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PROJECT FINAL REPORT

Grant Agreement number: 204472

Project acronym: AGROSENSE

Project title: Wireless Sensor Networks and Remote Sensing – Foundation of a Modern Agricultural Infrastructure in the Region

Funding Scheme: Coordination and support actions (Support)

Period covered: **from** 1/5/2008 **to** 30/04/2011

Name, title and organisation of the scientific representative of the project's coordinator:

Vladimir Crnojevic, Assistant Professor, Faculty of Technical Sciences, University of Novi Sad, Serbia

Tel: +381 21 485 2520

Fax: +381 21 475 2997

E-mail: crnojevic@uns.ac.rs

Project website address: www.agrosense.org

4.1 Final publishable summary report

Executive Summary

Sensing and monitoring systems will have a large impact on future precision agriculture methodologies, as well as on forestry and environmental protection. The **AgroSense** project focused on the application of sensing and monitoring systems in precision agriculture, which will have a large impact on future agriculture methodologies.

The consortium of the AgroSense project is composed of 6 institutions, each of them a leader in its field FTS - Faculty of Technical Sciences, University of Novi Sad, Serbia (Coordinator); DET - University of Florence, Department of Electronics and Telecommunications, Italy; JSI - Institute Jozef Stefan, Slovenia; FANS - Faculty of Agriculture, Novi Sad, Serbia; IMP - Institute Mihajlo Pupin, Belgrade, Serbia; PSAWF - Provincial Secretariat for Agriculture, Water Economy and Forestry of Vojvodina, Serbia.

Within the project the following activities have been performed:

- Purchasing of equipment (UAVs, thermal camera, WSN kits, sensors, satellite images etc.) and hiring new researchers (total of 11 new researchers have been hired solely for the purpose of this Project) - these activities reinforced human potential of the WBC centres, their S&T research capacities as well as of the partners from convergence region through free usage of the upgraded equipment. They also ensured sustainable development of the working groups at WBC universities and institutes.
- Trainings - total of 16 trainings have been held by JSI and DET. Staff from WBC was trained in areas of expertise of the project partners from the EU and region of convergence. They have also been acquainted with practical issues concerning deployment and utilisation of WSNs and RS systems.
- Placements - enabled WBC staff to gain access to resources existing at EU and region of convergence partner institutions. They have also been used to perform feasibility studies for the development of new infrastructures.
- Networking - was used to develop strong partnerships with existing centres of excellence established in Slovenia, Italy, Serbia and other WBC countries in the field of precision agriculture and to gain international experience and contacts.
- Dissemination - partners have promoted results of the Project and disseminated knowledge, influencing scientists, wider population and representatives of the law-making institutions both within and outside the project consortium.

All the activities conducted within the **AgroSense** project ensured the successful completion of all tasks. All foreseen milestones and objectives have been successfully reached. Taking into account the reputation and strength of the BioSense Center which have grown over the past three Project years beyond the state and even regional borders, it is clear that the full accomplishment of this FP7 call has been reached. Serbian research centres have become internationally recognised for its human resources and procured equipment. The BioSense Center has become a meeting place of experts and knowledge expertise in various research areas. With 4 new FP7 projects, over 6 other international projects and 3 national strategical development projects and a wide network of partners from all over the World, the BioSense Center, IMP and FANS have ensured its place in present and future European research area. Furthermore, partners form the region of convergence and EU gained valuable partners from WBC with whom they will continue to cooperate in the future.

Summary description of project context and objectives

Sensing and monitoring systems will have a large impact on future precision agriculture methodologies, as well as on forestry and environmental protection. Sensors can be distributed throughout the field in a form of Wireless Sensor Network (WSN) where they can monitor soil conditions, crop growth and other relevant bio-parameters. On the other hand, Remote Sensing (RS) system based on an autonomous Unmanned Aerial Vehicle (UAV) can provide valuable information which is hard to obtain from the ground. Such increased use of autonomous sensors linked into a GPS system for real-time monitoring and the use of low-cost RS sensing systems have the potential to significantly improve current trends and methods in the agricultural production, forestry and environmental protection.

The **AgroSense** project focuses on the application of sensing and monitoring systems in precision agriculture, which will have a large impact on future agriculture methodologies.

Logo of the** AgroSense **project

The consortium of the AgroSense project is composed of 6 institutions, each of them a leader in its field:

1. FTS - Faculty of Technical Sciences, University of Novi Sad, Serbia (Coordinator)
2. DET - University of Florence, Department of Electronics and Telecommunications, Italy
3. JSI - Institute Jozef Stefan, Slovenia
4. FANS - Faculty of Agriculture, Novi Sad, Serbia
5. IMP - Institute Mihajlo Pupin, Belgrade Serbia
6. PSAWF - Provincial Secretariat for Agriculture, Water Economy and Forestry of Vojvodina, Serbia

Objectives of the AgroSense project are:

- **Reinforcement of WBC research potential**

Improving of MeTeP@ Centre material and human resources, expanding the research topics and the number of research activities of the MeTeP@ Centre, widening its impact to a larger geographical area, covering the entire agricultural region of the province of Vojvodina and the WBC region. Reinforcement of WBC research potential was to be realized through the following activities:

Upgrade of the existing equipment – To purchase the equipment that will complement the existing equipment and enable MeTeP@ Centre to produce research results comparable with those of EU networking partners.

Recruitment of new researchers – To hire researchers that will increase the human potential of MeTeP@ and Institute Mihajlo Pupin (IMP).

- **Reinforcement of WBC and the region of convergence research potential**

Trainings – Trainings delivered by participants from the EU covering topics important for precision agriculture, corresponding to specific complementary expertise of participating institutions. Trainings and practical placements are also foreseen for the staff from the region of convergence participating institution.

Exchange and practical placements of staff among the consortium members – Placements of researchers in other project partner's institutions will allow them to acquire specific scientific and technical knowledge in the fields of interest.

- **Promoting closer S&T cooperation opportunities between Europe and WBC**

Brain-gain environments are being favoured through trans-national two-way exchanges of research staff between centres established in the EU, EU's convergence regions and in the WBC. Networking, training and placements expose WBC researchers to advanced working environments and help them gain international experience, contacts and access to the state of the art knowledge and technology.

- **Support to WBC participation in Framework Programmes**

By acquiring experience through this Project, WBC partner institutions will position themselves better for future participation in Framework Programmes, and will also be able to advise other research institutions in WBC region on all aspects of successful preparation, negotiation, management and finalization of future projects.

- **Contribution to sustainable research development of the WBC Centres**

Reinforcement of MeTeP@ Centre foreseen in this project aims at ensuring its sustainability. In the future, the Centre will be able to conduct state of the art research at the European level, as well as to contribute to the agricultural infrastructure in the region. Mobilization of human and material resources combined with the dissemination and networking activities will raise the reputation of the MeTeP@ Centre and its Serbian partners to a level that will ensure a long term development. Furthermore, it will reinforce the employment capacity of the Centre and stimulate young researchers to continue living in Serbia and working in the field of high-tech agriculture.

- **Dissemination of the Project results**

The most important results of the Project have been presented to the wider scientific community through participation in high impact conferences.

Description of the main S&T results/foregrounds

During the first project year state-of-the-art equipment has been purchased, where the most notable pieces are 4 UAVs, 2 multispectral cameras and a whole range of WSN kits. Detailed list of equipment is available on the Project site www.agrosense.org in deliverable D2.1.

