Dear Reviewer,

We would like to thank you for the comments and also your time to review this paper carefully with details. Following, you can find our answers regarding your questions and corrections.

I was glad to review your paper, interesting for contents and final aims. I list hereafter tasks you should review for publication. I will reconsider your paper after major revisions. The argument is encouraging, but actually incomplete for methodology and output. Specific reviews of chapters appears hereafter.

Paper is written with current and regular languages, you adopt technical jargons but not with accurate quality of single chapters. Introduction and background list a context in which the paper reveals the output. Concerning landslides, you introduce susceptibility, hazard, risk, survey types, patterns, distributions, statistics of slope failure, management strategies, risk assessment… Monitoring systems miss in the list, to complete landslide treatment from geomorphological and geophysical point of view (too much…) The general description is quite systematic but the references are not complete, because topics are vast, complex and only cited, often with a general redundancy. The database chapter explains technologies for data collection and GIS system for inventory of landslides in a territorial context. The methodology chapter should be the core, but it lists data and characteristics required for single landslide, integrating characteristic of landslide with element at risk, unclear and indefinite. Technology and Platform appears as core of the output with a copious integration of know-hows and available solutions. The study area illustrates landslides with subsequent results, but without specific enlightenment. Susceptibility map with spatial modelling and many types of data emerge again within chapter, confusing the real output.

The paper contains an innovative issue but not well ordered. ROOMA has a complex architecture, for gathering and field survey. The activity includes android environment to deploy free and open solution for data collection. The idea is offering a crowd system, to combine user-friendly tools for geospatial activity on field. The participation could include contribution in a large area, with rapid methods for slide mapping. This challenge is innovative, but not included as priority in the paper, because not clearly linked to the landslide dataset required. The paper overbalances interest on all details of risk assessment, deleting request of landslide data and technology adopted.

Digital field survey exists since around 10 years, within geomorphology final aims, controlled by high precision in GPS location and field GIS integration (MapIt, ArcPad, Geopaparazzi, GISTrimble, and other FOSS4G solutions). You mentioned tablet and mobiles, but the advantage of platform is android environment, customizable and free of costs. The advantage is the online-offline, independent by bandwidth, offering a tool definitely fast, user-friendly and low-cost. These advantages are not enlightened. Clear problems could be bug-fixing, GPS precision. The advantage of online-offline includes clear benefits, you need to highlight them compared to traditional field survey.

You explain the aims as android mobile application on both Offline-Online access. The aim is a fast and storing of data. The visualization and drawing tool is based on central database available to services (mobile, PCs and web browser). Data management improves in hazard event mapping as you declared, but the aim is too general, not simply split.

Mobile-GIS has a clear gain, but limits due to dimension of mobiles, resolutions, spatial tools available, zooming, spatial extent, route, snapping and editing tools have to be revealed. If compared to desktop GIS you have to explain the difference. ROOMA has a mobile solution, introduced in data transfer. Specify the content of slides and clarify what users can do on the field. Mobile-GIS with GPS are tools to increase efficiency in data collection.

Online-offline is an interesting approach with Geojson. How can data be saved and furthermore included in geospatial analysis? Explain a bit better the technology adopted. The architecture is not well shown.

Dear reviewer, regarding you general comments we would like to add the following points:

