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## Service Validation

### D11.2 - Validation report for regional end users – 5 case studies



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## Purpose of the Document

This document is the deliverable 11.2 Validation report for regional end users – 5 case studies, outcome of the WP11, Service Validation. It contains the description of the outcomes and conclusion of the validation missions carried out in the framework of the development done for the five case study.

The missions were organised from December 2015 to March 2016 (Table 1):

Validation Missions	Date
Haiti Validation mission	7-9 December 2015
Rotterdam Validation Mission	19 January 2016
Indonesia Validation Mission	8-11 February 2016
Greece Validation Mission	23 February 2016
Italy Validation Mission	2 March 2016

**Table 1: Validation mission schedule**

## Executive Summary

RASOR validation missions have been conducted by the members of the consortium between December 2015 and March 2016.

The validation missions mainly aimed at:

- Presenting the RASOR platform *beta* version and propose a set of exercises via the Validation Protocols completed in the framework of WP9.
- Ensure that the basic requirements identified by the project users are met
- Evaluate points of improvements to optimize the platform.

The validation is based on the *Validation Protocol* documentation. This documentation is made up of user cases, which once performed and validated, allow for the demonstration of basic requirements and additional functionalities.

## Abbreviations & Acronyms

Acronyms	Meaning
AG	Athena Global
BMKG	Meteorology and Geophysics Agency
BMKG	Meteorology and Geophysics Agency
BNPB	Badan Nasional Penanggulangan Bencana
CARICOM	Caribbean Community and Common Market
CDEMA	Caribbean Disaster Emergency Management Agency
CNIGS	Centre National de l'Information Géo-Spatiale
DEM	Digital Elevation Model
DIPECHO	Disaster Preparedness ECHO Programme
DPC	Civil Protection Department
DRR	Disaster Risk Reduction
DRR	Disaster Risk Reduction
ECHO	Humanitarian Aid and Civil Protection (European Commission)
ESA	European Space Agency
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GDFRR	Global Facility for Disaster Reduction and Recovery
GEM	Global Earthquake Model
GIS	Geographic Information System
GPS	Global Positioning System
InSAR	Interferometry SAR
MTPTC	Ministère des Travaux Publics Transports et Communications
NGO	Non-governmental organizations
NRT	Near Real Time
OSM	OpenStreetMap
PDNA	Pam Post-Disaster Needs Assessment
QGIS	Quantum GIS
RASOR	Rapid Analysis and Spatialisation of Risk
RMS	Risk Management Solutions
RWS	RijksWaterStaat (Center for Water Management)
SAR	Synthetic Aperture Radar
SPREP	Secretariat of the Pacific Regional Environment Programme (Vanuatu)
UNDP	U.N. Development Program

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<b>UNISDR</b>	United Nations Office for Disaster Risk Reduction
<b>UNOSAT</b>	United Nations Institute for Training and Research (UNITAR) Operational Satellite Applications Programme
<b>USAID</b>	United States Agency for International Development
<b>VAAC</b>	Volcanic Ash Advisory Center
<b>WB</b>	World Bank
<b>WMCN</b>	Watermanagementcentrum

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# 1 Haiti case study

The following document is a report presenting the main aspects of the first validation mission conducted in Haiti with the Centre National d'Information Géospatiale (CNIGS). The validation mission took place over the course of a three-day mission to Haiti on December 7, 8, and 9, 2015.

The validation mission mainly aims to present the beta version of RASOR platform, ensure that the basic requirements identified by CNIGS for the RASOR platform are met and evaluate points of improvements to optimize the platform for CNIGS' use, based on the team's feedback.

The validation is based on the *Validation Protocol* documentation. This documentation is made up of user cases, which once performed and validated, allow for the demonstration of basic requirements and additional functionalities.

## 1.1 Objectives and Organization of the validation mission

The Centre National de l'Information Géo-Spatiale (CNIGS) is a public agency within the Ministry of Planning and Internal Cooperation, established in 2005 in Haiti.

The mission of the Centre is to generate and disseminate geographic information of Haiti through the application of modern technologies, ensuring the availability of methods, tools, products and training to support the action planning for sustainable development.

CNIGS provides Geographic Information Systems (GIS) technology and services and serves as Haiti's repository for geo-spatial data.

CNIGS activities include topographic and thematic mapping, town plans, urban and rural planning, projects on land surface utilization and the maintenance of a geographic database. This data is being shared with the Ministère des Travaux Publics Transports et Communications (MTPTC) and with the Direction de la Protection Civile (DPC). Other clients include the Private Sector, as well as various construction companies.

