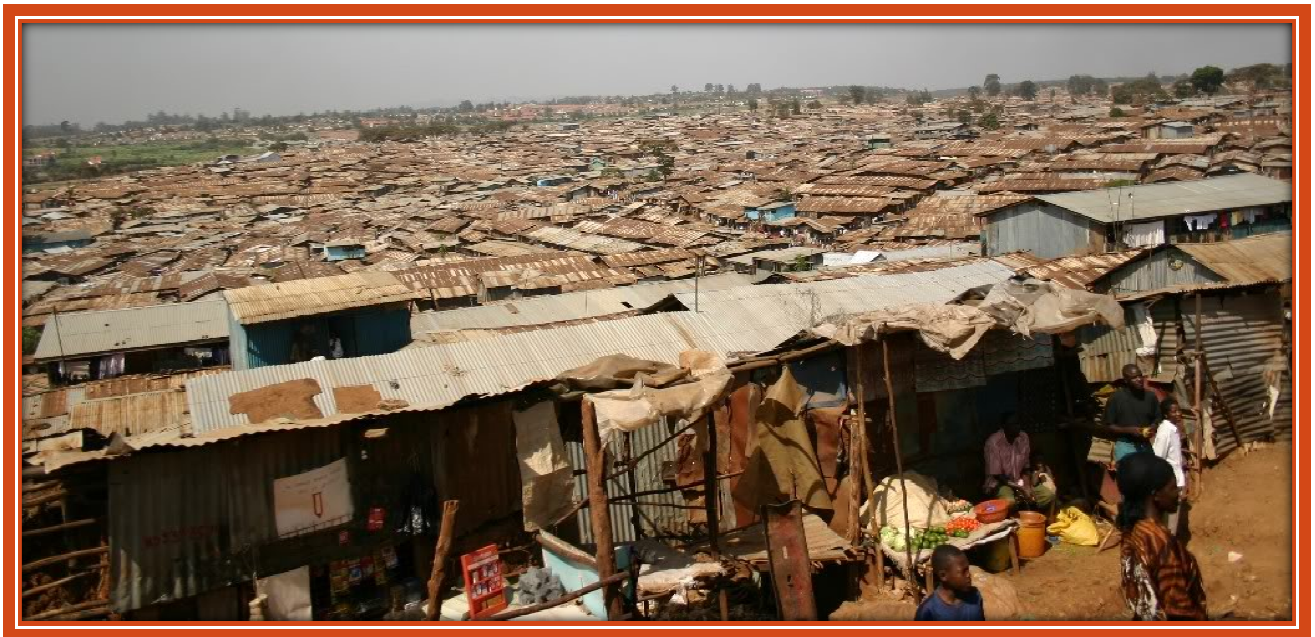# Slum mapping as a tool for improving the life of slum communities in Africa

Comparative studies of cases from Kenya, Uganda and Namibia

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M.SC. Programme in and Management

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The project is focused on different approaches to mapping slum areas in sub- Saharan Africa and the benefits which are gained by local communities of slums, due to the outcome of these projects. The main goal of the following report is to find common aspects which ensure success and impacts local communities in positive way. The report's analysis method is based on comparative studies with four cases of mapping projects. The discussion is based on sub- questions which answered will give an answer for main research question. General outcome of the report and findings are presented in closing chapter.

Title: Slum mapping as a tool for improving the life of slum communities in Africa: Comparative studies of cases from Kenya, Uganda and Namibia

Theme: slum mapping, slum enumeration

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Preface

The theme of the thesis is mapping slums and benefits which are gained by local communities of slums, after mapping the area they live. The thesis is written by Iwona Magdalena Kruk- student of 4th semester of M.SC. Programme in Land Management at Aalborg University. The period when the thesis has been written is between 1st of February 2015 and 10th of June 2015.

References

In the thesis there is used *Chicago Style* of referencing which is made in the way 'author- date'. Two types of references are used in the following project. The first one is referencing in the text to highlight the source of information used in the text. The second, full reference is located in the 'References' chapter, at the end of the report. The examples of construction of references included in the text and at the end of the report are given below:

- [Bacquier 2008, p.35-36]
- Bacquier, P. 2008. 'Urbanisation in developing countries: is the 'Cities without Slums' target Attainable?'*International Development Planning Review.* 30(1)

The number of pages in the first type of reference is given only in the situation of quotation.

Citation presented in the report and written in quotation marks and using *italic*. The source of quotation is given right before or after citation.

Figures and tables used in the project are numbered in succession and are included in the text of report. In the situation when table or figure is prepared by the author of the project based on found information, than the source of the information is given in the text as well.

There are 6 appendixes attached to the project. First four of them are interviews made by Skype, with additional questions sent by email, which are attached to the end of each interview. There is information about interviewed person provided together with the date of interview. Two last appendixes are maps which titles and sources are given as well.

There are also abbreviations used in the project. Most abbreviations used for the first time has its full name given in brackets, apart from well known names of organisation e.g. UNESCO. For easier checking during reading, all abbreviations and their full names are listed in the table below (including these which are not explained in the text):

Abbreviation	Full name
CLIP	Community Land Information Program
GIS	Geographic Information System
GPS	Global Positioning System
JICA	Japan International Cooperation Agency
LAS	Land Administration System
MDG	Millennium Development Goals
MSD	most different systems
MSS	most similar systems
NCC	Nairobi City County
NGO	Non- Governmental Organization
NIUPLAN	Integrated Urban Development Master Land for the City of Nairobi
NLP	National Land Policy
OECD	The Organization for Economic Co-operation and Development
PRA	Participatory Rural Appraisal
SEA	Strategic Environmental Assessment
UNESCO	The United Nations Educational, Scientific and Cultural Organization
UN-HABITAT	The United Nations Human Settlement Programme
UNICEF	The United Nations Children's Fund
VHR	very high resolution
WHO	World Health Organization

Introduction

In 1800 the number of population living in urban areas was on level of 2% [www.pwc.co.uk]. 65 years ago the number was already almost 30% and nowadays the world is half urbanized [www.pwc.co.uk, Glaeser 2013]. It is calculated that every week 1,5 million of people become a members of urban society [www.pwc.co.uk].