1. In this work, we do not consider any monitoring system. The idea is to map landslides fast and easy using mobile field survey and satellite image in the same time. Besides to create a database that is also easy to update as the offline can be easily connected to online by geojson-txt file. So even the uploads are very simple.
2. This application was tested in the field with ITC (Netherlands), Yale-NUS College (Singapore), University of Kathmandu and was requested by ICIMOD (Nepal), UNEP, Canton Vaud for forestry in Switzerland, and University in Tunisia. They were all interested to use this application and requested for an updated version. Due to our limited time, we have provided an updated version only to Singapore, Nepal, and Canton Vaud for testing. Recently, YaleNUS College and Canton Vaud have tested the offline application and they provided their feedbacks and comments on the application which some mentioned in the last chapter. We believe this application is far beyond the digital field survey because so many above mentioned showed their interest to use this app.
3. The advantage of this application was mentioned through the whole paper. We talked about free of cost, fast and storing in central database, following mentioned some. We have updated the new version with more highlight in the advantages of this application.
    a. “Abstract: can take advantage of Open Source web and mobile GIS tools for an improved ground-truthing of critical areas.”
    b. “Abstract: This prototype assists for quick creation of landslide inventory maps (LIMs) by…”
    c. “Introduction : 2. Fast and easy acquiring and storing of data and information”
    d. “Methodology: This methodology compensates the lack of landslide inventory and precise topographic process, decreases the resources and time needed for storage and update. In addition, the combination of the ROOMA data collection method in the field with GPS and satellite image as source maps can significantly improve the accuracy of input field data.”
    e. “Technology: The mapping process is quick and easy.”
    f. “Conclusion: Moreover, the ability to use the Open Source software indicates that analyses can be carried out without incurring the high costs associated with software acquisition, a particular advantage for developing country, researchers and government officials.”
4. We mentioned about the traditional method but comparison with them is not the purpose of this work. Indeed we wanted to show the differences of the work has been done in the office compared to our field work, which is highlighted in the result. As your request on S10 to remove the different techniques figure, it is removed and replaced with figure 2.

5. References for this paper were 48. We have added some more references as you requested that references were not complete
6. “Database” sub-chapter was connected to the background and talking about available database around the world. As it was not clear for reader, we merged it with subchapter Landslide data collection. We also added more details and a figure for data model of this study in methodology
7. The ROOMA has a complex architecture, that is true, but gathering the data and field survey for ROOMA is not complex and it is very easy. In our field trip, the data was recorded by those who did not have proper experience on using tablet or android application and they found it very simple. It just took 15 minutes in the field to show them how they can use this app and the rest of the 2 days of our field trips, they mapped all the landslides without any issues. We did not do any comparison test about field work and office work about gain of time however we did compare them by result. We tried our best to simple the offline version. The online version however needs more knowledge and experience especially for an admin user.
8. The tutorial and codes will be updated at the end of the study within a university link. For the technology adopted and database we have added more details and figure of data model in the new version.
9. Regarding your several questions about synchronization of the data: Data are saved in Geojson-txt file and then uploaded to the database when internet is available (as mentioned in the paper) so there is no synchronization. The developer should know how to extract data as geojson out of Leaflet map and then transfer it to a file using php and finally using another script in PHP, having the option to upload them back to server again. These are very technical and as mentioned tutorial and codes will be available later. We tried our best to explain it which NHESS readers can understand it simply.

We have merged and updated the structure of the paper as you requested. Following you can find your answers regarding your separate questions in the text.

Commentato [S1]: Please simplify differences, is not clear for data typology and requirements.

We have deleted this sentence and we have updated “Landslide map” to landslide inventory maps (LIMs)

Commentato [S2]: The access of field area is difficult (dynamic nature, what is?), because you require landslide inventory for final map.

The dynamic nature of landslides refers to the danger and difficulty to access and measure, where landslides usually happens in steep area with the possibility of reactivation. This is a cited sentence.

Commentato [S3]: Long process and intensive resource. What are these parameters?

We have updated to: “Landslide inventories are time consuming and resource intensive”.

Here again, it is a cited sentence to explain the difficulty of making landslide maps and mentioned in the text as follow:

“Typical issues for creating these maps include (Guzzetti, et al., 2012; van Westen, et al., 2006; Safaei, et al., 2010):”

Commentato [S4]: “GIS for landslide susceptibility and hazards” is redundant in the paper. These are complex and fundamental steps in risk assessment, with methodology since 10 years… Why do you consider these measurements as concept linked to landslide inventory?