The main objectives of the validation mission in Haiti were to:

- Ensure that the RASOR platform meets the main needs of the CNIGS
- Identify points of improvements to optimize the use of the platform by the CNIGS
- Guide potential users to use the platform in real situations in order to facilitate its quick adoption
- Start identifying leaders inside CNIGS and projects that could benefit from the use of the platform

Haiti is a strategic country to demonstrate and validate RASOR's platform, due to its vulnerability and exposure to natural disasters and as a regional reference for building resilience capacities after the 2010 earthquake. Haiti was identified as a main target country for RASOR's solutions in the preliminary study and prospective markets analysis, based on the country's needs, legal framework, systems in place, DRR culture as well as its potential access to international stakeholders' budget. Haiti was selected as a case study



to demonstrate the features of the platform. The country is also part of CDEMA, and CNIGS is considered by the Caribbean organization's directors as a good candidate to conduct DRR programs they are planning in the region.

CNIGS is a central organism that forms part of the natural disaster risk reduction system of Haiti. This is a very active organism that is in contact with several ministries and governmental agencies.

The main partner of CNIGS is Direction de La Protection Civile (DPC). Most of the studies CNIGS is conducting are required by DPC for its own use or transfer to ministries. CNIGS was thus identified in RASOR as a potential *local champion* as it is an organization that can make a full use of the platform, integrate it in its different missions and so promote it positively nationally and in the region.

The team met in Haiti was composed of experts in several fields such as informatics, cartography, geology, engineering, agriculture and project management.

The validation mission with CNIGS was organized in two days with the active collaboration and involvement of the CNIGS' team, and especially with Boby Emmanuel Piard, Director of CNIGS. The meeting was conducted in French, the official language in Haiti, to facilitate the communication between the different participants.

## 1.2 Validation Mission Haiti- Day 1

The validation meeting opened with the introduction by Boby Piard, CNIGS's president. Mr. Piard presented the next two days of meeting, insisting on the necessity to include better evaluation of risk in the studies the CNIGS is providing to their clients. The recent or current projects conducted by CNIGS are very diverse:

- Land use plan: several studies were conducted on behalf of the Ministry of Agriculture.
- Transportation network: studies are conducted each year to evaluate together with the Ministry of Transportation, the cost of the maintenance and new construction to improve the transportation network in Haiti.
- Creation and follow up of RAT (Risk Analysis Tool): risk analysis tool implemented in collaboration with the Ministry of Agriculture to compare harvest over several years on a local scale and create alarms when necessary.
- Geodesic network and climate stations: program lead in partnership with DPC to increase observation and forecasts capacities in Haiti. Currently 30% of the territory is covered by GPS, there is a plan to cover the entire country, Cap Haitien within the next 3 years and Jacmel during the next 2 years. A network of 14 stations to record precipitations and 10 full climate stations were installed financed by the World Bank.
- Observation global network system: the RENOP program aims to create a reference points' grid for the entire country. Each point is a 125x125 meter pixel and includes information on erosion, slope stability, air quality and demography.

- Agricultural statistics: this project, financed by ESA and using RENOP grid, aims to create a database for agriculture in Haiti, based on satellite acquisitions and models.
- Risk flooding programs: this program conducted in partnership with DPC consists in listing the potentially flood area/maps, creating layers of topographic information and interpretation.

These missions have allowed CNIGS to build a huge database of key information and develop efficient tools that can be useful to facilitate the immediate use of the RASOR platform.

The conclusion focused on the future of CNIGS. Up to now there is no organization specialized in disaster risk management in Haiti. CNIGS participates in this mission by providing strategic information to agencies and governmental organization and aims to increase its expertise in DRR. In partnership with the DPC, CNIGS has created an office specialized in risk management. This office needs to gain in capacities; to do so, critical information and efficient tools to process large amount of different type of data are essential.

Andrew Eddy, from Athena Global followed up with a presentation of the RASOR project. Except for CNIGS' top management, the attendees of the meeting were new to the project. Andrew Eddy introduced the RASOR Consortium conducting the project and described the project phase 1, as a FP7 project financed by the European Commission. The main message of this introduction was to get the maximum involvement and feedback from the CNIGS' team during the two next days.

Haiti is a particular country in RASOR as it was selected to be one of the five case studies. Data and different scenarios for several disasters were generated and are now available on the platform: Flood modelling, flood hazard maps, ground deformation maps, ground motion scenarios and damage assessment. Andrew Eddy also commented the advantage to update, integrate or acquire data depending on their needs/interests, such as using satellite acquisitions for InSAR or integration of Kalhaiti data<sup>1</sup>.