Some of the key pieces of equipment bought within the AgroSense project

Apart from the equipment purchased, our research potential was reinforced through the recruitment of new researchers. Three people were hired at FTS (2 researchers with M.Sc. degree and 1 technician) and two at IMP (2 M.Sc. researchers). The work of researchers at FTS concentrated on setting-up the new equipment, system integration and training in RS and WSN systems, while the work of researchers at IMP focused on WSN, with special emphasis in training supervised by a senior advisor from FTS.

As an efficient mean of reinforcing research potential, trainings present a very important part of the **AgroSense** project and they are delivered by experts primarily from the EU and convergence region partner institutions to WBC staff. Trainings were devoted to specific S&T aspects and topics such as: design of architectures and solutions for environmental monitoring applications, simulation tools and embedded device programming of WSNs, integration of wireless technologies with remote sensing devices and coordination of research projects. The most important introductory training to WSN was given by Prof. Romano Fantacci from DET. The goal of this training was to bring the knowledge of all trainees to the same level, thus preparing them for further specialized trainings foreseen for the beginning of the second project year. More details on trainings in the first year of the project can be found in deliverable D3.1 at www.agrosense.org. Apart from training devoted to specific S&T aspects, a series of three trainings related to usage of new equipment were organized within the first project year.

To expand the WBC staff's knowledge on some specific topics a total of four placements at partners' institutions were organized during the first project year. Two senior researchers from FTS were hosted by DET for one month, one researcher from FTS was at JSI for two weeks and one researcher from DET was at FTS for two weeks. The placements served as a mean for establishing better connections between partners and learning about the practices of other partners. This promotes closer S&T cooperation opportunities between Europe and WBC, and fosters successful collaboration during the rest of the project.

One of the most important and most intensive activities of the first project year was networking, with the main goal to promote communication and provide access to information and cross-fertilization of ideas. The networking deals with organizing the meetings, the information transfer, the contacts with industry and public and to governmental institution. Numerous networking activities were organized

both within the consortium and with potential partners outside the **AgroSense** consortium, with total of 17 official and a number of unofficial meetings held within the first year. As a direct consequence, several proposals for joint research projects were submitted under different programs and a solid base was formed for future cooperation and joint research work in the fields related to the **AgroSense** project. The networking activities lead to closer S&T cooperation opportunities between Europe and WBC and present a good support to future WBC participation in Framework Programmes. More details on the networking activities during the first year of the **AgroSense** project can be found in deliverable D4.1 at www.agrosense.org.

Work meeting on the field

Another objective of the **AgroSense** project is to promote results of the project and disseminate knowledge, to influence representatives of the law-making institutions both within and outside the project consortium, to present and promote the application of precision agriculture to student and non-scientific community (agricultural industry, farmers) in WBC, and to create the identity of the project through promotional package including the new website. During the first year of the project numerous dissemination activities were conducted including attendance on high-impact conferences and agricultural fairs and publication of a number of interviews and news articles. A recognizable identity of the **AgroSense** project is created through the design of the **AgroSense** logo and promotional package containing items with **AgroSense** motive: flyers, folders, notepads, waterproof stickers, T-Shirts, caps, posters, pencils, web site and power point slide background. More details about the specific items of the promotional package can be found in deliverable 5.1 at www.agrosense.org.

Apart from this, live demo is deployed at the project website where visitors can see the current reading of remotely installed WSN measuring different bio-parameters. This has proved to be very convincing method of dissemination which leaves very strong impressions on people potentially interested in deployment of this technology in agriculture, forestry and environmental protection.

All the activities conducted in the first year of the **AgroSense** project provide a good basis for further development and reinforcement of WBC partners, and for further dissemination of the project result. Already, academic staff from other related fields (such as ecology, water management etc.) as well as people from the industry showed great interest in the **AgroSense** project, especially in taking part in further development of systems based on sensing technologies like WSN and remote sensing.

Therefore, we expect that by the end of this project, a world-recognized centre for application of sensing technologies in agriculture, as well as in forestry, water management and environmental protection will be founded.

The first months of the 2nd Project year were characterized with work on preparation and submission of the Annual Report to EC. The report was submitted both in a hard copy and electronic version in July 2009. Together with the report, deliverables D1.1, D2.1, D3.1, D4.1 D5.1 and D5.2 were submitted in electronic form. All partners submitted their financial statements. The scientific part of the report was approved in September 2009 and the financial in October 2009.

The GA was amended twice. The first change was due to changes in banking details of the Project coordinating institution. The compliance by EC with the 1st amendment was received in October 2009. The second change was due to termination of subcontracting at JSI. The compliance by EC with the 2nd amendment was received in February 2010.

Within WP2 an additional piece of equipment was purchased - a thermal camera by FLIR model SC620 Researcher instead of the planned VTOL UAV as agreed with the Project Officer. The research potential was reinforced through the recruitment of new researchers. Both FTS and IMP faced difficulties in keeping employees for a period longer that a year due to legal obstacles in Serbia. New persons have been hired at FTS in June 2009 and September 2009 and at IMP new researchers were hired in April 2009 and November 2009.

Thermal camera FLIR SC620 Researcher

Vladan Minić (FTS) and Prof. Branko Marinković (FANS) using thermal camera to obtain images of sugar beet crops at experimental fields "Rimski Šančevi" near Novi Sad

Total of 11 trainings have been held within the period M13-M24. Apart from that, one candidate from IMP was sent to training to SENIOT Summer School in Betorino, Italy during July and August 2009. Also, one researcher from FTS attended the training course for usage of FLIR Thermal Camera in December 2009.

Five placements of senior researchers from DET and JSI were hosted at FTS. The placements also served as a mean for establishing better connections between partners and learning about the practices of other partners.

The networking within WP4 dealt with organizing the meetings, the information transfer, contacts with industry, public and governmental institution. Total of 30 official and a number of unofficial networking meetings have been held within M13-M24 both within the consortium and with potential partners outside the AgroSense consortium. As a direct consequence, several proposals for joint research projects were submitted under different programs and a solid base was formed for future cooperation and joint research work in the fields related to the AgroSense project.

Deployment and testing equipment in vineyard near Novi Sad with experts from the Faculty of Agriculture

The central dissemination activity of the whole reporting period was the Workshop on Sensing Technology in Agriculture, Forestry and Environment "BioSense09" held in Novi Sad on October 14th – 15th, 2009. All Project partners gave significant contribution to the successful organization of the Workshop. Total of 23 papers and plenary talks were presented. The Workshop enrolled 15 experts from USA, Canada and EU, as well as 26 from WBC region. Project partners also participated in 10 international conferences during the reporting period. They used this opportunity to gain access to state-of-the-art research and ideas and to promote the project results to a wider scientific community.

