



A P O L L O

D1.2: 1st Report on Advisory Board meetings

WP1 – Project Management

Authors: Lazaros Xenidis, Polimachi Simeonidou, Ioanna Pavlou



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 687412.

Disclaimer

Any dissemination of results reflects only the author's view and the European Commission is not responsible for any use that may be made of the information it contains.

Copyright message

© **APOLLO Consortium, 2016**

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both. Reproduction is authorised provided the source is acknowledged.



Document Information

Grant Agreement Number	687412	Acronym	APOLLO	
Full Title	Advisory platform for small farms based on earth observation			
Horizon 2020 Call	EO-1-2015: Bringing EO applications to the market			
Type of Action	Innovation Action			
Start Date	1 st May 2016	Duration	34 months	
Project URL	-			
Document URL	-			
EU Project Officer	Iulia SIMION			
Project Coordinator	Polimachi SIMEONIDOU			
Deliverable	D1.2: 1 st Report on Advisory Board meetings			
Work Package	WP1 – Project Management			
Date of Delivery	Contractual	M4 (31/08/2016)	Actual	08/09/2016
Nature	R – Report	Dissemination Level	PU - Public	
Lead Beneficiary	DRAXIS			
Lead Author	Lazaros Xenidis	Email	lxenidis@draxis.gr	
	DRAXIS	Phone	+302310274566	
Other authors	Polimachi Simeonidou (DRAXIS), Ioanna Pavlou (DRAXIS)			
Reviewer(s)	Anastasia Xatzistrati (ACP), Vasileios Kolovos (ACP), Giorgos Savvidis (ACP)			
Keywords	External Experts, Advisory board			

Document History

Version	Issue Date	Stage	Changes	Contributor
1.0	25/08/2016	Draft	First release	DRAXIS
2.0	31/08/2016	Draft	Comments from reviewer received	ACP
3.0	02/09/2016	Final	Final version. Reviewers comments included	DRAXIS



Table of Contents

Executive summary.....	5
1 The role of the External Expert Advisory Board (EEAB) in H2020 projects	6
2 External Expert Advisory Board for APOLLO project.....	6
2.1 Provisions in the Consortium and Grant Agreements.....	7
3 Methodology	7
3.1 Selection process	7
3.2 Invitation for participation and commitment	8
3.3 Continuous consultation procedure.....	8
4 APOLLO EEAB Members	9
4.1 Ms. Dr. Paula Antunes	9
4.2 Mr. Dr. Claus Aage Grøn Sørensen	10
4.3 Mr. Milan Miric	10
5 Meetings.....	11
5.1 Meeting procedure and technicalities.....	11
5.2 Conference call with Ms. Dr. Paula Antunes	11
5.3 Conference call with Mr. Dr. Claus Aage Grøn Sørensen	13
5.4 Interview with Mr. Milan Miric	15
6 Results and recommendations for APOLLO.....	17
7 ANNEX I – APOLLO EEAB List	21
8 ANNEX II – Invitation Letter	22

Tables

Table 1: indicative results and recommendations table	17
---	----



Executive summary

The current deliverable represents the first report on APOLLO project Advisory Board meetings. It starts with an overview of the role of an External Expert Advisory Board (EEAB) in Horizon 2020 projects and with a justification why an EEAB is important for APOLLO project. Furthermore, it includes a detailed description of the methodology used for the member selection process as well as a description of the rules that govern the functioning of this Board. It includes a description of the skills of each selected members and the detailed minutes of the meetings and teleconferences that were held with them. Last, the documents concludes with an analysis of the recommendations, suggestion and expert input for APOLLO and translates these recommendations into valuable input for the APOLLO Work structure, deliverables and partners.



1 The role of the External Expert Advisory Board (EEAB) in H2020 projects

The use of experts within the research programs of the European Union such as the FP7 and the ongoing Horizon 2020 has been and is a common practice since their contribution and expert knowledge is highly valued. Independent experts provide assistance and services to the European Commission ranging from the preparation, implementation or evaluation of work programmes and design of policies to the evaluation of research proposals and monitoring of actions^{1,2}.

Within the context of a Horizon 2020 project, the External Expert Advisory Board (EEAB) has the role of an external counselling body comprised by high-level international experts from different areas of knowledge that meet regularly with the project consortium throughout the project and participate in project meetings and events.

The main tasks and roles of the EEAB in a Horizon 2020 project can be summarised in the following list. The list is indicative and can be further extended according to the needs and specialities of each project. These tasks and roles are:

- to provide advice, guidance and recommendations for any project development ensuring high quality and excellence at all project stages and components,
- to provide with independent scrutiny on the project's development,
- to provide additional quality control and validation of the impact and outreach of the project,
- to give technical, ethical and legal guidance,
- to advise on links with relevant interest groups outside the project consortium,
- to propose and encourage the potential interactions of the project with other projects, initiatives and activities,
- to provide advice on cooperation opportunities,
- to give feedback and participate in the selection of initiatives to be implemented,
- to serve as a link between project and national/regional activities in EU,
- to help to ensure adequate orientation,
- to increase the visibility of project activities and support the dissemination of project results,
- to stimulate the discussion between the relevant key players in EU,
- to extend the scientific potential of the project,
- to extend the market potential of the project,
- to enhance the dissemination potential of the project.

