporting and misleading articles regarding presented technologies, their adoption, how complex they are for implementation, and direct benefits that farmers gained. These trainings should be provided by research institutes (e.g. BioSense Institute) and SFT providers. The topics should be broad enough to cover all important aspects, but at the same time to be concise in order to keep journalists' attention and to assure the uptake of presented knowledge.	
<b>Expected benefits</b>	
Better reporting in mass media about SFTs, tailored message to potential adopters	
<b>Multi-actor collaboration needed</b>	
<i>Research</i> <i>Industry</i> <i>Journalists</i>	

## Project Idea 4

Category of project	Smart Farming Technology	Crop system
<i>Innovation/ Market uptake</i>	<i>Farm Management App</i>	<i>Arable</i> <i>Tree</i> <i>Vegetables</i> <i>Vineyards</i>
<b>Promoter/s name/s</b>		
Bojan Borić, Vladimir Marić, Đorđe Đukić - farmers		
<b>Short description of project</b>		
Advanced users of agricultural technologies said that Serbian market needs more comprehensive farm management applications that will not be focused just on one problem (e.g. weather tracking), but involve many other services as well, such as: Production process management (with guided step-by-step agricultural knowledge base of best-practice production processes); Finance management (tracking of sales and expenses per farm); Early warning system (real-time pest and disease detection through intelligent weather pattern recognition). The most important features of new application should be multi-device access and interoperability between different services.		
<b>Expected benefits</b>		
Reduction of irrigation costs, reduction of crop protection costs, increase in farmer's profitability		
<b>Multi-actor collaboration needed</b>		
<i>Farmers,</i> <i>Industry</i>		

## Project Idea 5

Category of project	Smart Farming Technology	Crop system
<i>Market uptake</i>	<i>Smart Irrigation and fertilization</i>	<i>Arable</i> <i>Tree</i> <i>Vegetables</i>

Vineyards	
<b>Promoter/s name/s</b>	
Bojan Borić, Vladimir Marić, Đorđe Đukić - farmers	
<b>Short description of project</b>	
<p>The idea is to have several types of sensors installed in the field that will measure:</p> <ul style="list-style-type: none"> <li>• Air (temperature, humidity, rainfall, wind)</li> <li>• Soil (humidity)</li> <li>• Plats (wetness)</li> </ul> <p>and combine received data with weather predictions in order to provide timely information for irrigation and fertilization practices. The irrigation and fertilization system could be initiated by: farmers' decision or by artificial intelligence implemented in the system.</p>	
<b>Expected benefits</b>	
Reduction of irrigation costs, reduction of crop protection costs, increase in farmer's profitability	
<b>Multi-actor collaboration needed</b>	
Farmers, Industry	

## Project Idea 6

Category of project	Smart Farming Technology	Crop system
Market uptake	Farm management system application - Online organic advisory service	Tree Vegetables Vineyards
<b>Promoter/s name/s</b>		
Milovanović Nataša, Zornana Gajić, Marijana Nimčević, Šandor Balanji - farmers		
<b>Short description of project</b>		
<p>Many farmers in Serbia would like to transform their production from conventional to organic one. The biggest obstacle in this process is the lack of knowledge and ongoing support in terms of advices concerning crop rotation, and available (allowed) crops protection measures. Currently, farmers in Serbia can use high-priced services provided by certification bodies, consult other organic producers, or search the advice on Internet. The worst option is to cultivate the crops based on experience without enough information. The absence of single register of information makes it difficult to plan agricultural production and to estimate the impact of different measures that have been/will be applied.</p> <p>The proposed solution foresees online organic advisory service that will provide advices to agricultural producers, especially to those who are in the process of transformation from conventional to organic production. This online advisory service should be affordable (symbolic price) and supported by panel of experts. Special place is foreseen for first-hand advices from farmers that finished the process.</p>		
<b>Expected benefits</b>		
Support to organic production in region		
<b>Multi-actor collaboration needed</b>		
Farmers, Research Industry		

## Project Idea 7

Category of project	Smart Farming Technology	Crop system
Market uptake	Farm management system application – tracking of	Arable Tree

<i>organic production practices</i>	<i>Vegetables</i> <i>Vineyards</i>
<b>Promoter/s name/s</b>	
Vladimir Vokić, Petar Kukin, Ivan Gaćina – farmers	
<b>Short description of project</b>	
In order to be a certificated producer of organic fruit and vegetable, farmers need to provide various documents, results of tests and many other proofs of organic practice. The idea of this project is to create an app for smartphones, which will track the entire production from seed to harvest. Farmers' obligation is to note each agrotechnical operation/measure to this app and it will automatically be sent to the certification body which registers their work and stores all information online. The additional benefit of this app is the networking opportunity between organic farmers certification bodies and state. In addition, this app will secure considerable transparency in organic production.	
<b>Expected benefits</b>	
Better and faster certification process, product quality assurance, simple and smooth monitoring	
<b>Multi-actor collaboration needed</b>	
<i>Farmer</i> <i>Research</i> <i>Industry</i> <i>Advisory</i>	

## Project Idea 8

Category of project	Smart Farming Technology	Crop system
<i>Technology transfer</i>	<i>Robotic system or smart machine – subsoil irrigation</i>	<i>Arable</i> <i>Vineyards</i>
<b>Promoter/s name/s</b>		
Aleksandar Jokić – ICT sector, various farmers		
<b>Short description of project</b>		
This group analysed the irrigation system and concluded that currently available solutions are far ineffective and can easily be damaged by external influences. The solution is to build a subsoil capillary irrigation model. The first step would be to build specifically designed water transmitters into the soil. Second step would be to distribute water into the system under low pressure. This system wouldn't use eyedropper and therefore it can never be blocked. The pipes would be made of long life plastic which is installed under the ground, and would be highly damage resistant. The energy needed for this activity would be provided by solar energy panels. In addition, low pressure systems would be used.		
<b>Expected benefits</b>		
Large increase in irrigation water use, some increase in productivity (crop yield per ha), some increase in revenue, profit, and farm income		
<b>Multi-actor collaboration needed</b>		
<i>Farmer</i> <i>Research</i> <i>Industry</i>		

## Project Idea 9

Category of project	Smart Farming Technology	Crop system
<i>Market uptake</i>	<i>Farm management system application – meeting point between supply and demand</i>	<i>Arable</i> <i>Vineyards</i> <i>Orchards</i>

<i>side</i>
<b>Promoter/s name/s</b>
Nemanja Kovacević, Davor Zekić, Ivan Knežević
<b>Short description of project</b>
Vision: mobile application that will shorten the chain between primary agricultural producers and final consumers. The application wouldn't be just selling point for fresh fruit and vegetable, but rather the meeting point between supply and demand side, where each side would provide information about their practices, habits, needs and other relevant aspects. By using this application, farmers would know the exact needs of consumers, so they can address them timely and effectively. On the other side, consumers will be able to track the production from seeding to harvesting, so they can have their own farm without
<b>Expected benefits</b>
Fast, easy, and direct access to agricultural products. On the other hand, this application will provide secure point for placement of fresh products
<b>Multi-actor collaboration needed</b>
Farmer Research Industry

## Project Idea 10

Category of project	Smart Farming Technology	Crop system
<i>Innovation</i>	<i>Farm management system application</i>	<i>vegetable</i>
<b>Promoter/s name/s</b>		
Branislava Butorac - farmer		
<b>Short description of project</b>		
An idea is to create a unique software that will regulate the conditions in mushrooms production. A group of sensors and regulation relays would be installed and they would send accurate and timely data and parameters to a cloud. Then the cloud sends processed information to smart phone with comparative overview with normal/desired values and practical recommendations. The smart phone app has the power to change conditions on spot (e.g. to increase humidity), so the owner doesn't need to go directly to production hall.		
<b>Expected benefits</b>		
Decrease input costs, decrease workload, possibility for timely reaction		
<b>Multi-actor collaboration needed</b>		
<i>Farmer</i> <i>Research</i> <i>Industry</i>		

## RIW2 Evaluation

<b>Interest</b>	Average score	3.9
	More interesting presentations: South Hansa – all solutions	
<b>Organization</b>	Average score	4.9
	Improvement areas: More frequent breaks	
<b>Methodology</b>	Average score	4.1
	Improvement areas: More ice-breaking games at the beginning, one-to-one meetings with panellists	
<b>Project Ideas</b>	Average score	3.1
	Top Project Ideas: Idea number 3	
	Average rate of participants planning to take part on projects	4.9
<b>Open suggestions</b>	More Smart-AKIS events; more similar projects like Smart-AKIS, but specialized just for fruit production	



## 5.1.3. RIW3

# SMART AKIS 3<sup>rd</sup> REGIONAL INNOVATION WORKSHOP

## Novi Sad, 01.03.2018.

## RIW3 Programme



THIS PROJECT HAS RECEIVED FUNDING FROM  
THE EUROPEAN UNION'S HORIZON 2020 RESEARCH  
AND INNOVATION PROGRAMME UNDER GRANT  
AGREEMENT N. 696294



## Smart-AKIS

Third Innovative Workshop – From idea to creation – how  
to finance your agricultural innovation?

BioSense Institute,  
Dr Zorana Đinđića 1  
Novi Sad  
01.03.2018.

## AGENDA

Time	Activity
09:30 – 10:00	Registration
10:00 – 10:15	Milica Trajković, BioSense Institute, Introduction
10:15 – 11:30	Presentation of funding opportunities Dr Mladen Radišić – Financial NCP for H2020 Slađana Gluščević – IPARD Nebojša Ivanišević – Guarantee fund of Autonomous Province of Vojvodina Jelena Trenkić – Development Fund of Vojvodina Dragana Matić – Cascade funding (DIATOMIC and IoF2020)
11:30 – 12:15	Presentation of success stories Mirko Viček, organic agricultural producer Jovanka Sabljčić, agricultural producer ISABEL project – utilization of biogas
12:15 – 13:00	Matchmaking between project ideas and funding opportunities
13:00 – 14:00	Lunch break
14:15 – 15:00	Wrap up & next steps

[Registration link](#)

## SMART AKIS PARTNERS:



## RIW3 Power Point presentations

Presentation:

Sladana Gluščević – IPARD



MOGUĆNOSTI FINANSIRANJA POLJOPRIVREDE I RURALNOG RAZVOJA  
KROZ PRETPRISTUPNE PROGRAME EU – IPARD II PROGRAM

Sladana Gluščević  
SMART IPARD

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### Sadržaj

- IPARD, pojam i značaj
- Iskustva evropskih zemalja
- Tri mere IPARD II programa 2014-2020
- IPARD u Srbiji, problemi i preporuke

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## Šta je IPARD program

- IPA sektorska oblast "Poljoprivreda i ruralni razvoj"
- Instrument za pretpristupnu pomoć u oblasti ruralnog razvoja za programski period 2014-2020
- Dokument koji je akreditovao Direktor za poljoprivredu EU (DG AGRI)
- Definiše mere za podršku ruralnom razvoju u skladu sa aktuelnim regulativama EU
- Akreditacija predstavlja tek jedan od uslova za podršku ruralnom razvoju iz fondova EU, ostale strukture, promocija, podrška, finansiranje, procedure, tehnička tela programa
- DVA USLOVA – POLITIČKI I TEHNIČKI!



