

Strengthening Information Infrastructure for Emergency Management (SIIEM)

Phase I - Final report



Table of Contents

Acknowledgements	3
Executive summary	4
1. Background	6
2. The SIEM framework and process	7
3. In countries SIEM implementation.....	8
3.1 Implementation in the Philippines.....	9
3.1.1 Assessment phase (Assess)	9
3.1.2 Identification of activities aiming at improving the availability, quality and accessibility of data (Convene)	10
3.1.3 Implementation of the identified activities (Address).....	12
3.2 Implementation in Morocco	15
3.2.1 Assessment phase (Assess)	15
3.2.2 Identification of activities aiming at improving the availability, quality and accessibility of data (Convene)	18
3.2.3 Implementation of the identified activities (Address).....	19
4. Analysis of the maps produced during the response to typhoon Yolanda/Haiyan	19
5. Advocacy, outreach and opportunities.....	22
6. Financial report	24
7. Conclusion and recommendations	24

Acknowledgements

First and foremost, we would like to express our sincere gratitude to the Environment Agency - Abu Dhabi (AED) for funding the first phase of implementation of the SIEM project.

We also would like to particularly thank the following individuals, and their respective institution, for having made the implementation of the first phase of the SIEM project possible in countries:

- In the Philippines:
 - Under-Secretary Alexander Pama and Colonel Edwin C. Sadang from the Office of Civil Defense (OCD);
 - Assistant Secretary Vilma Cabrera, Director Felino Castro and Mr Lawrence Anthony Dimailig from the Department of Social Welfare and Development (DSWD);
 - Ms Agnes Palacio and Mr Joseph Adawe from the Manila Office of the UN Office for the Coordination of Humanitarian Affairs (UN-OCHA);
 - Mr Christopher P. Grajo and his team from the Emergency Response Integration Center (ERIC).
- In Morocco:
 - Prof. Zine El Abidine El Morjani from the University of Ibnou Zohr, Agadir;
 - Mr Hicham Ezzine from GIS for Decision Support (GIS4DS);
 - Prof. Mohamed Mastere from the National Institute of Planning and Urbanism (INAU).

We are then thankful to Helen Campbell from the Decision Makers Needs Community of Interest for her dedication and leadership in the context of the map review activity.

Our gratitude also goes to Prof. Costis Torgas, Associate Director of the Cyber Security Policy and Research Institute at the George Washington University and Chair of the Eye on Disaster Management Special Initiative, for his continuous support and always precious advices during the all duration of the project.

Finally, we also would like to thank the Association of American Geographers (AAG) for his support and for setting the Eye on Earth projects web site.

This report was prepared by Dr Steeve Ebener, Gaia GeoSystems (steeve.ebener@gaia-geosystems.org).

Executive summary

When a disaster strikes, people might lose all they have, including their lives in a matter of seconds. Those who survive become in urgent need of food, shelter and/or medical attention.

When this happens, the government has a very limited amount of time at disposal to make a difference, save lives and protect the country's investments. It needs to rapidly decide on how best to utilize its available resources. Baseline data are needed to take such decisions.

If this data does not exist, or is not ready, by that time then it is too late to use it during the first days of the response and the government, together with the local and international community, often have to put a lot of effort to try filling the gaps while they should be focusing on providing support to those who have been affected.

The solution to this is what we call data preparedness. In other words making sure that the necessary data is available, of quality and accessible before the crisis occurs. Data preparedness does not only ensure for this data to be ready but it also closes the loop of the all emergency cycle, therefore ensuring that the data and lessons learned collected during previous crisis feeds into the next one.

Unfortunately, most of the activities aiming at establishing or strengthening data preparedness in countries remain uncoordinated and lack a framework that would bring them together. In addition to that, ICT is often seen as one of the vertical pillars instead of being a supporting element.

We think that a more coordinated approach among stakeholders combined with a different way to look at the information infrastructure, to make it more supportive, would not only provide the necessary baseline data but also lead to better capacity building in countries. Developing and implementing this framework is the objective of the SIEM project.

This framework builds on 4 simple principles which, if implemented, would improve the availability, quality and accessibility of core baseline data for disaster risk reduction and emergency management. These principles are as follows:

1. Countries should be in a position to generate and maintain the core layers of information necessary to support disaster risk reduction and emergency management ;
2. The local and international community (which includes donors, NGOs including the UN system, the private sector,...) should support countries in reaching principle 1;
3. An open data policy should be used as much as possible. When this is not possible, agreements allowing access to this data should be signed between the

- government and all the actors involved in risk reduction and emergency management (including response, recovery and reconstruction) activities;
4. Data collected during the crisis by the international community should be integrated back into the government information system;

These principles have been implemented in two countries, the Philippines and Morocco, as part of a 3 steps approach, namely:

1. First, assess the current availability, quality and accessibility of core baseline data in the country
2. Then convene all concerned parties to present the results of the assessment and identify the main issues to be addressed
3. Finally, address these issues through the implementation of activities defined in collaboration with all the involved stakeholders. These activities include but are not limited to: workshops, training, definition of standards and/or writing of policies

The assessment step has been completed in both countries under the form of a paper describing the situation when it comes to the availability, quality and accessibility of core baseline data to support disaster risk reduction and emergency management.

Concerned parties have also been gathered in both countries and the discussions led to the identification of key activities that are now in the process of being implemented.

As a complement to the above, the SIEM project is supporting the development of an online platform to analyse the maps being generated during the response phase of a crisis and this to improve map production during disasters as well as support the implementation of the SIEM principles in other countries.

In conclusion, while the activities that have been started have not been fully completed by now, the first phase of implementation has demonstrated that the framework proposed by the SIEM project is not only relevant but can indeed also be applied and produce significant results when it comes to improving the availability, quality and accessibility of core baseline data to support disaster risk reduction and emergency management in countries, and this in a cost-effective manner.

