



A P O L L O

D1.4: 3rd Report on Advisory Board meetings

WP1 – Project Management

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Executive summary

The current deliverable represents the 3rd Report on the Advisory Board meetings and it presents the new members added after M14 (D1.3 2nd Report on Advisory Board Meetings) and their input for the APOLLO project. In total two new members were added to the board. The WebEx tool was used for realizing the discussions with both of them. The present document summarises the key points of the meetings, as well as the recommendations that the experts had to offer.

The document is structured as follows: Chapter 1 provides a recap of the role of the EEAB to the APOLLO project, in Chapter 2 the profiles of the newly invited members are briefly presented, while Chapter 3 contains the minutes of the meetings conducted, finally Chapter 4 summarises the recommendations made by the experts.



1 The role of the External Expert Advisory Board (EEAB) in a nutshell

As previously mentioned the tasks and roles of the Advisory Board can be many. In the present we mention indicatively that some of them are to provide advice, guidance and recommendations, additional quality control and validation, feedback, extend the scientific and market potential of the project and increase the visibility of the project. In order to ensure some of the above the APOLLO advisory board was formed early on the project (M4) and it will follow it until the end of its duration.

The External Expert Advisory Board already consists of experts with world-wide reputation in their scientific and technical fields such as Earth Observation, ICT for agriculture, farm management systems, market exploitation and stakeholder collaboration and engagement. The newly invited members only add up to that, since their widely acknowledged members of their communities.

2 The newly added EEAB members

The invitations that were extended from M12 until M23 from the consortium were: i) to Dr. Birgitte Holt Andersen, Partner Applied Economics, Denmark and ii) to Dr. Alexander Gruber, Division of Soil and Water Management, KU Leuven.

Dr. Holt Andersen has massive experience in business strategizing and she has been involved in various projects. Mr. Alexander Gruber was an integral member of the APOLLO implementation team with experience in geophysical parameter retrieval using remote sensing techniques, error characterization of earth observation data sets, up- and down-scaling techniques, and data assimilation, with a special focus on soil moisture.

2.1 Dr. Birgitte Holt Andersen



Dr. Birgitte Holt Andersen holds a PhD in Corporate Strategy and a Master's degree in Economics. She has profound experience with the European Union, working as Commission staff at the Joint Research Centre in Ispra (Space Institute) and DG TREN (Galileo Unit). She has worked intensively with projects for the European Space Agency (ESA) in relation to the GMES/ COPERNICUS (Global Monitoring for Environment and Security) Programme. Through her employment with the European Commission and later as Chief Project Manager for a large Consultancy firm, she gained experiences with European Policies from leading assignments for various EC customers in particular Regional Development Fund, European Investment Bank, General Directorate for Environment. She has participated in several European research projects as business partner responsible for economic feasibility analysis, development of relevant business models and market exploitation strategies. On a regular basis she acts as expert evaluator and reviewer of EC Research Programmes: Horizon 2020 (Space, Environment), Eurostar. Her analytical tool box includes policy impact assessment, cost benefit analysis, structural analysis of industries, value chain assessment and dynamics, competition analysis, market assessments, environmental and socio – economic analyses, life cycle cost analysis and externalities.



2.2 Alexander Gruber



Mr. Alexander Gruber received his BSc degree in Geodesy and Geoinformation, and his MSc degree in Geodesy and Geophysics, both from the Vienna University of Technology (TUW), in 2012 and 2013 respectively. Since 2013 he is working on his Ph.D. degree in remote sensing. His main research interest lies in geophysical parameter retrieval using remote sensing techniques, error characterization of earth observation data sets, up- and down-scaling techniques, and data assimilation, with a special focus on soil moisture. Mr. Gruber was a member of the APOLLO TUW team from the beginning of the project and with an integral role in the technical project implementation. In 2018 he joined KU Leuven University, where he is continuing his research. Taking into consideration his expertise and his role in the realization of the project APOLLO partners have extended an invitation to Mr. Gruber to join the APOLLO project from a different post, that of the Expert External Advisory Board. Finally, it should be mentioned that Mr. Gruber has been author and co-author of various peer-reviewed as seen below:

L. Ciabatta, C. Massari, L. Brocca, A. Gruber, C. Reimer, S. Hahn, C. Paulik, W. Dorigo, R. Kidd, W. Wagner: "SM2RAIN-CCI: a new global long-term rainfall data set derived from ESA CCI soil moisture"; Earth System Science Data, 10 (2018), 267 - 280. BibTeX

W. Dorigo, D. Chung, A. Gruber, S. Hahn, T. Mistelbauer, R. Parinussa, C. Reimer, R. van der Schalie, R. De Jeu, W. Wagner: "[Hydrological cycle] Soil Moisture [in "State of the Climate in 2016"]"; Bulletin of the American Meteorological Society, 98 (2017), 8; 30 - 32. BibTeX,

W. Dorigo, W. Wagner, C. Albergel, F. Albrecht, G. Balsamo, L. Brocca, D. Chung, M. Ertl, M. Forkel, A. Gruber, E. Haas, P. Hamer, M. Hirschi, J. Ikonen, R. De Jeu, R. Kidd, Y. Liu, D. Miralles, T. Mistelbauer, N. Nicolai-Shaw, R. Parinussa, C. Pratola, C. Reimer, R. van der Schalie, S. Seneviratne, T. Smolander, P. Lecomte: "ESA CCI Soil Moisture for improved Earth system understanding: State-of-the art and future directions"; Remote Sensing of Environment, 203 (2017), 185 - 215. BibTeX

A. Gruber, W. Dorigo, W. Crow, W. Wagner: "Triple Collocation-Based Merging of Satellite Soil Moisture Retrievals"; IEEE Transactions on Geoscience and Remote Sensing, 55 (2017), 12; 6780 - 6792. BibTeX

A. Loew, W. Bell, L. Brocca, C. Bulgin, J. Burdanowitz, X. Calbet, R. Donner, D. Ghent, A. Gruber, T. Kaminski, J. Kinzel, C. Klepp, J. Lambert, G. Schaepman-Strub, M. Schröder, T. Verhoelst: "Validation practices for satellite-based Earth observation data across communities"; Reviews of Geophysics, 55 (2017), 3; 779 - 817. BibTeX



3 Minutes of the meetings

3.1 Methodology: A few notes about unstructured interviews

As previously mentioned all teleconferences with APOLLO EEAB members were implemented using Webex. Due to the focus of the conversations an unstructured interview was chosen over a structured one. Despite the fact that the methods used to realise unstructured interviews vary a lot, the common characteristic is the more relaxed environment that usually makes the interviewee feel more comfortable and reveal more information. As a result more reliable information may be provided in comparison with a structured interview, since usually the people being interviewed feel at ease to bring into the conversation their own experiences and knowledge. Again it should be underlined that the result depends on the interviewer and the interviewee, but in the current occasion it seemed fit to follow that method.

Conducting an unstructured interview does not imply that there are no preparations made beforehand. In order to achieve an in depth and detailed analysis from the interviewee and take advantage of their expertise the interviewer needs to decide the topic and some questions that it is important to focus on and that was the case for the APOLLO Advisory Board Interviews as well.

Briefly the agenda that was followed in both cases was the following:

1. Short presentation of APOLLO project (DRAXIS)
2. Brief presentation of business plan
3. Discussion on the method used for the soil moisture data product and validation method

In the call the participants were the following:

1. DRAXIS: Dimitra Perperidou
2. EVF: Lefteris Mamais

3.2 Advisory Board Meeting with Birgitte Holt Andersen

The meeting started on time and all members attended. The first to speak was Mrs. Dimitra Perperidou that welcomed Mrs. Birgitte Holt Andersen and thanked her for accepting to be a part of APOLLOs' External Expert Advisory Board, as well as the partners that attended the meeting. She continued by briefly explaining that the process would be the following: a "tour de table" for everyone to introduce themselves and say a couple of words about themselves and their companies and/or organisations. Introductions would be followed by a short general presentation of the project, a brief introduction on the business plan and exploitation strategy for APOLLO, followed by a discussion with the experts on what was presented, asking for their feedback and thoughts.

After the introduction Mrs. Dimitra Perperidou briefly presented the APOLLO project. She mentioned that APOLLO is a Horizon 2020 Innovation Action aiming to create a commercial advisory platform for small farmers in Europe based on EO data. The project is coordinated by DRAXIS and there are eight other partners namely: AUA, TUW, Starlab, Evenflow, ACP, UPOR and AgriSat. She continued by explaining that Evenflow is the lead partner for exploitation.

