



# D1.7: Risk Management Plan (2)

## WP1 – Project Management & Quality Assurance

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# Executive summary

Risk is defined as an uncertain but potential element that always appears in the technical, human, social and political events, reflecting changes in the distribution of possible outcomes and subjective probability values and objectives, with possible damaging and irrelevant effects<sup>1</sup>. Therefore, the risk identification process is to ensure that all potential project risks are identified and reduces the number of surprises during the project delivery and thus, improves the chances of project success, allowing the team to meet the time, schedule, and quality objectives of the project.

The aim of the current deliverable is to provide further risks that were identified and documented during the project implementation and present the risk mitigation actions that were agreed among the consortium in order to prevent or mitigate the likelihood and seriousness of the risks.

This deliverable is the second Risk Management Plan developed during the BEACON project and it records the risks faced so far (M9 – M17) and the potential new ones that may occur until the third and last Risk Management Plan which will be implemented at M36.

The BEACON project Coordinator (KARAVIAS) has provided on time all the work package leaders and rest of the partners with a template along with instructions on how to fill it in.

The current deliverable is structured in the following chapters:

**Chapter 1: Risk analysis and management** – Includes the identified risks (faced and potential new ones)

**Chapter 2: Conclusion** – Includes the following steps

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<sup>11</sup> Opran, C., Paraipan. L, & Stan. S (2004). Risk management. Bucharest: Comunicare.ro.



# 1. Risk analysis and management

## 1.1. BEACON Risk Analysis and management

### 1.1.1. Risk identification

Based on the following risk categories, the risks faced so far and the potential new ones are presented below.

Risk Category	Risks faced	Potential new risks
<b>WP1</b> – Project Management & Quality assurance	RF1. Delays in submission of deliverables or reports RF2. Changes in the Consortium RF3. Alignment of the work done in various work packages	PNR1. Partners' reluctance to keep up with the deadlines
<b>WP2</b> – Structural Agri value chain collaboration and co-evolution of business models and services	RF4. Assessment needs questionnaire is not effective and recipients have difficulties in responding. RF5. Due to complexity of the blockchain, it was difficult to identify the users' requirements and needs. RF6. Lighthouse Customers (LHC) experienced difficulties with understanding the BEACON functionalities only from mockups	
<b>WP3</b> – Servitisation of Agri Business: Creating value by adding Earth(EO) data products and services	RF7. Limitations in the acquisition and analysis of EO data, leave gaps in claim-based insurance product.	PNR2. Failure on the integration of different components and fusion of different data types PNR3. Claim-based Damage Assessment fails to provide timely results. PNR4. Crop growth models fail to simulate real farming conditions. PNR5. Short-term numerical weather prediction models fail to provide precise results for index-based insurance. PNR6. There is a risk of data unavailability due to service or mission interruption (Sentinels) or defective instruments.
<b>WP4</b> – BEACON toolbox services & functions ecosystem: design and	RF8. Modifications/ Adaptations of the BEACON components RF9. Failure of integration with the blockchain RF10. Overall architecture and	PNR7. Need of pilots' workflow revision PNR8. Big number of issues that may be reported on Trello PNR9. Failure of integration with the component