1. Background

The need for accurate and up-to-date information to support emergency management has long been recognized.

Despite this recognition, capacity building efforts aiming at strengthening the information infrastructure in countries remains fragmented, resulting very often in:

- Fragmented and weak information systems,
- Duplicated and unaligned efforts,
- Incomplete, out-of-date and of limited quality/accuracy datasets.

One of the major consequences of the above is the lack of proper baseline data and information when a disaster strikes. A lot of time is therefore lost trying to get whatever is available, especially geographic information, to support the response.

In addition to that, once the crisis is over, neither the capacity that has been used nor the data which has been collected get institutionalized leading potential to the same gaps at the time of the following crisis.

The main objective of the Strengthening Information Infrastructure for Emergency Management project (SIEM) is to look at defining and testing a new conceptual framework that would help reducing the current fragmentation that exists among capacity building efforts and this with the objective to improve the availability, quality and accessibility of core baseline data at the time of crisis.

And the same time, to support the implementation of this framework, the SIEM project is also looking at analyzing the maps produced during the response to typhoon Yolanda/Haiyan (Philippines, November 2013) in order to:

1. Identify:
 - The actors producing maps during large events and the donors that support post-event disaster information analysis;
 - If and how governmental data are being used and if proper reference of the source and policy of the data is being made;
 - Potential duplication of efforts/overlap and geospatial data issues (i.e use of non-authoritative versus authoritative data, different datasets to present the same information creating confusion,...);
2. Provide recommendations aiming at:
 - Rationalizing the production of maps during a crisis;
 - Ensuring the use of authoritative data sources;
 - Advocating for part of the resources provided by donors to be used for strengthening information system in countries in order to have access to better data for the production of more relevant maps for decision-making.

2. The SIEM framework and process

The SIEM framework, as defined at the beginning of the project, builds on 4 simple principles, namely:

1. Countries should be in a position to generate and maintain the core layers of information necessary to support disaster risk reduction and emergency management ;
2. The international community (which includes governments and government Organizations, UN agencies as well other local and international NGOs, partners and Donors, the private sector, volunteers,.....) should support countries in reaching principle 1;
3. An open data policy should be used as much as possible. When this is not possible, agreements allowing access to this data should be signed between the government and all the actors involved in risk reduction and emergency management (including response, recovery and reconstruction) activities;
4. Data collected during the crisis by the international community should be integrated back into the government information system;

The vision behind these principles is to ensure for the data necessary to support not only emergency management during a crisis but also disaster risk reduction are available, of quality and accessible to all concerned stakeholders.

The mission of the SIEM project in this context is to bring these stakeholders together to reach this vision through the implementation of the above mentioned four principles and this using the following 3 steps approach (Figure 1):

1. **Assess** the current availability, quality and accessibility of core baseline data in the country
2. **Convene** all concerned parties to present the results of the assessment and identify the main issues to be addressed
3. **Address** these issues through the implementation of activities defined in collaboration with all the involved stakeholders. These activities include but are not limited to: workshops, training, definition of standards and/or writing of policies

This process, which is actually to be seen as a cycle is actually to be implemented between crises as part of country's data preparedness efforts.



Figure 1 - The SIEM process

3. In countries SIEM implementation

In view of the current situation, as well as the important vulnerabilities that exist in this part of the world, it was important that the first country be selected among the Middle East and North Africa (MENA) and the League of Arab States regions. Looking at the different options, Morocco got finally chosen among those countries and this not only because the country had an history of disasters but also because other Eye on Earth seed funds projects, EcoCitizen World Map and GeoSUMR were also being implemented in that country under the umbrella of the Community Sustainability and Resilience Special Initiative (CSR SI).

At the same time, the impact caused by the passage of typhoon Yolanda/Haiyan over the Southern part of the Philippines at the beginning of November 2013 called the attention of the international community. Thinking that the implementation of the SIEM project could contribute to improve the situation during forthcoming events, AGEDI kindly accepted for the SIEM project to also be implemented in the Philippines during the Eye on Disaster Management Special Initiative coordination meeting which took place in Geneva (November 18-19, 2013).

The implementation of the SIEM principles and process in both the Philippines and Morocco is described in the following chapters and this starting with the former as this implementation started first and served as the reference for the implementation in Morocco.

3.1 Implementation in the Philippines

3.1.1 Assessment phase (Assess)

The implementation of the SIEM project in the Philippines started in January 2014 after having identified the Department of Social Welfare and Development (DSWD) as the appropriate governmental partner.

The first joint SIEM-DSWD activity took place on February 17, 2014 under the form of a forum aiming at identifying:

- the challenges encountered by governmental institutions during the response to typhoon Yolanda/Haiyan when it comes to data quality, availability and accessibility,
- potential areas of collaboration between government and non-government agencies.

Despite the limited number of participants (13 representing 4 different institutions), this forum highlighted and discussed several important issues pertaining to improving the quality, availability and accessibility of data for emergency management and disaster risk reduction.

It was therefore decided to expand the discussion to a larger group of governmental and non-governmental institutions and to prepare a green paper that would support this discussion. The proceedings for this first forum can be downloaded from here: [www.gaia-geosystems.org/PROJECTS/SIEM/PHL/DSWD-SIEM Forum Summary 170214.pdf](http://www.gaia-geosystems.org/PROJECTS/SIEM/PHL/DSWD-SIEM_Forum_Summary_170214.pdf)

The above-mentioned green paper was finalized at the end of May 2014 (Accessible for download from here: [www.gaia-geosystems.org/PROJECTS/SIEM/PHL/Green Paper DSWD-SIEM 305014.pdf](http://www.gaia-geosystems.org/PROJECTS/SIEM/PHL/Green_Paper_DSWD-SIEM_305014.pdf)).