The biggest urbanization growth is seen in poor countries where are located 70% of all cities, with population larger than 1 million [Cohen 2005]. There are seen positive and negative aspects and consequences of so rapid urbanization. Unfortunately one of the most visible and the most difficult to solve is fast growth of very poor and often informal settlements. These areas are called slums and cause big problems for sustainable development and management of urban areas. These are also areas where people live in conditions under the level of generally approved life conditions, in deep poverty with no access to basic infrastructure and facilities [Cohen 2005].

The part of the world with the biggest problem with slums is Africa where 72% of urban population live in slums. Asia and the Pacific slum population is about 43%, in Latin America 32% and in the Middle East and Northern Africa 30% [Cohen 2005].

The urbanization of African countries is uncontrolled and very fast. Large number of people moving from rural to urban areas are low educated and low skilled, what limit their possibilities to get a well paid job and to be able to financially support family [Bacquier 2008, African Development Bank Group 2012]. Municipalities' offices are not prepared and capable to deal with so fast changes in cities and cannot offer to new coming people better conditions to live [Cohen 2005]. Often, slums do not provide the most necessary to live facilities and infrastructure. People live in low quality, dangerous houses without access to e.g. running water, sanitation facilities and electricity [UN-HABITAT 2003].

There are two types of actions seen in the activities connected with increasing the lifestyle level in African slums. First of them is connected with NGO's works on increasing life conditions and access to facilities which are crucial for living. Other

activities are introduced by municipalities and other levels' officials to involve slums in local planning and to increase access to facilities and infrastructure by creating local plans of development for these areas [Cohen 2005].

To be able to provide any kind of help or propositions of development, it is crucial to have basic information about the place. Very often slums are white spots on the map of the city, and it is even unknown the population of the slum [Cohen 2005]. The need for data and information is very high and every type of projects which main goal is to develop slum, need to start from enumeration and data collection [Cohen 2005]. For different purposes projects, there are different types of data collected, but more information, more possibilities to use it and to improve the life of slum societies.

The following research will focus on four projects which main goal was to get information, about the slum demography and infrastructure, for using them in further planning and increasing the level of life of local societies. All cases are located in Sub-Saharan Africa, as a place with the highest amount of population living in slums.

The main purpose of the following research is to investigate the way how projects were held and what kind of benefits did local societies gain by running these projects. It will be analysed if there are seen any common activities, among all projects, which could be highlighted as a key factors of successful engaging slums into local planning and improving local societies daily life. According to the purpose of the project there is a research question set, as follow:

How projects of mapping slums are used to improve life of slums' societies?

To be able to answer on the main research question, there are three sub questions provided. Sub questions will not be used only for achieving the answer for the main question, but they will be also guideline for setting the structure of the analysis, which will be described in details in the next chapter focused on methodology of the following project. Sub questions defined for this project, ale listed below:

1. How did the local societies participate in the process?
2. How do municipalities use collected data for improving the life and environment of slums?
3. How do the land use and daily life of slums' societies change?

The first question will let to analyze if communities were directly involved in processes which main goal is to improve their life. It will be also discussed if public participation in this type of projects do matter and causes positive and successful outcome of the project.

One of ways of improvement of life of local societies is to invest and develop their environment and place they live. Often these investments are made by municipal or regional authorities, and these projects, based on findings from mapping projects, will described and analyzed. What is more, other projects, made e.g. by NGO's and caused directly by projects of mapping, will be described as well.

Apart from development of environment and neighbourhood, there might be observed other improvements which might affect communities' life and might be caused by projects of mapping slums. These other benefits and advantages of analyzed projects will be described in the last part of analysis.

Methodology

The choice of the method which is used in the project may determine the whole outcome of the research. Thus it is crucial to choose the most suitable, for the problem of the research, method. The following chapter will describe the method chosen for this project and will also analyse the critique and disadvantages of the proposed method. In the next part there will be cases chosen for the project described, followed by argumentation why these cases are chosen. The description of the structure of the project and sources used in the research will close the chapter.

Comparative study method

The method proposed for the following research is called comparative studies and is one of basic methods which let to establish and formulate general propositions and conclusions [Lijphart 1971]. In simple words the comparison means *'study of similarities and differences'* [Lane and Ersson 1994, p.11]. Cases chosen for the analysis are compared according to defined parameters which let to study the same aspects of each case [Lane and Ersson 1994]. The number of analysed cases should be minimum two, but more cases and variables, more accurate result could be given and more possible theory, based on the analysis, can be proposed [Land and Ersson 1994].

Lim in his research [2010] defines two different types of comparative studies. First of them is called method of *most similar systems* (MSS). The MSS method takes into consideration two, for the first sight similar, cases. Among the similarities of the cases there are significant differences searched for. These differences might be a base for formulating theory and general assumptions of the analysed problem. The second type of comparative studies is method of *most different systems* (MDS) which let to search for similarities among the cases which seem to be significantly different. Similar to MSS method, defined similarities let to define theories and general rules which might be characteristic for the chosen problem solution [Lim 2010].