The CNIGS team showed immediate interest in the integration of different databases from their organization or local agencies such as precipitation provided by a local network of stations or DEM generated in previous projects. **The different RASOR tools existing or planned to facilitate the integration of local information were well welcome, such as for example the mobile app that can be used for easier characterization of ground and infrastructure exposure.**

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<sup>1</sup> <http://kal-haiti.kalimsat.eu/spip.php?article55>

Clément de Alcalá from Altamira Information presented the business model and first implementation of this model in Malawi. **CNIGS seemed to be interested in generating solutions for its clients integrating the use of RASOR platform, and re-use other results obtained in different projects to create more added-value.**

Lauro Rossi, from CIMA Foundation, follows up with the demonstration of the platform starting with the main technical concepts: web based, open source and interconnectable application with other software (GEM, OpenstreetMap). **To answer questions, different processing were realized in order to detail the usual procedure to perform simulations and generate reports. The basic demonstration, thanks to the active participation of the CNIGS' team was transformed in to a sort of training: selection of the disaster, selection of the exposure layers, and selection of the impact to obtain a report.**

The team showed a high interest in the possibility of using the tool in their own operations, proposing ways to include their own data in the platform. Very precise questions were raised the necessity to be able to use the platform offline (on the field after a disaster for example), the evaluation of the quality of a model/scenario, the integration of other hazards as drought, the availability of other languages...

**The main feedback was that the tool was very adapted to CNIGS' missions. A large number of data collected over the last 10 years could be used to optimize the use of the platform such as DEM, satellite data or even preferential access to new data (CSK data special price, 200 euros).**

**The adoption of the platform by the team was clear and direction indicates that the budget that was supposed to go to the development of a similar web based tool could be used to increase the budget for data collection and so platform feeding.**

Such a plan could be presented to CDEMA and World Bank during the first quarter of next year to activate the use of the platform in the Caribbean region.

### 1.3 Validation Mission Haiti - Day 2

The second day was dedicated to capacity building of the CNIGS' team and was mainly chaired by Lauro. The exercises listed in the Validation Protocol were carried out by some of the CNIGS' team members. The team was trained to be able to generate new exposure layers, scenarios and reports.

The interconnectivity of the tool was also demonstrated using the QGIS plug-in.

**The team showed a lot of interest and several questions were raised:** how to input information, which format can be used, compatibility with haitidata.com, how to customize the report (logo, information), help (wikipage, forum and community of practice), and the configuration of names for layers, or even advanced questions such as how to change model, add algorithms, how to add "customers" review/logo when generating layers or reports, how to use the application from the cloud.

**The general feedback underlined that the tool is very easy to use and could be quickly integrated to CNIGS' operations. It was clear that the different members of CNIGS's team**

would be able to create added-value for their different clients and mainly for the studies conducted for DPC.

It was proposed to contact the World Bank, to explain that RASOR platform could replace the tool that was originally planned and so to use the fund dedicated to this development to generate data for input in RASOR. To do so, a presentation will be organized locally with the representative of the World Bank.

**For the team, it could be also interested to focus a bit more on drought and food security, maybe in the framework of the mission lead for FAO.**

The CNIGS top management, David and Bobby, were very excited about moving forward with the platform and will present how they use it during the RASOR conference which will be held on May 17<sup>th</sup> at Venice.

## 2 Rotterdam case study

This report presents the results of the Rotterdam Validation Mission, conducted at Deltares Headquarters on January 19<sup>th</sup>. The participants of the meeting are listed below:

- Joost Beckers, Deltares
- Lauro Rossi, Acrotec
- Roberto Rudari, CIMA
- Andrew Eddy, Athena Global
- Jasper Stam, RWS (Centre For Water Management)

The Rotterdam case study offered several interesting distinctions from other riverine flood models. On the one hand, the region has not seen a major flood for several years, principally due to a very extensive network of dikes and storm surge dams. However, the area remains prone to flooding and in severe storm or flood cases, the possibility of dike breach or barrier overtopping is real. Although the probability of such events is very small, the consequences are huge.

The RASOR model, while offering no probabilistic assessment of the possibility of breach allows an end user to simulate a breach at predetermined locations, and model the impacts of the breach together with the riverine and storm surge floods. **This feature is useful as it allows the analysis of breaching and flooding scenario during times of crisis and assessment of potentially exposed populations and property.**

The main user for the Rotterdam Case Study is the Watermanagementcentrum Nederland (WMCN), part of Rijkswaterstaat (RWS), the executive agency of the Ministry of Infrastructure and the Environment. They were represented during the Validation Mission by Jasper Stam.

The use cases worked with the end user are presented in the Rotterdam Validation Protocol (D9.6).