Using the context of the response to typhoon Yolanda/Haiyan, this paper describes the situation in the Philippines when it comes to the availability, quality and accessibility of the following geospatial data: administrative boundaries (down to the lowest level of desegregation), key infrastructures (evacuation centers and health facilities) and the road networks.

Doing so, the objective of this paper was to engage all stakeholders involved in the disaster risk reduction and management and/or the production and maintenance of baseline data (e.g. Government, Donors, UN, NGOs, Open Data Community) in a constructive discussion, aiming at identifying and implementing sustainable solution to address the gaps.

This analysis first confirmed availability of key geospatial data in the Philippines. These data are nevertheless not easily accessible without a prior signed agreement with the institution in charge. This situation represented a major bottleneck during the response to typhoon Yolanda/Haiyan.

When accessible, the data is not necessarily documented. This, as well as the proliferation of sources, is generating a lot of confusion; which is also something you want to avoid during the response to a crisis.

Finally, the quality of the data in terms of completeness and accuracy remains limited and could definitively be improved if the necessary guidelines and standards were defined and agreed upon among all the institutions in charge of generating and maintaining these data.

3.1.2 Identification of activities aiming at improving the availability, quality and accessibility of data (Convene)

The green paper mentioned in the previous section has been used to convey an interagency meeting in collaboration with DSWD on June 16, 2014.

Fifty participants representing more than 20 Government, NGOs and International Agencies attended this meeting with the objective to increase the availability, quality and accessibility of common and fundamental operational datasets (CODs/FODs) to support disaster risk reduction and emergency management in the Philippines.

During the morning session, governmental institutions commented on the green paper and shared their own data related experience and challenges faced during the response to typhoon Yolanda/Haiyan.

These agencies also identified the following activities that, if implemented, would significantly improve availability, quality and accessibility of common operational datasets in the country in support to Disaster Risk Reduction and Emergency Management:

1. Organize an inter-governmental workshop aiming at defining and agreeing upon geospatial data specifications and standards to improve data compatibility among governmental and non-governmental agencies;
2. Clarify which institution has the mandate over which COD (as per the definition proposed by the participants) and identify if the data (registry and/or GIS layer) is available, of quality and accessible;
3. Organize a forum to discuss data accessibility including: conflict in data use between intellectual property act and the open data Philippines policy; data accessible with fees; confidentiality;

4. Address the question of availability of data that should be maintained by the Local Government Units (LGUs) under the umbrella of the Department of Interior and Local Government (DILG) potentially through crowd sourcing or other solutions;
5. Launch a project or organize a forum to discuss how to improve the Philippine Standard Geographic Code (PSGC) to make it more information management friendly;
6. Prepare a policy and guidelines on data sharing to be signed by the members of the National Disaster Risk Reduction Management Council (NDRRMC).

During the afternoon session, the international community (donors, United Nations, Open Data Community,...) was invited to join the governmental institutions to discuss how the activities identified during the morning could be covered.

The common thinking among the participants is that the policy and a stronger connection with programs aiming at supporting data sharing (Open Data Philippines initiative for example) were key to ensuring the availability of data.

When it comes to the question of accessibility, the proposition is for each Department to maintain the datasets on which they have the mandate and to ensure for NDRRMC's operation center to have access to all dataset. The international community would itself have access to the data through this same operation center.

Participants also expressed the need for a feedback mechanism to be established so that any new data/information collected during a crisis could not only be integrated into the operation's center dataset but also in the information system of the concerned Department. It was also emphasized that, while the green paper focuses on geospatial data, there was also room for improvement when it comes to the collection and management of statistical data prior and during the response to disasters.

When it comes to supporting the other activities, the international community would like to see the government coming together in a joint proposal, which could also be part of the draft policy and guidelines. In the meantime, it was announced that the SIEM project would be contributing US\$20,000 to start these activities as it is important to address these issues as soon as possible.

Finally, the need already expressed during the February 2014 forum to see these activities taking place directly under the umbrella of OCD has been reiterated as being the way not only to ensure their sustainability and this across the all emergency cycle.

It is also important to mention that the participants to the meeting suggested for the definition of the Common and Fundamental Operational Datasets (CODs/FODs) to be redefined as follow and this to be less confusing than the definitions currently used by the UN Office for the Coordination of Humanitarian Affairs (UN-OCHA):

- COD: Key geographic objects needed to support the operation and decision making during the response. This would include but not be limited to:

- administrative boundaries, populated places, transportation network, health facilities, schools, evacuation centers,...
- FOD: Statistics or information attached to the key geographic objects.

It was actually suggested for these definitions to be shared with UN OCHA Headquarter for their consideration.

3.1.3 Implementation of the identified activities (Address)

Following the recommendations of the June 2014 meeting, the first issue that needed to be addressed in order to ensure the sustainability of the project was to place the six activities defined during that same meeting under the umbrella of the Office of the Civil Defense (OCD).

The SIEM focal point at the Department of Social Welfare and Development (DSWD), Director Felino Castro, therefore put a lot of efforts for this to happen taking advantage of the fact that his Department is co-chairing the Disaster Response pillar within the NDRRMC.

Raising awareness both within his Department and the OCD regarding the importance for NDRRMC to integrate the concepts of CODs and FODs in their operations finally happened to take much more time than expected and this simply because, while the need for data and information was recognized, the concept of data preparedness was itself not well understood.

It has therefore been decided to raise awareness of NDRRMC Members through different channels as follow:

- The CODs/FODs concepts have been introduced by DSWD during different simulation exercises including the during the three-day Humanitarian Assistance and Disaster Response (HADR) Simulation Exercise undertaken by OCD and the Armed Forces of the Philippines in July 2014;
- A first draft policy addressing the question of availability, quality, and accessibility of Common and Fundamental Operational Datasets (CODs/FODs) to support disaster risk reduction and emergency management in the Philippines has been finalized and shared among NDRRMC Members in October 2014;
- We tried for the policy to be presented as an NDRRMC activity during the Third UN World Conference on Disaster Risk Reduction (WCDRR) that took in Sendai, Japan (14-18 March 2015). Unfortunately this did not work out;
- An internal champion to DSWD was found in the person of Assistant Secretary Vilma Cabrera.