Following that introduction Mr. Mamais made an introduction of the APOLLO exploitation plan and the different elements that comprise it such as: a more detailed description of the services and the product, the target market including the size of the market that is being addressed, target customers and key stakeholders, the market analysis carried out during the previous months of the project, the business case and value proposition of APOLLO, the business model, the marketing strategy, the



intellectual property rights, the financial analysis, the pricing scheme including benchmarking of comparable competitive solutions, financial analysis and decoupling, risk assessment and ways to move forward.

Mr. Mamais mentioned that the competitive landscape and emerging trends relevant to APOLLO services have already been investigated within the project and a visual semi-objective analysis was developed and substantiated to establish a competitive position for the services and identify the strengths and weaknesses. That was also a building block upon which the value proposition of APOLLO was based.

Additionally, Mr. Mamais explained that the target market of APOLLO are farmers, agricultural consultants and agricultural cooperatives. He continued on to explain the key aspects that were considered for deciding the particular market, along with the marketing strategy that will be used to approach those segments.

Mrs. Holt Andersen mentioned that we need to be very specific on our marketing approach as to whom we are addressing and the means that will be used. As she mentioned different target groups should be considered alongside the ones that were already mentioned, such as crop insurers, banks, fertilizer companies, machinery equipment companies and contractual farmers. As she added agricultural insurance is a growing market that could potentially have a lot of interest for APOLLO. For example crop insurance is already a big market in China and in the US and that will also be the case in Europe in a couple of years.

In addition to the target groups and marketing approach Mrs. Holt Andersen referred to the IPR issues amongst consortium partners. As she mentioned it must be very clear both the background and foreground issues and aligned with the approach that the consortium will choose to go.

Mrs. Holt Andersen also referred to the pricing scheme that APOLLO is going to use. She mentioned the options of providing a free service as a way to promote APOLLO and then charge for the rest of the services or use a subscription model from the beginning or a “pay as you go” model. In any case a research on the schemes that APOLLO’s competitors are using will be a good indicator on the way to go.

Finally, before the end of the conversation Mrs. Holt Andersen mentioned that it would be a very interesting to organize a workshop with the participation of all projects under the same call and that of crop insurers, banks and other relevant stakeholders under the auspices of the Research Executive Agency.

3.3 Advisory Board Mr. Alexander Gruber

As mentioned above Mr. Gruber was already a member of the APOLLO consortium and has contributed mainly in the development of a validation plan for the earth observation data. Due to his previous involvement in the project it was not deemed necessary to have a dedicated call with Mr. Gruber. He will continue to support and offer his expertise in earth observation data and specifically in work package three from the position of the Advisory Board Expert Member.

3.4 Continuous consultation procedure

Within the context of the continuous consultation procedure Mr. Mattia and Mrs. Holt Andersen were both invited to attend the upcoming project meeting in Vienna, Austria in the 4th and 5th of December 2017, as also indicated from the minutes above.



Due to some changes in his schedule Mr. Mattia was no able to attend the meeting, but Mrs. Holt Andersen did join, participating in the exploitation workshop that was carried out and providing her feedback along with the other partners. In a nutshell she proposed to pay much attention to possible synergies, keep working out the details, focus on our marketing strategies and work for the best possible refinement of the services.

As previously mentioned, all travel expenses of EEAB members (accommodation and flights) will be covered by the project budget. WP1 leader DRAXIS will provide well in advance the EEAB members with a schedule of project meeting.



4 Results and recommendations for APOLLO

As in D1.2 1st Report on Advisory Board meetings the results and recommendations produced from this chapter are summarized in the table below. 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.