<p>implementation</p>	<p>ecosystem design and architecture RF11. Blockchain and Smart Contracts</p>	<p>PNR10. The toolbox may not respond to the existing operational procedures. PNR11. Automating an insurance product with blockchain is clearly disrupting the role of the existing actors, leading to a change in their own processes and maybe even the nature of their work. Is an insurer willing to make these changes? PNR12. We have made it possible to completely automate an insurance product but upon request of the insurers we had to give back the option to the insurer to fully control the process to leave some room (days, weeks) for the insurance company to "claim" the decision made by the system.</p>
<p><b>WP5</b> – Creating Business Experience &amp; BEACON Accreditation path</p>	<p>RF12. Data accessibility (meteorology, field visit, and plot follow-up) RF13. Field work accessibility and tracking</p>	<p>PNR13. Insufficient data for the pilot implementation PNR14. Delays of the pilot partners to provide the requested input PNR15. Pilot activities not going according to the plan PNR16. COVID-19 may cause delays in the pilot implementation PNR17. Insurance company post-pandemic recovery period PNR18. Negative feedback received from the pilot users PNR19. No occurrence of any damage during the pilot implementation PNR20. Users do not complete evaluation forms and/ or quality of data is low</p>
<p><b>WP6</b> – BEACON Commercialisation Playbook and Growth Hacking</p>	<p>RF14. Slow response of Lighthouse Customers related to their inputs for BEACON RF15. Concern about the data sharing, input providing, etc. RF16. Difficulties in developing trust between the BEACON solution and Lighthouse Customers</p>	<p>PNR21. Poor interest of new potential Lighthouse Customers</p>
<p><b>WP7</b> – Dissemination, Communication and Diffusion of BEACON</p>	<p>RF17. Low motivation of partners to actively engage in communication activities RF18. Inadequate reporting of partners for communication and dissemination activities</p>	<p>PNR22. Failure to meet some Key Performance Indicators (KPIs) PNR23. Unbalanced geographical communication in the partners' countries and the rest of European Union (EU) PNR24. Discontinuity and unbalanced</p>







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experienced difficulties with understanding the BEACON functionalities only from mockups	teleconferences and produced video demonstration.
<b>RF7</b> Limitations in the acquisition and analysis of EO data, leave gaps in claim-based insurance product.	The developed methodologies aim in synergistically applying optical and SAR data for both the qualitative and quantitative assessment of damage. This stands for hailstorm damage, as well as flood damage.
<b>RF8</b> Modifications/ Adaptations of the BEACON components	Based on the results derived from the services validation process, most of the services needed to be modified based on new advanced algorithms. Therefore, further adaptations have been made in the different components of the BEACON toolbox. However, the technical team are highly experienced software engineers and they were able to handle any technical issue quickly.
<b>RF9</b> Failure of integration with the blockchain	Several calls have been performed in order to better facilitate this process and clearly understand how the integration should be performed and which actions should be done and by whom.
<b>RF10</b> Overall architecture and ecosystem design and integration	When different companies need to integrate their systems with each other it's always the question if this will work out well. We defined clear input agreements and deadlines amongst the development partners. Frequent calls and professional follow-up lead to an almost seamless integration.
<b>RF11</b> Blockchain and Smart Contracts	The main problem around blockchain and smart contracts is the limited understanding of the technology itself. We dedicated a lot of our time on explaining the technology and demonstrating the technology during the development phase.
<b>RF12</b> Data accessibility (meteorology, field visit, and plot follow-up)	Data request for meteorological data was slowdown because of pandemic period. It's planned that cereal harvesting period is around the 1st-2nd week of June. We cannot assure the pilot plot yields measurements could be taken because of pandemic circumstances. The field cross-checks at the end of the cereal season with the BEACON platform could be interrupted. However, during the next weeks, this could change. The pilot partners maintain continuous communication about pilot follow-up activities and find alternative sources in order to monitor the requested information.
<b>RF13</b> Field work accessibility and tracking	There are several governmental transportation restrictions because of the pandemic period between provinces. However, during the next weeks, this could change. Field tracking of hazards is limited to farmer's claims reported to Agri companies. The monitoring process was performed