Despite all these efforts, the CODs/FODs and data preparedness concepts together with the policy were not making their way within the NDRRMC. We therefore decided to

chance strategy at the beginning of 2015 by hiring a local project officer to help raise awareness as well as start implementing the activities defined in June 2014 while waiting for the OCD to come on board.

At the same time, we looked at gaining support from the UN community by presenting the SIEM project to the in country Information Management Working Group (IMWG) lead by OCHA. This presentation, which took place in March 26 2015, has been very timely as the question of the availability, quality and accessibility of data in preparation for the next typhoon season was central to the working group's discussion. The group in general and some specific institutions in particular (OCHA, DOST/NOAH and ERIC) expressed their direct willingness to support the signing of the draft policy by NDRRMC Members as well as the implementation of the joint DSWD-SIEM activities defined during last year's forum.

Thanks to this support and the connections that Christopher P. Grajo (director of ERIC), was having with OCD it has finally been possible to hold a meeting with Colonel Edwin Sadang, officer-in-charge of the NDRRMC Operations Division, in order to present the SIEM project and obtain his support for the implementation of the activities defined during the 2014 forum.

This meeting took place on May 5th, 2015 and was attended by representatives from OCD, DSWD, the Department of Interior and Local Government (DILG), UN OCHA and ERIC. It also happened to be very timely as the joint DSWD-SIEM activities were addressing an urgent need expressed by the NDRRMC. The momentum was such that the outcomes of the meeting were brought to the attention of Undersecretary Alexander Pama, OCD administrator and Executive Director of the NDRRMC, who requested these activities to be directly implemented as a project under the umbrella of the OCD with the support of DSWD, UN OCHA and SIEM.

The project in question, entitled "Improving the availability, quality and accessibility of Common and Fundamental Operational Datasets (CODs/FODs) for Disaster Risk Reduction Management in the Philippines (CAFOD-DRRM-PH) got officially launched in June 2015. The concept note for this project can be downloaded from here: http://www.gaia-geosystems.org/PROJECTS/SIEM/PHL/CAFOD_CONCEPT_NOTE.pdf.

At the same time, and in order to not only support the implementation of the CAFOD project but also create a forum for NDRRMC Members to discuss and address data and information management activities, it has been decided to establish an Information Management Technical Working Group (IM-TWG) for the Council.

In addition to that, the four SIEM principles have been proposed for inclusion in the Implementing Rules and Regulations of Republic Act No 10121¹ on strengthening the

¹ http://www.ndrrmc.gov.ph/attachments/article/45/Republic_Act_10121.pdf

Philippine Disaster Risk Reduction and Management System, providing for the National Disaster Risk Reduction and management framework and institutionalizing the National Disaster Risk Reduction and Management plan, appropriating funds therefore and for other purposes. This potential inclusion will take place as part of the revision of this document.

Finally, in view of his connections, and the support his team could provide to the project, Christopher P. Grajo, Managing Director of the Emergency Response Integration Center (ERIC), was hired as SIEM project officer.

Thanks to the above-mentioned support, the first two activities defined during the June 2014 meeting have been implemented during the course of July 2015.

First, the workshop aiming at defining and agreeing on geospatial and other data standards among NDRRMC members took place in Manila on July 10th. Fifty-eight participants representing 30 different institutions from the Government, the United Nations and other NGOs, International Organization as well as from the academic and the private sector attended the workshop. The executive summary for this workshop can be downloaded from here: http://www.gaia-geosystems.org/PROJECTS/SIEM/PHL/WORKSHOP_071015/Final_Executive_summary_Geo-other_Standards_July_10_2015.pdf.

During this workshop, the participants agreed on a list of data specifications and standards that once implemented will improve data quality and compatibility among all stakeholders and partners involved in disaster risk reduction and/or emergency management in the country. It is actually the first time ever that such a list was generated in the Philippines and it is therefore expected that it will not only be used for disaster risk reduction and emergency management but development in general. In this regards, the National Mapping and Resource Information Authority (NAMRIA), which is the National Mapping Agency (NMA) of the Philippines already indicated that they would be implementing these specifications and standards in the context of the National Spatial Data Infrastructure (NSDI). A set of common guidelines and protocols will now be developed in order to help all these institutions to implement these specifications and standards.

A second workshop then took place on July 16, 2015 with the objective to finalize the list of Common and Fundamental Operational Datasets (CODs/FODs) and define which institution is having an official mandate on each of them. The executive summary for this second workshop can be downloaded from here: http://www.gaia-geosystems.org/PROJECTS/SIEM/PHL/WORKSHOP_071615/Final_Executive_summary_CODs-FODs_July_16_2015.pdf.

Sixty-five (65) participants representing thirty-seven (37) different Agencies from the Government, the United Nations and other NGOs, International Organization as well as from the academic and the private sector attended the workshop and worked at

completing and improving the preliminary list defined in the context of previous activities. This workshop highlighted the need to include the head of the different NDRRMC clusters into the exercise and this to ensure that the list of CODs and FODs would directly support the decisions they have to take not only during each phase of the response but also before the crisis as part of the disaster risk reduction and preparedness measures. It has been decided that this would take place as part of the first meeting of the IM-TWG.

Before the first IM-TWG meeting, an update on the project was given to Under Secretary Pama on September 11, 2015. He was very pleased with the result obtained so far and actually requested for the OCD to consider the implementation of this project as a priority.