## Rezultati SAPARD programa

- EU obezbedila 3,12 milijarde evra
- 13 mera u programima 11 zemalja kandidata
- 32.000 projekata za EU-8 (najviše u Poljskoj)
- Prosečna vrednost projekata u Rumuniji i Bugarskoj pet puta veća od EU-8 (zbog ruralne infrastrukture)
- Svakim krugom proširenja padao stepen iskorišćenja (slabije se pripremali, a uslovi teži)



Tabela 1. Sprovođenje SAPARD programa u 10 novih zemalja članica EU<sup>1</sup>

Zemlja	Sredstva (u milionima evra)							
	Allokacija		Isplaćeno		Broj projekata		Prosečna vrednost EU podrške po	
	Godišnje	%	Ukupno	%		Plaćeno	%	
1. Češka	30,9	4,3	92,8	3,7	92,8	100	1,405	3,8
2. Estonija	17,0	2,4	51,0	1,7	50,6	90	1,062	2,7
3. Mađarska	53,3	7,5	160,0	5,4	160,0	100	2,575	6,6
4. Letonija	30,6	4,3	91,9	3,1	87,3	95	1,702	4,4
5. Litvanija	41,8	5,9	125,4	4,3	125,3	100	827	2,1
6. Poljska	236,5	33,2	709,4	24,1	708,7	100	22,775	58,6
7. Slovačka	25,6	3,6	76,9	2,6	76,9	100	893	2,3
8. Slovenija	8,9	1,2	26,7	0,9	26,6	100	559	1,4
<b>Ukupno EU8</b>	<b>444,7</b>	<b>62,4</b>	<b>1.334</b>	<b>45,4</b>	<b>1.320,2</b>	<b>100</b>	<b>31.808</b>	<b>82,1</b>
1. Bugarska	74,1	10,4	444,7	15,1	320,2	72	2,600	6,7
2. Rumunija	193,3	27,1	1.159	39,5	1.009,0	87	4,374	11,3
<b>Ukupno EU2</b>	<b>267,4</b>	<b>37,6</b>	<b>1.604,5</b>	<b>54,6</b>	<b>1.329,2</b>	<b>83</b>	<b>6,974</b>	<b>17,9</b>
<b>Ukupno EU10</b>	<b>712,1</b>	<b>100</b>	<b>2.938,7</b>	<b>100</b>	<b>2.652,5</b>	<b>90</b>	<b>38.862</b>	<b>100</b>



## SAPARD/IPARD < EAFRD

- RUMUNIJA: 193,5 mil EUR < 1,26 mlrd EUR
- SLOVAČKA: 25,6 mil EUR < 285,2 mil EUR
- POLJSKA: 236,4 mil EUR < 1,9 mlrd EUR
- MAĐARSKA: 53,3 mil EUR < 551,4 mil EUR
- HRVATSKA: 25,9 mil EUR < 333 mil EUR

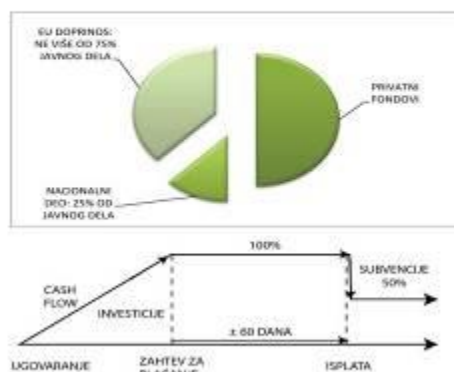
a) Ulaganje u izgradnju i/ili u rekonstrukciju objekata za držanje kokoši nosilja;  
 b) ulaganje u izgradnju i/ili u rekonstrukciju skladišnih kapaciteta za stajsko đubrivo;  
 c) ulaganje u opremanje objekata za držanje kokoši nosilja, uključujući opremu za sprečavanje širenja ptičjih bolesti.  
*Celokupna investicija vredela je oko 360.000 evra. Podrška IPARD-a iznosila je 55 % tako da je nakon završenog ulaganja ulagaču vraćeno oko 200.000 EUR*

## Mere IPARD programa

- *Prva faza:*
  - ✓ Investicije u fizičku imovinu RPG
  - ✓ Investicije u preradu i marketing poljoprivrednih proizvoda i proizvoda ribarstva
  - ✓ Diversifikacija poljoprivrednih gazdinstava i razvoj poslovanja i tehnička pomoć
- *Druga faza:*
  - ✓ Sprovođenje lokalnih strategija ruralnog razvoja – LEADER pristup
  - ✓ Agro-ekološko-klimatske mere i mera organske proizvodnje



## Princip kofinansiranja



## Proces obrade IPARD prijave



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## Kad se ugovor potpiše...



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## Nakon isplate...



11



## Mera 1. Investicije u fizičku imovinu poljoprivrednih gazdinstava



Ukupan budžet **101.386.667 EUR**

12



### Ko može da konkuriše za sredstva

Krajnji korisnici su poljoprivredni proizvođači ili grupe proizvođača, upisani u Registar poljoprivrednih gazdinstava, i to:

- **fizička lica** ili
- **pravna lica**, sa manje od 25% javnog kapitala ili glasačkih prava u posedu organa javne vlasti.

#### Korisnici treba da:

- dokažu da nemaju neizmirene poreze ili obaveza za socijalno osiguranje, ni bilo kakve druge neplaćene obaveze prema državi u trenutku podnošenja prijave;
- u slučaju podnošenja zahteva za investicije kroz IPARD, korisnik mora da izmiri sve dospele obaveze po ranije odobrenim investicijama finansiranih od strane MPZZS;
- u slučaju kada korisnik nije vlasnik imanja ili zemljišta gde će se investicija vršiti, mora da podnese ugovor o lizingu ili zakupu koji pokriva period od najmanje 5 godina od dana konačne isplate.

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#### Nacionalni standardi

- Najkasnije do konačne isplate, gazdinstvo mora poslovati u skladu sa odgovarajućim nacionalnim standardima (pravilnici i zakoni) vezanim za zaštitu životne sredine i dobrobit životinja.
- Podnosilac zahteva dostavlja uz zahtev za konačnu isplatu potvrdu iz nacionalne veterinarske i uprave za zaštitu životne sredine da se na gazdinstvu primenjuju i poštuju nacionalni standardi.

#### Standardi EU

Predmet investicije mora da ispunjava odgovarajuće standarde EU u pogledu zaštite životne sredine i dobrobiti životinja.

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## Zajednički prihvatljivi kriterijumi

- Samo investicije nastale nakon potpisivanja ugovora mogu da budu plaćene, osim studija izvodljivosti i drugih konsultantskih troškova vezanih za pripremu prijave;
- Korisnik je obavezan da u periodu od 5 godina nakon konačne isplate koristi investiciju u svrhu za koju je namenjena, bez suštinskih izmena;
- Korisnici treba da dokažu svoja iskustva i znanja u oblasti poljoprivrede kroz:
  - Završenu srednju školu u oblasti poljoprivrede;
  - Iskustvo u poljoprivredi od najmanje tri godine (dokazuje se kroz upis u Registar poljoprivrednih gazdinstava);
  - Završen fakultet;
  - Završenu srednju školu i pisanu izjavu da će pohađati najmanje 50 časova obuke iz oblasti za koju konkuriše u IPARD programu.

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## Proizvodnja mleka

### Poljoprivredna gazdinstva sa 20 do 300 krava:

- Investicije u izgradnju/rekonstrukciju i/ili u opremu: • za štale za muzne krave, uključujući opremu za objekte za proizvodnju mleka, opremu za mužu, opremu za hlađenje mleka i skladišne objekte na gazdinstvu,
- u objekte i opremu za upravljanje otpadom, tretman otpadnih voda, kao i opremu za sprečavanje zagađenja vazduha, •
- skladišne kapacitete za stajnjak, uključujući specifičnu opremu za objekte za manipulaciju i korišćenje stočne hrane i stajnjaka;
- Investicije u poljoprivrednu mehanizaciju (uključujući traktore do 100 kW) i opremu;
- Investicije u proizvodnju energije iz obnovljivih izvora na gazdinstvu.

### Poljoprivredna gazdinstva sa preko 300 krava:

- Izgradnja/rekonstrukcija kapaciteta za skladištenje stajnjaka i/ili nabavka specifične opreme i mehanizacije za manipulaciju i korišćenje stajnjaka;
- Investicije u proizvodnju energije iz obnovljivih izvora na gazdinstvu.

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## Ostali usevi (žitarice, uljarice, šećerna repa)

### Poljoprivredna gazdinstva sa 2 do 50 ha zemljišta pod usevima:

- Kupovina traktora (do 100 kW), mašina i mehanizacije, osim kombajna;
- Izgradnja skladišnih objekata i oprema.

### Poljoprivredna gazdinstva sa 50 do 100 ha zemljišta pod usevima:

- Kupovina mehanizacije i mašina za poljoprivrednu proizvodnju (osim kombajna);
- Izgradnja skladišnih objekata i opreme.

### Poljoprivredna gazdinstva sa preko 100 ha zemljišta pod usevima:

- Izgradnja, proširenje, renoviranje, modernizacija i opremanje skladišnih kapaciteta.

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### Intenzitet pomoći i stopa doprinosa EU

Intenzitet pomoći iznosi do:

- 60% ukupnih prihvatljivih troškova,
- 65% za mlade poljoprivrednike (mlađi od 40 godina u trenutku podnošenja prijave),
- 70% u planinskim oblastima.
- + 10% za skladištenje otpada sa farmi (stajnjak)

Minimalni i maksimalni iznos povraćaja sredstava po sektorima:

Za voće, povrće i ostale useve:

- min. 10.000 evra, maks. 700.000 evra;

Za sektor mleka i mesa:

- min. 15.000 evra, maks. 1.000.000 evra

Korisnik može dobiti podršku maksimalno 1,5 miliona evra  
javne pomoći iz IPARD II programa.

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## Mera II „Investicije u fizičku imovinu za preradu i marketing poljoprivrednih proizvoda i proizvoda ribarstva“



Prioritetni sektori za ulaganja u preradu i marketing:

- Mleko i mlečni proizvodi
- Meso i proizvodi
- Sektor voća i povrća

Ukupan budžet: 82.946.667 EUR

19



### Ko može da konkuriše

- Korisnici mogu biti preduzetnici i pravna lica/preduzeća sa manje od 25% javnog kapitala ili glasačkih prava u posedu organa javne vlasti, registrovani u APR, i moraju biti u aktivnom statusu.
- Korisnici mogu biti mikro, mala i srednja preduzeća - definisano u članu 6. Zakona o računovodstvu RS (SG RS 62/2013);
- U slučaju da korisnik nije vlasnik, neophodno je da obezbedi ugovor o zakupu zemljišta ili objekta sa minimalnim trajanjem zakupa od 10 godina od dana podnošenja prijave;

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### Prihvatljivi troškovi

- Izgradnja ili unapređenje nepokretne imovine, do njene tržišne vrednosti;
- Kupovina novih mašina i opreme, uključujući kompjuterske programe, do njihove tržišne vrednosti;
- Opšti troškovi, kao što su troškovi: arhitekta, inženjera, drugih konsultanata; studija izvodljivosti; sve do iznosa od 12% troškova;
- Visina prihvatljivih troškova za izradu biznis plana (do milion evra - 5%, od 1-3 miliona - 4%, preko 3 miliona - 3%);
- Opravdani troškovi se određuju bez PDV;
- Investicije ne mogu značajno da se menjaju u roku od 5 godina od konačne isplate od strane IPARD agencije.

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### Visina pomoći – udeo javne podrške

- Intenzitet pomoći:
  - 50% ukupnih prihvatljivih troškova, ili
  - Investicije koje se odnose na skladištenje otpada maksimalni intenzitet pomoći može biti veći za 10% (maksimum 60%)

Minimalni i maksimalni iznosi povraćaja sredstava

- Prerada mleka (min. 20.000 €; maks. 2.000.000 €);
- Prerada mesa (min. 20.000 €; maks. 1.000.000 €);
- Prerada voća i povrća (min. 20.000 €; maks. 1.000.000 €);
- Korisnik ne može da primi više od 2 miliona evra javne podrške u okviru IPARD II programa.