The following project, focused on mapping slums and benefits of this activity, will be handled by the MDS method. There are chosen four generally different projects

which were done in three different locations. The differences which determine the choice of particular slum are:

- Size of slum (there are very big and rather small settlements chosen)
- Purpose of mapping
- Approach to the project
- Success of the project
- Institution which initiated the project (one project is initiated by governmental institution, one by private researcher and two by NGOs organisations)

Among the differences in approach and method of handling each of them, there will be found and analysed similarities which will let to conclude which type of actions might be seen as these which determine or preclude benefits gained by local societies by mapping areas they live.

As every research method, there is also heavy critique of the comparative study method. The most important findings about the negative aspects of the method are pointed out by Lijphart in his paper from 1971 [Lijphart 1971]. The first disadvantage of the method is a fact that the comparative study is very general. It does not contain any statistical or technical way of analysing the cases and variables thus the outcome cannot be taken as the one and only outcome of the analysis [Lijphart 1971]. Due to this generality it is often called the comparative approach or strategy, but not a scientific method [Lijphart 1971]. According to the problem described above Lijphart proposes further studies and using some of statistical methods as a second stage of the analysis. The generality of the method is also pointed out by Pieter [Pieter 1967] who confirms that comparative method of the research might be useful but is not technical enough to be able to solve the scientific problems by itself.

Due to lack of time and financial support the author of the following project decided to keep the possibility of using statistical method as a possibility of further research but it will not be used in the following research.

The other negative aspect which seems to be suitable for this project is a small amount of cases and variables which may cause giving too large meaning and significance for findings (mostly negative) [Lijphart 1971]. Thus the author of the following project needs to be aware of the possibility of determining the final

statement on too many negative or just incorrect outcomes of the analysis of variables. The knowledge of the possible wrong conclusion will keep the author very careful in making the final statements of the conclusions of the project.

Cases

There are four cases of slums mapping used in the following project. In the beginning of the searching for suitable cases the author was planning to use four projects from four different locations, but afterwards it was decided to use four projects, but two of them were made in the same location.

First variable of choosing cases was the location in Sub-Saharan Africa. Author of the project has big interest in social issues in poor countries of this region, thus the narrowing to this area was quite natural choice for the author. Another point was to find cases in countries which are post British colonies which could ensure access to the data and information in the English language. After setting these variables it was clear that there is very limited choice of cases. In the end it was decided that the last case will be a case from Namibia which is post German and South African colony. The case suits the method of most different cases and seems to be a perfect choice for the following report. According to the fact that it is post South African colony, all documentation is also available in English, what meets previously required conditions. All four cases are briefly described below.

Kibera

First project is called Map Kibera and was the boost for the author of the following chapter to consider the problem of mapping slums as a topic for the research. The project of mapping Kibera is the most popular and well known project of this type, with number of videos posted on the internet, which touch upon the project itself. Kibera (Figure 1) is considered as a one of the biggest slums in Africa with the area 2,5 square kilometres divided on 13 villages and total number of citizens varied from 200,000 up to even 1,000,000. There is no official information about the population. Until the project the area of the Kibera was white spot on the map of the city, with no basic information, about life in there, given.

The Map Kibera is a project founded by Erica Hagen and Mikel Maron, in cooperation with number of partners and cofounders e.g. UNICEF [www.mapkibera.org]. The project was held in 2009 and 2010 and ended up with group of thematic maps [Hagen 2010]. The goal of the project was to give the local

society knowledge and possibility of using sources and facilities located in the area. The main goal was to make people aware of the place they live in [www.mapkibera.org]. There have been made previously couple of projects which were addressed to other audience, which did not have any meaning for the people most interested- its citizens. Hagen and Maron decided to fully address the project to the locals and with their help create a platform where all information could be gathered and shared [www.mapkibera.org].

Figure 1: Slum Kibera
Personal evaluation based on www.maps.google.com

Kianda

Second case is a project called Map Kibera Project, which was handled by Italian PhD student Stefano Marras. The goal of the project was to create maps of physical and socio- demographic features in Kibera. Due to the lack of funds, Marras with help of local people were able to make a map of one village (Kianda) out of 13 (Figure 2) [www.mapkiberaproject.yolasite.com]. There are no further plans to continue with the project to map the whole area of Kibera [Appendix 1]. Due to the fact that Map Kibera, project described above mapped already most of the facilities, there would be only need to focus on socio- demographic issues of the Kibera.

Figure 2: Village Kianda in Kibera
Personal evaluation based on www.mapkiberaproject.yolasite.com