2 External Expert Advisory Board for APOLLO project

APOLLO is an innovation action project responding to the topic EO-1-2015: Bringing EO applications to the market. The inclusion of an EEAB for APOLLO project has been considered even from the proposal stage. The External Expert Advisory Board will consist of experts with world-wide reputation in the scientific and technical fields addressed by APOLLO such as Earth Observation, ICT for

¹ <http://ec.europa.eu/research/participants/portal/desktop/en/experts/index.html>

² <http://ec.europa.eu/programmes/horizon2020/en/experts>



agriculture, farm management systems, market exploitation and stakeholder collaboration and engagement.

The APOLLO EEAB will have the tasks and roles described the previous chapter and additionally shall assist and facilitate the decisions made by the General Assembly of the project consortium and will also participate in workshops and conference calls organized by the project consortium. The Work Package leaders will take part in the Advisory Board meetings and present key progress on the project discussion with the Advisory Board Members. It is worth mentioning that travel and accommodation costs of the members of the Advisory Board will be covered by the project budget.

All the processes related with the activity of the EEAB in APOLLO are under WP1 Project Management, that partner DRAXIS is leading, and will be documented in four successive deliverables spread evenly across the whole project duration. The current deliverable D1.2 1st Report on Advisory Board meetings represents the first deliverable of the four, reflecting the EEAB activities from project start till Month 4 (31 of August 2016). The rest of the three deliverables will be submitted in M14 (June 2017), M23 (March 2018) and M34 (February 2019) respectively.

2.1 Provisions in the Consortium and Grant Agreements

The APOLLO Consortium Agreement, signed by all consortium members and modelled according to DESCA³ (Development of a Simplified Consortium Agreement), contains a provision that describes the rules under which the APOLLO EEAB will function. In specific, in chapter 6.5 the following provision is provided:

“An External Expert Advisory Board (EEAB) will be appointed and steered by the Executive Board. The EEAB shall assist and facilitate the decisions made by the General Assembly. The Coordinator is authorised to execute with each member of the EEAB a non-disclosure agreement, which terms shall be not less stringent than those stipulated in this Consortium Agreement, no later than 30 calendar days after their nomination or before any confidential information will be exchanged, whichever date is earlier. The Coordinator shall write the minutes of the EEAB meetings and prepare the implementation of the EEAB's suggestions. The EEAB members shall be allowed to participate in General Assembly meetings upon invitation but have not any voting rights.”

The above provisions included in the APOLLO Consortium Agreement will be implemented through the course of the project and reported in the upcoming deliverables.

Further provisions for the functioning of the APOLLO EEAB are provided in the APOLLO Grant Agreement. In specific in Annex 1 (part A) in the description of WP1 and in part B in the description of the project management structure and the project's management bodies.

3 Methodology

3.1 Selection process

The selection of the EEAB members has been an open and transparent process involving all consortium members. Initially the WP1 leader DRAXIS identified the fields of expertise that are essential for APOLLO project and also the ideal number of experts needed. These were one expert in the primary sector and local regional development, one expert in the field of ICT for agriculture,

³ <http://www.desca-2020.eu/>



one expert in stakeholder collaboration and engagement, one expert in Space industry and solutions and one marketing expert. In total the number of 5 experts was proposed.

The list of experts proposed was not definite but instead it was a point of departure for expert selection. The number and the expertise selected in this selection process reflects the needs of the project in its initial stage especially during user requirements identification. Further experts could be added during the course of the project.

In the next step of the selection process the list of needed experts was sent by email to all APOLLO partners asking them to screen their personal contacts and networks in order to propose potential members for the APOLLO EEAB. Ideally the proposed members of the EEAB shall not only be experts in their field, but also have formal or informal influence within the respective networks and have experience in participating in an EU research project. Special attention was given to a good geographical coverage of EU countries and to a world-wide reputation of the EEAB members in the scientific and technical fields addressed by the project.

The response of the consortium partners was immediate providing timely the needed information.

3.2 Invitation for participation and commitment

After the proposal of the potential members by the project partners, DRAXIS the project coordinator and leader of WP1, initially screened the proposed individuals to check whether the proposed member fulfilled the requirements set. Then, an official invitation letter was sent by email to all proposed EEAB members in order to confirm their intention and willingness to join the APOLLO EEAB. The invitation letter is presented in ANNEX II. The letter was signed by the APOLLO project coordinator Ms. Dr. Polimachi Simeonidou. If the proposed member accepted the invitation it became officially a member of the APOLLO project advisory board. If a proposed member declined the invitation to join the EEAB a further selection of experts would be carried out until the desired number and the needed fields of expertise would be fulfilled.

All the experts who accepted to become an EEAB members were proposed to participate into a joint teleconference. If an expert was not able to participate to the joint teleconference, then a separate individual teleconference was arranged. All accepted EEAB members received an email with a factsheet and a short presentation of the APOLLO project in order to give them a first impression of how the project is structured, its objectives, consortium and pilots.