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## Mera III „Diverzifikacija poljoprivrednih gazdinstava i razvoj poslovanja“



**Ukupan budžet: 23.333.333 EUR**

23

## Ko može da konkuriše?



- Registrovani poljoprivrednici ili članovi poljoprivrednog gazdinstva koji se bave poljoprivrednim ili nepoljoprivrednim aktivnostima na selu;
- Mikro i mala privatna pravna lica iz ruralnih područja – u skladu sa Zakonom o računovodstvu RS (SG RS br. 62/2013 i njegove naknadne izmene).

### Specifični kriterijumi prihvatljivosti

- Maksimalan broj ležajeva je ograničen na 30 ležajeva po registrovanom korisniku.

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## Hvala na pažnji!

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Nebojša Ivanišević – Garancijski Fond Vojvodine





## СПЕЦИФИЧНОСТ ФОНДА

Гаранцијски фонд као микрофинансијска институција свој гарантни потенцијал усмерава ка оним будућим клијентима који имају потенцијал за успостављање или развој свог пословања, а из било ког разлога нису тренутно у позицији да самостално аплицирају код пословне Банке.



## УЗ НАШЕ ГАРАНЦИЈЕ

Пословне Банка су Вама одобравале кредите уз:

- \* ниски колатерал;
- \* нижу каматну стопу;
- \* дужи период мировања;
- \* дужи рок отплате кредита.



## ОМОГУЋЕНО АПЛИЦИРАЊЕ

- \* земљорадничким задругама;
- \* привредним друштвима (микро, малим и средњим) и
- \* предузетницима регистрованим за обављање пољопривредне делатности на свим Конкурсима који се односе на пољопривредну производњу.



## У ПОСТОЈЕЋИМ КОНКУРСИМА

- проширене области финансирања;
- продужени рокови отплате;
- повећани максимални износи издатих гаранција;
- продужен период мировања отплате.

## УСВОЈЕНИ НОВИ КОНКУРСИ

ГАРАНЦИЈСКИ ФОНД  
АП ВОЈВОДИНЕ

### СКЛАДИШТА

Кредити / Гаранције  
за финансирање градње,  
реконструкције,  
адаптације силоса, хладњана,  
подних складишта  
и набавке пратеће опреме



Износ одобреног кредита	од максимално 5.000,00 ЕУР до максимално 250.000,00 ЕУР у зависности од износних средстава ЕУФ по динамичком ценовном курсу НБС на дан пуштања кредита у коришћење
Рок отплате кредита	до 10 година од дана пуштања кредита у коришћење
Годишња процентна стапка	до 24 месеца, која је уложена у отплате кредита у случају кредитног секвела, максимални период расписаности за повлачење у договору са пословном банком
Услови	у складу са пословном политиком банке
Платежи кредита у коришћењу	равно се уноси на рачун пореза на доходе подносиоца, по динамичком курсу НБС на дан пуштања средстава одобреног кредита у течај или подносиоца гаранције на рачун кредита у обавезно каматног праћења
Платежи кредита	до истеку трећег периода у једном месеци, тримесечно, полугодично или годишње износима (укупно) у износу од осамнаест драготиња и то у динарској противвредности ЕУФ по ценовном курсу НБС на дан отплате
Процентна стапка	0%
Платежи банака за издавање гаранција	до 2% од износа одобреног кредита

ГАРАНЦИЈСКИ ФОНД  
АП ВОЈВОДИНЕ

Процент за издавање гаранција	0%
Процент за каматно праћење	0,5% годишњи одговорног износа гаранције и плаћа се при издавању гаранције
Максимална годишња износна гаранција	у износу укупно једнакој износу који износи 0,5% од износа износа гаранције, а не више од 8.000,00 динара на текући рачун Фонда
Обавезна изостројна обезбеђења	банку сопствено имовно порезова и кредита за Банку и Фонд
Обавезна изостројна обезбеђења	својимачно сопствено имовно осигурање производа или износима 1. лица на пољопривредном земљишту у износу не више од 1:1,3 вредности или износима 1. лица на стамбено-пословном објекту у износу не више од 1:1,5 вредности или Банку и Фонд и Лицензу могу уложити и друга средства обезбеђења уредити гаранције, до којих објекта

ГАРАНЦИЈСКИ ФОНД  
АП ВОЈВОДИНЕ

## ЗЕМЉИШТЕ

Кредити/Гаранције  
за куповину  
пољопривредног земљишта



Износ кредитног кредита	од максимално 5.000,00 EUR до максимално 200.000,00 EUR у зависности од износ kreditnog EPR, ali najviše od iznosa kreditnog EPR na dan prijave kredita u garanciji
Намена кредита	у складу са пословним планом
Рок отплате кредита	до 15 година
Платежи кредита у кредитовању	када се у складу са рачуном продава изврши отплата кредита (финансијски износ кредитног EPR на датум плаћања кредитног кредитног кредита у складу са пословним планом на датум плаћања кредита)
Плата отплате кредита	постојеће стање кредита у складу са пословним планом, финансијским, пословним планом и годишњим извештајем (такође у складу са годишњим извештајем до ког се одређује стање кредита)
Процент отплате	0%
Наплата бане за обраду земљишта	до 1% од износа кредитног кредита
Наплата за мониторинг	0%

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Процент за издржавање гаранције	0,1% поред осталих минималних трошкова гаранције и плаћања поред издржавања гаранције
Трошкови спровођења конкурса	у складу са пословним планом и извештајем (такође у складу са пословним планом и извештајем, али не више од 5.000,00 динара на годишњи конкурс Фонда)
Обавезе инструментне обезбеђења	финансијски план и извештај (такође у складу са пословним планом и извештајем)
Остале инструментне обезбеђења	у складу са пословним планом и извештајем (такође у складу са пословним планом и извештајем, али не више од 5.000,00 динара на годишњи конкурс Фонда)

**ГАРАНЦИЈСКИ ФОНД**  
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## МЕХАНИЗАЦИЈА

Кредити / Гаранције  
за финансирање набавке  
пољопривредне опреме  
и механизације



Износ одобреног kredita	od maksimalno 5.000.000 EUR до maksimalno 250.000.000 EUR u dinarima / protivvrednosti EUR po iznosenom srednjem kursu NBS na dan prijave kredita u kreditiranje
Износ kredita за производњу млијека / стока	до максимално 10.000.000 EUR u dinarima / protivvrednosti EUR po iznosenom srednjem kursu NBS na dan prijave kredita u kreditiranje
Износ kredita за подизање енергетских заслада (фотонапонске, вјетровне, хидроелектричне)	до максимално 50.000.000 EUR u dinarima / protivvrednosti EUR po iznosenom srednjem kursu NBS na dan prijave kredita u kreditiranje
Повишење каматног стопа	u складу са одредбом банке
Трјај периода новог kredita за производњу млијека / стока	до 12 месеци, који је укључен у рок отплате kredita
Трјај периода новог kredita за подизање енергетских заслада (фотонапонске, вјетровне, хидроелектричне)	до 24 месеца, који је укључен у рок отплате kredita
Рок отплате kredita	до 30 година
Пристап kredita у коришћење	кредит се упућује на рачун kredita на основу издатог гаранционог писма / кредит се може кредитирај, по изнеником курсу NBS на дан пријаве кредитног писма у том, или порученом банком на основу кредитног писма / обавезе издатог писма



Износ отплате kredita	по основу трјаја периода у различитим износима, трансформационим, подизањем енергетских заслада / износ отплате од основне депозитне износине по у динарима / противвредности EUR по средњем курсу NBS на дан отплате
Процент отплате	0%
Наплата банке за обраду отплате	до 1% од износа одобреног kredita
Наплата за процену отплате	0%
Трјајове спровођења трансакција	у складу са банком / банком / кредитној банци / до 1% од износа одобреног kredita, а не више од 8.000.000 динара на трансакцију
Обавезе из трансакција обавезују	банку / кредитној банци / кредитној банци / до 1% од износа одобреног kredita
Остали инструменти обавезују	у складу са банком / банком / кредитној банци / до 1% од износа одобреног kredita, а не више од 8.000.000 динара на трансакцију



## ЕНЕРГЕТСКА ЕФИКАСНОСТ

Кредити / Гаранције  
за енергетску ефикасност  
и обновљиве изворе енергије



Износ одобреног kredita	od maksimalno 5.000.000 EUR до maksimalno 250.000.000 EUR u dinarima / protivvrednosti EUR po iznosenom srednjem kursu NBS na dan prijave kredita u kreditiranje
Износ kredita	до 10 пута од дозвољеног kredita у кредитирање
Трјај периода	до 18 месеци, који је укључен у рок отплате kredita
Повишење каматног стопа	u складу са одредбом банке
Трјај	u складу са одредбом банке
Пристап kredita у коришћење	кредит се упућује на рачун kredita на основу издатог гаранционог писма / кредит се може кредитирај, по изнеником курсу NBS на дан пријаве кредитног писма у том, или порученом банком на основу кредитног писма / обавезе издатог писма
Износ отплате kredita	по основу трјаја периода у различитим износима, трансформационим, подизањем енергетских заслада / износ отплате од основне депозитне износине по у динарима / противвредности EUR по средњем курсу NBS на дан отплате
Процент отплате	0%
Наплата банке за обраду отплате	до 1% од износа одобреног kredita
Наплата за процену отплате	0%





[illegible][illegible]

Привлечение инвестиций в экономику	8,5% годовых (для иностранных инвесторов) и 10% для российских инвесторов
Бюджетное финансирование, дотации	в размере 10% от суммы государственного заказа (контракта) и 50% от суммы налога на прибыль (для субъектов, в которых нет 0,0002 от суммы государственного заказа)
Субсидии на осуществление субсидируемых мероприятий	бюджетное содействие на осуществление мероприятий, финансируемых из бюджета
Иные источники финансирования	судьба инвестора-иностранца, а также инвестора-гражданина РФ, определяется в зависимости от того, какой вид деятельности он осуществляет: <ul style="list-style-type: none"> <li>а) если деятельность осуществляется в сфере, регулируемой законодательством Российской Федерации, то инвестор-иностранец должен иметь лицензию на осуществление этой деятельности;</li> <li>б) если деятельность осуществляется в сфере, регулируемой законодательством субъектов Российской Федерации, то инвестор-иностранец должен иметь лицензию на осуществление этой деятельности;</li> <li>в) если деятельность осуществляется в сфере, регулируемой законодательством субъектов Российской Федерации, то инвестор-иностранец должен иметь лицензию на осуществление этой деятельности;</li> </ul>





## Изградња објекта

Кредити/Гаранције  
за изградњу, реконструкцију,  
доградњу  
и адаптацију објекта за  
прераду  
пољопривредних производа и  
производа рибарства



Износ одобрене кредити	од минимално 10.000,00 EUR до максимално 250.000,00 EUR у зависности од износа ЕУР на постојећим објектима ЕУР на дан пуштања кредита у ток.
Време одобрене кредити	до 10 година од дана пуштања кредита у изградњу
Процент	до 12 месеци, који је у складу са условима кредита
Максимална камата 1 година	у складу са постојећим банкарским
Износ отплате	у складу са банкарским условима
Уплата	у складу са постојећим банкарским
Процент отплате	0%
Износ банкарске отплате	1% од износа одобрене кредити, једном годишње
Процент за изградњу објекта	0,5% на годишњу камату, а максимално 1% од износа кредита, а максимално 1% од износа кредита, а максимално 1% од износа кредита
Процент за адаптацију објекта	у складу са постојећим банкарским, а максимално 1% од износа кредита, а максимално 1% од износа кредита, а максимално 1% од износа кредита



Износ кредити у изградњу	кредити се у складу са условима кредита, а максимално 1% од износа кредита, а максимално 1% од износа кредита, а максимално 1% од износа кредита
Износ кредити у изградњу	кредити се у складу са условима кредита, а максимално 1% од износа кредита, а максимално 1% од износа кредита, а максимално 1% од износа кредита
Износ кредити у изградњу	кредити се у складу са условима кредита, а максимално 1% од износа кредита, а максимално 1% од износа кредита, а максимално 1% од износа кредита



## КУПОВИНА ОБЈЕКТА

Кредити/Гаранције  
за куповину објекта за  
обављање  
привредних делатности и  
вршење  
медицинских и васпитно-  
образовних услуга



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**ГАРАНЦИЈСКИ ФОНД  
АП ВОЈВОДИНЕ**

- Слободни гарантни потенцијал Гаранцијског фонда у 2018 години износи 1.091.290.983,18 динара (9.129.704,98 евра);
- Можемо гарантовати пословним банкама за преко 11 милиона евра кредита.