The first meeting of the NDRRMC IM-TWG took itself place on September 22, 2015. Attended by 20 representatives from 14 NDRRMC Members and 30 representatives from 18 other organizations, this meeting first served as a way to introduce the CAFOD project to the NDRRMC Members. The terms of Reference (TOR) of the TWG have then been discussed and modified before engaging the participants in an exercise aiming at defining the data and information needs of the different clusters before and during a crisis. Using typhoons as an example, this exercise clearly demonstrated the value of data preparedness and encouraged NDRRMC Members to contribute to the consultation aiming at finalizing the list of Common and Fundamental Operational Datasets (CODs/FODs). The executive summary for this meeting together with the working group TOR will be available for download from the SIEM web site (<http://eoe.aag.org/siem-project/>) once finalized.

At the time of ending the first phase of implementation of the SIEM project, several of the activities identified during the June 2014 workshop remains to be implemented, more precisely activity 3, 4, 5 and 6 reported in section 3.1.2. These activities will therefore be conducted as part of the second phase of the SIEM project.

3.2 Implementation in Morocco

3.2.1 Assessment phase (Assess)

Identifying a government counterpart in Morocco has been more difficult, and therefore more time consuming, than in the Philippines. One of the main reasons for this was the change of government which took place in 2013 and which led to several months without knowing which institution was in charge of Disaster Risk Reduction and/or Emergency Management in the country.

Because of this, the first step consisted in hiring the following SIEM focal points to help identifying the government counterpart in question:

- Dr Zine El Abidine El Morjani: Head of the GIS chair at the Taroudant poly-disciplinary faculty of the Ibn Zohr University of Agadir, Morocco. Among other

- projects, Dr El Morjani is at the origin of the models used in the context of the WHO e-atlas of disaster risk;
- Mr Hicham Ezzine: Consultant based in Rabat where he previously worked with the Royal Center for Remote Sensing (CRTS). He also worked at the Regional Centre for Disaster Risk Reduction (RCDRR) in Cairo and has been involved in the first phase of the WB project aiming at establishing a comprehensive an integrated risk management strategy for the country.

Starting from November 2013, both Dr El Morjani and Mr Ezzine have been promoting the SIEM principles either through direct contacts with key institutions or during events organized in Morocco and this in search of the above mentioned governmental counterpart. This has been for example the case during the following events:

- Meetings with governmental institutions involved in disaster management (Rabat, 05.11.2013);
- The "Interaction between policy and research in the field of capacity building" conference (Rabat, 30.01.2014);
- The "Bringing GEOSS Services into practice" workshop (Rabat, 31.01.2014);
- The National Geo-information meeting (Tanger, 23-24.05.2014)
- The GeoInformation for Sustainable Urban Management and Resilience (GeoSUMR) workshop (Casablanca, 13-17 October 2014);
- A meeting organized by the Ministry of Industry, Trade, Investment and digital economy to discuss the possibility to build a GIS system for disaster prevention and response organized due to the flooding that occurred in the Province of Sidi Ifni at in November 2014 (Rabat, 25 November 2014).

In parallel to this, direct contacts have been taken with the World Bank team lead for the development of the comprehensive and integrated risk management strategy (Mr Axel Baeumler) as well as the person in charge of the Open Data for Resilience Initiative launched by GFDDR (Mr Robert Soden). The objective here was to discuss potential collaboration between them and the SIEM especially in regards to establishing a Risk Information and Management System (RIMS) in the country. Members from the GeoSUMR and EcoCity projects got also involved in this discussion.

At the end of this process:

- The World Bank was finally more interested in investing in the system itself than on the content and, without the support from AGEDI, it has not been possible to establish any partnership with them.
- The discussions which took place with the Ministry of Environment, the Ministry of Urbanism and Land Management and the Ministry of Industry, Commerce, Investment and Digital Economy led to the same result partly because they were more attracted by the World Bank integrated risk management project as it was offering the perspective of a much higher financial support than the SIEM project.

In view of the above, it has finally been decided to write a paper similar to the one prepared for the Philippines (see previous section) and to use this paper as a

way to engage stakeholders in discussing the question of availability, quality and accessibility of common and fundamental operation datasets in the country. Compare to the one in the Philippines, this paper looked at describing the data that would be accessible to the international community in case of a crisis. This paper can be downloaded from here (in French): http://www.gaia-geosystems.org/PROJECTS/SIEM/MAR/Papier_SIEM_MAR_final.pdf

While writing the above article, and thanks to the efforts of Mr Ezzine, a formal partnership got between SIEM and the National Institute of Planning and Urbanism (INAU, <http://www.inau.ac.ma>). Placed under the Ministry of Urbanism and Land Management, this Institute has therefore become the governmental counterpart of the SIEM project in Morocco and was invited to join the writing of the paper.

The paper concentrated on five core baseline datasets (administrative boundaries, schools, health facilities, road and hydrographic network). The results obtained through this assessment (Table 1) makes the distinction between the availability, accessibility and quality of a registry (defined as a complete, up-to-date, official, uniquely coded list) and the corresponding GIS layer.

		Registry			GIS layer		
		Availability	Accessibility	Quality	Availability	Accessibility	Quality
Administrative boundaries	Official source	To be confirmed	Partially	Medium	Yes	Restricted	Medium
	Other sources	No	Not applicable		Yes	Yes	Low
Schools	Official source	Incomplete	Partially	Medium	To be verified	To be verified	To be verified
	Other sources	No	Not applicable		Yes	Yes	Low
Health facilities	Official source	Incomplete	Partially	Medium	No	Not applicable	
	Other sources	No	Not applicable		Yes	Yes	Low
Road network	Official source	Not analysed			Yes	Restricted	Medium
	Other sources				Yes	Yes	Medium
Hydrographic network	Official source	Not analysed			Yes	Restricted	Medium
	Other sources				Yes	Yes	Medium

Table 1 - Summary of the assessment conducted in the paper

The colors reported in Table 1 allow identifying where each of the data source finds itself against reaching the criteria of availability, accessibility and quality. In other words, cells in green corresponds to criteria that have been reached, those in orange to cases where improvement needs to take place while those in red indicates significant shortcomings.

