e-shape

EuroGEOSS Showcases: Applications Powered by Europe

S6P3 – Co-Design Workflow

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1 INTRODUCTION

Co-design process is a key point in the e-shape project, trying to close the gap between the scientific advances and its use by the stakeholders. Sometimes, this contact between both sides needs iterative processes to improve the general methodology and generate specific products adapted to each test site.

2 CO-DESIGN PROCESS

Since a general methodology is already designed, co-design process with individual stakeholders is needed in two aspects. First, stakeholders are not usually familiarized with the Pilot Products, and they need to understand their usefulness. Second, all the test sites have singular characteristics and especial needs that can be solved or not by the provided products but should be considered at least.

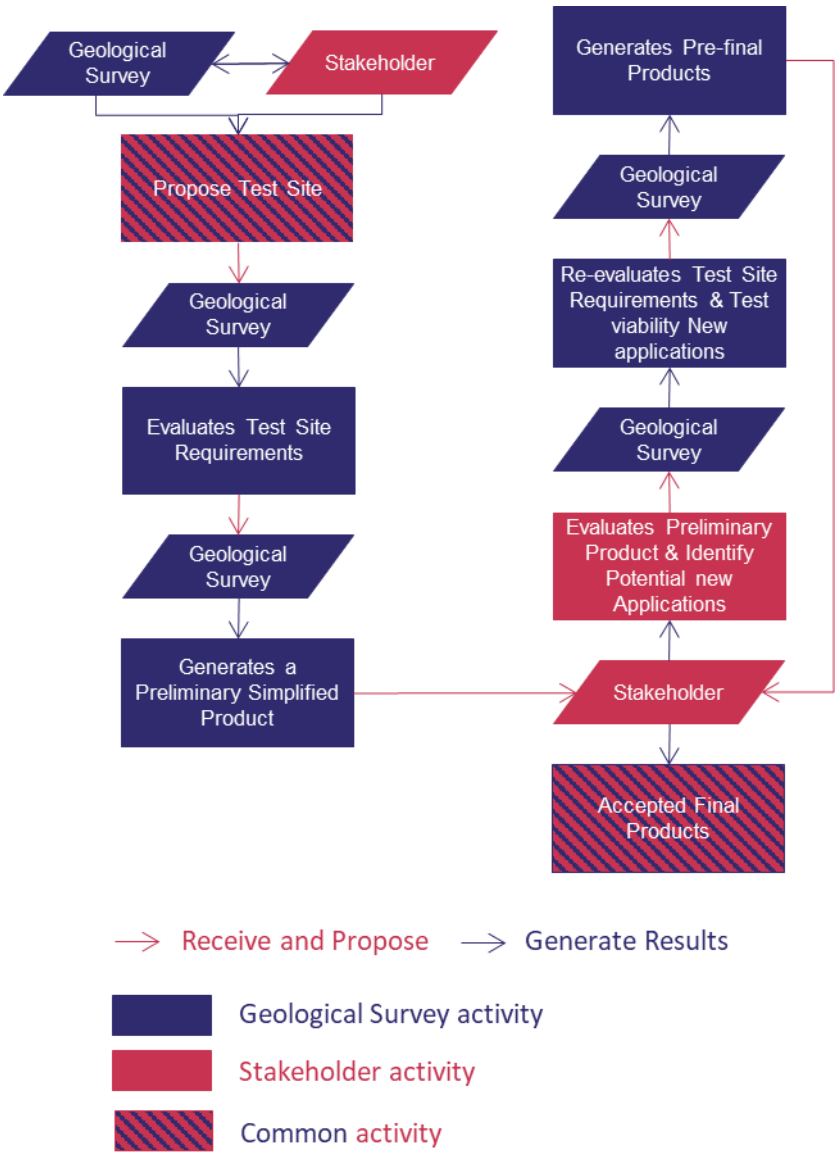

Fig. 1: Co-design Process. Current status

This process begins with the test site proposal. Currently, the proposals are suggested by the Geological Services (GS) in agreement with the stakeholders. It is expected that stakeholders will be

able to request the activation of this products to their associated Geological Services since they will be trained. In this phase, Stakeholder and GS can select a main geohazard or wait the preliminary results to focus on it.