Name	Recommendations, Suggestion and advice	WP	Partner	Deliverable	Timeplan	Comments / Actions
Alexander Löw	Suggested an agricultural site in Austria with quite accurate data, which may also be a complementary source of data for validation for the project	WP3	Starlab, TUV	-	-	Partners TUV and Starlab should advise on whether there should be a contact in order to include that set of data in the validation
Alexander Löw	Suggested that the resolution for his algorithm depends on the area and should be used accordingly	WP3	Starlab	-	M34	Partner Starlab has already taken that into consideration
Alexander Löw	For APOLLO there is no need to do the retrieval in geocoding, but maybe it would help to project that information as well	WP3	Starlab	-	-	It will be taken into consideration by partner Starlab, nevertheless Mr. Löw himself mentioned that he was not sure if that was worth the effort.
Alexander Löw	Mr. Löw suggested for the pre-processing to alternatively be done in snap python	WP3	Starlab	D3.2	-	Starlab team is already using Sigma 0, but it will be considered in case an alternative is required



Name	Recommendations, Suggestion and advice	WP	Partner	Deliverable	Timeplan	Comments / Actions
Alexander Löw	Mr. Löw mentioned that another colleague of the domain Mr. Mattias has developed a different process to optimize irrigation index or absolute value to decrease the uncertainty of soil moisture retrieval and suggested to look into it	WP3	DRAXIS Starlab TUV UBFCE AgriSat ACP	D3.1, D3.2, D3.3, D3.4, D3.5, D3.6	-	The partners agreed to look into it and also they would have the chance to discuss with Mr. Mattias, since he was the second member towards who an invitation was extended
Alexander Löw	Mr. Löw suggested that in order to do the calibration we will need the services to be as accurate as possible before we use them in the pilots with the farmers	WP3	DRAXIS Starlab TUV UBFCE AgriSat ACP	-	-	Service validation from technical partners
Francesco Mattia	Mr. Mattia suggested that in general approaches that can be considered as empirical can provide quite rational results, but normally when the results are calibrated they change and he suggested a model calibration	WP3	Starlab	D3.2	M34	To be taken into consideration by the Starlab team
Francesco Mattia	Mr. Mattia also stated that in his opinion since an empirical approach was selected, it should not be applied in parcel level, but in larger areas.	WP3	DRAXIS Starlab TUV UBFCE AgriSat ACP	-	-	To be taken into consideration by the team
Francesco Mattia	Mr. Mattia made a suggestion to try to start with the easiest cases like bare soil or wheat or barley that are more sensitive, corn seems to be a rather challenging one, especially developing corn, as well as onion. He also added that it is not recommended to calibrate corn because it loses its' sensitivity to soil moisture	WP3	Starlab	-	-	To be taken into consideration by the Starlab team
Francesco Mattia	Mr. Mattia suggested that it may be better to go at least 100 meter and product at 40meter pixel, otherwise it is too challenging	WP3	Starlab	-	-	To be taken into consideration by the Starlab team



Name	Recommendations, Suggestion and advice	WP	Partner	Deliverable	Timeplan	Comments / Actions
Brigitte Holt Andersen	Mrs. Holt Andersen suggested to widen our target groups and in addition to farmers and consultants also try to include other stakeholders such as: crop insurers, banks, fertilizer companies, machinery companies, etc	WP7	EVF	D7.11	M34	To be taken into consideration by the EVF team
Brigitte Holt Andersen	Mrs. Holt Andersen suggested that we should also consider markets such as the crop insurance. As she mentioned that particular market is already booming in China and the US.	WP7	EVF	-	-	To be taken into consideration by the EVF team
Brigitte Holt Andersen	Mrs. Holt Andersen suggested that our pricing scheme should be carefully considered. She mentioned that no matter what will be chosen, a recording of what the competition is doing should also be included.	WP7	EVF	D7.11	M34	To be taken into consideration by the EVF team

Table 1 - Indicative results and recommendations table



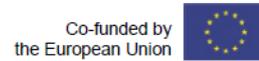
5 ANNEX I – Updated APOLLO EEAB List

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
Prof. Dr. Alexander Löw	Germany	Ludwig-Maximilians-Universität Munich	Terrestrial Remote Sensing* ¹	Starlab
Francesco Mattia	Italy	Institute of Intelligent Systems for Automation	Modeling of microwave scattering from land surfaces	TUW
Mrs. Birgitte Holt Andersen	Denmark	Partner Applied Economics	Business expert	Reviewer Nina Costa

¹ His research interests also include the quantitative retrieval of geophysical parameters from remote sensing data, the development of image processing algorithms, coupling of land surface process models with microwave scattering and emission models, and the development of land surface process models and data assimilation techniques



6 ANNEX II – Updated Invitation Letter



Invitation to participate in the APOLLO project External Expert Advisory Board

Thessaloniki, 2017

Dear,

We would like to invite you to become a 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.



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