POTENTIAL NEW RISKS

Risk Event	Risk mitigation measure	ROT
<p><b>PNR1</b> Partners' reluctance to keep up with the deadlines.</p>	<p>In order to minimise the risk of delays, the PC requests the documents/ tasks needed from the responsible partner through directly communication either via emails or skype. Reminders are sent before the due to date. If an indication of possible delay arises, the project manager requests a meeting through skype in order to identify the reason of this delay and assist the partner in any required manner.</p>	<p>Mid</p>
<p><b>PNR2</b> Failure on the integration of different components and fusion of different data types.</p>	<p>Already a number of methodologies and automated workflows have been developed and implemented in OCTOPUSH operational system. BEACON's claim and index insurance schemes, fully exploit the following products and components:</p> <ul style="list-style-type: none"> <li>i.) Sentinel-2;</li> <li>ii.) Sentinel-1;</li> <li>iii.) two MODIS satellite products (the MOD16A2 ET and the GMOD09Q1 NDVI);</li> <li>iv.) gridded meteorological data for the calculation of monthly SPI for drought monitoring and alerting;</li> <li>v.) an advanced coupling of a land surface model (Noah-MP) and a crop growth model (Gecros);</li> <li>vi.) seasonal climate predictions for the estimation of seasonal yield variations and anomalies;</li> <li>vii.) a machine learning model (support vector regression) for the estimation of drought damage (expected yield) at the end of the growing season;</li> <li>viii.) a machine learning model (support vector classifier) that takes into account a number of EO derived indices and biophysical parameters, as well as the crops' growing degree days for the classification of damage;</li> </ul>	<p>Mid</p>
<p><b>PNR3</b> Claim-based Damage Assessment fails to provide timely results.</p>	<p>The machine learning models for hail and drought damage quantification and classification respectively, provide results at the end of the growing season, following the companies' actual workflows for planning reimbursements. The number of collected MODIS NDVI and S-2, S-1 images throughout the growing season, has been considered sufficient to provide results, even if half of the acquisitions (due to cloudiness limitations) become available. In the case of MODIS NDVI, a spline interpolation is applied to assign values for missing ones.</p> <p>Furthermore, the Agri companies can exploit a number of products provided through BEACON to prepare for</p>	<p>Mid</p>



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	possible damage occurrence, some of which are: 1. high resolution extreme weather events alerts; 2. visualization of MODIS NDVI Anomaly, providing the ongoing vegetation anomaly compared to the average NDVI from 2001, in the case of drought.	
<b>PNR4</b> Crop growth models fail to simulate real farming conditions.	Crop growth models will simulate the growing conditions and expected yield based on weather and soil data. Crop management data like fertilizing will not be used in model GECROS setup. Simulations with historical meteorological data, will aim in providing a mean expected yield for the particular crop type and region. On the other hand, seasonal weather predictions will feed the meteorological input requirements of GECROS. Comparison of the historical mean and the seasonally expected, will provide a possible increase or decrease (anomaly) based on the predicted climate conditions. Therefore, representative or actual farming conditions and operations are of secondary importance, setting the historical and seasonal meteorological information of primary importance to derive results on possible yield declines. However, important parameters for crop growth, such as soil characterizations and initial soil moisture are provided as input in the coupled Noah-MP-Gecros scheme.  A reason that has lead GECROS selection for BEACON, is that the model has been modified appropriately to account for both winter wheat and a summer crop which is maize.	Mid
<b>PNR5</b> Short-term numerical weather prediction models fail to provide precise results for index-based insurance.	Index insurance has been developed on MODIS satellite Actual Evapotranspiration (ETa) product. This product can be customized based on the needs of an Agri company. The product's spatial resolution at 250 m and temporal resolution of 10-days can be considered satisfactory in both detecting drought and quantifying the effect of drought on agricultural production.	Mid
<b>PNR6</b> There is a risk of data unavailability due to service or mission interruption (Sentinels) or defective instruments.	There is a risk of data unavailability due to service or mission interruption or defective instruments, in this case alternative EO data procurement will be suggested from other available missions. For the time being no mission interruption was announced. Sentinel products have an operational status, unless clearly mentioned.	Mid
<b>PNR7</b> Need of pilots' workflow revision	The pilot partners are involved in the toolbox development phase from the early stages of the project in order to avoid any modification during the pilot implementation. Slightly adaptations only	Mid









## 2. Conclusions

The deliverable is an update of the first Risk Management Plan that was delivered on M6 and covers all the aspects related to what could go wrong (risks), which risks are important to deal with and what strategies should be implemented to deal with those risks. Further analysis will be implemented and illustrated in the last version of the Risk Management Plan (M36).