Katanga

The third case is a project made in slum Katanga located in Kampala, the capital of Uganda. The slum is located in outskirts of town between Makerere University and Mulago hospital (Figure 3) [Adoko and Sliuzas 2012]. The project was held in 2011 [Adoko and Sliuzas 2012] and its main goal was to improve the life of local society of Katanga by mapping facilities and by giving free access to the information. The project is a part of *Mapping Slums around the World* project invented by Richard Sliuzas and Rob Lemmens. The project is made in cooperation with Google thus each map is created in the Google Map Maker software (more information about the methods used in each project will be presented in further chapters). The project of mapping Katanga slum has never been finished, due to the lack of long-term interest of volunteers [Appendix 4].
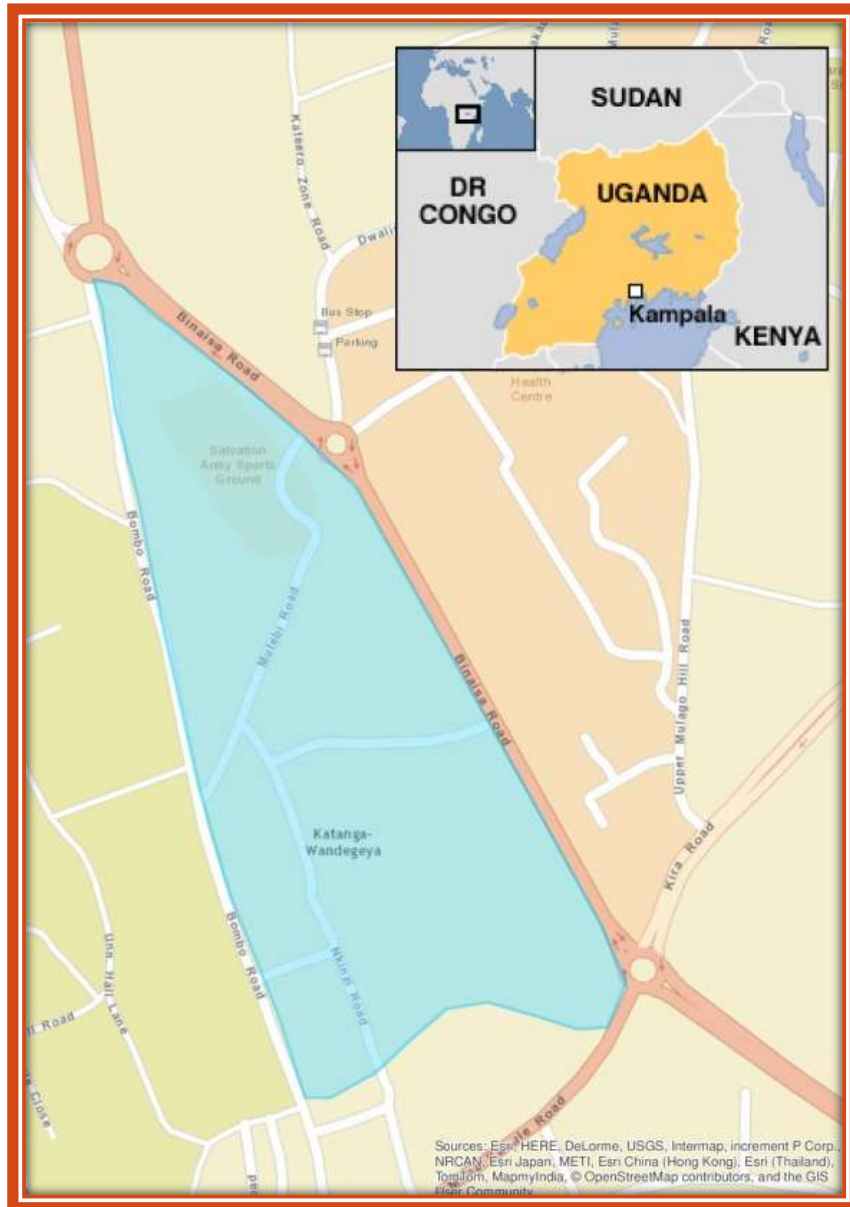
Figure 3: Slum Katanga
Personal evaluation based on www.google.co.ug

DRC

The last case used for the comparison is a case of DRC informal settlement[1] located in the city Swakopmund in Namibia. The project of DRC is a part of national project Community Land Information Programme (CLIP) which was established in 2006 as an outcome of Africa City Summit in Nairobi, Kenya [The Shack Dwellers Federation 2009]. Minister of Regional and Local Development encouraged Shack Dwellers Federation of Namibia and other stakeholders connected with housing

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[1] All official sources use words 'informal settlement' thus it will be used in this project as well. After digging into description of the case and the place author of the following project decided that DRC meet the rules given by UN-HABITAT (described in next chapter) and could be considered as a slum.

and land tenure, to profile all informal settlement in Namibia. The main goals for this project were: need for information necessary for upgrading of settlements, possibility of increasing land tenure, possibility of transparent planning and including informal settlements in local planning [The Shack Dwellers Federation 2009]. As an additional outcome there was expected knowledge about the place which communities living there get, and which can help improving their daily life [The Shack Dwellers Federation 2009].
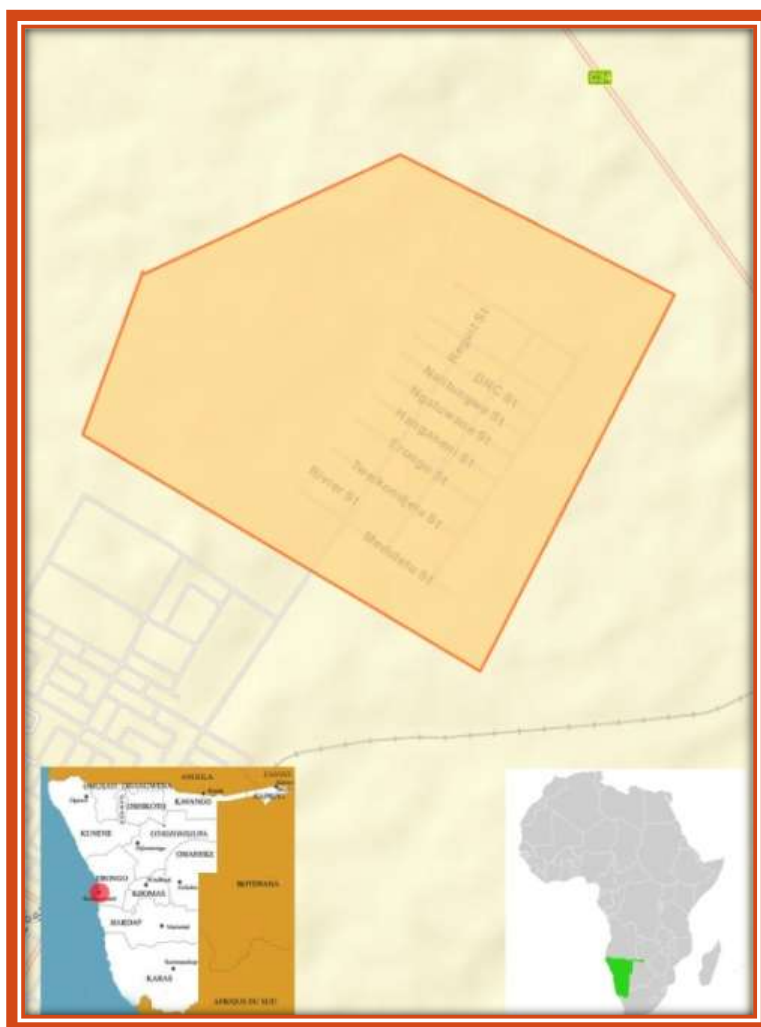
Figure 4: DRC
Personal evaluation based on [www.maps.google.com]