**The Validation Mission concluded with a request from RWS to make a further presentation to WMCN staff to better brief them on the functionality offered by RASOR.** Several specific recommendations were made with regard to improving RASOR functionality for the end user, many of which did not involve significant new effort. These included:

1. Using the automatically generated water level forecasts in FEWS as input to breach scenarios analyses within RASOR, so that simulations can be based on real-time forecasting and support decision making. In connection with this, a better connection to FEWS metadata should be included.
2. Provide the user with a simple interface to change the legend themselves, to be able to adapt the coloring to key thresholds such as flow over thresholds. These thresholds

change by neighborhood, so the ability to change the legend is important to make the output map more useful.

3. Allow user to examine damage from successive floods in a cumulative fashion, ensuring damage is not subject to double accounting (already implemented).
4. Identifying the “keepers” of critical data sets that allow more detailed analysis (e.g. number of handicapped and aged persons per household or area, allowing a better estimation of the number of people requiring support during evacuation).

### 3 Indonesia Case study

The validation mission took place over a four-day mission to Indonesia from February 8 to 11, 2016. The RASOR consortium was represented by:

- Andrew Eddy, Athena Global
- Roberto Rudari, CIMA
- Lauro Rossi, Acrotec
- Clément de Alcalá, ALTAMIRA INFORMATION
- Stefano Salvi, INGV
- Joost Beckers, Deltares

The validation mission was conducted with different representative in hazard management and risk analysis.

- BNPB (Badan Nasional Penanggulangan Bencana) or National Agency for Disaster Management, national division
- BNPB Jakarta operation center
- Bandung Geodetic Institute
- Local Partners meeting: Deltares Jakarta and Bandung offices, CLS Indonesia and Unilever Foundation

This document includes a report of the meetings conducted with BNPB and the Bandung Geodetic Institute team.

#### 3.1 Objectives and Organization of the validation mission

Indonesia is a strategic country for RASOR, as one of the five test sites, due to the high vulnerability & exposure to disasters and the high technological capacities in Disaster and Risk Reduction. In the prospective markets analysis, included in the business plan, Indonesia was identified as a favourable country to launch RASOR based on the country's needs, legal framework and system in place, DRR culture, as well as its potential access to international stakeholders' budget.

The main objectives of the validation mission in Indonesia are to:

- Ensure that the RASOR platform meets the main needs of the National Agency for Disaster Management
- Identify points of improvement to optimize the use of the platform by the National Agency for Disaster Management
- Guide potential users to use the platform in real situations in order to facilitate its quick adoption
- Start identifying leaders inside the National Agency for Disaster Management and projects that could benefit from the use of the platform

The 17,508 islands that form Indonesia are in an area with one of the highest level of seismicity in the world owing to the fact that the islands are on the confluence of the world's three active tectonic plates: the Indo-Australian plate, the Eurasian plate and the Pacific plate. This also means that Indonesia is highly vulnerable to volcanoes (129 active volcanoes), earthquakes, and tsunamis. The area is also vulnerable to flooding owing to the tropical climate and the surface topography coupled with human activities.

Facing this challenging situation the office of the Indonesian National Agency for Disaster Management was one of the first public agencies created after independence, in 1945.

The mission of the National Agency for Disaster Management in Indonesia is to protect the nation from the threat of disasters through risk reduction, by building a reliable system of Disaster management for the entire country.

The validation mission with BNPB was organized in Jakarta and lasted two days. It included meetings with the national and the Jakarta-operation teams; the meetings were conducted in English.

Following the validation mission in Jakarta, a meeting with the Bandung Geodetic institute was set up to present RASOR and get local support and feedback from experts mainly in flooding and volcanoes domains.

### 3.2 Meeting with the National Team of the National Agency for Disaster Management,

Pak Wisnu from BNPB, opened the first day of meeting with the presentation of the objectives of the meeting and the organization of the BNPB's national division.

The introductory speech insisted on the necessity to integrate more and better satellite information and updated disaster models, in their current missions at the data center unit. The main objective of this meeting was for BNPB to analyze RASOR's platform and determine if and how it could be integrated into BNPB's routine. BNPB's national division is composed of two teams, each one using specific tools and methods: the emergency team or hot issues team, and the data center team or prevention center team. Members of both teams attended this meeting.

The main focus of the introduction was to present RASOR as an efficient tool to measure the potential impact of a natural disaster in Indonesia on population and assets. Highlights were made on the use of high resolution DEM, flooding models, to perform more reliable simulations. The speed of the RASOR engine was highlighted, showing how fast the platform could perform simulations and the subsequent option to use the platform in different contexts (emergency tool).