3.3 Continuous consultation procedure

The EEAB role in APOLLO is expected to last during the whole project duration (34 months). Meetings of the EEAB will be held either through teleconference (using Skype or WebEx) or with personal presence of the experts. These meetings can be held with all the EEAB members or with each member separately. As mentioned above, all travel expenses of EEAB members (accommodation and flights) will be covered by the project budget. The time and the place of the meetings that the EEAB will be present will be defined by the Project Coordinator and WP1 leader DRAXIS, who will provide well in advance the EEAB members with a schedule of project meetings and events. EEAB members are expected to join these meetings or teleconferences.

At the end of an EEAB meeting, DRAXIS will keep minutes and write a report with all conclusions, including observations on project results, recommendations on actions for impact creation as well as connection of the recommendations. DRAXIS will make sure that the conclusions and recommendations of the EEAB are adequately taken into consideration by the Executive Board in the decision making process during the project but most importantly will have to make sure that the conclusions and recommendations are conveyed to the responsible WP leaders. Last, DRAXIS will



be responsible to regularly inform on time all the EEAB members about any project developments and results.

All communication between APOLLO and the EEAB will be done in English. EEAB members commit to respond to correspondence within a reasonable time period. Correspondence will normally be sent by email. Members will ordinarily have two weeks to provide feedback on documents sent for consultation. The coordinator may shorten this period in some instances to keep project deadlines.

4 APOLLO EEAB Members

4.1 Ms. Dr. Paula Antunes



Paula Antunes has a degree in Environmental Engineering (5 years) and a PhD in Environmental Systems from the Universidade Nova de Lisboa. She is Full Professor at the Department of Environmental Sciences and Engineering, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, where she has been a lecturer since 1982. She teaches Environmental Management, Corporate Environmental Management, Ecological Economics and Sustainability Science both in MSc and PhD programs (Environmental Engineering MSc Program, European Master in System Dynamics and Environment PhD Program).

Paula Antunes was the Head of the Department of Environmental Sciences and Engineering in the period 2006-2009 and she currently is the Director of CENSE – Center for Environmental and Sustainability Research, classified as Excellent in the scope of the Programa de Financiamento Plurianual de Unidades de I&D of the Foundation for Science and Technology (FCT-MCTES).

She has a background in environmental engineering and considerable experience in developing interdisciplinary research and coordinating multidisciplinary research teams in the interface between natural and social sciences. Her research interests are focused in ecological economics with an emphasis in sustainability assessment, system dynamics modelling, environmental management and methods and tools for stakeholder engagement in environmental planning and decision support.

She has coordinated and participated in several research projects, financed by the European Commission and the Portuguese Foundation for Science and Technology. She has also participated in several studies both for public and private organizations, dealing with environmental assessment, support to the development and implementation of environmental policies, sustainability monitoring and benchmarking. She has authored and co-authored a significant number of publications in peer-reviewed journals and books and she has collaborated in several national and international expert panels.

She is Associate Editor of Ecological Economics and has been Vice-President of the European Society for Ecological Economics (ESEE) between 2006-2009 and has served in the board of the International Society for Ecological Economics (ISEE) (2002-2004). She was a member of the Portuguese Council for Sustainable Development between 2009-2011 and belongs to the Scientific Council for Natural Resources and the Environment of the Portuguese Foundation for Science and Technology.

Ms. Dr. Paula Antunes was invited to join APOLLO Advisory Board due to her expertise in policy analysis and stakeholder engagement. She was proposed by partner AgriSat.



4.2 Mr. Dr. Claus Aage Grøn Sørensen



Claus Grøn Sørensen is a Senior Scientist/Head of Research Unit in the Operations Management division of the Department of Engineering, Aarhus University, Denmark. He holds a PhD in Production and Operations Management. He has over 25 year experience in production and operations management, decision analysis, information modeling, system analysis, and simulation and modeling of technology application in agriculture. Research topics include resource analyses and optimizations, whole farm analyses and optimizations, the feasibility of introducing robotic systems in agriculture, development of management information systems and smart applications (e.g. FP7, FutureFarm, AgriFood2). He has participated (as project coordinator, WP leader, and partner coordinator) in multiple international projects. He is the author of more than 350 articles in peer reviewed Journals and conference proceedings. He is currently the Danish representative on the Executive Council of the European Society of Agricultural Engineers (EurAgEng), post-chairman for CIGR (International Commission of Agricultural Engineering) Section V on System Management, and currently the President of EurAgEng (European Society of Agricultural Engineers).

Main areas of research and qualifications

Production and operations management with focus on:

- Operations analyses and modeling (optimisation and evaluation of production systems and decision support logistics, supply chain management)
- Resource analyses and optimisations (technology usage, energy demand, and work methods, Life Cycle Assessment)
- Information modeling (information types and information flows in relation to management of systems, requirements for design of ICT systems, information valuation/value chain)
- System analyses/system engineering (technology assessment, impact assessment of innovative technologies, sensitivity analyses/feasibility studies, simulation/modeling)

Mr. Sørensen was proposed by partner Agricultural University of Athens.