There were 235 informal settlements in 13 regions defined[2]. The process of gathering data started in region Erongo and the case from this region is chosen for the project. The case of DRC in Swakopmund is one of the first cases, which were developing and reaching different goals of the project the fastest [The Shack

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[2] In 2007 when project began, there were 13 regions in the country. In 2013 the number of regions was increased to 14 [USAID 2010c].

Dwellers Federation 2009], thus there is relatively easy access to the information about the project.

DRC is an informal settlement established in 2000. The land where the settlement is located belongs to the state. The reason of creation of DRC was an eviction of people from neighbour city Mondesa. Evicted people started building shelters on land belonging to the municipality of Swakopmund [The Shack Dwellers Federation 2009]. There were made agreements about registering and giving rights to the land, however until the beginning of the CLIP there was no result and the case was still open. There are 1300 households with 10000 inhabitants. There is limited access to fresh water, sanitation facilities, schools markets etc [The Shack Dwellers Federation 2009].

Structure of the project

A well prepared structure of the project is a key for understandable and clear way of presenting the problem and its analysis. Structure prepared at the beginning of the research helps to achieve the goal of the project but also guides and keep the analysis going in the direction determined by the author. What is more following the structure prepared and presented at the beginning of the project helps readers to follow the flow of thoughts and argumentation of the author.

Theoretical framework

The analytical part of the project will be divided on four main chapters preceded by theoretical framework. Information presented in this chapter will create a base for further understanding of the problem and will give some additional and background information which might be necessary for the proper understanding of the problem.

At the beginning the author will try to explain what the slum is. It is crucial to understand what the slum is and what kind or rules administer and rule the place. Often in sources there is a word 'informal settlement used' instead of 'slum'. Word 'slum' as such is often seen, in authors opinion, as a very negative word, thus there will be confrontation of definitions of 'slum' and 'informal settlement' made. This part will determine further used vocabulary and the understanding of the places described and analysed in the project. In the previous part of the project there is word slum used. It is caused by authors of the literature and interviewees interviewed by the author of the project before the written part has started.

However because of negative undertone of the word 'slum', the author would like to analyse if it is possible to replace the word keeping the real meaning of it.

Another important issue is mapping slums as such, which is the focus of the following project. In different sources there are used words 'mapping' and 'enumerations' to describe similar processes of gathering data about slum communities. It will be described and analysed what do they mean and if they can be used as synonyms.

There will be history of the idea of mapping presented, together with examples of cases which are not analysed in the project. There will be also basically presented types of approaches and purposes and methods which might be used in mapping slums.

The last part of the theory chapter will be focused on cases chosen for the analysis. To be able to understand the rules running and causing existing relations in slums, it is necessary to understand the land administration systems (LAS) of Kenya, Uganda and Namibia. Basically, African countries often do not have LAS developed as well as European countries, what gives a need to present the land situation in these countries. The reader (and the author) needs to be aware of relations and regulations which exist in these countries, to be able to see if any changes and positive (or negative) outcome of the mapping projects took place and were made. The LAS description will be divided in 2 main parts. First one will look deeper into general rules, land tenure and its security, level and organs of management etc. Second part of each case LAS will be focused on issues of urban planning and rules which determine planning in the cities. Depends on available data and information, the issue of slums will be touched upon as well.

Analysis

Structure of analysis, and the chapters which will be presented in this part, is closely related to the sub questions which were presented in the introduction to the project, as a support for the general, main research question. The structure of the analysis is presented on the figure below (Figure 5).

Analysis will be divided on 3 main chapters. Each of them will be divided according to the cases. First chapter will describe process of mapping and participation of the local societies. Public participation in developed countries is seen as a part of sustainable development and shows the 'voice' which locals have in the

development of the place they live. In African cases it is even more important because through the participation is such projects local societies can literally and actively create the space they live and better land use of the space. In cases of slums it also can make them feel that they mean something for the society and for the local administration. Participation as such can determine success of the project and can increase the benefits gained from it. It will be analysed if in these cases public participation meant anything and gave any benefits.

Second chapter will be focused on effort which was taken by officials on different level, to improve and develop slums. There will be also given examples of works made by NGO's but based on findings from projects analysed in the following report. There will be analyzed if projects had any impact at all and how were they used to develop the place, according to the goal of each project and apart from it.