In conclusion, complete and up-to-date registries are not available or are incomplete for administrative boundaries, schools and health facilities. When it comes to GIS layers, while available for most of the datasets covered by the article, access to official sources is restricted and the quality of all these layers remains limited.

3.2.2 Identification of activities aiming at improving the availability, quality and accessibility of data (Convène)

The first SIEM workshop co-organized in partnership with the National Institute of Planning and Urbanism (INAU) took place in Rabat on June 9th, 2015.

Attended by 37 participants from 26 different governmental, international (UN and other NGOs) and academic institutions, this workshop had for objective to presented and discussed the result of the SIEM paper (see previous section) as a way to identify key activities which, if implemented, would improve the availability, quality and accessibility of core baseline datasets to support Disaster Risk Reduction and emergency Management in the country. The executive summary for this workshop (in French) can be downloaded from http://www.gaia-geosystems.org/PROJECTS/SIEM/MAR/ATELIER_06_15/Final_compte_rendu_atelier_SIEM_090615.pdf.

The discussions led to the identification of the following activities to be implemented in the context of a pilot project covering one Province:

1. Identify the Common Operational Datasets (CODs, as defined during the workshop) the country needs to support disaster risk reduction and emergency management;
2. Identify the official producers of CODs in Morocco;
3. Address the question of the norms and standards to ensure compatibility of geospatial data;
4. Restore trust and promote voluntarism among institutions regarding data sharing and this through the following activities:
 - Creation of a national metadata catalog (could potentially be achieved through the open data website of the Moroccan Administration);
 - Establishment of a data sharing network;
 - Explore the possibility to simplify data acquisition processes.
5. Strengthen quality control, relevance and usefulness of data through, for example, the creation of a data collection protocol;
6. Institutionalize what has been implemented through:
 - the preparation of a policy that would formally awards the mandate for each data and encourages partners to share data;
 - the strengthening of national agencies technical capacities.

Taking advantage the lessons learned from the implementation of the project in the Philippines it has been possible to identify the activities to be implemented after only one workshop.

3.2.3 Implementation of the identified activities (Address)

Following the recommendations from the first workshop, the activities that have been identified (see previous section) are to be implemented in one Province before being potentially implemented at the national level.

The SIEM Team has therefore been working on identifying the most appropriate Province for this first implementation and this based on the criteria set during that same workshop, namely:

1. Level of exposure to natural hazards;
2. Current level of preparedness and awareness to the issue of risk reduction and management emergencies.

The interest of the Province to be involved of the project, the presence of other projects that would allow some synergies to be established as well as the need to obtain the support of the Ministry of Interior are other criteria that are also being taken into account for the selection.

At the moment of writing this report, two Provinces in particular are coming on top of the list through this process:

1. Sidi Ifni (Southern part of the country) which was the topic of an article in EoE newsletter due to the flooding that occurred in November 2014. A representative from this Province attended the June 2015 workshop and the governor has expressed his interest for the SIEM project to be implemented in his Province;
2. Al Hoceima (Northern part of the country). The Agency for the Northern Provinces (ADPN) has also expressed their interest in seeing the SIEM project being implemented in one of their Province. The fact that other DRR related projects are being implemented in this Province is a plus.

A final decision regarding the Province(s) in which the identified activities will be implemented will be taken after the Eye on Earth Summit in Abu Dhabi. This implementation will therefore take place as part of the second phase of the SIEM project.

4. Analysis of the maps produced during the response to typhoon Yolanda/Haiyan

Analyzing the maps produced in the context of the response to a large crisis, such as the passage of typhoon Yolanda/Haiyan over the Philippines in November 2013, is something that has seldom been done despite the interest of different organization on this topic.

A collaboration with MapAction, the Assessment Capacities Project (ACAPS), the Disaster Resilience Lab (DRL) and the UN Office for Coordination of Humanitarian Affairs (UN OCHA) has therefore established in order to come up with a questionnaire

which could be filled by volunteers in order to analyze some specific aspects of these maps.

While the interest for the SIIEM project are listed in the background section of this report, for ACAPS, MapAction and DRL, the aim was to look at timeliness of data provision in relation to known information needs during different phases of the response, what the main sources of the data used are, what the gaps in data provision are and how well current mapping practices are meeting decision makers needs. More precisely the types of outputs expected from the review for these institutions were to include:

- When (in the disaster cycle) are the datasets listed in the questionnaire being used (and conversely therefore, which datasets are not being used), and does this fit with the information requirements of the response phases detailed in the Multi-Cluster/Sector Initial Rapid Assessment (MIRA);
- Which sources are being used at which time (and conversely, which ones are not)
- Who are the main map producers/donors during which stage of the cycle;
- How does map metadata need to be structured to best facilitate discovery of maps by decision makers, and real-time monitoring of progress against needs (e.g. MIRA phases).

Coming up with a questionnaire that would answer everybody's interest took quite some time and several iterations. At the same time, efforts have been put in order for the questionnaire to be generic and therefore applicable to other events than just typhoon Yolanda/Haiyan as well as allow real time data capture during a crisis.

The second stage was to promote the importance of the map review to a wider community. This was done by presenting the project in different occasions including during the:

- CrisisMappers meeting that took place in New-York on November 6-9, 2014;
- Decision Makers Needs Community of Interest workshop that took place on May 28th, 2015 in Norway (University of Agder), just after the Information Systems for Crisis Response and Management (ISCRAM) conference. Due to the importance of the topic being addressed, SIIEM financially supported the organization of this workshop. The executive summary for this workshop is accessible from here: <https://drive.google.com/file/d/0BygOefTzagSOek9Xb0VDWTZvejA/view?pli=1>.