4.3 Mr. Milan Miric

Mr. Milan Miric is currently the Executive Director of the Regional Development Agency of Srem Municipality, Serbia. He is responsible for the planning, management and realization of regional development projects related to local infrastructure, tourism, agriculture and energy efficiency as well as developing an annual strategy for the municipality. He has been in close liaison between the municipality, the ministries, the central government and EU agencies. Mr. Miric has a great experience in management, budget planning, strategic planning on local level, organizational development, quality and innovation management. He has a project work experience gained through more than 30 municipality projects financed from municipality budget, republic budget, EU funds, Exchange, GTZ and USAID.

Mr. Miric has been proposed by partner University of Belgrade - Faculty of Civil Engineering (UBFCE) due to his extensive experience in local regional development and agriculture in Serbia.



5 Meetings

5.1 Meeting procedure and technicalities

All teleconferences with APOLLO EEAB members were implemented using Skype or Webex. For each Member a set of questions has been prepared prior to the call with the aim to facilitate the discussion. Upon the start of the call an introductory presentation to APOLLO project was given by DRAXIS. The audio sound of all teleconferences was recorded along and the discussions were converted to text for archiving reasons. The results of these calls are presented in the following chapters.

5.2 Conference call with Ms. Dr. Paula Antunes

The teleconference was held of the 27 of July 2016. Participants of the meeting were Mr. Lazaros Xenidis from DRAXIS and Ms. Dr. Paula Antunes. The meeting was held on Skype and it lasted approximately 23 minutes. The topics discussed were the use of policy analysis methodology within APOLLO, methods to increase stakeholder engagement but also general topics about the project. The questions and replies are presented below.

Policy analysis

What is the current policy status and developments in the EU regarding the EO driven precision agriculture?

Ms. Antunes replied that for the moment she is not familiar with such policy developments in the EU regarding EO driven precision agriculture. Her policy analysis research on EU directives mainly focused on the Nitrates Directive and the Water Framework Directive. She replied that she will make a research about it and she will provide the needed information at a later stage of the project.

Do you think that policy analysis is essential for APOLLO project? If yes please justify your answer.

Ms. Antunes replied that indeed policy analysis is essential for APOLLO project. According to her opinion it is essential to understand what are the motivations and the main drivers of farmer's behaviors and decisions. It is essential to have a clear view and understanding of what farmers consider in order to take decisions for the management of their farms, which are the drivers of their decisions and policies are an important part that shapes their decisions.

APOLLO includes a non EU candidate country Serbia as a pilot country. What should be done in order to harmonize procedures with respect to policy harmonization and pilot implementation?

Ms. Antunes mentioned that the use of the word harmonization is not proper in the context of this question since it is not in the scope of the project to harmonize policies. However she mentioned it would be important in the context of a policy analysis within APOLLO project to understand what the policies in Serbia are, how effective they are, how do they act or not act, if there are main issues to be addressed regarding these policies and if this changes anything for the implementation of APOLLO project. It is important to have an inner knowledge of the policies related to APOLLO in Serbia and tailor the services offered by APOLLO considering the policies that are in place there.

Stakeholder engagement

APOLLO contains a WP for user needs analysis and specification as well as one for Pilot implementation. How can we increase stakeholder engagement during user requirements collection and co-creation process but also during pilot implementation (trial users)?



According to the experience of Ms. Antunes with similar EU projects related to new developments in agriculture such as Pleiades and FATIMA, on one hand there are one or two farmers who are part of the project and they are collaborating in the pilot experiences and they are very much engaged and try to apply and co-create tools with the project consortium but on the other hand the remaining rest of the farmers are left out of the whole process. Farmers who participate in the pilot are indeed of major importance, however according to Ms. Antunes APOLLO should aim to a broader farmer and user engagement from the beginning of the project. Ms. Antunes suggested that probably a seminar or a wider reach event would be suitable to try to reach the majority of farmers and to give them something that is interesting for them so that in the end we don't focus to those 2 or 3 farmers that collaborate with the project but a wider uptake by the farmers. She suggested to define and follow a mixed approach. Some farmers/users should be deeply engaged with the project and can act as a role models/local champions paving the road for the rest but more targeted actions are needed from the beginning of the project in order to reach a wider audience.

Do you foresee any barriers for the adoption of APOLLO platform by the targeted stakeholders? If yes, how to overcome these barriers?

For Ms. Antunes barriers do exist for the adoption of APOLLO platform. According to her experience in face to face interviews with farmers in Portugal farmers believe that they don't need extra tools for doing their work because they say "We know when the plant needs water and when the soil needs to be treated" but also they don't trust and rely on new tools such APOLLO because they don't see the usefulness of such tools. Ms. Antunes suggested that it is of major importance in order to overcome such barriers to show/demonstrate the usefulness and the results that you get from these tools as soon as they become available. The provided services from APOLLO must be given exactly on the time they need it and it must be tested and reliable.

General

Define any problems/barriers that you foresee that may occur during project implementation and propose ways for their mitigation.