The last chapter will focus on daily life of local societies. It will be analysed if the level of life was improved after the project and if local societies benefited anything what could make their daily life better. Projects like the one analysed in the following analysis are not only made for external reader but also for people who live in there and struggle with the reality of living in the slum. In author's opinion improvement of level of life of local societies on this basic, daily life level, can determine success of the whole project, which should be seen as something made by people, for people. There will not be analysed improvement already contained in the chapter about officials' actions. There will be taken other aspects which do not depend on decisions made by local authorities.

Discussion will be also based on sub questions. There will be provided answers for the sub questions presented in the Figure 5. The answers will be extracted from each chapter of the analysis. At the end of the discussion there will be answer for the research question given, which will be based on answers for sub questions.

Conclusion as a last part will be a submission of the project and there will be concluded if the goal of the project (given in the introduction) was achieved.

There will be appendixes added to the end of the project. These documents will contain full interviews made by the author with people who were related with the projects of mapping. More about these interviews is written in the next part of the chapter.
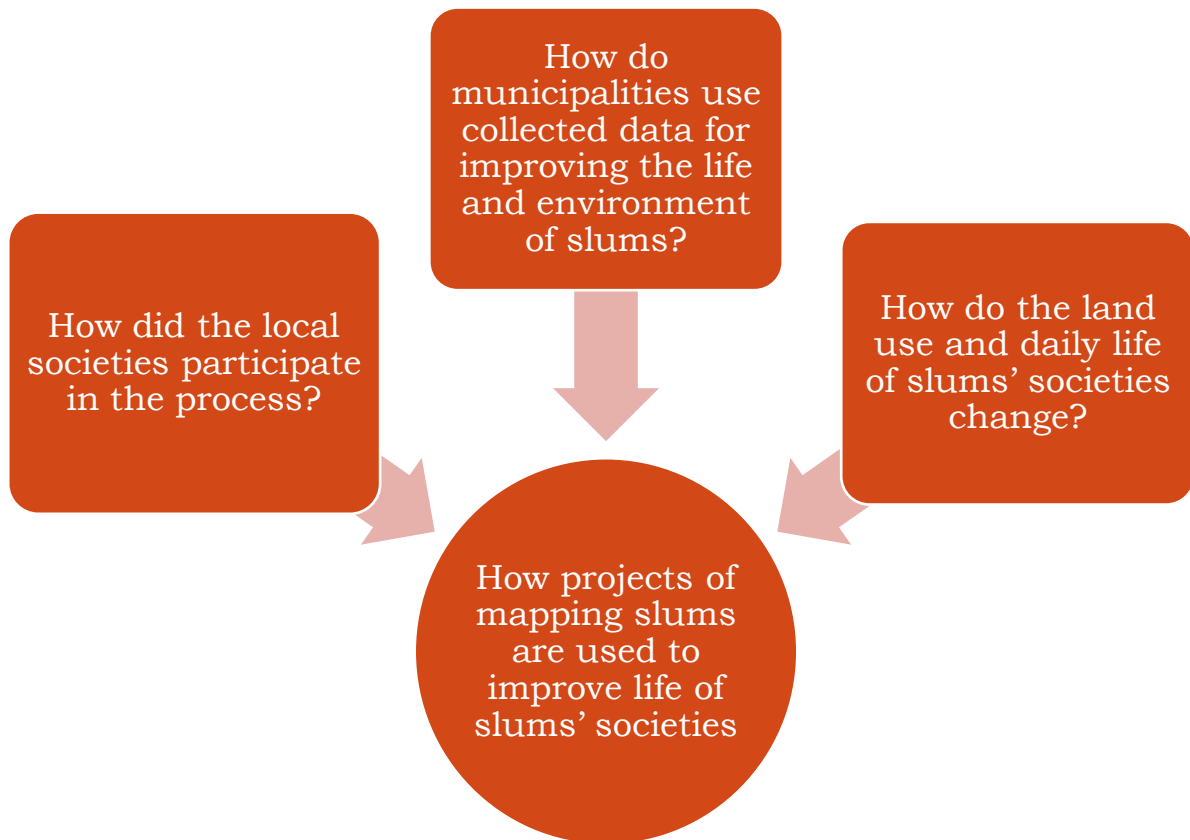
Figure 5: Structure of the analysis part of the project

Sources

There are couple of types of sources of the information used in the following research. The first part of the project, where the most of theoretical information is used, is based on scientific researches and official reports made e.g. by UN-HABITAT. This kind of source seems to be the most trustworthy due to the fact that scientific researches should not be laden by subjectivity.

General information about cases and their locations are taken from websites of the projects and additional online sources including official project descriptions and articles focused on the topic. When information posted on the official websites of the projects and official reports might be taken as a fully trustworthy, there is need to be aware that other sources might be laden by some kind of subjectivity and misinterpretation.

The information for the analysis part will be taken partly from the websites of the projects and reports, where the process of the project is described and additional necessary and useful information is given. There will be also used websites of

municipalities and newsletters which contain information about cases of the following project.

Another source of information are videos found on www.youtube.com and websites of the projects, which contain interviews with participants of the projects and give additional information about the location and process of mapping.

The last and most interesting, in author's opinion, sources are interviews which were made by the author of the project with participants of projects analyzed in this report.

There was no need to make an interview about the case of Kibera due to the detailed reports and descriptions posted on the website of the project.

First interview [Appendix 1] was made with Stefano Marras who was that time an Italian PhD student and was the person who ran the Map Kibera Project focused on demographic issues of Kianda village. Additional information about Kianda case was collected via email, from with Kepha Ngito [Appendix 2] and Benson Sarago [Appendix 3] who was a participant of the Map Kibera Project. Kepha Ngito and Benson Sarago are citizens of Kibera and were chosen by Stefano Marras to be a part of mapping team. The purpose of additional interview with them was getting community point of view on the project, as well as opinion about the project from participant point of view. Stefano Marras finished his project and do not have an actual update of impact which the project of mapping Kianda had on local societies. Kepha Ngito and Benson Sarago are citizens of the area and are able to share all newest information about development of Kianda after the project.