BioSense09 Participants

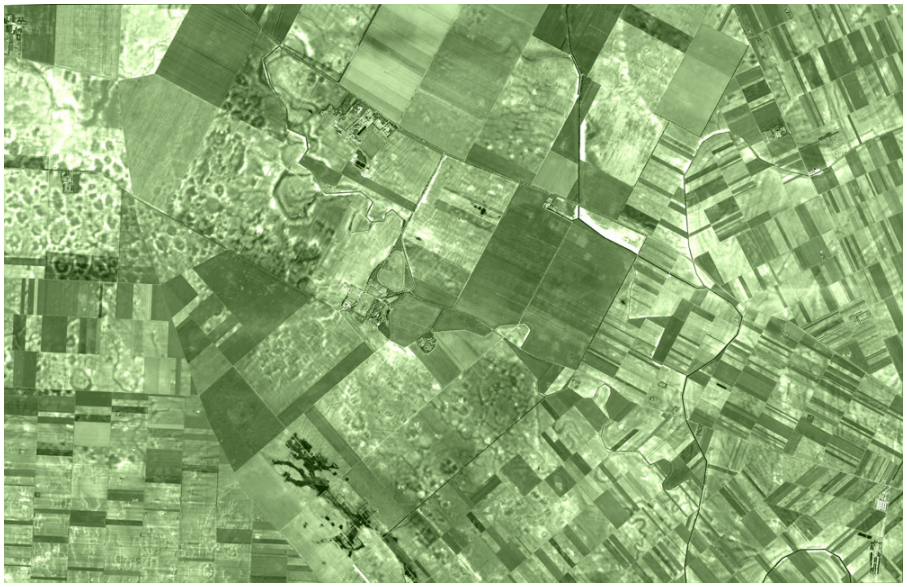
Activities conducted in the 2nd Project year provide a more intensive continuation of activities performed within the 1st Project year. Thus, all foreseen milestones and objectives for the reporting period have been successfully reached. Already, academic staff from other related fields (such as ecology, water management etc.) as well as people from the industry showed great interest in the AgroSense project, especially in taking part in further development of systems based on sensing technologies like WSN and remote sensing. As a consequence, the MeTeP@ Center at FTS was renamed to BioSense Centre to take advantage of the success of the AgroSense project and BioSense09 workshop.

The first months of the third Project year (May to June 2010) were characterized by preparation and submission of the Annual Report to the EC. The task was carried out by all members of the Management Board with Project Manager and Project Coordinator as leaders of the activity. The report was submitted both in a hard copy and electronic version in due time. Together with the report, the deliverables D3.2 and D4.2were submitted in electronic form. All partners submitted their financial statements (Forms C) and FTS provided a Certificate on Financial Statement.

In June 2010, Bojan Pajić, president of the Executive Council of the Autonomous Province of Vojvodina officially opened the new BioSense Center by activating WSN pilot site at Green House in Rimski Sancevi. This event has been followed by a great number of press representatives and resulted in significant publicity for the BioSense Center.

Bojan Pajić, president of the Executive Council of the Autonomous Province of Vojvodina officially opens the BioSense Center and WSN pilot sites

With Serbian research centres reinforced and all foreseen equipment purchased, Project partners brought another two work-packages to conclusion. WP3 – Trainings and Placements has been finalized with trainings No. 6, 7 and 8 provided by DET and Trainings No. 5 provided by JSI. Placements of JSI and FTS staff at institutions within the Project consortium resulted in better coordination of research activities. JSI and IMP were able to resolve problems occurred in the development of new types of WSN. While IMP faced difficulties in the deployment of communication protocols, researchers at JSI had problems to port the operating system into their new hardware. Placements of Miloš Rovčanin from FTS at IMP in September 2010 and at JSI in November 2010 resulted in necessary knowledge transfer between IMP, FTS and JSI, filling the gap in missing expertise and leading to a successful completion of the on going research activities. Placement of Denis Škrabl from JSI at FTS in May 2010 was a continuation of the 2nd year training "Theory and Hands on Experience Flying Model Aircraft". During his stay at FTS Mr. Škrabl assisted FTS staff in perfecting their UAV steering skills. His great practical knowledge proved useful in overcoming technical difficulties in obtaining aerial images. The less experienced FTS staff was then able to take images with greater accuracy, reliability and safety.



Part of the 8-band satellite image of 100 km^2 of arable land near the town of Bečej, Serbia

The WP4 – Networking was concluded in 2010. Performed networking activities in the third Project year led to closer S&T cooperation opportunities between Europe and WBC. Total of 20 meetings have been held. New contacts and network of partners have proven to be fruitful and resulted in two new FP7 projects awarded to the BioSense Center as the coordinator. More details on the networking activities during the third Project year is provided in the deliverable D4.3.

Final activities related to dissemination and hiring of researchers lasted until the very end of the Project. Project partners participated at several international conferences during the reporting period. They used this opportunity to gain access to state-of-the-art research and ideas and to promote the project results to a wider scientific community. The central dissemination event in the reporting period was the official opening of the multidisciplinary BioSense Center in June 2010. The Project partners have prepared and held the 2nd Workshop called EcoSense 2011 in Belgrade on April 6th-7th, 2011. With over 15 submitted regular papers and 7 invited spokesmen, workshop gathered experts from 20 countries around the World.

All the activities conducted in the third year of the **AgroSense** project ensured the successful completion of all tasks. All foreseen milestones and objectives for the period have been successfully reached. Taking into account the reputation and strength of the BioSense Center which have grown over the past three Project years beyond the state and even regional borders, it is clear that the full accomplishment of this FP7 call has been reached. Serbian research centres have become internationally recognised as competent both in uman resources and procured equipment. The BioSense Center has become a meeting place of experts and knowledge expertise in various research areas. With 4 new FP7 projects, over 6 other international projects and 3 national strategical development projects and a wide network of partners from all over the World, the BioSense Center, IMP and FANS have ensured its place in present and future European research area. Furthermore, partners form the region of convergence and EU have gained valuable partners from WBC with whom they will continue to cooperate within joint projects and initiatives.

Participants of EcoSense 2011

The potential impact and the main dissemination activities and exploitation of results

Dissemination of project results had a separate dedicated workpackage within this Project.

The objectives of this workpackage were:

- To promote results of the Project and disseminate knowledge.
- To influence representatives of the law-making institutions both within and outside the project consortium.
- To present and promote the application of precision agriculture to student and non-scientific community (agricultural industry, farmers) in WBC.
- To allow free access to newly purchased equipment at the BeioSense Centre to all partners and other interested institutions in WBC region.
- To promote project partners as regional leaders in the area of precision agriculture.
- To present Project results on high impact conferences.
- To upgrade the existing website.
- To create promotional packages for WBC partners.

The following activities have been performed within 3 years to ensure wide dissemination and full achievement of the impact of this Project.

During the first year of the AgroSense project a number of different dissemination activities were conducted. The response we received from the targeted audience was very favorable in all cases. Application of information technologies in agriculture was generally recognized as a subject of great importance and with an outstanding impact. The approach taken in the AgroSense project, including the focus on two major areas of remote sensing and wireless sensor networks, as well as the choice of the equipment to be bought within the project, was recognized as very promising and in line with recent efforts in this field worldwide.

Potentials and results of AgroSense project were disseminated on three levels: national (Serbia), regional and international. Apart from attractive and informative web-site and promotional package, every opportunity was to inform wider community about the AgroSense. Apart from the conferences where attending was funded by AgroSense, we have also used other conferences and meetings funded from other sources to spread knowledge about the goals of the AgroSense project, its team and recent accomplishments.

Newly deployed web site of AgroSense project www.agrosense.org is very attractive and informative. It has been very frequently visited and quickly it became the first *agrosense* hit on the Google, although there are numerous entities with the same name worldwide. Visitors can get insight in the project details: consortium, people, equipment, objectives, work packages and project related events. Demo application accessible through website gives the opportunity to the users and visitors to check environmental parameters at University of Novi Sad at different locations in real-time. In due time, the same system will provide similar information from the agricultural fields, vineyards and forests. Apart from the dissemination purposes, website is also used for management for management and document exchange.

Promotional package consisting of various items with AgroSense visual identity is carefully designed and distributed. AgroSense logo that appears in the whole package is very easy to remember and can be associated with different notions in agriculture. In a short period of time it became very successful and helped a lot in the efficient project dissemination.