Ms. Antunes replied that she is not so familiar with the technical barriers such as having the Earth Observation data and the automatic processing of the data and then giving the information back to the farmers in format in any time. However she replied that as mentioned in the previous question the most important barriers is the uptake barrier. Her main advice was to start with an initial survey and to try to have this wider engagement of all your targeted farmers not only the champions but everybody. This survey must be done with all farmers, setting up frequent meetings with farmers taking into account the specialties of each area, effort must be given to reach them, to listen to their needs and try to motivate them for the project. People who work in the technical issues and development, they tend to undervalue this engagement and leave it at the final stage of the project and her advice would be start right from the beginning of the project and start seriously in a committed way.

What is your (and your organisation's) view on precision agriculture especially EO driven precision agriculture?

Ms. Antunes replied that her organisation is does not specialize in agriculture, but it is more related to environmental engineering so her organisation doesn't have an actual view on this. Her personal opinion is that precision agriculture and ICT based farms advisory tools will play a substantial role for sustainable agriculture in the future because there is this need to feed 6 billion people and precision agriculture is the way to do it, to achieve it, to provide food for everybody, with less burden for the environment in a sustainable way. She thinks that it is the way to achieve these goals of feeding everybody in a sustainable way so she thinks it is very important. For, EO driven precision agriculture she believes that there is a lot of potential in this area and that it makes a lot of sense.



What is your message to future initiators of EO precision agriculture projects?

Her message was to try to bring out stakeholder engagement from early stages and since APOLLO is targeted to small farmers and in most cases they are difficult to mobilize and they are too many so she suggested to try to reach and set up these relations with farmers associations, so that farmers associations or cooperatives can play a very important role acting like a bridging organisations between technology and the farmers. Having such partners is a good thing to start.

5.3 Conference call with Mr. Dr. Claus Aage Grøn Sørensen

The teleconference with Mr. Sørensen took place on the 30th of August 2016. Participants of the meeting were the Project Coordinator Ms. Polimachi Simeonidou from DRAXIS, Mr. Lazaros Xenidis from DRAXIS and Mr. Claus Aage Grøn Sørensen. The meeting was held on Skype and lasted approximately 40 minutes. During the meeting it was discussed how the expertise of Mr. Sørensen in the fields of operation analysis and information modelling, the market potential of APOLLO product but also the identification of user groups and their differences across Europe.

What is your first impression of APOLLO project after the general presentation?

Mr. Sørensen replied that APOLLO project is very interesting and promising because it uses existing, tested models and algorithms for the services that are going to be provided, it uses free and open satellite data and combines them all to develop a strong business case and a concrete product. This is exactly what an Innovation action is. He mentioned that at the moment he works on the development of new algorithms for services such as tillage and irrigation scheduling.

According to your long experience with this kind of systems and these kind of services, so what is your background, what is your idea of how the system could be used by the farmers?

Mr. Sørensen mentioned that he has been recently involved to an AgriFood EU project and that the trend now is to create smart web applications and platforms that combine components such as models and satellite data. So APOLLO is at the edge of technological innovation for farm advisory following the latest technological trends while the approach to be followed in APOLLO is promising.

If we go beyond projects, what is your feeling, what is your approach towards the actual market? Is the market ready? Are the farmers ready to adopt these kind of systems or is it too early for them?

According to the experience of Mr. Sørensen there might be some constrains since it is difficult to have farmers take out and adopt these new tools. However, he mentioned that there is a growing interest in scheduling operations but this interest is mainly concentrated for the big farms because big farms have many fields and they want to prioritize their operation in order not to go to the field every day. He mentioned that small farmers have a better overview of their farms than the big ones and he didn't know if that would be a constrain for adopting tools like APOLLO. He mentioned that it is of major importance that APOLLO involves farmers in setting up the interface and setting up the system. His past experience showed that in many cases they tried to develop similar tools that at the end they got too complicated and at the end farmers decline to adopt them. His opinion is that the co-creation process of APOLLO is of major importance since when you involve farmers you extract requirements, the users can test the system and adjustments have to be made.

Can you tell us a bit more what is operation analysis and modeling, what is resource analysis and modelling and optimization and how these expertise can be used within APOLLO? We have an existing workflow, how can this be optimized, how can it be monitored? How operations analysis and modelling can be used for APOLLO during project implementation and after during the provision of a final product?



According to Mr. Sørensen operations analysis and management it is all about doing your operation in an efficient way and of course also from an environmental perspective. He pointed out that for example tillage scheduling and irrigation scheduling are typical operations/tools that can be analyzed using operation analysis, a methodology that decomposes the system process into individual components. He confirmed that this methodology can be applied to APOLLO even if existing models are used. His opinion is that it is of major importance to show during project implementation that operations have been analyzed. For the provision of the final product maybe he suggested that operation analysis and modelling can be used to show the benefits one can gain by using these services, how it will improve operations in term of higher yield, reduced cost etc.

Can we use the operations analysis and management for the workflow that we use within APOLLO or is this something that does not apply?