Finally, Andrew insisted on the importance to collaborate to make the tool really useful for BNPB in Indonesia.



Andrew Eddy commented on the large amount of tools and data available in Indonesia, and the potential bridge that the RASOR platform could play in this environment. His introductory speech insisted mainly on RASOR's added value and compatibility-complementarity with other platforms such as InaSAFE or InAWARE from the World Bank. Clément de Alcalá, presented the business plan to ensure the sustainability of the platform over the next three years and the potential role that BNPB could play, at the national and regional level.

### 3.2.1 Technical presentation

Roberto Rudari started with the presentation of the main features of the platform. The first questions asked by the audience were about the selection of assets and parameters to characterize the exposure layers. BNPB seemed to be satisfied by the model used (Capra), the large diversity of parameters to select and the ease to customize them. The next question allowed Roberto to deal with an essential point: the future availability of the platform in the national language: Bahasa.

A lot of interest was then shown for the integration of new models, especially the flooding models. A good point was made, insisting on the concept of the platform as an open source *and* source open system, to upload and exchange the very large amount of information generated in Indonesia. An example followed with the flooding model developed by Deltares in Jakarta. This point opened a conversation on community management and how to share, trust the data generated by RASOR's users. BNPB seemed very interested in the option to use data from different experts, being able to check the source of the model/layer and measuring its reliability.

This introduction was followed by a complete presentation of the platform by Roberto Rudari, starting with the organization of the platform: engine and catalog. Then, the main technical concepts of the platform were described: web based, open source and interconnectable application with other software (GEM, OpenstreetMap).

The exposure module was largely commented on, insisting on the options already available for the user, and future developments including the app. An extensive presentation of the engine followed, insisting on the concept behind the fast processing of RASOR. Multiple processing were performed and scenarios generated in Indonesia, mainly Jakarta and Bandung, to make the usual process for carrying out a simulation clearer as well as how to generate a report. A specific point was made on the InSAR processing in Jakarta by Clément de Alcalá. During this presentation, the participation of BNPB was very active.

As happened previously in Haiti, the first series of questions showed clearly that BNPB was working on the implementation of a similar tool. As the meeting progressed, it was revealed that BNPB was starting to work on the design of a similar platform, and were thus very interested in the presentation of RASOR.

### 3.2.2 BNPB's feedback

Very interesting feedback was given by the audience. The compatibility with other applications such as InAWARE and InaSAFE are essential to ease the adoption of RASOR at BNPB. Specific guidance on how to use the outputs in RASOR and opposite will be very interesting for users. As mentioned during the validation mission in Haiti, the report should be more customizable to be able to quickly identify the source of the information (logo BNPB). A lot of interest was also shown in the access to the data (local server or cloud) and how a lower quality internet connection could impact negatively on the management of the platform. This point has to be taken into account while deciding how to distribute RASOR: local data storage and internet access should be part of the solution RASOR proposed. The different accesses proposed on the platform: display and management seem to be an interesting point for BNPB in order to facilitate the adoption of the tool by experts and non-expert users. The community aspects triggered an intense debate pointing out critical points about data safety, and reliability.

Both BNPB teams, including the emergency and prevention groups, were very interested in RASOR and are willing to make progress in the use of the platform. They proposed listing some hot spots to study before and during the coming floods. After the meeting a visit of BNPB offices and especially the data center showed that BNPB was in a process of restructuring.

## 3.3 Meeting with the Jakarta-Operation Team of the National Agency for Disaster Management,

### 3.3.1 Introduction

The Jakarta operation team is a target user for RASOR's implementation in Indonesia. This team could not join the first meeting, and so a second meeting was organized in the offices of the operation division in Jakarta.

The introduction from Basuki Rakhmat, head of Controlling Section, indicated that this team was growing, and integrating a lot of new missions for operation but also in the prevention phase to assess risk. In the framework of these new missions, they are very interested in seeing the platform and how it could help them to reach their objective in assessment and risk reduction.

The team is really advanced in assessment and operation tools for DRR. Several experts attended the meeting and participated actively. A visit of the data center after the meeting showed a very good control of the live, historic data, models to assess, prevent and limit impact of natural disasters. The active collaboration with different agencies was clear such as The Meteorology and Geophysics Agency (BMKG) or Deltares.

Given the time available for this presentation and the general level of the audience, the main focus was on the demonstration of the platform in Indonesia.

Andrew's introductory speech mentioned that considering the missions their agency was conducting; they could be the main beneficiaries of RASOR's use in Indonesia. The coming

flood season may be a good opportunity to start collaborating on the potential adoption of RASOR at BNPB.