In the Katanga case in was crucial to get the information by the conversation because the information given online is strongly limited and is not enough for this kind of project which require detailed information. Thus there were taken 2 interviews for the case of Katanga. The first one was taken with Max Adoko [Appendix 4] who is a Ugandan mapmaker participating in the project of mapping Katanga slum in Kampala. According to the fact that information about this case is very limited and hard to get, this interview will be main source used in analysis of this case. The second, additional interview was made with Richard Sliuzas [Appendix 5] who was a coordinator of the international project which the Katanga case was part of. This interview gave background information about the whole

project and its limitations and mistakes which are seen as a reason of the outcome of the project.

There were taken, by the author of the project, probes to interview people responsible for Map Kibera and DRC projects, but unfortunately until the deadline of the submission of the following report, there has not been any response received.

There was also a try of communication with municipalities officials from Nairobi, Kampala and Swakompund made. However, answers for questions about the projects from municipalities point of view, have not been received as well.

Theoretical framework

Theoretical framework is crucial for the project like the following one, because it gives understanding of basic definitions and information. This chapter let to understand the author's point of view and understanding of the analysed problem, what later gives a chance to follow the analysis and understand it in the same way as the author.

Following chapter is divided on three parts. First one will be focused on definition of 'slum' and 'informal settlement' which in daily life are seen as synonyms and might be used alternately. The author of the project sees word 'slum' as a negative one thus the try to replace it with 'informal settlement' will be made. To be sure that in scientific understanding of these words they are also synonyms, further investigation is necessary.

Second part will be focused on history of mapping slums and the cases around the world. It will show how these projects are developing and in which place of the development it is now. It is necessary to understand if it is a new idea which does not have yet some universal rules of success, or if it is well developed branch with deep understanding of the problem.

The last part of the chapter will look closely into LAS of Kenya and Uganda to give a better understanding of general tenure rules which are valid in both countries.

Slum vs. informal settlement

Slum

Slums around the world are seen as an effect of development and fast urbanisation [Bacquier 2008]. People rapidly move to big cities looking for a better life and job opportunities. Low skilled and not well educated society is forced to look for cheap housing opportunities [Bacquier 2008]. Thus the organisation Cities Alliance [www.citiesalliance.org] understands slum as an informal settlement within city borders and Urban Dictionary [www.urbandictionary.com] goes even further calling slum metropolitan ghetto. These definitions are very broad and could be considered as a synonym to the informal settlement. However looking deeper into the definition using scientific sources, may slightly change the definition.

Bacquier [2008] states that slums are areas found in fast developing places with high level of urbanisation, places where poorer part of society lives often with limited access to health institutions, education, fresh water and sanitation. Going further slums are seen as places with lack of proper shelter and with limited possibilities of proper lifestyle which may cause diseases, illiteracy and insecure on all levels [Garau, Sclar and Carolini 2005].

Table 1: Definition of acceptable urban condition
Personal evaluation based on UN-HABITAT [2003]

Type of condition	Detailed required access to infrastructure[3]
Access to improved water	• Piped connection to house or plot • Public stand pipe serving no more than 5 households • Bore hole • Protected dug well • Protected spring • Rain water collection
Access to improved sanitation	• Direct connection to public sewer • Direct connection to septic tank • Pour flush latrine • Ventilated improved pit latrine
Sufficient- living area	• Fewer than 3 persons per room (minimum of four square meter)
Structural quality/durability of dwellings	• Permanency of Structure • Permanent building material for the walls, roof and floor • Compliance of building codes • The dwelling is not in a dilapidated state • The dwelling is not in need of major repair • Location of house (hazardous) • The dwelling is not located on or near toxic waste • The dwelling is not located in a flood plain • The dwelling is not located on a steep slope • The dwelling is not located in a dangerous right of way (rail, highway, airport, power lines)
Security of tenure	• Evidence of documentation that can be used as proof of secure tenure status • Either *de facto* or perceived/protection from forced evictions

The most detailed definition is given by UN-HABITAT [2003] which sees a slum as an overcrowded group of slum households. Slum household is a *'group of individuals living under the same roof'* [UN-HABITAT 2003, pp. 18] with lack of

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[3] Required to recognize condition as acceptable

access to basic infrastructure listed below. Slum is defined when local societies have a problem with access to minimum one of these basic things:

- Fresh water,
- Improved sanitation facilities,
- Not overcrowded, sufficient- living area,
- Structural quality of dwellings,
- Security of tenure;

To have a better understanding of list above there is a table of combined standards of UN-HABITAT, UNESCO and WHO given (Table 2). The information contained in the table was given by UN-HABITAT [2003] to give an opportunity for proper slum identification which could be accepted by all organisations focused on these areas.

Informal settlement

Looking at the general dictionary definition, informal settlement is a place where temporary shelters are built by people. Often these shelters are later changed into permanent houses. It is seen that access to fresh water, electricity and sanitation facilities is often made too [www.oxfordlearnersdictionaries.com].

Similar definition is given by organisation Upgrading Support [www.upgradingsupport. org] which states that informal settlements are *'housings created in urban or peri-urban location without official approval'*.