According to Mr. Sørensen operations analysis can also be used in the IT software related workflow of APOLLO but also information modelling can be used so that it is known exactly what information are needed, in what format and how much and when is it needed. Information modelling can be used to set up a blueprint for the whole system. And that is during the implementation of the project. Operations analysis or cost benefit analysis can be used after the implementation of the final product to show the benefits from it. He mentioned that has a great experience in these methods from other projects.

Do you foresee any barriers in the provision of the final service? If yes, how to overcome these barriers?

For Mr. Sørensen one barrier is that such systems quickly become complicated for the farmers to use. He proposed that the way to overcome this is to involve the users in the development process and of course make it as simple as possible. Another barrier arises if not all data management is automated and the farmer has to go and move data from one place to the other. He suggested that the processes for the provision of the service have to be as automated as possible.

Do you think that Life Cycle Assessment methodology can be used for the final APOLLO product? If yes how?

Mr. Sørensen replied that he has some reservations about it at the moment and he will reply at a later stage.

Maybe you want to add something more according to the discussion we've had already. Can you give us some indication of what we should research and what could be the topics of our future meetings and collaboration and webinars? What would be interesting for you? In which part of the project would you like to interfere more?

He expressed his interest in information modelling and developing a blueprint for the whole system. He also expressed his interest in use of models for the provision of the APOLLO services because he has extensive experience of that. He suggested to work closely with partner AUA since they collaborated with them in the past.

In your experience have you seen any cultural differences between farmers in different countries or have you seen some things that really differentiate them from the south to north?

He replied that of course there are differences. One difference is the size of the farm operations because the big farms they are more willing to uptake and to adopt these systems. But according to his experience small farmers can also be interested in new technologies. He mentioned that to some degree it is dependent on the size of the farm operation, what type of operation, what type of production system but then it also depends on the farmer himself, his willingness, is he progressive, is he willing to adopt new methods. So it is a little mixed picture.



There is a big discussion on the definition of a small farm. Do you think there is a way to distinguish a small farmer from a big farmer? Because to our understanding you have a small farm but the profit of this farm can be much higher than someone who has a big farm, it depends on many things. So given the fact that we don't have a clear definition from EU about that, how you see that the actual market is divided in terms of small and big? How is the real market, should we consider small farms in terms of size, of profit of labour?

Mr. Sørensen agreed with this view. He suggested that some other parameter have to be taken into account and that the general understanding is that big means a lot of hectares. But such definition is too simple, to look at it that way. But for APOLLO the primary target audience are small farmers. In terms of profit and maturity big farms have access to technology, they have a good understanding of the benefits they get from technology while small farmers who are not that mature do need this boost in order to take the advantages of open data and the low cost of technology. He suggested that APOLLO would be even more interesting for organic farmers because in organic farming there are no artificial inputs such as fertilisers and organic farmers have to have an efficient control of their operations. Also the typical size of an organic farm is much smaller than the typical size of a conventional farm and it is labour intensive so organic farmers really need to organise in the best possible way their resources and according to his experience parameters like weather prediction and growth estimation are really crucial for them. So he suggested that APOLLO has a strong potential for organic farmers as they form a good target group also in term of business.

The discussion ended with the commitment of Mr. Sørensen to work more closely with partner AUA but also to send information about his previous and ongoing similar projects.

5.4 Interview with Mr. Milan Miric

A teleconference or a web meeting was not possible to be arranged with Mr. Milan Miric due to his intensive work and duties during the time that the current deliverable had to be compiled. However, Mr. Miric has sent written by email the replies to the set of questions prepared by the WP1 Leader DRAXIS. The questions and replies are presented below.

Small scale farmers in Serbia

What is the current status of small farmers in Serbia and in specific in Vojvodina?

Small farmers in Serbia (Vojvodina) are experiencing serious difficulties in doing business as a consequence of non-existing stable agrarian politics and the expected unorganized market. As a result of it, there is a large percent of giving up when it comes to investments and innovations in the production.

What are the main problems that small farmers are now facing in Serbia?

The most frequent problems are the following: small properties, a large number of dispersed parcels, non-existing land consolidation, non-existing development plans.

Are there any peculiarities in the way agriculture is applied and functions in Serbia that have to be taken into account and are worth mentioning?

In Serbia, there is a growing representation of organic production. According to the data of the Directorate for national reference laboratories, there are 292 certified producers of organic products in our country. Total surface where organic productions is based is 9.547,82 ha, out of which 68% is at the surface of Vojvodina. The production of organic products in the Republic of Serbia is regulated in the Law on Organic Production, secondary legislation acts and the rulebooks. Control system of the organic products in Serbia has been established on the basis of control system which is prescribed in the EU regulations.



Perceptions towards innovative farm management ICT tools

What is the current perception of farmers and agricultural consultants in Serbia towards innovative farm management ICT tools (including EO driven) and related applications like the one that APOLLO is going to develop?

In the beginning, small farmers are mistrustful but consider that such an approach is necessary. Only big producers own more knowledge and therefore put more trust into the application of ICT tools in agriculture.

What are the main drivers of this perception?