**ГАРАНЦИЈСКИ ФОНД  
АП ВОЈВОДИНЕ**

- Кроз постојеће Конкурсе и нови Конкурс за издавање гаранција за изградњу, реконструкцију, доградњу и адаптацију објеката за прераду пољопривредних производа и производа рибарства;
- Гаранцијски фонд је „покрио“ све области на које се ИПАРД подстицаји односе;
- Пружање тачних информација о самој процедури остваривања подстицаја.


**ГАРАНЦИЈСКИ ФОНД  
АП ВОЈВОДИНЕ**

## ЕНЕРГЕТСКА ЕФИКАСНОСТ

- Гаранцијски фонд АПВ већ неколико година успешно прати клијенте који се опредељују да инвестирају у обновљиве изворе енергије и спровођење мера енергетске ефикасности;
- Постојећа наменска кредитна линија омогућава уштеду енергије или замену фосилних горива еколошки прихватљивим, што битно утиче на тржишну позицију наших пољопривредника.




## ПРОЈЕКАТ „КЛУБ ПРИЈАТЕЉА ГФ АПВ“

- Нова услуга намењена нашим клијентима из области привреде и пољопривреде;
- Добровољно чланство у Клубу омогућава добијање информација значајних за њихову делатност;
- Комуникација са члановима ће се вршити путем званичне презентације Фонда, "sms" порука, електронске поште и сл. и
- Фонд ће на овај начин вршити промоцију својих активности, бити у сталном контакту са својим клијентима, док би чланови Клуба поред корисних информација остваривали и друге бенефите од правних лица са којима ће Фонд закључити одређене пословне аранжмане.



## Jelena Trenkić – Razvojni Fond Vojvodine



### ПРОЦЕДУРЕ И УСЛОВИ ЗАЈЕДНИЧКИ ЗА СВЕ КОНКУРСЕ

- Конкурси Фонда налазе се на сајту Фонда [www.rfapv.rs](http://www.rfapv.rs)
- Услови и потребна документација су наведени у сваком конкурс.
- Конкурси су отворени до искоришћења средстава планираних за њихову реализацију и нису временски ограничени
- Фонд кредитне захтеве оцењује у смислу испуњености конкурсних услова, као и кредитне способности подносиоца захтева
- Коначну одлуку о одобравању кредита доноси Надзорни одбор

### Каматна стопа

- 2% на годишњем нивоу за кредите обезбеђене гаранцијом
- 3% на годишњем нивоу за кредите обезбеђене хипотеком

Каматна стопа за кориснике кредита који имају седиште на територијама градова и општина Аутономне покрајине Војводине сарстаних у трећу и четврту групу развијености се смањује за један процентни поен

- 1,5% на годишњем нивоу без обзира на понуђене инструменте обезбеђења код Конкурса за набавку нове механизације

- примена валутне клаузуле – за све обрачунае кредита по свим питањима примењује се средњи курс евра на дан уплате или исплате
- У грејс периоду се обрачунава и плаћа интеркаларна камата у висини уговорене каматне стопе
- Динамика враћања: могућност избора (месечни, тромесечни или шестомесечни анuitети)

### ИНСТРУМЕНТИ ОБЕЗБЕЂЕЊА КРЕДИТА

- гаранција пословне банке, или
- хипотека првог реда на пољопривредном земљишту чија вредност је минимум 1,5 пута већа од вредности кредита, или
- хипотека првог реда на грађевинском земљишту, стамбеној или пословној непокретности чија тржишна вредност је минимум 2 пута већа од вредности кредита само код кредитирања правних лица и предузетника и појединих намена код РПГ
- Могућност успостављања залогa на новкупљеној погонској пољопривредној машини која се финансира средствима кредита

### КРЕДИТИРАЊЕ ИНДИВИДУАЛНИХ ПОЉОПРИВРЕДНИХ ГАЗДИНСТАВА

**КОРИСНИЦИ КРЕДИТА:** физичко лице – носиоцац регистрованог пољопривредног газдинстава на територији АП Војводине које:

- има активан статус газдинства и навршених мање од 70 година
- Нема доспелих неизмирених обавеза према Фонду
- Нема доспелих неизмирених обавеза према АП Војводини по кредитима одобреним од стране ФЗР
- Нема неизмирених обавеза по основу пореза и осталих јавних прихода

### Кредитирање РПГ реализује кроз 6 конкурса:

- 1 конкурс за **краткорочно** финансирање
- ✓ Краткорочни кредит за обртна средства у пољопривреди
- 5 конкурса за **дугорочно** финансирање
- ✓ Дугорочни кредит за пољопривреду
- ✓ Дугорочни кредит за куповину пољопривредног земљишта
- ✓ Дугорочни кредит за набавку нове пољопривредне механизације
- ✓ Дугорочни кредит за развој туризма
- ✓ Дугорочни кредит за инвестиције у пољопривреди у оквиру ИПАРД програма





### КОНКУРС ЗА КРАТКОРОЧНЕ КРЕДИТЕ ЗА ОБРТНА СРЕДСТВА У ПОЉОПРИВРЕДИ

**НАМЕНА СРЕДСТАВА:** Финансирање обртних средстава у пољопривредној производњи



#### УСЛОВИ КРЕДИТИРАЊА

- износ кредита: од 300.000,00 до 10.000.000,00 динара
- расположивост средстава: 48 месеци од прве реализације
- рок враћања трансхе: 12 месеци

Репрезентативан пример за износ кредита од 10.000 ЕУР

Рок враћања: 12 месеци (једнотрано) Камата: полугодниња

Каматна стопа	1 %	2 %	3 %
Шестомесечна камата	50	100	150
Укупна камата за 12 месеци	100	200	300



### КОНКУРС ЗА ДУГОРОЧНЕ КРЕДИТЕ ЗА ПОЉОПРИВРЕДУ



#### НАМЕНА СРЕДСТАВА

- набавка пољопривредне механизације за пољопривредну производњу (трактори, комбайни и припојачно-машине)
- набавка опреме за пољопривредну производњу
- набавка квалитетног прикладног материјала у стољарству, матичног јата
- набавка пчелињих друштва, кошница и опреме за пчеларство
- набавка вилебричних засада воћа, винове лозе и осталих вишегодишњих засада са ограниченим површином под засадама
- набавка транспарентних мрежа са напонам и мрежа за засенчавање
- набавка пластеника, стакленика и опреме за заштитени простор
- изградња бинара и набавка опреме и система за наводњавање
- набавка опреме за повећање капацитета и осавремењавање линија за прераду пољопривредних производа
- куповина, изградња, адаптација и опремање складишних капацитета – силоса, поднег складишта и складишта и капацитета за прераду пољопривредних производа
- куповина, изградња и адаптација прећеничних објеката за стољарску производњу у циљу заштите животне средине и могућности стандарда у области пољопривредне производње



#### УСЛОВИ КРЕДИТИРАЊА

- износ кредита: од 300.000,00 до 100.000.000,00 динара
- сопствено учешће: минимално 20%
- рок враћања кредита: до 7 година
- грејс период: до 24 месеци
- Могућност успостављања залогa на новокупљеној погонској пољопривредној машини која се финансира средствима кредита
- Могућност обезбеђења кредита хипотеком на стамбену или пословну непокретност уколико је намена кредита финансирање програма у области пчеларства
- Кредити у износу вишем од 20.000.000,00 динара обезбеђују се искључиво гаранцијом пословне банке.



#### КОНКУРС ЗА ДУГОРОЧНЕ КРЕДИТЕ ЗА ПОЉОПРИВРЕДУ

Репрезентативан пример за износ кредита од 10.000 ЕУР

Рок враћања: 7 година Пир: 2 године Акупит: ајстотомечни

Каматна стопа	1 %	2 %	3 %
Шестомесечна камата у грејсу	50	100	150
Укупна камата за 2 године грејса	200	400	600
Износ акупитета	1.028	1.056	1.084
Укупно враћање	10.480	10.960	11.440



### КОНКУРС ЗА ДУГОРОЧНЕ КРЕДИТЕ ЗА КУПОВИНУ ПОЉОПРИВРЕДНОГ ЗЕМЉИШТА

**НАМЕНА СРЕДСТАВА:** Кредити су намењени за финансирање куповине пољопривредног земљишта у циљу укупљавања поседа регистрованих пољопривредних газдинстава



#### УСЛОВИ КРЕДИТИРАЊА

- износ кредита: од 300.000,00 до 20.000.000,00 динара
- сопствено учешће: минимално 20%
- рок враћања кредита: до 7 година (укључујући и грејс период)
- грејс период: до 12 месеци
- пољопривредно земљиште које је предмет куповине мора бити у пречнику до 50 км од седишта регистрованог пољопривредног газдинства;
- продајца земљишта не могу бити законски наследници у правој линији или брачни другови подносиоца захтева;
- куповина пољопривредног земљишта ће се извршити у року од најдуже 10 месеци рачунато од дана закључења Уговора о кредиту





### КОНКУРС ЗА ДУГОРОЧНЕ КРЕДИТЕ ЗА КУПОВИНУ ПОЉОПРИВРЕДНОГ ЗЕМЉИШТА

Репрезентативан пример за износ кредита од 10.000 ЕУР  
 Рок враћања: 7 година Греш: 1 година Анuitет: шестомесечни

Каматна стопа	1 %	2 %	3 %
Шестомесечна камата	50	100	150
Укупна камата за 1 годину грејса	100	200	300
Износ анuitета	861	888	917
Укупно враћање	10.432	10.856	11.304



### КОНКУРС ЗА ДУГОРОЧНЕ КРЕДИТЕ ЗА НАБАВКУ НОВЕ ПОЉОПРИВРЕДНЕ МЕХАНИЗАЦИЈЕ

**НАМЕНА СРЕДСТАВА:** Кредити су намењени за финансирање набавке нове пољопривредне механизације



### УСЛОВИ КРЕДИТИРАЊА

- износ кредита: од 100.000,00 до 5.000.000,00 динара
- сопствено учешће: - минимално 20% - за погонске машине  
- без учешћа - за прикључне машине
- рок враћања кредита: до 5 година (укључујући и грејс период)
- грејс период 6 месеци

### ПОСЕБНЕ ПОГОДНОСТИ

- 1,5% на годишњем нивоу без обзира на понуђене инструменте обезбеђења
- Могућност успостављања залого на новокупљеној погонској пољопривредној машини која се финансира средствима кредита
- Без накнаде за обраду кредитног захтева
- Поједностављена процедура
- Без старосне границе носиоца пољопривредног газдинства
- Без минималних услова који важе за све остале конкурсе РФВ



### КОНКУРС ЗА ДУГОРОЧНЕ КРЕДИТЕ ЗА НАБАВКУ НОВЕ ПОЉОПРИВРЕДНЕ МЕХАНИЗАЦИЈЕ

Репрезентативан пример за износ кредита од 10.000 ЕУР  
 Рок враћања: 5 година Греш: 8 месеци Анuitет: шестомесечни