Figure 1: BNPB's Jakarta Operation team

### 3.3.2 BNPB's feedback

A lot of questions show a high interest in the characterization of the exposure layer. A good point was made on the possibility of merging RASOR with another project JacSAFE. JacSAFE ([Jaksafe.bpbd.go.id/report/auto/](http://Jaksafe.bpbd.go.id/report/auto/)) is a large scale project from the World Bank that aims to characterize Jakarta main hot spots focusing on DRR: schools, community centers, hospitals. Further investigation will be conducted to determine how to import this information to RASOR.

The models used in RASOR were also largely commented on, as BNPB is a long term collaborator of Deltares and very interested in being able to update the models used in the platform. Another important point was the use of the data they already own.

The feedback of BNPB-operation was extremely interesting; the main questions mainly refer to the typical limits shown by DRR solutions in developing countries such as license fees, building capacities, hardware requirements. BNPB was very interested to see that RASOR overcame these different limits to propose a platform that can easily be integrated into their routine. Different points about where to locate the data locally (server available), when to start using the platform, and how to merge with their data, show that they are serious about the implementation of the platform at BNPB.

Finally, it was decided that a test should be conducted with the operation team, starting immediately, in prevention of the coming flooding (water getting high upstream, flooding season should stop in March). Satellite optical images will be acquired before and during the flooding season, and a training session will be set next week. A lot of interest was shown for InSAR's results in urban coastal areas.

BNPB operation team would be a very good candidate for the presentation of work accomplished with the platform at the Istanbul conference in May.



Figure 2: BNPB, control center room

### 3.4 Meeting at the Bandung Geodetic institute

Ten to fifteen experts mainly in volcanology, flooding and disaster communication, attended this meeting, introduced by Dr. Hasanudin Z. Abidin. The main goal of this meeting was to determine if the platform could be easily integrated into their research activities and find support for RASOR locally.

Some important points were made on users' needs, the Institute's main focus is on:

- Determining Hazard extent
- Collecting Up to date information on exposure for people and asset

- Comprehensive information of past disasters
- Modification of key parameters and project impact

The team was very interested in the several innovations included in RASOR, the fast processing engine, use of high resolution DEM of 12 meters and the smart presentation of the results such as the InSAR results over Jakarta. The mobile application mainly to characterize exposure layers seems to be an interesting feature for them. The multi risk option and full cycle approaches were extensively commented.

The compatibility with other applications such as Openstreet software for exposure assessment and more generally GIS software, is a key point for them. As the insitute is trying to create a catalog of past events, they were very interested in the use and stock of historic data in RASOR. The option to conduct comparative reports using one or another stack of data was a central point, discussed at length by the audience.

Some ideas of improvement were added during the conversation following the presentation of the platform such as including volcanic ash and cloud model and maybe collaborating on this issue with the local VAAC office and the Australian VAAC office. Some other basic features such as printing maps, downloading data from the interface (not the catalog) were also asked about. Strategic collaboration with the institute for ground water resources is an idea to investigate. Regarding the InSAR results, a good point was made on the importance to show the velocity rate in order to define risk of damage on a structure such as a building for example.



Figure 3: Bandung Geodetic Institute

## 4 Greece case study

The Greek validation mission was organised on 23 February. The meeting was chaired by Dr. Athanassios Ganas, NOA, and Mr. Andrew Eddy, Athena Global.

The meeting was attended by twenty (20) experts.

### 4.1 General presentation of the RASOR platform functionalities

Roberto Rudari presented the RASOR tool and its functionalities. He first starts by explaining the main tabs of the tool interface.

It is important to explain that RASOR is formed of complex modules that are combined in order to allow user to run realistic scenarios and simulation with user friendly interface.

The demonstration will rather focus on the geophysical simulation. Earthquake, flood hazards are highlighted.

#### **Hazards:**

- Use of subsidence results that are extrapolated to make a DEM correction before flood simulation in Bandung.
- Example of Italy, simulation done on RASOR and compared with actual situation.

#### **Exposure:**

- 1500 attributes.
- The platform guides so that only the attributes relevant for the study (depending on the hazards and exposure considered) that will be led are required.
- QGIS plug-in that allows to further edit the layers and provide required attributes.

**Vulnerability** models with open libraries included, such as HASUS, CAPRA libraries and some modifications added to better adapt them to the considered case-study.

**Impact** that ask you the kind of impact you would like to address and the target.

Different questions are raised, especially on the possibility to import own layers, as Shape Maps, in the platform and on the user-friendliness of the platform for normal "users". The possibility to make the platform download new layers via webservices is also discussed.