In the new version, we will reduce redundancies for “landslide hazard and risk”. As it is mentioned in the background and figure 1, landslide inventory serves as the basis of landslide susceptibility, hazard and risk. They all need a data collection or verification process in the field.

Commentato [S5]: “mobile-GIS offers technology for more effective ground-truthing and a rapid tool which can systematically fill a database, especially for unexperienced mappers. Currently, there is a high possibility to apply mobile-GIS including GPS and mapping tools to significantly increase data collection efficiencies”. Please explain the efficiency of the output. User obtains field data, not clear which geometries and contents. And which specific information is collected.

The user can obtain any kind of data in the field with GIS and GPS mobile technology. The GPS is given 4 to 15 meter accuracy. However, as we also use satellite image as base layer, the accuracy of the map depends on the quality of that image. In this work we used a 5 meter resolution satellite image (explained in result chapter). Coupled field survey and image interpolation, definitely increase the quality of our data. The detailed information of which data collected can be seen in the text paragraph and chapter 3. We will update it in the next version as:

“Currently, there is a high possibility to apply mobile-GIS including GPS and mapping tools to significantly increase data collection efficiencies such as location accuracy and detailed information of features.”

Commentato [S6]: A rapid offline-online technology is the output, absolutely appealing, but not well-defined as collect data on landslide events, hazard impacts and damaged infrastructure. Please specify which information and which aim users can collect during survey. This prototype provides a solution for preparing landslide hazard maps in relation with vulnerability. Too general, a Mobile-GIS offers support to landslide hazard with vulnerability (you did not introduce vulnerability before…). Be clear with details of aims.

The application with online-offline technology was tested in a real study area for data collection of landslide events (figure 13), hazard impacts and damaged infrastructure (figure 14, 15, 16), which is the three main outputs of the application. The aim is to facilitate the data collection process in the field using this advanced technologies for authorities, stakeholders and the general public. The detailed information of which types of data/information are collected can be seen in chapter Result and methodology.

Since the paper is focused on the application, we only added some selected results and comparison with the old version of visual interpolation (figure 15, 16). We have added this following sentence (more details of outputs can be seen in the result chapter): “The preliminary result of this application for landslide maps is also compared with the results obtained from satellite image interpolation.”

We have deleted the vulnerability sentence to avoid complication.

Commentato [S7]: The chapter introduce risk management, with tasks and criteria. Landslide inventory is a part of methods available, but also the target of paper. What is the aim to illustrate all steps that you do not face? Focus on landslide inventory and the architecture provided for it.

This is the background chapter for landslide hazard and risk which is a part of the title. We mentioned available methods and why landslide inventories are more important, serving as the basis of landslide hazard and risk assessment and are the simplest method. In the sub-chapters of this background chapter, we focused more on the background technology and landslide inventories which you also suggested to remove them in S10.

We have deleted following sentence:

"The classification comprises three different methodologies: 1. Qualitative 2. Semi-quantitative and 3. Quantitative."

Commentato [S8]: Which kind of stakeholders and for which role?

We have deleted stakeholders from the sentence for clarity. This paper and work does not focus on stakeholders and roles.

Commentato [S9]: The subchapter is poor of matters. You list again landslide inventory data, hazard factors, and elements at risk with a table about contents, but you declare to focus on inventory one. Why do you need to repeat? I suggest merging with next chapter.

We have merged as you suggested.

Commentato [S10]: Techniques for data collection are actives since years. The list of them is outside the goal of your work.

The title of this paper is "Fast Data Acquisition of Landslide Hazard and Risk" and we want to highlight how the mobile-GIS technology plays an important role in acquiring ground-based field data collection. Therefore, we believe that it is important to mention different/conventional and available techniques to prepare landslide inventory maps (also as you requested in S7). Subsequently, we mentioned in the paper that there are few works using mobile technology for landslide field survey, which served as a motivation of our work.