Каматна стопа	1,5 %
Шестомесечна камата у грејсу	75
Износ анuitета	1.163
Укупно враћање	10.452



### КОНКУРС ЗА ДУГОРОЧНЕ КРЕДИТЕ ЗА РАЗВОЈ ТУРИЗМА

**НАМЕНА СРЕДСТАВА:** Кредити су намењени за финансирање инвестиционих улагања у области туризма



### КОРИСНИЦИ КРЕДИТА

- Корисници кредита могу бити како носиоци регистрованих пољопривредних газдинстава тако и правна лица и предузетници

### УСЛОВИ КРЕДИТИРАЊА

- износ кредита: до 10.000.000,00 динара за регистрована пољопривредна газдинства односно до 20.000.000,00 динара за правна лица и предузетнике
- сопствено учешће: минимално 20%
- рок враћања кредита: до 7 година (укључујући и грејс период)
- грејс период: до 2 године



### КОНКУРС ЗА ДУГОРОЧНЕ КРЕДИТЕ ЗА РАЗВОЈ ТУРИЗМА

Репрезентативан пример за износ кредита од 10.000 ЕУР  
 Рок враћања: 7 година Греш: 2 година Анuitет: шестомесечни

Каматна стопа	1 %	2 %	3 %
Шестомесечна камата	50	100	150
Укупна камата за 2 године	200	400	600
Износ анuitета	1.028	1.056	1.084
Укупно враћање	10.480	10.960	11.440



### КОНКУРС ЗА ДУГОРОЧНЕ КРЕДИТЕ ЗА ИНВЕСТИЦИЈЕ У ПОЉОПРИВРЕДИ У ОКВИРУ ИПАРД ПРОГРАМА

**НАМЕНА СРЕДСТАВА:** Кредити су намењени за подршку инвестицијама у пољопривреди у складу са правилником о ИПАРД подстицајима



#### КОРИСНИЦИ КРЕДИТА

- Корисници кредита могу бити, каво носиоци регистрованих пољопривредних газдината тако и правна лица и предузетници

#### УСЛОВИ КРЕДИТИРАЊА

- до 150.000,00 EUR у динарској противвредности по средњем курсу НБС за EUR на дан реализације кредита - за одобрене пројекте за набаву погонске пољопривредне механизације и пољопривредних машина, у складу са Листом приватних инвестиција и трошкова
- до 800.000,00 EUR у динарској противвредности по средњем курсу НБС за EUR на дан реализације кредита - за одобрене пројекте за инвестиције у објекте и опрему, у складу са Листом приватних инвестиција и трошкова
- Без сопственог учешћа
- рок враћања кредита: до 7 година (услужујући и грејс период)
- грејс период: до 2 године



#### КРЕДИТИРАЊЕ ПРАВНИХ ЛИЦА И ПРЕДУЗЕТНИКА

**КОРИСНИЦИ КРЕДИТА** - Правна лица и предузетници разврстани као микро, мало или средње правно лице са регистрованим седиштем на територији Аутономне Покрајине Војводине



#### МИНИМАЛНИ УСЛОВИ

За кредите обезбеђене **гаранцијом**:

- Нема доспелих неизмиренних обавеза према Фонду
- Нема доспелих неизмиренних обавеза према АП Војводини по кредитима одобреним од стране ФЗР
- Нема неизмиренних обавеза по основу пореза и осталих јавних прихода

За кредите обезбеђене **хипотеком** поред наведених, неопходни су и следећи услови:

- Најмање два годишња финансијска извештаја
- Пословање са пословним и нето добитком по последњем завршном рачуну
- Укупни капитал већи од нуле по последњем завршном рачуну



Кредитирање правних лица и предузетника реализује се кроз 5 отворених конкурса:

- 1 конкурс за **краткорочно** финансирање
- ✓ Краткорочни кредит за обртна средства
- 4 конкурса за **дугорочно** финансирање
- ✓ Дугорочни кредит за трајна обртна средства
- ✓ Дугорочни кредит за инвестициона улагања
- ✓ Дугорочни кредит за развој туризма
- ✓ Дугорочни кредит за инвестиције у пољопривреди у оквиру ИПАРД програма



#### КОНКУРС ЗА КРАТКОРОЧНЕ КРЕДИТЕ ЗА ОБРТНА СРЕДСТВА

**НАМЕНА СРЕДСТАВА:** Кредити су намењени за финансирање обртних средстава.



#### УСЛОВИ КРЕДИТИРАЊА

- износ кредита у складу са кредитном способношћу:  
од 300.000,00 до 20.000.000,00 динара
- рок враћања кредита: до 12 месеци
- грејс период: до 3 месеца
- период расположивости: 48 месеци од дана прве реализације кредита, при чему корисник може користити нову траншу након потпуног измирења обавеза по претходној транши

Репрезентативан пример: за износ кредита од 10.000 EUR

Рок враћања: 1 година Грејс: 3 месеца Анuitет: месечно

Каматна стопа	1 %	2 %	3 %
Месечна камата	8	17	25
Износ анuitета	1.116	1.120	1.125
Укупно враћање	10.068	10.131	10.200



#### КОНКУРС ЗА ДУГОРОЧНЕ КРЕДИТЕ ЗА ТРАЈНА ОБРТНА СРЕДСТВА

**НАМЕНА СРЕДСТАВА:** Кредити су намењени за финансирање трајних обртних средстава потребних за обезбеђење континуитета пословног процеса.



#### УСЛОВИ КРЕДИТИРАЊА

- износ кредита: у складу са кредитном способношћу:  
од 500.000,00 до 50.000.000,00 динара
- рок враћања кредита: до 48 месеци
- грејс период: до 6 месеци
- кредити у износу вишем од 20.000.000,00 динара обезбеђују се искључиво гаранцијом пословне банке.

Репрезентативан пример: за износ кредита од 10.000 EUR

Рок враћања: 4 године Грејс: 6 месеци Анuitет: шестомесечно

Каматна стопа	1 %	2 %	3 %
Шестомесечна камата	50	100	150
Анuitет	1.457	1.486	1.516
Укупно враћање	10.249	10.502	10.762

**КОНКУРС  
ЗА ДУГОРОЧНЕ КРЕДИТЕ  
ЗА ИНВЕСТИЦИОНА УЛАГАЊА**

**НАМЕНА СРЕДСТАВА:** Кредити ће се додељивати за финансирање инвестиционих улагања.

**УСЛОВИ КРЕДИТИРАЊА**

- износ кредита: у складу са кредитном способношћу: од 500.000,00 до 100.000.000,00 динара
- сопствено учешће: минимално 20 %
- рок враћања кредита: до 7 година
- грејс период: до 24 месеца
- кредити у износу вишем од 50.000.000,00 динара обезбеђују се искључиво гаранцијом пословне банке.
- Инвестиција која је предмет финансирања се мора реализовати на територији АП Војводине.

Репрезентативан пример за износ кредита од 10.000 ЕУР.  
Посеђања: 7 година Грейс: 2 године Анuitет: ајстовосени

Каматна стопа	1 %	2 %	3 %
Шестомесечна камата у грејсу	50	100	150
Укупна камата за 2 године грејса	200	400	600
Износ анuitета	1.028	1.056	1.084
Укупно враћање	10.480	10.960	11.440

- 21000 Нови Сад, Булевар цара Лазара 7а
- Телефон: 021 454 334,
- email: [office@rtapv.rs](mailto:office@rtapv.rs),
- web: [www.rtapv.rs](http://www.rtapv.rs) [www.rfv.rs](http://www.rfv.rs)

Dragana Matić – Cascade funding



**BioSense INSTITUTE**

Kaskadno finansiranje

Aktuelni projekti Instituta BioSens

Dragana Matić

Novi Sad, 01.03.2018.





## THE IOF2020 STORY

Connect the Internet of Things and the agri-food sectors for a more competitive and sustainable agriculture

BY

Connecting and building communities

TO

Tackle global challenges: food security, biodiversity, health & nutrition



## THE CONSORTIUM

- 45 partners private sector
- 26 SME's
- 50 AgriFood partners
- 21 IoT Technology suppliers
- 32 not-for-profit, 12 academics
- 60 partners direct involved in use case



## 5 TRIALS, 19 USE CASES



## VISION & AMBITION

IoF2020 paves the way for:

- Sustainable, flexible and adaptable farming;
- A data-driven farming;
- Autonomous farm operations;
- Integrated and transparent agri-food chain;
- Virtual food chains;
- Interoperable farm activities;
- A personalized nutrition of the European citizens.

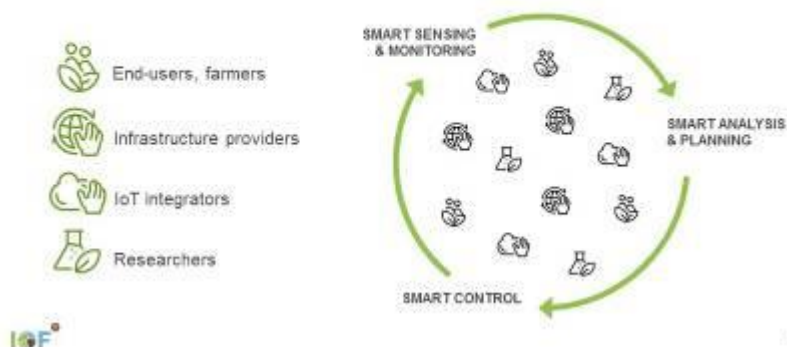


\*Second half of 2018,  
€5-6 million

LARGE-SCALE EXPANSION



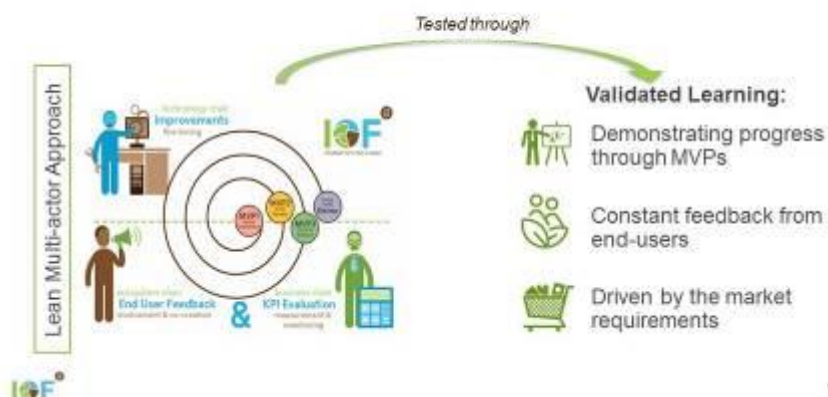
## MULTI-ACTOR APPROACH



## TOWARDS THE IOF2020 ECOSYSTEM

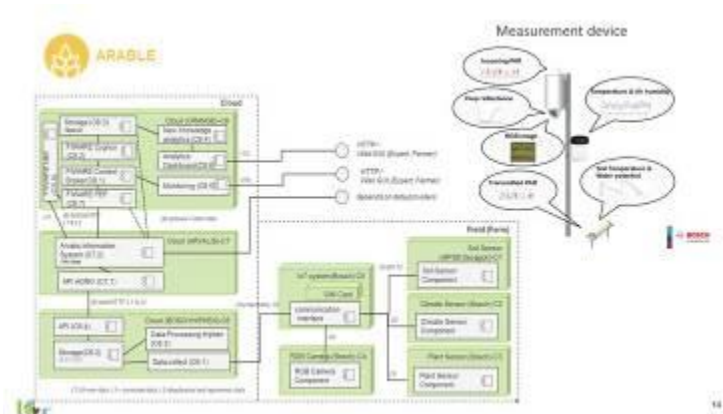


## TESTING AND VALIDATION METHOD



## TRIALS STATUS







## STAY-TUNED VIA

- Website: [www.iof2020.eu](http://www.iof2020.eu)
- Twitter: [@loF2020](https://twitter.com/loF2020) 
- Facebook: loF2020 
- Newsletter subscription & contact: [communications@iof2020.eu](mailto:communications@iof2020.eu)



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### PUSHING TOWARDS EU SMART GROWTH



## CALL CHALLENGES

Sector	Challenges to be addressed	Benefits
Agrifood	Food delivery, food quality, reduced spoilage, personalised food production, complete visibility, precision agriculture, optimize planting, maximize crops, identify disease and outbreaks, produce maintenance	Reduced costs, reduced environmental impact (through lower fuel consumption), improved quality and well-being

diatomic

## OPEN CALL 1 TIMELINE



diatomic

## OPEN CALL 2 INDICATIVE TIMELINE



diatomic

## OPEN CALL 1 MARCH 15th - JUNE 15th, 2018



diatomic





**Thank you!**



 @diatomicEU  
 fb.com/diatomicEU  
 <https://www.linkedin.com/groups/13543145>

The given information about the open calls is indicative and will be specified at later stage. It can't be considered as legally binding.