Dissemination at national level

Kick-off meeting of the project was a good to opportunity to attract the attention of media, policy makers and other colleagues from the University working in similar fields. Large number of participants at the ceremonial part of kick-off meeting had an opportunity to get a closer insight into the AgroSense project objectives, instruments and potential impacts. Assistant minister of Science and technological development of Republic of Serbia was present, as well as a number of other officials from the local government and University.

Prof. Vladimir Crnojević had an invited talk at the annual meeting of LTER network Serbia (Long-Term Ecosystem Research) where he presented AgroSense project. Since this network consists of a number of leading Serbian institution in the field of ecosystem monitoring, this was a very good opportunity for other researchers to see the possibilities of information technology applied in the fields of agriculture, forestry and environmental protection. Researchers from LTER network showed great interest in establishing cooperation with AgroSense project staff and taking part in future projects.

Dissemination through electronic and printed media was performed on several occasions. There were several newspaper articles about the AgroSense project (Gradjanski list, Večerenje novosti, Politika) and one short TV interview. The most important one is the article in the oldest and very influential newspapers POLITIKA, where one UAV purchased within the AgroSense project is presented as well as the part AgroSense team in the field.

PSAWF enabled the Project promotional package to be presented at the International Fair of Agriculture which was held in the period from May 9th to 16th, 2009 in Novi Sad, Serbia. It was an important promotional step which demonstrated not only the availability of state-of-the-art technology in Serbia, but also the support of the regional government to the AgroSense project and application of WSN and remote sensing in agriculture.

Several meetings have been held with partners from Romania, Hungary, Serbia, Slovenia and Austria. These meeting were excellent opportunities to promote FTS as a regional leader in sensing technologies in agriculture. The results of these promotions were numerous invitations for joint proposal submissions listed in the description of the WP4 of this report.

Dissemination at regional level

As a part of regional dissemination in other West-Balkan Countries, prof. Vladimir Crnojević visited Faculty of Electrical Engineering, University of Montenegro, Podgorica on April 22nd. He had a meeting with Prof. Ljubiša Stanković, Prof. Srdjan Stanković, Prof. Miloš Daković and Vesna Popović from Time-Frequency Signal Analysis group, where he presented the results and potentials of AgroSense project. This meeting was of special importance since the group of Prof. Stanković is world recognized name in communications and signal processing, and possible cooperation with them would lead to further convergence of research potentials in WBC. Since Montenegro is also agricultural country, especially with respect to wine production, new opportunities for deployment of AgroSense project results were discussed.

Dissemination at international level

Project partner's researchers have visited numerous international conferences which were a good opportunity to spread excellence and project results.

Over 50 conference attendances and over 50 networking meetings have been performed both at regional and international level. A complete overview of visited conferences is given in section 4.2, part A.

Central events of the dissemination were two workshops and official opening of the new BioSense Center.

Two workshops have been organised. The first workshop within the Project called "BioSense09" was held on October 14th – 15th, 2009. The Workshop was devoted to sensing technologies application in agriculture, forestry and environmental protection. All Project partners gave significant contribution to the successful organization of the Workshop. The Workshop was hosted at FTS, Serbia. Five (5) plenary talks were held by invited spokesman, 18 papers were submitted and presented at the Workshop. The Workshop enrolled 15 experts from USA, Canada and European Union (UK, Germany, Belgium, Italy, Slovenia and Hungary) and 26 from WBC region (Serbia, Montenegro, and Bosnia and Herzegovina). Indirectly, the Workshop also included co-authors of papers from Spain, Austria and Ukraine, and through the programme committee it also included experts from the Czech Republic and Portugal.

The Second International Workshop on Sensing Technologies in agriculture, forestry and environment called "EcoSense09" aimed to be a forum where researchers and practitioners address the challenges in the design, development and evaluation of different biosensing systems, with specific focus on practical aspects. Aside 7 plenary talks held by invited spokesman, 14 regular papers were submitted and presented at the Workshop. The workshop enrolled 15 experts from Europe, USA, Asia and 25 from Serbia.

Bojan Pajtić, the president of the Executive Council of the Autonomous Province of Vojvodina opened the new BioSense Center at the University of Novi Sad by activating the latest wireless sensor network at the green house pilot site in Rimski Šančevi near Novi Sad. The event has been covered by all major national television and radio networks and by a great number of press representatives.

Taking into account the reputation and strength of the BioSense Center which have grown over the past three Project years beyond the state and even regional borders, it is clear that the full accomplishment of this FP7 call has been reached. Serbian research centres have become internationally recognised for its human resources and procured equipment. The BioSense Center has become a meeting place of experts and knowledge expertise in various research areas. With 4 new FP7 projects, over 6 other international projects and 3 national strategical development projects and a wide network of partners from all over the World, the BioSense Center, IMP and FANS have ensured its place in present and future European research area. Furthermore, partners form the region of convergence and EU gained valuable partners from WBC with whom they will continue to cooperate in the future.

The address of the project public website, if applicable as well as relevant contact details.

Project website address: www.agrosense.org

Contact details:

Partner	Acronym	Contact
Faculty of Technical Sciences, University of Novi Sad	FTS	Ass. Prof. Vladimir Crnojević Department of Power Engineering, Electronics and Telecommunications Trg Dositeja Obradovića 6 21000 Novi Sad Serbia #e crnojevic@uns.ac.rs #t +381-21-4852520, #f +381-21-475 2997
Department of Electronics and Telecommunications, University of Florence	DET	Prof. Romano Fantacci Department of Electronics and Telecommunications via di S. Marta 3 Florence I-50139 Italy #e romano.fantacci@unifi.it #t +39-055-4796270, #f +39-055-494569
Jožef Stefan Institute	JSI	Prof. Gorazd Kandus Department of Communication Systems Jamova 39 Ljubljana 1000 Slovenia #e gorazd.kandus@ijs.si #t +386-1-4773608, #f +386-1-4773111
Faculty of Agriculture, University of Novi Sad	FANS	Prof. Branko Marinković Institute for Field and Vegetable Crops Trg Dositeja Obradovića 6 21000 Novi Sad Serbia #e branko@polj.ns.ac.yu #t +381-21-4853200, #f +381-21-470731
Institute Mihailo Pupin	IMP	Dr. Goran Dimić Telecommunications Department Volgina 15 11000 Belgrade Serbia #e gdimic@kondor.imp.bg.ac.yu #t +381-11-2775159, #f +381-11-2772953
Provincial Secretariat for Agriculture, Water Economy and Forestry, Executive Council of AP Vojvodina	PSAWF	Mr. Borislav Brunet Bulevar Mihaila Pupina 16 21000 Novi Sad Serbia #e borislav.brunet@vojvodina.sr.gov.yu #t + 381-21-4874405, #f + 381-21-456040

4.2 Use and dissemination of foreground

Since the AgroSense project has been financed as a CSA action

Section A (public)

No papers have been published directly as the result of this project. It is due to the nature of the CSA funding scheme which prohibits finance of research.

TEMPLATE A1: LIST OF SCIENTIFIC (PEER REVIEWED) PUBLICATIONS, STARTING WITH THE MOST IMPORTANT ONES										
NO.	Title	Main author	Title of the periodical or the series	Number, date or frequency	Publisher	Place of publication	Year of publication	Relevant pages	Permanent identifiers[1] (if available)	Is/Will open access[2] provided to this publication?
1										
2										
3										

[1] A permanent identifier should be a persistent link to the published version full text if open access or abstract if article is pay per view) or to the final manuscript accepted for publication (link to article in repository).