We have deleted the figure 3: "Overview of techniques for landslide data acquisition" as you requested.

Commentato [S11]: You reveal existing background on similar experiences, but a bit poor. Please enlarge examples, here a bit limited.

We have updated this sub-chapter.

Commentato [S12]: What is the aim of this sentence? It is out of context.

We have deleted.

Commentato [S13]: Please explain what is

BGS-SIGMA is the name of the application. For more details you can refer to the resource. We have updated more details.

"The BGS digital field mapping system (BGS-SIGMA mobile 2012) includes customises ArcMap 10 and Ms Access 2007. **It is customised of two toolbars for mobile and desktop. The mobile toolbar** is to capture the data in the field on rugged tablet PCs with integrated GPS units **and desktop toolbar focuses**

on data interrogation, data interpretation and the generation of finalised data. This is free software however it requires Arc Editor Licence to run (BGS, 2013)."

Commentato [S14]: If your mark Open Source GIS as guideline, these techniques does not look compatible…

We did not use any of these techniques. It is just an example of different GIS tools for landslide inventories or data collection. We will update this chapter with more details of why each was not suitable for our study.

Commentato [S15]: Output running on rugged tablet, able in few copies, only for technicians. Not clear why it is not in Technology of ROOMA.

GIS technologies are wide, and most of the times, they are selected based on the developer's preferences, capacity, knowledge and ease of use. In our case, we did not select ArcGIS and ArcMap as (obviously) they are not free and open source solutions. We will add this in the respective chapter.

Commentato [S16]: Mobile app in android collects info on field, I supposed by different users. This is the advantage. Dot point or polygons can be marked on field since a lot of years. MapIT e.g. or ArcPad, if you maintain ESRI environment. If you pass on Open Source GIS the environment is another. With other solutions.

MapIt is no longer available for purchase. The database capabilities of the Spatial Data Service (SDS) in MapIt will be available through ArcGIS for Server Basic version 10.1. [ref: http://www.esri.com/software/mapit)]

MapIT is no longer available and ArcPad does not look compatible for this paper (as you mentioned in S14) because they are not open source and we do not focus on digitizing in this chapter. This chapter rather explains available frameworks and platforms for data collection related to landslide data collection and available online database for landslide hazard and risk. The purpose of this work is far beyond the digitizing, however, drawing tools plays an important role in this application because we made it extremely easy and fast. We added the advantage of this mobile application in the result chapter.

Commentato [S17]: You mentioned GeoServer, here you list only MapServer. Why this choice?

This was simply a reference of the cited works, in which MapServer was applied. In this Chapter, we did not compare different technologies and it was rather focused different available platforms on using GIS for the landslide inventory. We mentioned already, but we will update with the clarification of why we could not use any available platforms and we implemented our own platform.

Commentato [S18]: Cadaster?

A cadastre (also spelled as cadaster), https://en.oxforddictionaries.com/definition/us/cadastre.

Commentato [S19]: Two professional outputs, one is a company and one is a crowd emergency webgis. What is your choice?

We explained different available platforms for GIS landslide and the only one using mobile was BGS-SIGMA. So we provided some other popular mobile applications which are not about landslide but they are all using mobile for data collection in the field. However they were not still advantageous for our works

as we needed satellite image and offline version working together. Therefore none were compatible to our work that is why we made a new application. We will update it at the end of this chapter.

Commentato [S20]: Why do you collect point, line and polygon as shape of landslides? Do you plan different methodologies?

No. Landslides can be collected on all different shapes and we mentioned before that the best practice is polygon. Sometimes, collecting data in the fields are in urge and therefore, they do not have time to draw polygons. In this case, they can simply use a point marker or maybe a line to record it, and then they can update and edit it later in the office. This is a user-choice depending on their needs and the application made it possible for their preferences.

Commentato [S21]: Not clear

Updated as:

"This methodology compensates the lack of landslide inventory and precise topographic process, and decreases the resources and time needed for storage and update."