The map review project raised a lot of interest during both of these events therefore confirming the pertinence of this work.

The third stage was to identify the best platform for the review to be conducted online by remote teams of volunteers who may come from the organizations producing the maps or from the Crisis Mapping and DHN communities.

The first option the group looked at was KoboToolbox (<http://www.kobotoolbox.org/>). KoboToolbox is a free and open source suite of tools for field data collection developed by a team of developers and researchers based in the US, Canada and Chile.

After having integrated the questionnaire in this platform the group realized that one major limitation was the fact that the reviewers could not directly view the map next to the questionnaire and would therefore have to flick between screens during the review making it time-consuming and frustrating.

An alternative was therefore found in the platform developed by Geotag-X (<http://geotagx.org/>) which is a crowd sourcing research project set up by the United Nations Institute for Training and Research's Operational Satellite Applications Programme (UNITAR-UNOSAT) as part of the Citizen Cyberlab project.

The first advantage in using this platform is not only that it has been specifically designed to help disaster relief efforts on the ground to plan a response by asking volunteers to analyze photos taken in disaster-affected areas and could therefore be customized to do the same with maps. The other advantages in using this platform is that it is being hosted by UNOSAT, has been designed to be user-friendly for crowd-sourcing of information and a represent a tool that the crisis mapping and DHN communities are already familiar with.

The questionnaire is therefore currently been implemented in that platform and SIEM will be financially supporting its improvement when it comes to the possibility to directly import and visualize maps in pdf format from the reliefweb web site (<http://reliefweb.int/>). The questionnaire will be available from the following link once integrated into the platform some help/guidance added to each question: <http://geotagx.org/project/mapreview/>. The answers received will themselves be accessible under the form of a database open to all for analysis, and we therefore hope to get a multi-faceted view of the current state of crisis mapping and this even in real time when applicable.

In conclusion, while the review of the maps generated during the response to typhoon Yolanda has not been finalized the process and collaboration initiated as part of this first phase of implementation of the SIEM project will go beyond the initial objective as the tool that is being developed could be used to analyze maps during any past or forthcoming events, and this even in real time.

The analytical capacity that is being developed is therefore expected to help drive timely production of maps for a wide range of decision makers as well as provide the necessary advocacy to support the implementation of the SIEM principles. Specific statistical results are expected to be available during the course of the second phase of implementation of the project.

5. Advocacy, outreach and opportunities

Three platforms have been considered in order to build a community around the SIEM project and engage them into discussions related to the availability, quality and accessibility of core baseline datasets to support disaster risk reduction and emergency management in countries, namely:

- The SIEM pages on AAG's Eye on Earth project web site (<http://eoe.aag.org/>);
- A SIEM discussion group has also been established on LinkedIn (Search for SIEM once logged in);
- A twitter account (@SIEMtweets).

With 77 members, and several discussions initiated, the group on LinkedIn has provided a good platform for building such a community but maintaining the discussion has proven to be very time consuming and often at the detriment of the project implementation itself. The level of activity within this group has therefore decreased over the past months.

The SIEM pages on AAG's web site have themselves been kept up-to-date over the all duration of the first phase and have proven to be very useful not only to keep interested parties informed about the progresses made with the project but also to share the documents produced through the implementation in both countries.

Information management during disasters is a topic of interest to many groups. The SIEM project has therefore been reaching out to two of them in particular:

- OCHA's Information Management Working Group (IMWG) Data Sub group in order to advocate for:
 - Data preparedness to be added to the list of activities of the sub group and have SIEM's work as one example of work currently been done in this area;
 - OCHA to consider the alternative definition for Common and Fundamental Operational Datasets (COD and FOD) proposed by the participants to the June 2014 joint DSWD-SIEM meeting in Manila.
- The UN Committee of Experts on Global Geospatial Information Management (UN-GGIM, <http://ggim.un.org/>) because of their interest in improving geospatial information and services to support emergency responses.

The UN-GGIM actually launched a project aiming at defining and implementing a strategic framework for the necessary geospatial information and geospatial information services are available, of quality and accessible in a coordinated way to decision-making and operations during disasters. The concept note for this project can be downloaded from here: http://www.un.org/Depts/Cartographic/Improving_GI4ER/Concept_Note-Improving_GI4ER.pdf.

Directly connected to the SIEM principle, this project represents an opportunity to discuss, build on, and even go beyond, the framework developed for SIEM by plugging

more Member States to the discussion as well as leveraging some of the other work that has been going on within the United Nations.

The draft report describing the results of the fact-finding analysis conducted as part of this project as well as the proposed strategic framework has been presented to Member States during the 5th session of the UN-GGIM committee that took place in New York at the beginning of month. The recommendations from this report to include geospatial information and services for disasters as part of the priority UN-GGIM topics and to establish a working group to look into this issue have been accepted with the support of 32 countries. - The draft report for this session can be downloaded from here: <http://ggim.un.org/docs/meetings/GGIM5/GGIM5%20Report%20Draft%2014Aug.pdf>.

Serving as an overarching framework to all the above, as well as for the SIEM project, is of course the “Sendai Framework for Disaster Risk Reduction 2015-2030” (http://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf) adopted during the Third United Nations World Conference on Disaster Risk Reduction (WCDRR) in March 2015 and subsequently endorsed by the United Nations General Assembly in June 2015.

Compare to the Hyogo framework for Action 2000-2015 (http://www.unisdr.org/files/1037_hyogoframeworkforactionenglish.pdf), this new framework is not only emphasizing the need to pass from the global/regional to the national/sub national levels to address risk related challenges but does also make a much larger reference to information in general, and geospatial data and technology in particular.