 This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 741029.





## Mr Iakovos Delioglani – ISABEL project



**ISABEL**  
powered by your local community

Smart AKIS – 3<sup>rd</sup> Innovative Workshop  
01/03/2018, Novi Sad, Serbia

### Regional biogas communities: Socio-economic and environmental challenges and opportunities for local economies



ISABEL has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 681712

*Mr Iakovos Delioglani*  
Q-PLAN INTERNATIONAL ADVISORS PC  
[delioglani@qplan.gr](mailto:delioglani@qplan.gr)

Triggering  
SustainAble Biogas  
Energy  
Communities  
through Social  
Innovation

### What is a Biogas plant?



Source: <http://www.lesbiogas.it/en/biogas-plant-operation/356>



Smart AKIS – 3<sup>rd</sup> Innovative Workshop, 1/3/2018, Novi Sad, Serbia

## Opportunities for local communities

### Economic benefits

- ✓ New revenues streams (electricity and/or heat and/or manure)

### Environmental benefits

- ✓ Waste management – licensing of farms, oil mills, dairy, etc
- ✓ Better quality of manure for agricultural use
- ✓ Protection of water supplies
- ✓ Energy production from renewable resources

### Social benefits

- ✓ Strengthening of local economy
- ✓ Cooperation culture

## Challenges – enabling factors

### What is available?

- Type, quality, quantity, availability throughout the year of biomass (+ cost ?)
- Manure from cows, pigs, etc (sheltered / free animals)
- Agricultural residues, crops, silage, reeds, grass, etc.

### Size/location of the plant

- Electric power produced and/or heat
- Location of the farms
- Access to the electricity grid
- Technical characteristics

### External environment

- National legislation - Requirements, procedures, feed-in tariffs, etc
- Funding sources (bank loans, structural funds, etc.)



Smart AKIS – 3<sup>rd</sup> Innovative Workshop, 1/3/2018, Novi Sad, Serbia

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## Example 1 – The “Prespes biogas community”

### Stakeholders involved

- the PRESPE municipality
- the Society for the Protection of Prespa (NGO)
- the Management Body of Prespa National Park (public entity)
- the Livestock Association of Municipality of Prespa
- the Agricultural Cooperative of Bean Producers “PELICAN”
- the Local Land Reclamation Organization (public entity)



### Challenge

- Protect the environment (agricultural activities – fertilizers)
- Region's economic growth

### Available biomass

- Manure (cows, pigs)
- Reeds from the lake and the drainage channels



### Support offered

- Estimation on the energy production of the potential biogas plant
- Location of potential biogas plant
- Analysis of the licensing procedures
- Elaboration of a feasibility study for the Biogas Plant operation



Smart AKIS – 3<sup>rd</sup> Innovative Workshop, 1/3/2018, Novi Sad, Serbia

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## Example 2 – The “NEOGAL biogas community”

### Stakeholders involved

- Members (breeders/farmers) of NEOGAL cooperative dairy industry

### Challenge

- Compliance with national and European legislation regarding livestock breeders' and NEOGAL dairy waste management
- New sources of income for its shareholders
- Use of biogas plant's digestate (organic fertilizer) to its members' farms



### Available biomass

- Manure from its members' farms (cows)
- Dairy waste

### Support offered

- Estimation on the energy production of the potential biogas plant
- Location of potential biogas plant
- Analysis of the licensing procedures
- Elaboration of a feasibility study for the Biogas Plant operation



Smart AKIS – 3<sup>rd</sup> Innovative Workshop, 1/3/2018, Novi Sad, Serbia

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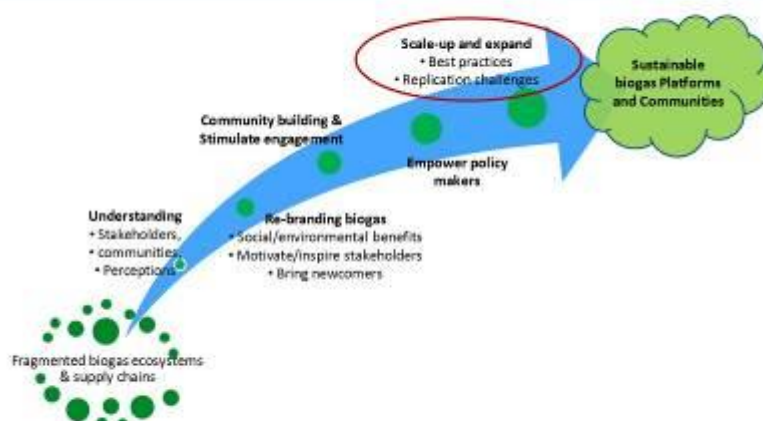


### ISABEL Project identity

Type	Coordination and Support Action
Duration	36 months (Jan 2016 – Dec 2018)
Coordinator	Q-PLAN INTERNATIONAL ADVISORS (GR)
Programme	HORIZON2020 "Secure, clean and efficient energy"
Aim	Support local communities to set up biogas energy initiatives and strengthen the development of sustainable biogas production and consumption systems around Europe



### Methodological concept



Smart-AKIS – 3<sup>rd</sup> Innovative Workshop, 1/3/2018, Novi Sad, Serbia

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Smart-AKIS – 3<sup>rd</sup> Innovative Workshop, 1/3/2018, Novi Sad, Serbia

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### RIW3 Attendance Sheets

The list is not provided due to confidentiality reasons.

### RIW3 Pictures



RIW3 – Novi Sad (audience)



Slađana Glušević – IPARD fond





Nebojša Ivanišević, Guarantee Found of



APV

Jelena Trenkić, Development Found of APV





Iakovos Delioglakis, Qplan International



Mirko Vlček, agricultural producer

## RIW3 Findings

On top of the multi-actor collaborations that are to emerge from the RIWs, other outputs are expected as a result of bringing together stakeholders into the RIWs. One of the overall objectives of Smart-AKIS is to capture these outputs in order to produce recommendations for fostering the penetration of SFT in Europe.

This section of the “minutes” document provides a number of headlines, covering different aspects that could emerge in the discussion in the RIWs (both in plenary but also in the Work Groups). **Hub partners are encouraged to pay careful attention to the discussions taking place in the RIWs in order to identify these “findings”.** As suggested in the Guidelines, the Work Groups can be tape recorded in order to better grasp the discussion taking place. These “findings” will be included on the “Smart AKIS Report” to be produced by each Hub partner after all RIWs.

### Identification of needs regarding SFTs

*Are the users’ needs identified in D2.2 confirmed by the RIW findings for your Hub? Can other needs regarding SFTs be identified from the discussions in the RIW? These can be technological needs, but also others, such as need for training, need for improved advisory, etc. Can these needs be addressed by setting up collaborations (for example, by a collaboration project) or are there to be addressed at the political level (for example, by setting up a subsidy for SFTs)? Do attendees have ideas regarding the use of SFT to your Hub?*

Users’ needs identified in D2.2 during 2016 are fully confirmed during all RIWs held in 2017 and 2018. The need that was once again stressed is the need for training and testing of SFTs in their own fields. One of possible solutions that was proposed is to establish a demonstration farm(s) that will serve as a open air show-room for ag technologies.

### Identification of barriers and incentives for adoption of SFTs

*Are the barriers identified in D2.3 confirmed by the RIW findings for your Hub (i.e. farm size, cropping system, farmers’ age and education/training, etc)? Can other barriers for SFT adoption be identified that are specific to your Hub?*

The biggest obstacle for brother adoption of SFTs is the price, combined with the fragmentation of agricultural land. Namely, majority agricultural producers cultivate small parcels, which distance is often more kilometres. That is the reason why the ROI on some SFTs is not so attractive to small producers in Serbia, Vojvodina.

### Interest on adoption and transfer of presented SFTs

*Do attendees show a special interest towards specific SFTs? Are these SFTs in the market yet or are they being developed (TRL<9)? Have attendees provided feedback to SFT industry in the RIW for improving the SFTs or adjusting them to the specific regional conditions so as to bring them into practice?*

During RIW3 special interest was on drones and its use in vineyards. The features farmers explained already exist in the market (TRL9), but the cost is too high (farmers that were interested in these solutions participated in the demonstration day of one of the leading companies in this field, and presented prices were inconvenient, even though companies proposed some discounts and special offers).

## Potential new uses for existing SFTs (to feed EIP-Agri template “Needs for research”)

*Have new uses been identified for the SFTs presented (i.e. SFT presented for arable crops that can be adapted for vineyard).*

## Potential inputs for research (to feed EIP-Agri template “Needs for research”)

*Are there specific needs that can be addressed through research (it can be basic research on i.e. development of a new remote sensing index, but also applied research on, i.e. application of a specific SFT to a new environment)? Have attendees (SFT industry, farmers) provided feedback to research results regarding specific SFT?*

On RIW3 we have confirmed that some of the needs highlighted in previous workshops are still in focus. Namely, two issues that can be addressed by research are *sensors* for soil moisture that will not depend on the type of soil. At the same time, the need for cheap sensors is still very urgent to farmers.

Another topic that was discussed was regarding drones and its usage in pest control (in vineyards, according to farmers, it will be very useful to detect the level of pests on the edges, where one vineyard borders another. This might be done by implementation of different sensors on drone, but further research is needed.

## RIW3 Project Ideas

### Project Idea 1

Category of project	Smart Farming Technology	Crop system
<i>Innovation</i>	<i>Soil moisture sensor</i>	<i>Arable</i>
<b>Promoter/s name/s</b>		
Goran Kitić – researcher		
<b>Partner/s of the proposal and role</b>		
BioSense Institute – technical partner		
Farm associations and individual partners – testing and validation		
<b>Title of project</b>		
<b>Soil moisture sensor regardless on soil type</b>		
<b>Expected benefits</b>		
Productivity increase, revenue profit farm income increase (due to lowering input costs), reduction of irrigation water use		
<b>Goal and objectives</b>		
<ul style="list-style-type: none"> <li>Develop ecological, robust and durable solution with the performance that does not degrade with time</li> <li>Use materials that will lower the production cost (<math>\approx 6\\$</math>)</li> <li>Pave the way for market take-up</li> </ul>		
<b>Planned work packages or main activities</b>		
Following activities are foreseen for the implementation of the project: <ul style="list-style-type: none"> <li>Construct 25 prototypes</li> <li>Test prototypes on different soil variates in Serbia, and preferably abroad (target: 20 use cases with different crops)</li> <li>Co-creation and validation with end-users (feedback regarding user experience)</li> <li>Redesign the prototype accordingly</li> </ul>		
<b>Estimated budget</b>		

500.000€
<b>Planned source of funding</b>
EC
<b>Maturity level</b>
Very mature
<b>Cross-border potentiality</b>
Cross-border collaboration is foreseen in the project. The potential for successful collaboration is very high since some initial connections have already been established.