Commentato [S22]: ROOMA should improve quality and quantity of inventory. GPS is basically important, depend also by resolution and signal. Field survey usually requires control on GPS signal and calibration, otherwise field survey is not precis. Did you treat it? Which kind of satellite images do you use? Field data is corrected by images. But is it on field control or post-processing? Please specify this integration, it is fundamental.

We mapped it directly on the field and therefore, we did not do any post-processing afterwards. We using mobile GPS and GPS signal and calibration is not the goal of this work. The user can obtain any kind of data in the field with GIS and GPS mobile technology. The GPS is given 4 to 15 meter accuracy. However, as we also use satellite image as base layer, the accuracy of the map depends on the quality of this image. In this work we used a 5 meter resolution satellite image (as explained in result chapter). Coupled field survey and image interpolation, definitely increase the quality of our data. We explained in the result chapter, which satellite image we have used for clarification of data collection. We can use any satellite images based of our budget. In another test, for an area we did not have satellite images and we used google image.

Commentato [S23]: Title not acceptable. Integrate with previous chapter.

We have merged with previous one. We want to highlight that our application, compared to others we mentioned in background has an advantage and we can also record element at risk related to each event. So the final database not only has the data on landslides but also GIS data on damage (element at risk).

Commentato [S24]: Confusing. The previous methodology treats landslides with characteristics (materials, type, and damage). Here element at risk. Merge all data type in same chapter.

We have merged accordingly.

Commentato [S25]: Do you mean land cover mapping? Otherwise you cite a company…

Yes. We mean landcover mapping by geoville as it is referenced too.

Commentato [S26]: Too vague, specify simply your aim.

We have updated in the revised version.

Commentato [S27]: Which is the difference between Open Source Geospatial Software and Open-source geospatial technology. Clarify.

They use different technologies to implement software. What we used in this paper are all technologies. Examples of software are those mentioned in the beginning of the chapter (UNEP, 2014; Geoville, 2016; USHAHIDI, 2015). Software is available and ready to use, while technology is something we need to do some more programming to achieve what we need. The difference of technology and software is out of the context for this paper. They are actually being used as synonym here for not having redundancy.

Commentato [S28]: Which DBS? Who is the owner?

We have updated: PostgreSQL, 2015; PostGIS, 2015; MySQL, 2015; UserCake, 2015

The owner? It should be admin, as always in all database.

Commentato [S29]: Why do you repeat so many times?

We have deleted.

Commentato [S30]: This is innovative. You have to dedicate more time then past experiences on classic landslide database… Your app treats with PhoneGap, linked to existing web development. By website I read "hybrid applications built with HTML, CSS and JavaScript". You should specify which link on web storages, simply to include in your methodology.

This is not a hybrid application, as we mentioned since the beginning, it has 2 versions. One is offline and one is online (as can be seen in figure 5). The output of offline map is geojson-txt files which will be uploaded to the online version when internet is available. As we had to spend 8 hours or sometimes 2 days in the field without internet or very poor internet, hybrid applications are not advantageous for our work.

Commentato [S31]: Which one? Both.

Commentato [S32]: Correct but redundant sentence

We have removed it accordingly.

Commentato [S33]: Describe which info by photo

We will update the methodology chapter with more information on database.

Commentato [S34]: User profiles

It offers more than user profiles for the application. By meaning user management, users can manage different things and admin can define different public/private pages and privileges for different users. The online application will not be loaded if a user does not log in, which we refer to as authentication.

Commentato [S35]: Not all components of architecture are explained. Consider them and introduce.

We added them (PHP and JQuery) and updated.

Commentato [S36]: Why do you use prototype definition? The app will be updated, is not completed working or you need a piloting?

This application is already tested for a couple of times in the field, however, it is still a prototype because to use it widely, it needs to be completed, updated and supported in different areas. This is not the final product. We have mentioned some problems we faced while using it in the last chapter. We also provided some new versions for other institutes and universities for their works and test.