[2] Open Access is defined as free of charge access for anyone via Internet. Please answer "yes" if the open access to the publication is already established and also if the embargo period for open access is not yet over but you intend to establish open access afterwards.

TEMPLATE A2: LIST OF DISSEMINATION ACTIVITIES								
NO.	*Type of activities*[3]	*Main leader*	*Title*	*Date*	*Place*	*Type of audience*[4]	*Size of audience*	*Countries addressed*
1	*Interviews*	*INSTITUT MIHAJLO PUPIN*	*Vecernje novosti*	*08/05/2008*	*Belgrade, Serbia*	*Civil society*	*9999*	*Serbia*
2	*Interviews*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*Kick-off meeting*	*12/06/2008*	*Novi Sad, Serbia*	*Medias*	*9999*	*Serbia*
3	*Interviews*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*Gradjanski List*	*20/06/2008*	*Novi Sad, Serbia*	*Civil society*	*9999*	*Serbia*
4	*Conference*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*ICDSC 2008*	*07/09/2008*	*Stanford University, California, USA*	*Scientific community (higher education, Research)*	*250*	*worldwide*
5	*Conference*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*IRMMW-THz 2008*	*15/09/2008*	*California Institute of Technology, Pasadena, USA*	*Scientific community (higher education, Research)*	*250*	*worldwide*
6	*Flyers*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*Promotional package*	*01/10/2008*	*Novi Sad, Serbia*	*Scientific community (higher education, Research) - Industry - Civil society - Policy makers - Medias*	*9999*	*worldwide*
7	*Presentations*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*Long-Term Ecosystem Research*	*10/10/2008*	*Novi Sad, Serbia*	*Scientific community (higher education, Research)*	*25*	*Serbia*
8	*Conference*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*Microwave Week 2008*	*27/10/2008*	*Amsterdam, Netherlands*	*Scientific community (higher education, Research)*	*100*	*worldwide*
9	*Conference*	*UNIVERSITA DEGLI*	*AHSN TC meeting at*	*01/12/2008*	*Honolulu, USA*	*Scientific*	*45*	*worldwide*

[3] A drop down list allows choosing the dissemination activity: publications, conferences, workshops, web, press releases, flyers, articles published in the popular press, videos, media briefings, presentations, exhibitions, thesis, interviews, films, TV clips, posters, Other.

[4] A drop down list allows choosing the type of public: Scientific Community (higher education, Research), Industry, Civil Society, Policy makers, Medias ('multiple choices' is possible.

TEMPLATE A2: LIST OF DISSEMINATION ACTIVITIES								
NO.	*Type of activities[3]*	*Main leader*	*Title*	*Date*	*Place*	*Type of audience[4]*	*Size of audience*	*Countries addressed*
		STUDI DI FIRENZE	*GLOBECOM 2008*			*community (higher education, Research)*		
10	*Conference*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*2008 MARS Annual Conference*	*03/12/2008*	*Ljubljana, Slovenia*	*Scientific community (higher education, Research)*	*50*	*wordlwide*
11	*Interviews*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*Politika - Paori u bezicnoj mrezi*	*05/05/2009*	*Novi Sad, Serbia*	*Civil society*	*9999*	*Serbia*
12	*Workshops*	*UNIVERSITA DEGLI STUDI DI FIRENZE*	*MAPPS Workshop 2009*	*08/05/2009*	*Florence, Italy*	*Scientific community (higher education, Research)*	*30*	*Italy*
13	*Exhibitions*	*PROVINCIAL SECRETARIAT OF AGRICULTURE, WATER ECONOMY AND FORESTRY, VOJVODINA*	*International Fair of Agriculture*	*09/05/2009*	*Novi Sad, Serbia*	*Scientific community (higher education, Research) - Industry - Civil society - Policy makers - Medias*	*9999*	*WBC*
14	*Web sites/Applications*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*AgroSense Pilot Sites*	*15/05/2009*	*Novi Sad, Serbia*	*Scientific community (higher education, Research) - Industry - Civil society - Policy makers - Medias*	*9999*	*worldwide*
15	*Workshops*	*Faculty of Agriculture Novi Sad*	*BIOEN 2009*	*12/06/2009*	*Timisoara, Romania*	*Scientific community (higher education, Research)*	*35*	*worldwide*
16	*Conference*	*UNIVERSITA DEGLI STUDI DI FIRENZE*	*IEEE ICC 2009*	*14/06/2009*	*Dresden, Germany*	*Scientific community (higher education, Research)*	*150*	*worldwide*
17	*Conference*	*INSTITUT MIHAJLO*	*ETRAN 2009*	*15/06/2009*	*Vrnjačka Banja,*	*Scientific*	*100*	*Serbia*

TEMPLATE A2: LIST OF DISSEMINATION ACTIVITIES								
NO.	*Type of activities[3]*	*Main leader*	*Title*	*Date*	*Place*	*Type of audience[4]*	*Size of audience*	*Countries addressed*
		PUPIN			*Serbia*	*community (higher education, Research)*		
18	*Conference*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*XXXIII CIOSTA 2009*	*17/06/2009*	*Reggio Calabria, Italy*	*Scientific community (higher education, Research)*	*100*	*worldwide*
19	*Conference*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*IEEE SECON conference*	*22/06/2009*	*Rome, Italy*	*Scientific community (higher education, Research)*	*100*	*worldwide*
20	*Conference*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*IEEE DSP 2009*	*04/07/2009*	*Santorini, Greece*	*Scientific community (higher education, Research)*	*50*	*worldwide*
21	*Workshops*	*INSTITUT MIHAJLO PUPIN*	*SENIOT Summer School*	*26/07/2009*	*Bertinoro, Italy*	*Scientific community (higher education, Research)*	*35*	*worldwide*
22	*Conference*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*17th EUSIPCO 2009*	*24/08/2009*	*Glasgow, UK*	*Scientific community (higher education, Research)*	*35*	*worldwide*
23	*Conference*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*17th EUSIPCO 2009*	*02/09/2009*	*Minneapolis, Minnesota, USA*	*Scientific community (higher education, Research)*	*120*	*worldwide*
24	*Publication*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*BMVC 2009*	*07/09/2009*	*London, UK*	*Scientific community (higher education, Research)*	*75*	*worldwide*
25	*TV clips*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*RTV Mozaik*	*08/09/2009*	*Novi Sad, Serbia*	*Scientific community (higher education, Research) - Industry - Civil society - Policy makers - Medias*	*9999*	*Serbia*