Once the test site is selected, GS must evaluate the available information of the area and the conditions to obtain the main InSAR results. Also, the possible geohazards that affect the area can be identify. Finally, at this point the test site can be rejected due to different problems like lack of information, bad performance of InSAR data, etc.

Accepted test sites are considered by GS to obtain preliminary products like Product 1: InSAR Processing, based on Sentinel-1 data and GEP cloud-computing processing. Preliminary geohazards identification (tool developed within the project) can also be useful to present the results to the stakeholder and show the potential benefits of the test site implementation. After the publication of European Ground Motion Service (EGMS) massive InSAR results from Sentinel-1 are free available. EGMS provides Displacement results overcoming the difficulties associated to InSAR processing.

Second interaction with the stakeholders is essential for the achievement of satisfactory results. The preliminary results must be understanded and discussed. As a result, a draft of the final products will be proposed, as well as specific problems can be considered to adapt them the results. GS should make an especial effort to transfer the information in an easy way, understandable by non-expert users.

Back to the GS, stakeholders needs are evaluated to test their feasibility, introducing the possible changes to final products. At this moment all the information requested (defined by the “Data Requirements” document) must be available to define geohazards analysed and the products to be generated.

Last step is the generation of the pre-final and final products. Once the products are near to be ready, the collaboration with the stakeholders increase to present them the results, analyse the utility, introduce minor changes and updates, etc.

3 CHALLENGES AND UPDATES

Knowledge transference is one of the most difficult task of research projects. E-Shape aims to reduce that gap introducing the final user at the beginning of the process. This fact improves the interaction but also generate troubles and new challenges that should be addressed. Trying to solve them, this co-design process has been updated.

3.1 Challenges

The main challenges detected regarding the co-design are:

- Stakeholders are not usually conscious of the InSAR techniques and the possibilities to improve the monitoring and management of geohazards.

S6P3 products are focused to their use by public administrations in charge of geohazards management. From local to national level some of them are not aware of the solutions that remote sensing provides and lack of specialized technicians to develop their own solutions. On this matter, technical part is carried by GS, but final results must be very descriptive, and reports oriented in a more “operative” way. Other aspect is that stakeholders are prone to collaborate, make recommendations and suggest ideas when results, or at least preliminary results, from areas of their interest are presented

- Scientific products are not fitted to the necessities of decision-makers.

Even general products are the best option to provide a standard list of results and organize the work, most of the times the stakeholders require a specific analysis in their case studies. If feasible, that kind of effort increase the usefulness of the results and stakeholders approval.

- GS InSAR Processing capacities.

InSAR products are difficult to obtain but needs and interest of the stakeholders change or adapt once they understand the InSAR capacities. Unexpected changes require updating the processed areas and periods which is expensive (economically or in working time) and usually unaffordable. New EGMS product will help to solve problems related to this issue once it will be published during the first half of 2022.

3.2 Updates

Regarding the previous section challenges some changes have been incorporated to the co-design process:

- New re-evaluation of the data requirements after second interaction with the stakeholders
- Generation of preliminary results to present to the stakeholders at an early stage of test site development.
- Opportunity to the final users to suggest new products that analyse the data focusing on the topics of their interest.
- Option to the GS to accept or reject the proposed application depending on the feasibility.
- Introduction of EGMS data as valuable input for preliminary and advanced analysis

4 EXAMPLES

4.1 Segura River Basin

Segura River basin was the first case study developed and was used to define part of the products and workflows. CHS stakeholders already know about InSAR potential due to problems detected by this technique during previous pumping periods. Despite that initial analysis of time series was complemented with the analysis of influence areas suggested during the second assessment. Once obtained the advanced results, specific analysis related to the groundwater – subsidence relationship helped to distribute the extraction rates.

4.2 Silesian Coal Basin

Silesian coal basin has helped to generate the working methodology associated with mining areas. Also the detected displacements and regional information provided by stakeholders, suggested to improve the “Vulnerable urban areas report” from one to three displacement thresholds that define better the situation of the area.