Commentato [S37]: Explain which kind of combination.

As can be seen in figure 8, there are different base layers from different sources. We can have different base layers in the offline version. Openstreetmaps, satellite images, google maps or vector data, all can be added in advance to both offline and online versions. We updated the sentence for better clarification.

Commentato [S38]: Not clear which analysis you intend

To convert the stored Geosjon to database and then to .shp file, we do some analysis. For example, we convert latitude and longitude to a geometry column in PostGIS. The querying in database is also another type of analysis. An example of result is in figure 14, showing number of landslides that caused damages to roads and so on. Calculating the area is another analysis, which can be easily done in PostGIS. They are mentioned in the result section.

Commentato [S39]: Editing events of landslides based on satellite image is not innovative. Field survey exists since a lot. You should mark the online-offline technology as real advantage on field. You did not describe the relations to update database in online-offline condition. You should describe how can be data collected be synchronized. Do users choose online-offline mode or is automatic upgrade based on bandwith? Figure 8 is not innovative, simply you edit a polygon on a raster image, what is new?

As a whole, editing landslide events on satellite image using a mobile device/application in the field itself is innovative. This application was tested in the field with ITC (Netherlands), Yale-NUS College (Singapore), University of Kathmandu and ICIMOD (Nepal), UNEP and Canton Vaud for forestry in Switzerland, and University in Tunisia. They were all interested to use this application and requested for an updated version. Due to our limited time, we have provided an updated version only to Singapore, Nepal, and Canton Vaud for testing. Recently, YaleNUS College tested the offline application and they provided their feedbacks and comments on the application.

As we mentioned before, we don't synchronize data automatically. Data are saved in offline as Geojson and then uploaded to online or directly added online in database. The admin user has to deal with updates and other things, as it is a normal task in all organizations working with data.

Figure 8 shows an example of online version. We explained all the tasks that both offline and online versions can do in this paragraph:

"The offline component of ROOMA (Figure 6) contains the following modules: 1. Geolocation, 2. Map with combination of multi-source base layer (Openstreetmaps, Satellite Image, vector data) 3. Map drawer (Line, Polygon, Rectangle and Marker) 4. Satellite image as the base layer and 5. Saving options as Geojson-txt file in the offline mode. The mapping process is quick and easy; different features can be

drawn on a map drawer after geolocation. Following, different satellite images as base layers assist for finding different objects on the map. However, the online component presents more modules besides map and geolocation modules: 1.Saving online events directly to database, 2. Photo mapping, 3.Photo and event clustering, 4. User privileges 5. Data storage and analysis, 6. Import from/Export to Shape files."

And then, we provided some photos to give the reader an idea of how they look like, for example different base layers (S37). We have used available technologies; therefore, we agree that editing a polygon itself is not innovative, but the application can be considered as innovative as a whole, especially as it provides an offline-online approach for data collection in the field. As you mentioned before, the architecture is very complex and to come up with this approach, we had to merge and program different functionalities of the application.

Commentato [S40]: Clarify distance, features, polygon revealed. Actually it is only a picture.

This chapter explains about the study area and therefore, figure 10 is only an overview of the area we did in our field survey. We clarified and mentioned the results achieved in the result section.

Commentato [S41]: Parameters not present in previous list within methodology. Did you add new text? Why?

These are not parameters, but an example of what could be added while recording landslides. To avoid redundancy and to give a clear idea, we added the "e.g." so that the reader can remember what we mean by land use features. We have updated it again as follows:

"The mapping of landslides (using polygons) was accompanied by data collection on land use features for each event (e.g. roads, rivers and forests)"

Commentato [S42]: Clarify the link between mobile-GIS and frequency distribution

Frequency is deleted.

Commentato [S43]: It is a reason why you integrate satellite image. It has to be mentioned within definition of methodology

We have added accordingly.