**Mobile app:** Validation of the platform results by going on the field → mobile app. A good feedback is received, the example of the exposure layers that can be easily updated is given.

## 4.2 Examples of the participant's activities in hazard mapping and risk analysis

Some selected participants are invited to present their work.

First presentation is dedicated to some information on the science background and vulnerability on Santorini. Discussions are led on how conduct risk analysis on RASOR by integrating the methodologies developed at NOA. Roberto explains that the platform could be updated, but this is a work that should be made in common and some help could be provided to CIMA to define the required format (typology, input/output).

Discussion is also ongoing on the problem of the publication and availability of hazards maps or scenarios that could scare people and have important impact on tourism in Santorini. This is sensitive information, useful for scientist but that can represent a risk. Roberto Rudari further explain the different levels of permission proposed on the platform and the possibility to restrict the access on data integrated by specific users.

Other presentation is dedicated on hazard management in Bulgaria. The presenter shows that information on the different hazard (landslide, flood, earthquake) is hard to access because it is distributed in different websites. Discussion is led on how RASOR could serve by gathering information. SAR and GIS expert and InSAR landslide and flood – highlight the need for correct information, Bulgaria suffer earthquake – speaks of the pb of hazard management with urban planning

## 4.3 Live presentation of the platform

The last part of the meeting is dedicated to an extensive presentation of the platform and its characteristics.

The audience provides feedback, the main points that are raised concerned:

1. The use of the Geonode tool <http://geonode.org/> in RASOR was very successful and it should be continued
2. Further links of the RASOR platform with the open-source QGIS software should be developed <http://www.qgis.org/en/site/>
3. A need emerged for the creation of personal vulnerability libraries (e.g. Santorini case study)
4. A need emerged for including historical records of disasters (as GIS thematic layers) on the RASOR platform
5. The announcement of the mobile application for field data collection was received with enthusiasm
6. Include site effects parameters (Acceleration factor, Predominant frequency of soils) on the RASOR platform

7. Include two earthquake scenarios for the Santorini test case depending on the direction of dip of the Kammeni Fault
8. Arrange a local meeting in Santorini with local civil protection experts, NOA and University of Athens
9. Include RASOR platform in forthcoming Horizon Proposals / Interreg Proposals etc.
10. Send a feedback for the quality of the Tandem-X DEM for Santorini when this is available
11. Work towards planning RASOR-2 proposals and maintain Santorini as test case.



## 5 Italy case study

The last validation mission was organised on 2 March 2016 at the DPC (Civil Protection Department) facility in Rome.

### 5.1 General presentation of the RASOR platform functionalities

Roberto Rudari presented the RASOR tool and its functionalities. He first starts by explaining the main tabs of the tool interface.

It is important to explain that RASOR is formed of complex modules that are combined in order to allow user to run realistic scenarios and simulation with user friendly interface.

The demonstration will rather focus on the joint simulation of seismic and hydraulic hazard with special attention to their interaction.

#### **Hazards:**

- Use of shake maps to replicate historical case studies like the 2012 Emilia-Romagna earthquake.
- Flood hazard as a consequence of a levee breach.
- Example of Italy, simulation done on RASOR and compared with actual situation.

#### **Exposure:**

- 1500 attributes.
- The platform guides so that only the attributes relevant for the study (depending on the hazards and exposure considered) that will be led are required.
- QGIS plug-in that allows to further edit the layers and provide required attributes.

**Vulnerability** models with open libraries included, such as HASUS, CAPRA libraries and some modifications added to better adapt them to the considered case-study.

**Impact** that ask you the kind of impact you would like to address and the target.

Different questions are raised, especially on the possibility to import layers derived from the Italian catalogue of historical faults and the one of the historical earthquakes epicentres, as well as historical and modelled Shape Maps. The user-friendliness of the platform has been discussed as well.

**Mobile app:** Validation of the platform results by going on the field → mobile app. A good feedback is received, the example of the exposure layers that can be easily updated is given.

## 5.2 Live presentation of the platform

The last part of the meeting is dedicated to an extensive presentation of the platform and its characteristics.