TEMPLATE A2: LIST OF DISSEMINATION ACTIVITIES								
NO.	*Type of activities[3]*	*Main leader*	*Title*	*Date*	*Place*	*Type of audience[4]*	*Size of audience*	*Countries addressed*
26	*Workshops*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*REP-LECOTOX 2nd WORKSHOP*	*21/09/2009*	*Novi Sad, Serbia*	*Scientific community (higher education, Research)*	*45*	*WBC*
27	*Conference*	*INSTITUT JOZEF STEFAN*	*18th International Electrotechnical and Computer Science Conference ERK 2009*	*21/09/2009*	*Portorož, Slovenija*	*Scientific community (higher education, Research)*	*45*	*worldwide*
28	*Conference*	*Faculty of Agriculture Novi Sad*	*Quality and Safety Food Production Chain*	*24/09/2009*	*Wroclaw, Poland*	*Scientific community (higher education, Research)*	*35*	*worldwide*
29	*Conference*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*Microwave Week 2009*	*28/09/2009*	*Rome, Italy*	*Scientific community (higher education, Research)*	*100*	*worldwide*
30	*Flyers*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*Promotional package No.2*	*01/10/2009*	*Novi Sad, Serbia*	*Scientific community (higher education, Research) - Industry - Civil society - Policy makers - Medias*	*9999*	*worldwide*
31	*Workshops*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*BioSense09*	*14/10/2009*	*Novi Sad, Serbia*	*Scientific community (higher education, Research) - Policy makers - Medias*	*50*	*Serbia, Montenegro, Bosnia & Herzegovina, UK, Germany, Belgium, Italy, Slovenia, Hungary, USA, CND*
32	*Conference*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*IEEE ICIP 2009*	*07/11/2009*	*Cairo, Egypt*	*Scientific community (higher education, Research)*	*100*	*worldwide*
33	*Conference*	*PROVINCIAL SECRETARIAT OF*	*15th GeoCAP 2009*	*18/11/2009*	*Taormina, Italy*	*Scientific community (higher*	*100*	*worldwide*

TEMPLATE A2: LIST OF DISSEMINATION ACTIVITIES								
NO.	*Type of activities[3]*	*Main leader*	*Title*	*Date*	*Place*	*Type of audience[4]*	*Size of audience*	*Countries addressed*
		AGRICULTURE, WATER ECONOMY AND FORESTRY, VOJVODINA				*education, Research)*		
34	*Conference*	*INSTITUT MIHAJLO PUPIN*	*Telfor 2009*	*24/11/2009*	*Belgrade, Serbia*	*Scientific community (higher education, Research)*	*45*	*Serbia*
35	*Conference*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*7th WONS 2010*	*03/02/2010*	*Kranjska Gora, Slovenia*	*Scientific community (higher education, Research)*	*45*	*worldwide*
36	*Conference*	*INSTITUT MIHAJLO PUPIN*	*Infoteh 2010*	*12/03/2010*	*Jahorina, Bosnia and Herzegovina*	*Scientific community (higher education, Research)*	*120*	*WBC*
37	*Workshops*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*4th GEO European Projects Workshop*	*29/04/2010*	*Athens, Greece*	*Scientific community (higher education, Research) - Policy makers*	*120*	*worldwide*
38	*Conference*	*UNIVERSITA DEGLI STUDI DI FIRENZE*	*IEEE ICC 2010*	*23/05/2010*	*Cape Town, South Africa*	*Scientific community (higher education, Research)*	*230*	*worldwide*
39	*Conference*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*IUFRO - Sylva World Conference*	*24/05/2010*	*Casablanca, Morocco*	*Scientific community (higher education, Research) - Industry*	*45*	*worldwide*
40	*Conference*	*INSTITUT MIHAJLO PUPIN*	*ETRAN 2010*	*08/06/2010*	*Belgrade, Serbia*	*Scientific community (higher education, Research)*	*120*	*Serbia*
41	*Videos*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*Promotional video of the BioSense Center*	*20/06/2010*	*Novi Sad, Serbia*	*Scientific community (higher education, Research) -*	*230*	*Serbia, worldwide*

TEMPLATE A2: LIST OF DISSEMINATION ACTIVITIES								
NO.	*Type of activities[3]*	*Main leader*	*Title*	*Date*	*Place*	*Type of audience[4]*	*Size of audience*	*Countries addressed*
						Industry - Civil society - Policy makers - Medias		
42	*Conference*	*INSTITUT JOZEF STEFAN*	*32nd International Conference on Information Technology Interfaces*	*21/06/2010*	*Dubrovnik, Croatia*	*Scientific community (higher education, Research)*	*75*	*worldwide*
43	*Conference*	*Faculty of Agriculture Novi Sad*	*International Symposium on Ecology & Safety*	*06/07/2010*	*Nessebar, Bulgaria*	*Scientific community (higher education, Research)*	*45*	*worldwide*
44	*Conference*	*Faculty of Agriculture Novi Sad*	*28th International Horticultural Congress*	*22/08/2010*	*Lisbon, Portugal*	*Scientific community (higher education, Research)*	*150*	*worldwide*
45	*Conference*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*6th Conference on Sequences and their Applications*	*12/09/2010*	*Paris, France*	*Scientific community (higher education, Research)*	*120*	*worldwide*
46	*Conference*	*INSTITUT JOZEF STEFAN*	*19th Electrotechnical and Computer Science Conference ERK*	*20/09/2010*	*Portorož, Slovenia*	*Scientific community (higher education, Research)*	*100*	*Slovenia*
47	*Conference*	*INSTITUT JOZEF STEFAN*	*18th International Conference on Software Telecommunications and Computer Networks*	*23/09/2010*	*Split, Croatia*	*Scientific community (higher education, Research)*	*75*	*worldwide*
48	*Conference*	*INSTITUT MIHAJLO PUPIN*	*Neurel 2010*	*23/09/2010*	*Belgrade, Serbia*	*Scientific community (higher education, Research)*	*50*	*Serbia*
49	*Conference*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*ICIP 2011*	*26/09/2010*	*Hong Konk, China*	*Scientific community (higher education, Research)*	*180*	*worldwide*
50	*Conference*	*UNIVERZITET U NOVOM SADU FAKULTET*	*Microwave Week 2010*	*28/09/2010*	*Paris, France*	*Scientific community (higher education,*	*120*	*worldwide*

TEMPLATE A2: LIST OF DISSEMINATION ACTIVITIES								
NO.	*Type of activities[3]*	*Main leader*	*Title*	*Date*	*Place*	*Type of audience[4]*	*Size of audience*	*Countries addressed*
		TEHNICKIH NAUKA				*Research)*		
51	*Conference*	*INSTITUT MIHAJLO PUPIN*	*9th ISITC 2010*	*08/11/2010*	*Timisoara, Romania*	*Scientific community (higher education, Research)*	*65*	*worldwide*
52	*Conference*	*INSTITUT MIHAJLO PUPIN*	*5th European Conference on Circuits and Systems in Communications*	*15/11/2010*	*Belgrade, Serbia*	*Scientific community (higher education, Research)*	*75*	*EU*
53	*Conference*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*8th International Conference on Wireless On-demand Network Systems and Services*	*26/01/2011*	*Bardonecchia, Italy*	*Scientific community (higher education, Research)*	*75*	*worldwide*
54	*Conference*	*INSTITUT MIHAJLO PUPIN*	*4th IFIP Conference and 3rd Wireless Sensor Network Workshop*	*08/02/2011*	*Paris, France*	*Scientific community (higher education, Research)*	*75*	*worldwide*
55	*Flyers*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*Promotional package No.3*	*01/03/2011*	*Novi Sad, Serbia*	*Scientific community (higher education, Research) - Industry - Civil society - Policy makers - Medias*	*9999*	*worldwide*
56	*Conference*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*INFOTEH 2011*	*16/03/2011*	*Jahorina, Bosnia and Herzegovina*	*Scientific community (higher education, Research)*	*120*	*WBC*
57	*Conference*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*ESA-EUSC-JRC Conference on Image Information Mining*	*30/03/2011*	*Ispra-Varese, Italy*	*Scientific community (higher education, Research)*	*120*	*worldwide*
58	*Workshops*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*EcoSense 2011*	*06/04/2011*	*Belgrade*	*Scientific community (higher education, Research)*	*35*	*Serbia, Montenegro, Greece, Israel, Slovenia, Italy, Spain, Germany,*