Commentato [S44]: It is a bit ambiguous. You update landslides with you field actions, but some of events are not accessible, but visible only with distance like in Figure 12. I would consider as integration.

Yes, that is why we mentioned "assisted visual integration". You can easily look around and look at satellite image, and confirm landslides or not. We combined both field surveys with visual interpretation. We clearly mentioned that before (S43).

Commentato [S45]: Large landslides are visible on satellite. Did you edit on desktop GIS or check shape of landslide on field. IT could be a tool to upgrade what is existing as polygon.

We collected all landslides in the fields, and then compared with an example we did in the office. (Figure 15). Our work only took 2 days of field trip and one day of uploading them to online, and the work in

office took couple of weeks. There was no existing polygon when we started the field trip. That is true having a tool to show existing polygon can be a good idea, but we do not have it in this work for offline version. As we mentioned, online version has the option to upload shp file.

Commentato [S46]: These are scientific and practical results. Not clear and too general. Delete.

We can have all different results and we have updated that we mentioned just some selected results.

Commentato [S47]: New version of output

In methodology, we mentioned that which type of data including materials and damages were gathered. (Refer to table 1). Thus for all the data we gathered, we can have different outputs. We can easily see distribution of landslides (figure 13) or we can also do query on the database and see distribution of landslides that are debris (materials) or can even see all the landslides which have high hazard degrees (Hazard factors) and select those areas as urgent areas to consider. We can make hazard susceptibility and by having element at risk, we can have risk. As we mentioned, we can have all different output maps for landslide hazard and risk, and we only mentioned some here.

Commentato [S48]: This conclusion is positive. You declare landslides in gullies visible with high resolution images, while adding filed survey you can define and edit better the polygons

This example was to emphasise that field survey even with a low resolution image can give us better view of the landslide. As in the field we simply noticed that is bigger landslide and not two separate landslides as drawn in the office. We have updated more clarification there.

Commentato [S49]: Reply all these aims within discussion. While you focus simply on data collection and database…

All works and articles need a conclusion at the end. Unfortunately we cannot delete conclusion from our paper. We updated it to “concluding remarks and discussion”.

Commentato [S50]: Quite old sentence…

Commentato [S51]: You repeat several times elements at risk, but I do not see some examples about field trip or database about them

We have added the data model to the methodology. In our field trips, we did not collect and draw features for element at risks like roads or houses because there were crisis in Nepal those time and finding a Jeep with petrol was very hard so we had limited time using the jeep (2 days). However, we did gather them in our offline form of app (Table 1: Number 8 and 9) by pointing out whether there are roads, houses or others close to this landslide or not and also whether they are damage or not. Figure 14 shows an example of damage data (Element at Risk which are damaged): how many landslides were close to the road and how many have damaged road.

Commentato [S52]: You do not mention before. Who participates and which organizations or teams.

We have mentioned that in Line 33 (page 1: accessible to authorities, stakeholders and the general public) and in the last line (to use such data for landslide hazard and risk assessments for both stakeholders and local authorities).

Data can be used by anyone who needs and are interested in it. They are so many organizations that are interested in landslide data. For example, transport companies need to see relations between roads and landslides and their damages. Different participates and organization is out of context, we just mentioned it in overall.

Commentato [S53]: Concept of data synchronized and gain of time with ROOMA are not mentioned

As we mentioned already several times, there is no synchronization in this work. It was not necessary for us to include. Data for landslides can be updated from time to time. Thus, it will be added and updated to database based on the responsible admin's choice.

We did not do any scientific test for the Gain of time (if you meant to say fast acquiring with ROOMA, compared to other conventional approaches?) But it is obvious collecting data in mobile is fast compare to paper work. Still most of the landslide field works collect information on the field with paper (We mentioned some in background) and those need to be added, typed, and drawn separately one by one in the office which require more times however we just need to click, upload file and the online application does all for us with one click.