The audience provides feedback, the main points that are raised concerned:

1. The use of the metadata catalogue of Geonode tool <http://geonode.org/> as a basis for RASOR
2. A need emerged for the creation of personal vulnerability libraries (e.g. Italian Specific Libraries developed by EUCentre)
3. Include site effects parameters (Acceleration factor, Predominant frequency of soils) on the RASOR platform
4. A request emerged to include the fault databases from the Italian DB and the European one.
5. The possibility of linking other seismic libraries as the one provided by Open-quake by the Global Earthquake Model.
6. Discussion on future utilization of RASOR in Italy has been held. A first idea was to use it to develop some multi-hazard worst case scenarios to be presented in the revision of the National Disaster Risk Reduction Plan that is routinely updated for the European Environmental Agency. A second idea was the one of identifying two or three location where the multi-hazard component is significant and develop ad hoc additional case studies in order to test the platform in other conditions.
7. Include RASOR platform in forthcoming Horizon Proposals / Interreg Proposals etc.
8. Work towards planning RASOR-2 proposals and expand current RASOR functionalities
9. Enhance the Interoperability of RASOR with other existing tools, Open Quake to start with.

## 5.3 Questions and analysis of the presentation

Both the Seismic department and the Hydrologic/hydraulic department of the Italian National Civil protection exposed and discussed their expectations from the platform. The modelling behind both seismic and the hydraulic hazard was exposed and discussed.

Requests have been made from the Seismic department to expand the interface to work not only with epicentres but with faults. The model allows that already and only modifications to the interface are need to allow that.

On the side of the hydraulic modelling some questions have been raised on how the fragility curves of levees have been determined. It was explained that they have been determined from the SISMApo project and adapted them to the RASOR platform.

## Conclusions/Implications for RASOR

The different validation missions were really successful and also allow to serve the interest of many actors in the field of DRM. Those missions have been completed by validation missions that have been realized with international users as World Bank, UNOSAT and JRC. The mission report is provided in another deliverable, the D11.1.

## 6 Appendix 1: References

- [RD 1] European Union expenditure on natural disasters,  
[http://www.europarl.europa.eu/RegData/etudes/BRIE/2015/557022/EPRS\\_BRI\(2015\)557022\\_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/BRIE/2015/557022/EPRS_BRI(2015)557022_EN.pdf)
- [RD 2] Europe disaster statistics,  
[http://www.preventionweb.net/english/countries/statistics/index\\_region.php?rid=3](http://www.preventionweb.net/english/countries/statistics/index_region.php?rid=3)
- [RD 3] European Union budget for 2014 Serbia floods,  
[http://www.b92.net/eng/news/in\\_focus.php?id=1319](http://www.b92.net/eng/news/in_focus.php?id=1319)
- [RD 4] United Nations donation for 2014 Serbia floods,  
<http://rs.one.un.org/news.php?id=468>
- [RD 5] European Union budget for 2014 Georgia floods,  
[http://europa.eu/rapid/press-release\\_IP-15-5209\\_es.htm](http://europa.eu/rapid/press-release_IP-15-5209_es.htm)
- [RD 6] World Bank report 2013 Asia-Pacific,  
<http://thediplomat.com/2015/04/natural-disasters-preparing-for-the-big-one/>
- [RD 7] Philippian Government DRR budget,  
<http://www.unisdr.org/archive/35997>
- [RD 8] Disaster prevention and mitigation Indonesia National Agency for Disaster Management (BNBP) for 2015,  
<http://www.thejakartapost.com/news/2015/08/05/more-natural-disaster-research-urgent.html>
- [RD 9] International NGO's donation in Indonesia for disaster risk reduction,  
<http://www.give2asia.org/disaster-preparedness-and-resilience-indonesia/>
- [RD 10] Iran Government and UNDP Disaster Risk Reduction Program,  
[http://www.ir.undp.org/content/iran/en/home/operations/projects/disaster\\_risk\\_management/strengthening\\_DRR\\_in\\_IR/](http://www.ir.undp.org/content/iran/en/home/operations/projects/disaster_risk_management/strengthening_DRR_in_IR/)
- [RD 11] USAID DRR budget for Latin America and the Caribbean,  
[https://scms.usaid.gov/sites/default/files/documents/1866/lac\\_drr\\_fs01\\_09-30-2014.pdf](https://scms.usaid.gov/sites/default/files/documents/1866/lac_drr_fs01_09-30-2014.pdf)
- [RD 12] European Union DIPECHO budget for the Caribbean,  
[http://ec.europa.eu/echo/what/humanitarian-aid/risk-reduction\\_en](http://ec.europa.eu/echo/what/humanitarian-aid/risk-reduction_en)
- [RD 13] World Bank and PDNA funding for seasonal rainfall Malawi 2015,  
<http://www.drrinacp.org/acp-eu>
- [RD 14] Funds from the Tonga Cyclone Ian Reconstruction and Climate Resilience Project (TCIRCRP)  
<http://www.drrinacp.org/acp-eu>

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[HTTP://WWW.GASOR-PROJECT.EU](http://www.gasor-project.eu)