TEMPLATE A2: LIST OF DISSEMINATION ACTIVITIES								
NO.	*Type of activities*[3]	*Main leader*	*Title*	*Date*	*Place*	*Type of audience*[4]	*Size of audience*	*Countries addressed*
								Denmark, UK, USA
59	*Conference*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*2011 IEEE Symposium on Computational Intelligence and Data Mining*	*11/04/2011*	*Paris, France*	*Scientific community (higher education, Research)*	*120*	*worldwide*
60	*Conference*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*Earth Observation on Global Changes 2011*	*13/04/2011*	*Munich, Germany*	*Scientific community (higher education, Research)*	*150*	*worldwide*
61	*Press releases*	*INSTITUT MIHAJLO PUPIN*	*Politika - Science, Information, Technologies*	*16/05/2011*	*Belgrade, Serbia*	*Scientific community (higher education, Research) - Industry - Civil society - Policy makers - Medias*	*9999*	*Serbia*
62	*Exhibitions*	*UNIVERZITET U NOVOM SADU FAKULTET TEHNICKIH NAUKA*	*Week on Innovative Regions WIRE 2010*	*14/03/1010*	*Granada, Spain*	*Scientific community (higher education, Research) - Policy makers - Medias*	*250*	*worldwide*

Section B (Confidential[5] or public: confidential information to be marked clearly)
Part B1

No items to be listed due to the nature of CSA financing.

TEMPLATE B1: LIST OF APPLICATIONS FOR PATENTS, TRADEMARKS, REGISTERED DESIGNS, ETC.					
Type of IP Rights[6]:	Confidential Click on YES/NO	Foreseen embargo date dd/mm/yyyy	Application reference(s) (e.g. EP123456)	Subject or title of application	Applicant (s) (as on the application)

[5] Note to be confused with the "EU CONFIDENTIAL" classification for some security research projects.

[6] A drop down list allows choosing the type of IP rights: Patents, Trademarks, Registered designs, Utility models, Others.

Part B2
Please complete the table hereafter:

Type of Exploitable Foreground[7]	**Description of exploitable foreground**	Confidential Click on YES/NO	Foreseen embargo date dd/mm/yyyy	**Exploitable product(s) or measure(s)**	**Sector(s) of application**[8]	**Timetable, commercial or any other use**	**Patents or other IPR exploitation (licences)**	**Owner & Other Beneficiary(s) involved**

In addition to the table, please provide a text to explain the exploitable foreground, in particular:

- Its purpose
- How the foreground might be exploited, when and by whom
- IPR exploitable measures taken or intended
- Further research necessary, if any
- Potential/expected impact (quantify where possible)

[19] A drop down list allows choosing the type of foreground: General advancement of knowledge, Commercial exploitation of R&D results, Exploitation of R&D results via standards, exploitation of results through EU policies, exploitation of results through (social) innovation.
[8] A drop down list allows choosing the type sector (NACE nomenclature) : http://ec.europa.eu/competition/mergers/cases/index/nace_all.html

4.3 Report on societal implications

Replies to the following questions will assist the Commission to obtain statistics and indicators on societal and socio-economic issues addressed by projects. The questions are arranged in a number of key themes. As well as producing certain statistics, the replies will also help identify those projects that have shown a real engagement with wider societal issues, and thereby identify interesting approaches to these issues and best practices. The replies for individual projects will not be made public.

A General Information *(completed automatically when **Grant Agreement number** is entered.*	
Grant Agreement Number:	204472
Title of Project:	Wireless Sensor Networks and Remote Sensing – Foundation of a
Name and Title of Coordinator:	Prof. dr Vladimir Crnojevic

B Ethics	
1. Did your project undergo an Ethics Review (and/or Screening)? • If Yes: have you described the progress of compliance with the relevant Ethics Review/Screening Requirements in the frame of the periodic/final project reports? Special Reminder: the progress of compliance with the Ethics Review/Screening Requirements should be described in the Period/Final Project Reports under the Section 3.2.2 *'Work Progress and Achievements'*	***0Yes XNo***
2. Please indicate whether your project involved any of the following issues (tick box) :	***YES***
RESEARCH ON HUMANS	
• Did the project involve children?	
• Did the project involve patients?	
• Did the project involve persons not able to give consent?	
• Did the project involve adult healthy volunteers?	
• Did the project involve Human genetic material?	
• Did the project involve Human biological samples?	
• Did the project involve Human data collection?	
RESEARCH ON HUMAN EMBRYO/FOETUS	
• Did the project involve Human Embryos?	
• Did the project involve Human Foetal Tissue / Cells?	
• Did the project involve Human Embryonic Stem Cells (hESCs)?	
• Did the project on human Embryonic Stem Cells involve cells in culture?	
• Did the project on human Embryonic Stem Cells involve the derivation of cells from Embryos?	
PRIVACY	
• Did the project involve processing of genetic information or personal data (eg. health, sexual lifestyle, ethnicity, political opinion, religious or philosophical conviction)?	
• Did the project involve tracking the location or observation of people?	
RESEARCH ON ANIMALS	
• Did the project involve research on animals?	
• Were those animals transgenic small laboratory animals?	
• Were those animals transgenic farm animals?	

• Were those animals cloned farm animals?	
• Were those animals non-human primates?	
RESEARCH INVOLVING DEVELOPING COUNTRIES	
• Did the project involve the use of local resources (genetic, animal, plant etc)?	
• Was the project of benefit to local community (capacity building, access to healthcare, education etc)?	
DUAL USE	
• Research having direct military use	0 Yes 0 No
• Research having the potential for terrorist abuse	

C Workforce Statistics

3. Workforce statistics for the project: Please indicate in the table below the number of people who worked on the project (on a headcount basis).

Type of Position	Number of Women	Number of Men
Scientific Coordinator	2	6
Work package leaders	0	3
Experienced researchers (i.e. PhD holders)	7	16
PhD Students	2	11
Other	1	0

4. How many additional researchers (in companies and universities) were recruited specifically for this project?	**11**
Of which, indicate the number of men:	9

D Gender Aspects

5. Did you carry out specific Gender Equality Actions under the project?

X Yes
○ No

6. Which of the following actions did you carry out and how effective were they?

		Not at all effective				Very effective
☒	Design and implement an equal opportunity policy	○	○	X	○	○
☒	Set targets to achieve a gender balance in the workforce	○	X	○	○	○
❑	Organise conferences and workshops on gender	○	○	○	○	○
☒	Actions to improve work-life balance	○	○	X	○	○
○	Other:					

7. Was there a gender dimension associated with the research content – i.e. wherever people were the focus of the research as, for example, consumers, users, patients or in trials, was the issue of gender considered and addressed?

○ Yes- please specify

X No

E Synergies with Science Education

8. Did your project involve working with students and/or school pupils (e.g. open days, participation in science festivals and events, prizes/competitions or joint projects)?

○ Yes- please specify

X No

9. Did the project generate any science education material (e.g. kits, websites, explanatory booklets, DVDs)?

○ Yes- please specify

X No

F Interdisciplinarity

10. Which disciplines (see list below) are involved in your project?

X Main discipline[9]: 2 Engineering and Technology

X Associated discipline[9]: 4.1 Agriculture, forestry, fisheries and allied sci.

X Associated discipline[9]: 1.4 Earth and related environmental sciences

G Engaging with Civil society and policy makers

11a Did your project engage with societal actors beyond the research community? *(if 'No', go to Question 14)*

X Yes
○ No

11b If yes, did you engage with citizens (citizens' panels / juries) or organised civil society (NGOs, patients' groups etc.)?