## Project Idea 2

Category of project	Smart Farming Technology	Crop system
<i>Innovation</i>	<i>Decision support tool allowing farmers to calculate the economic benefit of specific seed variety</i>	<i>Arable Tree Vegetables Vineyards</i>
<b>Promoter/s name/s</b>		
Oskar Marko – researcher		
<b>Partner/s of the proposal and role</b>		
BioSense Institute – technical partner Agricultural associations – testing and validation Seed companies - testing Silo owners in Vojvodina Group of individual farmers – testing and validation		
<b>Title of project</b>		
<b>Decision support tool allowing farmers to calculate the economic benefit of specific seed variety</b>		
<b>Expected benefits</b>		
Productivity increase, quality of product increase, some decrease in input costs, decrease of stress or fatigue for farmer		
<b>Goal and objectives</b>		
<ul style="list-style-type: none"> <li>• Provide an advice to farmers regarding:</li> <li>• Needed (adequate) SFT</li> <li>• Type of crops for following season</li> <li>• Present quantified benefit</li> </ul>		
<b>Planned work packages or main activities</b>		
This project foresees following steps: <ul style="list-style-type: none"> <li>• To gather historical data on crops (yields per season), prices, price volatility...</li> <li>• To feed the system with information regarding needed activities per parcel (human and machine working hours), crop rotation and demand estimation</li> <li>• Scientific research in the field of multi-objective optimization</li> </ul>		
<b>Estimated budget</b>		
300.000€		
<b>Planned source of funding</b>		
EU / national		
<b>Maturity level</b>		
Very mature since part of the algorithm has already been approved by Syngenta company		
<b>Cross-border potentiality</b>		
Some potential		

### Project Idea 3

Category of project	Smart Farming Technology	Crop system
<i>Innovation/Market uptake</i>	<i>Trainings to agricultural journalists</i>	<i>Arable Tree Vegetables Vineyards Grasslands</i>
<b>Promoter/s name/s</b>		
Ivana Horvat		
<b>Partner/s of the proposal and role</b>		
BioSense Institute – coordinator and provider of trainings		
Serbian network of journalists		
Balkan network of scientific journalists		
Serbian independent association of journalists		
<b>Title of project</b>		
Journalists as evangelists for SFTs		
<b>Expected benefits</b>		
Increase of adoption of SFTs among small agricultural producers in Balkan region		
<b>Goal and objectives</b>		
<b>The main goal is to broaden the news</b>		
<b>Planned work packages or main activities</b>		
<ul style="list-style-type: none"> <li>To present to journalists (dedicated to agriculture and rural development) what are possibilities of technologies and how they can add value to agricultural production</li> <li>To train them how main technologies might be used</li> <li>To create database of all ag journalists in the region and classify them according pre-defend methodology/specializations</li> <li>To keep journalists updated regarding main trends and events in the region that might be useful for farmers</li> <li>To organize open days on demonstration farms for journalists</li> </ul>		
<b>Estimated budget</b>		
400.000€		
<b>Planned source of funding</b>		
EC, cross-border collaboration		
<b>Maturity level</b>		
Very mature		
<b>Cross-border potentiality</b>		
The cross-border potential is very high due to already established connections. In addition, there is already developed plan for attracting more foreign journalists.		

### Project Idea 4

Category of project	Smart Farming Technology	Crop system
<i>Innovation/Market uptake</i>	<i>Agricultural platform with possibility to acquire drone data</i>	<i>Arable Tree Vegetables Vineyards</i>
<b>Promoter/s name/s</b>		
Vladan Minić – BioSense Institute (AgroSens platform)		
<b>Partner/s of the proposal and role</b>		



Drone company – Agremo Farmers for testing
<b>Title of project</b>
Data-based decision support system
<b>Expected benefits</b>
Increased yield, input costs decrease
<b>Goal and objectives</b>
The goal of the project is to upgrade the currently existing platform, so it can absorb, and process drone data and provide advices to agricultural producers. For the beginning, the platform will be fully interoperable just with project partner's system (Agremo), but further upgrades and developments are foreseen. After second iteration, the platform will be compatible with main drone systems.
<b>Planned work packages or main activities</b>
The main activity will be to understand what type of information is gathered through drones and to analyse what information is presented on the platform. The next step will be to make link with two systems and develop the back-office algorithm that will process data and transfer ready-to-use information to the platform. The final step will be to implement changes and publish new option for users that have drone data. In addition, there are two parallel activities that are planned: dissemination of new platform features and further promotion of Agremo services to agricultural producers.
<b>Estimated budget</b>
250.000€
<b>Planned source of funding</b>
Private and national
<b>Maturity level</b>
Very mature
<b>Cross-border potentiality</b>
Since the platform is currently available just in Serbia, the transnational potential is very low. If (when) the platform will offer its services outside Serbia, this collaboration will have very high cross-border potential.

## Project Idea 5

Category of project	Smart Farming Technology	Crop system
<i>Innovation</i>	<i>Marketplace for organic products</i>	<i>Arable Tree Vegetables Vineyards</i>
<b>Promoter/s name/s</b>		
Mirko Vlček, agricultural producer and IT developer		
<b>Partner/s of the proposal and role</b>		
Jerry Software, Belgrade		
<b>Title of project</b>		
Grocery in your pocket		
<b>Expected benefits</b>		
Revenue profit farm income increased, stress and fatigue for farmers decreased		
<b>Goal and objectives</b>		
The goal of this project is to get closer organic agricultural producers and end-user (buyers). The idea behind the project is to turn the smart phone into ultimate tool for running business – an instant messaging application for ordering and selling.		
<b>Planned work packages or main activities</b>		

The main activities can be divided in three groups:

Develop an application (and technical maintenance)

Fill the database with:

- Customer database (for buyers' engagement)
- Producers database (each producer will have its own profile with description)
- Interactive message board
- Expert field (knowledge, innovative methods/technologies, experiences from entire agricultural chain;
- Training field – one level for consumers (in order to get familiar with organic production and benefits organic products have on health) and another for ag producers (which will be able to create their own workflow by defining different levels that producers will go through to complete the course. Potential areas: organic production legislation, planting in organic production, cultivation in organic production, etc.)

Market positioning

**Estimated budget**

**100.000€**

**Planned source of funding**

Private (if the prototype is successful, might be an option for internationalization and therefore an external founding)

**Maturity level**

Very mature

**Cross-border potentiality**

High (after initial testing phase in Serbia)

## RIW3 Evaluation

Information summing up the results from the Evaluation Form voluntarily filled in by participants.

An Evaluation Form in English is proposed but partners are free to tailor it to their needs and to use a local language form.

<b>Interest</b>	Average score	3.8
	More interesting presentations Mirko Vlček – experience form cascade funding	
<b>Organization</b>	Average score	4.9
	Improvement areas no	
<b>Methodology</b>	Average score	4.0
	Improvement areas no	
<b>Project Ideas</b>		3.0

	Average score	
	Top Project Ideas Soil moisture sensor	
	Average rate of participants planning to take part on projects	3
<b>Sources of funding</b>	Average score	4.1
	Top sources of funding Development Found of Vojvodina	
	Average rate of participants planning to use sources of funding	3
<b>Open suggestions</b>	Continuation of Smart-AKIS events and matchmaking sessions even after the project ends	

## 5.2. Research needs in Smart Farming

### Needs for research from practice (EIP-Agri format)

#### Title

Soil moisture sensor

#### This is the problem (summary in your language)

Trenutno, poljoprivrednici koji koriste senzore u svojim poljima moraju koristiti različite tipove senzora za svaki tip useva. Potreba za identifikacijom nivoa vlažnosti zemljišta navela je poljoprivrednike da razmišljaju o jednom tipu senzora koji se može instalirati u njihovom vinogradu, voćnjaku i drugim poljima.

*Please briefly explain in your national language the problems you are experiencing in practice and which type of research (or knowledge) you need to solve them.*

#### This is the problem (summary in English)

Farmers who use moisture sensors in their fields need to use different types of sensors for each crop type. The need for identification of soil moisture level brought farmers to think about one type of sensor that can be installed in their vineyard, orchard, and other fields, regardless on soil type. This issue will be addressed by research group of BioSense Institute, which will develop ecological, robust and durable solution with the performance that does not degrade with time. In addition, materials that will be used will lower the production cost (≈ 6\$)

*Please briefly explain in English the problem that you are experiencing in practice and which type of research (or knowledge) you need to solve it.*

#### Geographical scope

Austria

*Please specify the geographical area/s where the need has been identified.*

#### Keywords

Moisture soil sensor, WSN, prototype, soil varieties

#### Agricultural sectors

- None -

*Choose the sectors your issue is relevant for (max.5 selections).*

#### Additional information

The research on this topic will involve end-users (farmers) to

*Please provide here any other relevant information concerning your initiative.*

#### Attachments

*When necessary, auxiliary files can be added*

## Needs for research from practice (EIP-Agri format)

### Title

Decision support tool allowing farmers to calculate the economy

### This is the problem (summary in your language)

Poljoprivrednici najčešće prate savete dobijene od dobavljača semena ili nekog drugog relevantnog izvora. Ipak, svi saveti su zasnovani samo na iskustvima. Uz nove tehnologije (koristeći mašinsko učenje), poljoprivrednici će dobiti savet koje seme treba koristiti u narednoj poljoprivrednoj sezoni. Da bi to uradili, istraživači će morati prikupiti istorijske podatke o usevima (prinos po sezoni), cene, varijabilnost cena; sistem će hraniti podacima o potrebnim aktivnostima po parcelama (radno i poslovno vreme), rotiranju useva i procena potražnje. Ishod će biti gotov savet o usevima i sorti semena koje treba koristiti kako bi se postigli određeni (unapred definisani) prinosi.

*Please briefly explain in your national language the problems you are experiencing in practice and which type of research (or knowledge) you need to solve them.*

### This is the problem (summary in English)

Farmers are used to follow advices from seed suppliers or some other relevant source. Nevertheless, all these advices are just experience-based. With new technology (using machine learning), farmers will receive an advice which seeds should they use in the following agricultural season. In order to do so, researchers will need to gather historical data on crops (yields per season), prices, price volatility; to feed the system with data regarding needed activities per parcel (human and machine working hours), crop rotation and demand estimation. The outcome will be ready-to-use advice on crops and seed variety that needs to be followed in order to have certain (in advance defined) yields.

*Please briefly explain in English the problem that you are experiencing in practice and which type of research (or knowledge) you need to solve it.*

### Geographical scope

Austria

*Please specify the geographical area/s where the need has been identified.*

### Keywords

Machine learning, seed variety, yield estimation, farm performance

### Agricultural sectors

- None -

*Choose the sectors your issue is relevant for (max.5 selections).*

### Additional information

This system will be developed based on information from Serbia

*Please provide here any other relevant information concerning your initiative.*

### Attachments

*When necessary, auxiliary files can be added*



## Needs for research from practice (EIP-Agri format)

### Title

Grocery in your pocket

### This is the problem (summary in your language)

Osnovni problem sa kojim se suočavaju organski poljoprivredni proizvođači je plasiranje njihovih proizvoda na tržište. Ovaj problem bi se mogao rešiti sigurnim i pouzdanim sistemom koji će premostiti jaz između proizvođača i krajnjih korisnika. Ideja ovog projekta je pretvoriti pametni telefon u vrhunski alat za pokretanje poslovanja - aplikaciju za trenutne poruke za naručivanje i prodaju. Sistem će sadržati:

- Baza podataka klijenata (za angažovanje kupaca)
- Bazu podataka proizvođača (svaki proizvođač će imati svoj profil sa opisom)
- Interaktivna tabla sa porukama
- Ekspertska oblast (znanje, inovativne metode / tehnologije, iskustva iz čitavog poljoprivrednog lanca);
- Područje obuke - jedan nivo za potrošače (kako bi se upoznali sa organskom proizvodnjom i koristima ekoloških proizvoda na zdravlje), a drugi za proizvođače (koji će moći kreirati svoj vlastiti tok rada definisanjem različitih nivoa koje će prelaziti. Potencijalne oblasti: zakonodavstvo o organskoj proizvodnji, sadnja u organskoj proizvodnji, kultivacija u organskoj proizvodnji itd.)