Such attitude of small farmers is mostly influenced by the lack of knowledge and information, unfavorable age structure, low level of education and unwillingness to accept new technologies.

If negative, how this perception can be changed to positive?

There is a necessity for additional education, animation of a larger number of agriculture producers, especially the young, representing best practice examples from the surrounding.

How to increase the adoption of farm management ICT tools from farmers and agricultural consultants in Serbia?

It is necessary to represent and explain all the positive effects using specific examples of best practice. In addition, the application should contain very precise entry parameters in real time of the shown location in order to get applicable exit data for the user.

What is your (and your organisation's) view on farm management ICT tools?

This system will provide collection of data which will lead to progress in agriculture sector, not only in the sense of increasing efficiency, reducing pollution and achieving savings in money, but also in the sense of the manner in which agriculture business is perceived and conducted. This will make agriculture sustainable, and through the acceptable professional choice, even for the younger generations of farmers.

Agriculture policy in Serbia

What are the current policy status and developments in Serbia regarding farm management ICT tools but also regarding the use of Earth Observation and satellite data in agriculture?

At the moment, GPS devices are used only for the control of subsidies. (Agriculture expert services)

Are there any funding provisions for farmers in order to adopt ICT farm management tools like APOLLO?

There are no systemic subsidies, and there are small amounts of money invested into the development of more simple tools which cannot give more quality and more comprehensive solutions.

Do you think that ICT farm management tools like APOLLO can be a driver for local and regional development?

From the point of view of RDA Srem, as the leading institutions of the regional development of Srem, we consider that the creation of innovative solutions formulated in according to the needs of end users, usage of more advanced technologies, available to all the farmers no matter the size of their property, with the available prices, will enable keeping them in the global competitive surrounding. This is one of the conditions of local but also of even regional development.



Perceptions for APOLLO

Do you foresee any potential barriers to the adoption of APOLLO platform?

There are no foreseen barriers for the adoption of the APOLLO platform given that the means for the implementation of the project have been provided and the focus groups are interested for further cooperation.

How can APOLLO be more appealing to potential users in Serbia?

APOLLO platform should be simple to use, reliable and financially available to the end users.

6 Results and recommendations for APOLLO

The results and recommendations produced from the 3 advisory board teleconferences are presented in this chapter. In order to present the results in an easily conservable and applicable way, all results and recommendations are presented in a table. The results and recommendations table contains the following fields: a) The name of the EEAB Member, b) the recommendation and advice that resulted from the discussion, c) the respective work package that the recommendation refers to, d) the responsible APOLLO partners that have to incorporate the recommendation, e) the respective deliverable that the recommendation has to be incorporated in, f) a time plan for implementing the recommendations and g) a field for extra comments.

It has to be noted here that all results and recommendations presented in the following table are not binding but rather indicative. They are presented in order to act as a starting point of discussions among the consortium and the EEAB members. The Coordinator in consultation with the project Executive Board and the WP leaders will decide whether these results and recommendations will be included in the project, in which format and in which deliverable.

Table 1: Indicative results and recommendations table

Name	Recommendations, Suggestion and advice	WP	Partner	Deliverable	Timeplan	Comments / Actions
Paula Antunes	Policy analysis can be performed for APOLLO project because farmers consider policies to take their decisions	WP2	AUA	-	-	Consultation with partner AUA to conclude whether policy analysis can be used in APOLLO



Name	Recommendations, Suggestion and advice	WP	Partner	Deliverable	Timeplan	Comments / Actions
Paula Antunes	Get inner knowledge of policies in Serbia related to Agriculture and EO	WP2, WP6	UBFCE, UPOR	-	M14	APOLLO already includes two partners (UBFCE and UPPR) and an EEAB Member Milan Miric from Serbia who will provide the proposed consultation
Paula Antunes	More targeted actions needed to reach the majority of the farmers and not just the ones who participate in the pilots. Increase user engagement from the beginning of the project	WP7	EVF	D7.2, D7.6, D7.7, D7.8, D7.9	All project duration	Design of specific dissemination material, organise events/workshops from early project stages
Paula Antunes	Show/demonstrate the usefulness and results of the developed solution from these tools as soon as they become available	WP6, WP7	UBFCE, AUA, EVF	D6.5, D6.6, D6.7, D7.2, D7.6, D7.7, D7.8, D7.9	All project duration and after project end	Rapid result uptake from EVF, translate them into conceivable information for the users.
Paula Antunes	Reliability of provided services must be proven	WP3, WP4, WP5, WP6	AUA, UBFCE, TUW, DRAXIS, Starlab	D5.2, D5.3, D6.5, D6.6, D6.7	During pilot implementation (M13-M34) and after project end	Service validation from technical partners
Paula Antunes	Reduce uptake barrier risk. Involve users from the beginning, connect tech partners with real users	WP2, WP6, WP7	AgriSat, UBFCE, EVF	D2.3, D6.5, D6.6, D6.7, D7.2, D7.6, D7.7, D7.8, D7.9	All project duration	Increase user participation in pilots. Trial user survey form already in place in project website
Paula Antunes	Try to reach and set up relations with farmers associations and cooperatives	WP2, WP7	AgriSat, UPOR, ACP, EVF	D7.2, D7.6, D7.7, D7.8, D7.9	All project duration	Two cooperatives already partners of the consortium. Dissemination activities designed to reach other associations and cooperatives