X No

○ Yes- in determining what research should be performed

[9] Insert number from list below (Frascati Manual).

○ Yes - in implementing the research ○ Yes, in communicating /disseminating / using the results of the project		
11c In doing so, did your project involve actors whose role is mainly to organise the dialogue with citizens and organised civil society (e.g. professional mediator; communication company, science museums)?	○ Yes X No	
12. Did you engage with government / public bodies or policy makers (including international organisations)		
○ No ○ Yes- in framing the research agenda ○ Yes - in implementing the research agenda X Yes, in communicating /disseminating / using the results of the project		
13a Will the project generate outputs (expertise or scientific advice) which could be used by policy makers? ○ Yes – as a **primary** objective (please indicate areas below- multiple answers possible) X Yes – as a **secondary** objective (please indicate areas below - multiple answer possible) ○ No		

13b If Yes, in which fields?

Agriculture ✓		Energy		Human rights	
Audiovisual and Media		Enlargement		Information Society	
Budget		Enterprise		Institutional affairs	
Competition		Environment		Internal Market	
Consumers		External Relations		Justice, freedom and security	
Culture		External Trade		Public Health	
Customs		Fisheries and Maritime Affairs		Regional Policy	
Development Economic and Monetary Affairs		Food Safety		Research and Innovation	
		Foreign and Security Policy		Space	
Education, Training, Youth		Fraud		Taxation	
Employment and Social Affairs		Humanitarian aid		Transport	

13c If Yes, at which level?

- X Local / regional levels
- ○ National level
- ○ European level
- ○ International level

H Use and dissemination

14. How many Articles were published/accepted for publication in peer-reviewed journals?	**0**
To how many of these is open access[10] provided?	**0**
How many of these are published in open access journals?	**0**
How many of these are published in open repositories?	**0**
To how many of these is open access not provided?	**0**
Please check all applicable reasons for not providing open access:	
❑ publisher's licensing agreement would not permit publishing in a repository ❑ no suitable repository available ❑ no suitable open access journal available ❑ no funds available to publish in an open access journal ❑ lack of time and resources ❑ lack of information on open access ❑ other[11]: ……	

15. How many new patent applications ('priority filings') have been made? *("Technologically unique": multiple applications for the same invention in different jurisdictions should be counted as just one application of grant).*		**0**
16. Indicate how many of the following Intellectual Property Rights were applied for (give number in each box).	Trademark	**0**
	Registered design	**0**
	Other	**0**
17. How many spin-off companies were created / are planned as a direct result of the project?		**0**
Indicate the approximate number of additional jobs in these companies:		**0**

18. Please indicate whether your project has a potential impact on employment, in comparison with the situation before your project:

❑ Increase in employment, or	❑ In small & medium-sized enterprises
❑ Safeguard employment, or	❑ In large companies
❑ Decrease in employment,	❑ None of the above / not relevant to the project
☒ Difficult to estimate / not possible to quantify	

19. For your project partnership please estimate the employment effect resulting directly from your participation in Full Time Equivalent (*FTE = one person working fulltime for a year*) jobs:	*Indicate figure:*

[10] Open Access is defined as free of charge access for anyone via Internet.
[11] For instance: classification for security project.

☒ Difficult to estimate / not possible to quantify	❑

I Media and Communication to the general public

20. As part of the project, were any of the beneficiaries professionals in communication or media relations?

○ Yes X No

21. As part of the project, have any beneficiaries received professional media / communication training / advice to improve communication with the general public?

○ Yes X No

22 Which of the following have been used to communicate information about your project to the general public, or have resulted from your project?

☒	Press Release	☒	Coverage in specialist press
❑	Media briefing	❑	Coverage in general (non-specialist) press
☒	TV coverage / report	☒	Coverage in national press
❑	Radio coverage / report	❑	Coverage in international press
☒	Brochures /posters / flyers	☒	Website for the general public / internet
☒	DVD /Film /Multimedia	❑	Event targeting general public (festival, conference, exhibition, science café)

23 In which languages are the information products for the general public produced?

☒	Language of the coordinator	☒	English
❑	Other language(s)		

***Question F-10*:** Classification of Scientific Disciplines according to the Frascati Manual 2002 (Proposed Standard Practice for Surveys on Research and Experimental Development, OECD 2002):

FIELDS OF SCIENCE AND TECHNOLOGY

1. NATURAL SCIENCES

1.1 Mathematics and computer sciences [mathematics and other allied fields: computer sciences and other allied subjects (software development only; hardware development should be classified in the engineering fields)]

1.2 Physical sciences (astronomy and space sciences, physics and other allied subjects)

1.3 Chemical sciences (chemistry, other allied subjects)

1.4 Earth and related environmental sciences (geology, geophysics, mineralogy, physical geography and other geosciences, meteorology and other atmospheric sciences including climatic research, oceanography, vulcanology, palaeoecology, other allied sciences)

1.5 Biological sciences (biology, botany, bacteriology, microbiology, zoology, entomology, genetics, biochemistry, biophysics, other allied sciences, excluding clinical and veterinary sciences)

2 ENGINEERING AND TECHNOLOGY

2.1 Civil engineering (architecture engineering, building science and engineering, construction engineering, municipal and structural engineering and other allied subjects)

2.2 Electrical engineering, electronics [electrical engineering, electronics, communication engineering and systems, computer engineering (hardware only) and other allied subjects]

2.3. Other engineering sciences (such as chemical, aeronautical and space, mechanical, metallurgical and materials engineering, and their specialised subdivisions; forest products; applied sciences such as

geodesy, industrial chemistry, etc.; the science and technology of food production; specialised technologies of interdisciplinary fields, e.g. systems analysis, metallurgy, mining, textile technology and other applied subjects)

3. MEDICAL SCIENCES

3.1 Basic medicine (anatomy, cytology, physiology, genetics, pharmacy, pharmacology, toxicology, immunology and immunohaematology, clinical chemistry, clinical microbiology, pathology)

3.2 Clinical medicine (anaesthesiology, paediatrics, obstetrics and gynaecology, internal medicine, surgery, dentistry, neurology, psychiatry, radiology, therapeutics, otorhinolaryngology, ophthalmology)

3.3 Health sciences (public health services, social medicine, hygiene, nursing, epidemiology)

4. AGRICULTURAL SCIENCES

4.1 Agriculture, forestry, fisheries and allied sciences (agronomy, animal husbandry, fisheries, forestry, horticulture, other allied subjects)

4.2 Veterinary medicine

5. SOCIAL SCIENCES

5.1 Psychology

5.2 Economics

5.3 Educational sciences (education and training and other allied subjects)

5.4 Other social sciences [anthropology (social and cultural) and ethnology, demography, geography (human, economic and social), town and country planning, management, law, linguistics, political sciences, sociology, organisation and methods, miscellaneous social sciences and interdisciplinary , methodological and historical S1T activities relating to subjects in this group. Physical anthropology, physical geography and psychophysiology should normally be classified with the natural sciences].

6. HUMANITIES

6.1 History (history, prehistory and history, together with auxiliary historical disciplines such as archaeology, numismatics, palaeography, genealogy, etc.)

6.2 Languages and literature (ancient and modern)

6.3 Other humanities [philosophy (including the history of science and technology) arts, history of art, art criticism, painting, sculpture, musicology, dramatic art excluding artistic "research" of any kind, religion, theology, other fields and subjects pertaining to the humanities, methodological, historical and other S1T activities relating to the subjects in this group]