The importance of this topic was also highlighted during the WCDRR itself as reported by Hicham Ezzine who had a chance attending it. Two workshops in particular are to be mentioned in this regards:

1. The Information and Knowledge Management for Disaster Risk Reduction (IKM4DRR) workshop organized by UN ISDR on March 13 with the objective to identify and discuss the main bottlenecks to using data and information for DRR. The institutional, legal and technical aspects of the issue have been addressed through group discussions. The original concept note can be accessed here while waiting for a report to be generated out of this workshop: http://www.preventionweb.net/files/workspace/31691_ikm4drconceptnotefinal.pdf
2. The second workshop organized by GFDRR took place on March 16 and went through the same exercise than the first one.

The Sendai framework does actually not only represent an opportunity for the SIEM project but for the all DM SI to contribute to the global DRR agenda. As such, breakout session aiming not only at looking at the Sendai framework but also the other two key important framework accepted or renewed in 2015, the Sustainable Development Goals (SDGs) and the United Nations Framework Convention on Climate Change (UNFCCC), is being organized as part of the 2015 Eye on Earth Summit.

6. Financial report

Table 2 below summaries how the seed funding provided by AGEDI has been spent during this first phase of implementation of the SIEM project.

Item	Amount (US\$)
<u>In country activities</u>	
Morocco	15,300
Philippines	15,000
<u>Map review analysis</u>	
Development application, workshop	5,000
<u>Salaries</u>	
Coordination, implementation	74,500
In countries focal points	23,000
<u>Travels</u>	
Country activities	8,200
Eye on Earth	5,500
<u>Other expenses</u>	
AAG web site	3,000
Functioning	500
Total	150,000

Table 2 - Distribution of spending for the first phase of implementation

7. Conclusion and recommendations

The SIEM project has been launched to come up and implement with a more coordinated and comprehensive approach to reduce the reducing the current fragmentation that exists among capacity building efforts and this with the objective to improve the availability, quality and accessibility of core baseline data at the time of crisis.

Building on four simple principles, the framework which is being proposed has been implemented in both the Philippines and Morocco using a 3 steps approach: assess, convene and address.

In the Philippines, the assessment took place in 2014 and resulted in the writing of a white paper that served as the basis to convene governmental and non-governmental organizations and identify 6 key activities which, if implemented, would significantly improve availability, quality and accessibility of common operational datasets in the

country in support to Disaster Risk Reduction and Emergency Management in the country.

Benefiting from the support of the Office of the Civil Defense (OCD) and the Members of the National Disaster Risk Reduction Management Council (NDRRMC), starting with the Department of Social Welfare and Development (DSWD), these activities have been implemented since July 2015 and have already led to the definition of geospatial and other data standards as well as the identification of the Common and Operational Datasets (CODs/FODs) needed to support the response.

While several activities remain to be implemented as part of the second phase, what the SIEM project has accomplished so far has already been recognized as a very important contribution to improving decision-making before and during crisis in the country.

The major success factors that lead to such a result have been:

- The support and active involvement of a governmental entity directly implicated in disaster risk reduction and emergency management, the Department of Social Welfare and Development (DSWD) in this case;
- The hiring of a focal point very much involved in country in the same activities as well, Mr Christopher P. Grajo and his team from the Emergency Response Integration Center (ERIC);
- The writing of the white paper as the instrument to engage all stakeholders in the discussions that resulted in the identification of the key activities to be implemented;
- Placing these activities under the umbrella of the Office of the Civil Defense (OCD);
- For the SIEM project to have the necessary resources at disposal to support all the above as well as the implementation of the activities in question.

Taking these success factors into account, the same process has been applied in Morocco.

While it took us more time to identify a local governmental partner, the writing of the assessment paper together with the gathering of main stakeholders as well as the identification of the activities to be implemented took place already.

Interestingly, the activities in question are very similar to those that have been identified in the case of the Philippines therefore potentially indicating the needs across countries might actually be quite the same. This will nevertheless have to be confirmed once the process will have been applied to a larger number of countries.

In any case, the four principles together with the three steps process have proven to be effective during the implementation in both countries. The fact that the four principles are being considered for inclusion in the Implementing Rules and Regulations of Republic Act No 10121 on strengthening the Philippine Disaster Risk Reduction and Management

System and could very much also be used as a reference for the framework on geospatial information and services on which the UN-GGIM is working are additional confirmation of their pertinence.

When it comes to the map review, while the analysis has not been conducted yet, the collaboration that has been established together with the platform which is currently under development will allow for this activity to go beyond its original expectations and therefore provide the international community with an instrument that might improve map production during disasters as well as support the implementation of the SIIEM principles in other countries.

In conclusion, while the activities that have been started have not been fully completed by now, the first phase of implementation has demonstrated that the framework proposed by the SIIEM project is not only relevant but can indeed also be applied and produce significant results when it comes to improving the availability, quality and accessibility of core baseline data to support disaster risk reduction and emergency management in countries, and this in a cost-effective manner.

In view of the above it is recommended for:

- The Eye on Earth Alliance to consider:
 - Expanding the support provided during the first phase in order for the SIIEM principles to be finalized in the first two countries and implemented in other ones. A fiche has been submitted and short list as part of the second round of support to be provided by the EoE Alliance;
 - Presenting the SIIEM framework to the United Nations International Strategy for Disaster Reduction (UN ISDR) as a potential Eye on Earth contribution to the implementation of the Sendai framework for Disaster Risk Reduction 2015-2030;
- The SIIEM team to:
 - Finalize the implementation of the identified activities in the Philippines and Morocco and help governmental entities in finding solutions to sustain the technical capacity which is being established through the implementation of the project;
 - Work at transferring the knowledge and experience acquired in the first two countries to other ones when the necessary resources will be available.
 - Continue advocating for the revision of the definitions currently used by UN OCHA when it comes to Common and Fundamental Operational Datasets (CODs/FODs);
 - Continue being involved in the UN-GGIM project on geospatial information and services for disasters;
 - Finalize the online platform to be used to review maps generated during the response phase of crisis.