Name	Recommendations, Suggestion and advice	WP	Partner	Deliverable	Timeplan	Comments / Actions
Claus Sørensen	Reduce complexity of platform	WP2, WP5	DRAXIS, AUA	D2.1, D2.2, D5.2, D5.3	From project start until release of first demonstrator	User requirements collection continues even after submission of D2.1.
Claus Sørensen	Use operation analysis and modelling methodology to assess the provided services	WP4	AUA	D4.1	Until M12	Mr. Sørensen committed to work with AUA for this purpose
Claus Sørensen	Demonstrate the environmental benefits derived from the use of APOLLO service.	WP7	EVF	D7.2, D7.6-D7.9	During pilot implementation and during the development of the services	Environmental benefits gained from the use of the service will be included in dissemination material
Claus Sørensen	Set up a blueprint for the APOLLO system	WP5	DRAXIS	D5.1	M7	The D5.1 will include a detailed description of the APOLLO system architecture and design
Claus Sørensen	Special attention must be given to organic farmers as a potential user group	WP7	EVF	D7.2, D7.6, D7.7, D7.8, D7.9	All project duration	Design of specific dissemination material, organisation of targeted events, establish contacts with relative clusters.
Milan Miric	Growing representation of organic farming in Serbia. Control system for organic products existing based on EU.	WP7	EVF, UPOR, UBFCE	D7.2, D7.6, D7.7, D7.8, D7.9	All project duration	Design of specific dissemination material, organisation of events targeting Serbian organic farmers.



Name	Recommendations, Suggestion and advice	WP	Partner	Deliverable	Timeplan	Comments / Actions
Milan Miric	Small farmers are mistrustful towards innovative farm management ICT tools but consider that such an approach is necessary.	WP6, WP7	UBFCE, UPOR, EVF	D6.2, D6.3, D7.2, D7.6, D7.7, D7.8, D7.9	All project duration	Mistrust has to be reversed to trust. Demonstrate tangible results of APOLLO to Serbian small farmers. Organise education activities, workshops and most importantly target young small farmers in Serbia for gaining their trust.
Milan Miric	Adoption of farm management ICT tools from farmers and agricultural consultants in Serbia can be increased through the demonstration of positive effects using specific examples of best practice	WP6, WP7	UBFCE, UPOR, EVF	D6.2, D6.3, D7.2, D7.6, D7.7, D7.8, D7.9	All project duration	Positive effects of APOLLO usage can be demonstrated during pilot implementation and with the design of specific dissemination material.
Milan Miric	The application should contain very precise entry parameters in real time of the shown location in order to get applicable exit data for the user	WP5	DRAXIS	D5.2, D5.3	During platform design	This recommendation has been already taken into account during the elicitation of user requirements and is will be included in the system design.



7 ANNEX I – APOLLO EEAB List

Name	Country	Organisation	Expertise	Proposed by
Paula Antunes	Portugal	Universidade Nova de Lisboa	Policy analysis, Stakeholder engagement	AgriSat
Claus Aage Grøn Sørensen	Denmark	Aarhus University	Operations analyses and modelling, Information modeling	AUA
Milan Miric	Serbia	Regional Development Agency of Srem Municipality	Local regional development	UBFCE



8 ANNEX II – Invitation Letter



Invitation to participate in the APOLLO project External Expert Advisory Board

Dear.....,

We would like to invite you to become a distinguished member of the External Expert Advisory Board of the **APOLLO** project. APOLLO has received funding from the EC under the **Horizon 2020** Research and Innovation programme, which is the financial instrument of the EC that will offer funding to research projects for 7 years (2014 to 2020).

The project APOLLO (*Advisory platform for small farms based on earth observation*) aims to develop a **commercial platform** that will provide a suite of **farm management advisory services** (tillage scheduling, irrigation scheduling, crop growth monitoring, and crop yield estimation) specifically designed to address the needs of **small farmers**. APOLLO will use **state-of-the-art methodologies** for the calculation of **agricultural parameters** based on **EO data** and take advantage of the **improved spatial and temporal coverage** of the new **Sentinel satellites**.

The role of the members of the APOLLO External Expert Advisory Board is to **participate in project's meetings**, in which they will review the project activities and outcomes, identify the strong/weak points with respect to the objectives of the project and the applications of the results, and provide expert recommendations. **All travel and accommodation costs will be covered by the project budget.**

The APOLLO External Expert Advisory Board will be convened some times throughout the duration of the project either in **meetings** or in **conference calls**. With your collaboration we will be able to issue recommendations that will ensure the fulfillment of the project's objectives.

We are looking forward to welcoming you as a member of this unique group.

Do not hesitate to contact us for any further information or clarification.

Best regards,

Machi Simeonidou
APOLLO Project Coordinator
DRAXIS Environmental S.A.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 687412.