*Please briefly explain in your national language the problems you are experiencing in practice and which type of research (or knowledge) you need to solve them.*

### This is the problem (summary in English)

The main problem organic agricultural producers are facing with is placement of their products to the market. This problem could be addressed with secure and reliable system that will bridge the gap between producers and end-users.

The idea behind this project is to turn the smart phone into ultimate tool for running business – an instant messaging application for ordering and selling. The system will contain:

- Customer database (for buyers' engagement)
- Producers database (each producer will have its own profile with description)
- Interactive message board
- Expert field (knowledge, innovative methods/technologies, experiences from entire agricultural chain;
- Training field – one level for consumers (in order to get familiar with organic production and benefits organic products have on health) and another for ag producers (which will be able to create their own workflow by defining different levels that producers will go through to complete the course. Potential areas: organic production legislation, planting in organic production, cultivation in organic production, etc.)

*Please briefly explain in English the problem that you are experiencing in practice and which type of research (or knowledge) you need to solve it.*

### Geographical scope

Austria

*Please specify the geographical area/s where the need has been identified.*

### Keywords

organic production, smart phone, marketplace, app

### Agricultural sectors

- None -

*Choose the sectors your issue is relevant for (max.5 selections).*

### Additional information

This project could increase overall farm income and decrease

*Please provide here any other relevant information concerning your initiative.*

### Attachments

*When necessary, auxiliary files can be added*

### 5.3. Project ideas Research needs in Smart Farming

#### Create Project ideas

##### Title (native language)

Sistem za podršku odlučivanju

##### Title (in English)

Data-based decision support system

##### Description

Cilj projekta je nadogradnja postojeće platforme, tako da može apsorbovati i obraditi podatke dobijene dronovima i pružiti savete poljoprivrednim proizvođačima. Za početak, platforma će biti potpuno interoperabilna samo sa sistemom partnera projekta, ali su predviđene dalje nadogradnje i razvoj. Nakon druge iteracije, platforma će biti kompatibilna sa glavnim proizvođačima dron sistemima. Osnovna delatnost će biti razumevanje koje vrste podataka se prikupljaju pomoću bespilotnih letilica i analiza informacija koje su predstavljene na platformi. Sledeći korak će biti povezivanje između dva sistema i razvoj algoritma za back office koji će obraditi podatke i preneti spremne za korišćenje informacije platformi. Poslednji korak će biti implementacija promena i objavljivanje nove opcije za korisnike koji imaju podatke iz dronova. Pored toga, planirane su i dve paralelne aktivnosti: širenje novih karakteristika platforme i dalje unapređenje agremo usluga poljoprivrednim proizvođačima.

*Please provide information in your national language to describe the background of your project (problems to be addressed, objectives, main activities, target groups, innovative elements of this action, expected results).*

##### Description (in English)

The goal of the project is to upgrade the currently existing platform, so it can absorb and process drone data and provide advices to agricultural producers. For the beginning, the platform will be fully interoperable just with project partner's system, but further upgrades and developments are foreseen. After second iteration, the platform will be compatible with main drone systems. The main activity will be to understand what type of data is gathered through drones and to analyze what information is presented on the platform. The next step will be to make link between two systems and develop the back-office algorithm that will process data and transfer ready-to-use information to the platform. The final step will be to implement changes and publish new option for users that have drone data. In addition, there are two parallel activities that are planned: dissemination of new platform features and further promotion of services to agricultural producers.

*Please provide information in English to describe the background of your project (problems to be addressed, objectives, main activities, target groups, innovative elements of this action, expected results).*

##### Project coordinator is searching for...

End-users that will be willing to test demo version and participate in co-creation process by providing relevant feedback to the project.

*Provide information on what you are looking for (for example, specific expertise, partner in a specific location).*

##### Geographical scope

Austria

*Please specify the geographical area(s) where the project will (would) be implemented.*

##### Keywords

FMIS, app, drone, data

##### Agricultural sectors

- None -

*Choose the sectors the project is relevant for (max.5 selections).*

##### Proposing person or organization

Milica Trajkovic, Dr Zorana Đinđića 1, Novi Sad, Serbia

*Include the name and address of the person or organization that proposes the project idea.*

##### Contact E-mail

trajkovic@biosense.rs

*Please provide the e-mail of a contact person for the project.*

**Expected starting date of the project**

Month  Day  Year

**Expected duration**

*Please provide the expected duration of the project in months.*

**Additional information**

-

*Please provide here any other relevant information concerning your initiative.*

**Attachments**

When necessary, auxiliary files can be added using this link.

## Create Project ideas

### Title (native language)

Treninzi i obuke za novinare koji se bave poljoprivredom

### Title (in English)

Trainings to agricultural journalists

### Description

Ideja ovog projekta je organizovanje sveobuhvatnih obuka o pametnim tehnologijama namenjenih poljoprivredi novinarima koji prate poljoprivredne teme. Potreba za ovom idejom dolazi od neadekvatnog izveštavanja i članaka koji dovode u zabludu čitaoce, a vezani su za tehnologije, njihovom usvajanju, složeni za implementaciju, i direktne koristi koje su poljoprivrednici stekli. Ove obuke treba obezbediti istraživački instituti (npr. BioSense Institut) i proizvođači/distributeri poljoprivredne tehnologija. Teme bi trebale biti dovoljno široke da pokriju sve važne aspekte, ali istovremeno budu koncizne kako bi pažnju novinara zadržale i osigurale unošenje predstavljenog znanja.

*Please provide information in your national language to describe the background of your project (problems to be addressed, objectives, main activities, target groups, innovative elements of this action, expected results).*

### Description (in English)

The idea behind this project is to organize comprehensive trainings regarding SFTs and their potential impact in agriculture to journalists who are following agricultural topics. The need for this idea comes from inadequate reporting and misleading articles regarding presented technologies, their adoption, how complex they are for implementation, and direct benefits that farmers gained. These trainings should be provided by research institutes (e.g. BioSense Institute) and SFT providers. The topics should be broad enough to cover all important aspects, but at the same time to be concise in order to keep journalists' attention and to assure the uptake of presented knowledge.

*Please provide information in English to describe the background of your project (problems to be addressed, objectives, main activities, target groups, innovative elements of this action, expected results).*

### Project coordinator is searching for...

Partners that have access to journalistic associations (or are associations of journalist themselves). The area that should be covered is entire Balkan (Croatia, Serbia, BiH, Montenegro)

*Provide information on what you are looking for (for example, specific expertise, partner in a specific location).*

### Geographical scope

Austria

*Please specify the geographical area(s) where the project will (would) be implemented.*

### Keywords

trainings, journalist, adoption of SFTs

### Agricultural sectors

- None -

*Choose the sectors the project is relevant for (max.5 selections).*

### Proposing person or organization

Ivana Horvat, Dr Zorana Đinđića 1, Novi Sad, Serbia

*Include the name and address of the person or organization that proposes the project idea.*

### Contact E-mail

horvat@biosense.rs

*Please provide the e-mail of a contact person for the project.*

### Expected starting date of the project

Month  Day  Year

### Expected duration

36

*Please provide the expected duration of the project in months.*

### **Additional information**

Main activities foreseen for this project:

- To present to journalists (dedicated to agriculture and rural development) what are possibilities of technologies and how they can add value to agricultural production
- To train them how main technologies might be used
- To create database of all ag journalists in the region and classify them according pre-defend methodology/specializations
- To keep journalists updated regarding main trends and events in the region that might be useful for farmers
- To organize open days on demonstration farms for journalists open days on demonstration farms for journalists

*Please provide here any other relevant information concerning your initiative.*

### **Attachments**

When necessary, auxiliary files can be added using this link.



## Create Project ideas

### Title (native language)

Online savetodavna služba za organsku proizvodnju

### Title (in English)

Online organic advisory service

### Description

Mnogi farmeri u Srbiji žele da transformišu svoju proizvodnju sa konvencionalne na organsku. Najveća prepreka u ovom procesu jeste nedostatak znanja i kontinuirana podrška u pogledu saveta u vezi sa rotiranjem useva i dostupnim (dozvoljenim) merama zaštite useva. Trenutno, poljoprivrednici u Srbiji mogu da koriste koje pružaju sertifikaciona tela po izuzetno visokim cenama, konsultuju druge organske proizvođače ili pretražuju savete na Internetu. Najgora opcija je kultiviranje useva na osnovu iskustva bez dovoljno informacija. Odsustvo jedinstvenog registra informacija otežava planiranje poljoprivredne proizvodnje i procene uticaja različitih mera koje su / će se primenjivati.

Predloženo rešenje predviđa online organske savetodavne usluge koje će pružiti savete poljoprivrednim proizvođačima, naročito onima koji su u procesu transformacije od konvencionalne do organske proizvodnje. Ova onlajn savetodavna služba bi trebalo da bude pristupačna (simbolička cena) i podržavao bi je panel stručnjaka. Predviđeno je posebno mesto za savete od strane poljoprivrednika koji su završili process transformacije.

*Please provide information in your national language to describe the background of your project (problems to be addressed, objectives, main activities, target groups, innovative elements of this action, expected results).*

### Description (in English)

Many farmers in Serbia would like to transform their production from conventional to organic one. The biggest obstacle in this process is the lack of knowledge and ongoing support in terms of advices concerning crop rotation, and available (allowed) crops protection measures. Currently, farmers in Serbia can use high-priced services provided by certification bodies, consult other organic producers, or search the advice on Internet. The worst option is to cultivate the crops based on experience without enough information. The absence of single register of information makes it difficult to plan agricultural production and to estimate the impact of different measures that have been/will be applied.

The proposed solution foresees online organic advisory service that will provide advices to agricultural producers, especially to those who are in the process of transformation from conventional to organic production. This online advisory service should be affordable (symbolic price) and supported by panel of experts. Special place is foreseen for first-hand advices from farmers that finished the process.

*Please provide information in English to describe the background of your project (problems to be addressed, objectives, main activities, target groups, innovative elements of this action, expected results).*

### Project coordinator is searching for...

Universities (faculties) and/or advisory bodies that are willing to participate in the project and share relevant knowledge regarding organic production

*Provide information on what you are looking for (for example, specific expertise, partner in a specific location).*

### Geographical scope

Austria

*Please specify the geographical area(s) where the project will (would) be implemented.*

### Keywords

organic production, certification, advisory services

### Agricultural sectors

- None -

*Choose the sectors the project is relevant for (max.5 selections).*

### Proposing person or organization

Milica Trajkovic, Dr Zorana Đinđića 1, Novi Sad, Serbia

*Include the name and address of the person or organization that proposes the project idea.*

### Contact E-mail

*Please provide the e-mail of a contact person for the project.*

**Expected starting date of the project**

Month  Day  Year

**Expected duration**

*Please provide the expected duration of the project in months.*

**Additional information**

-

*Please provide here any other relevant information concerning your initiative.*

**Attachments**

When necessary, auxiliary files can be added using this link.

## 5.4. Project ideas from workshops



smart **AKIS**  
Smart Farming Thematic Network



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