OECD on its website with statistical information [www.stats.oecd.org] gives two similar definitions of informal settlement. First of them says that informal settlements are *'areas where groups of housing units have been constructed on land that the occupants have no legal claim to, or occupy illegally'*. Second states that informal settlement is an unauthorised housing which construction is unplanned and is not a part of current planning [www.stats.oecd.org]

As it is seen from definitions given above, slum is a place where poor part of fast developing and growing city lives. The biggest focus when defining slums is put on level of life and lack of access to basic infrastructure rather than the legality of dwellings. On the other hand, the informal settlement is seen as a place where houses are built illegal with not official approval. Slum is considered as a poor place with no access to basic infrastructure when informal settlement is considered by legality of houses often with access to basic infrastructure.

After analysing definitions given above, it would be misunderstanding to use term informal settlement instead of slum, because the focus on each definition and a way of defining a place as a slum or informal settlement is strongly different and might give wrong understanding of the places chosen as cases for the following analysis.

Enumeration vs. mapping

During the process of choosing cases for the following project the author found out that there are not only projects which are called 'mapping of' the area. There are also programmes which are called 'enumeration of' slums and the purposes of these projects are similar if not the same as purposes of different kind of mapping projects. To find out if projects called 'enumeration' are relevant for the following project, it is necessary to analyze and compare definitions of both terms and to decide if they might be treated as synonymous or not.

Enumeration

Enumeration is a process of data collection or surveying for getting particular data and information [www.fao.com]. It is also called as numbering, counting and determining a number of some phenomena [www.yourdictionary.com]. A lot of phenomena can be enumerated, and this word is not only used for gathering spatial data, it could be used in any other kind of analysis and collection of information. There are couple of steps which might be highlighted when talking about enumeration. The structure of process of enumeration is described and presented below (Figure 6).

First phase of enumeration is to determine the framework of the survey. It is crucial to decide what kind of information and within which filed is necessary to get a set output and information needed for further analysis. The framework could be housing or demographic information which is focus of some of cases chosen for the following project. Other frames could be e.g. fishery, market etc. [www.fao.com]. This is also a stage of setting exact kind of data which need to be gathered for the purpose of the project. The example for enumeration of housing could be e.g. size of household, number of people living in it, number of rooms, materials used for building etc. [www.fao.com].

Second step of enumeration process it the evaluation of existing data. It is important to be aware what kind of data already exist and if it is possible to get

access to it. Knowledge about accessible information can save a lot of time and sources which need to be used to get the information [www.fao.com].

Next step is to determine the approach for the enumeration. There are plenty of approaches which could be chosen for making a survey, the example could be complete enumeration which assumes getting information about each case within chosen coverage [www.fao.com]. Following the example of housing within chosen slum, the complete enumeration is set when each household is going to be surveyed.

After determining approach it is necessary to choose the method of gathering data [www.fao.com]. The methods which are used in gathering information about slums might vary but often includes e.g. interviews and questionnaires. All methods of collection and enumeration will be closer presented in the chapter describing process of each project chosen for the following report.
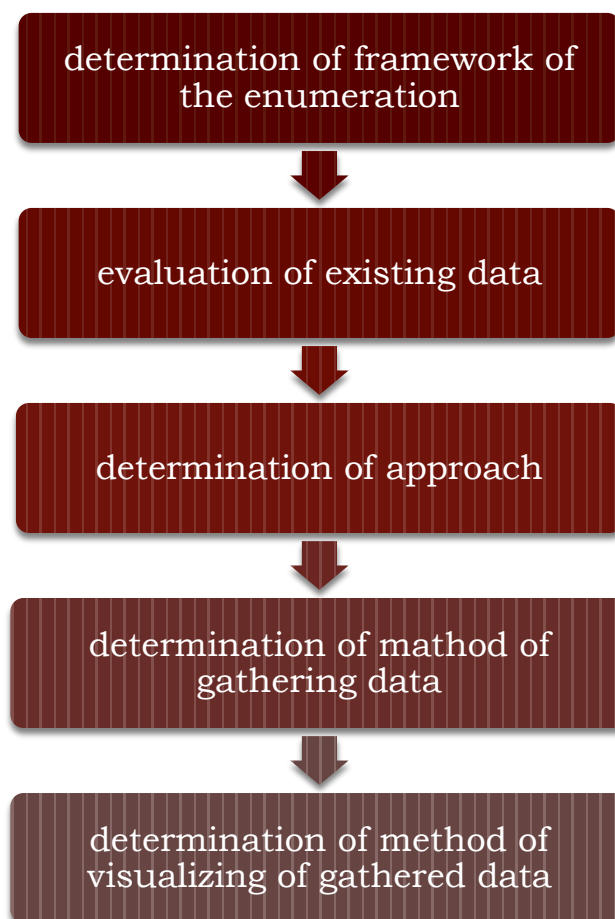
Figure 6: Steps of enumeration process
Personal evaluation based on www.fao.com

The last step in enumeration is choosing the method of visualisation collected data. Proper visualisation is a key for successful analysis and delivering the information understandable for wide audience. Spatial data which is a focus of following project is usually presented on maps, but some issues and phenomena might be presented e.g. on graphs [www.fao.com].

Mapping

According to the dictionary mapping is 'the act or process of making map' [www.thefreedictionary.com]. Creating a map is also called a cartographic process including actions which main purpose is to give an outcome of good quality, understandable for broad audience, map.

The whole process of creating a map is presented on the Figure 7. The process is divided on four stages: data collection, map design, map use and decision- making.

Figure 7 Process of mapping
source: www.e-education.psu.edu

Data collection is the phase when information, necessary for creating a map of particular purpose, is gathered from the environment. It is possible to make a map including almost any information as long, as visualised data has spatial information included. There are different techniques of gatheri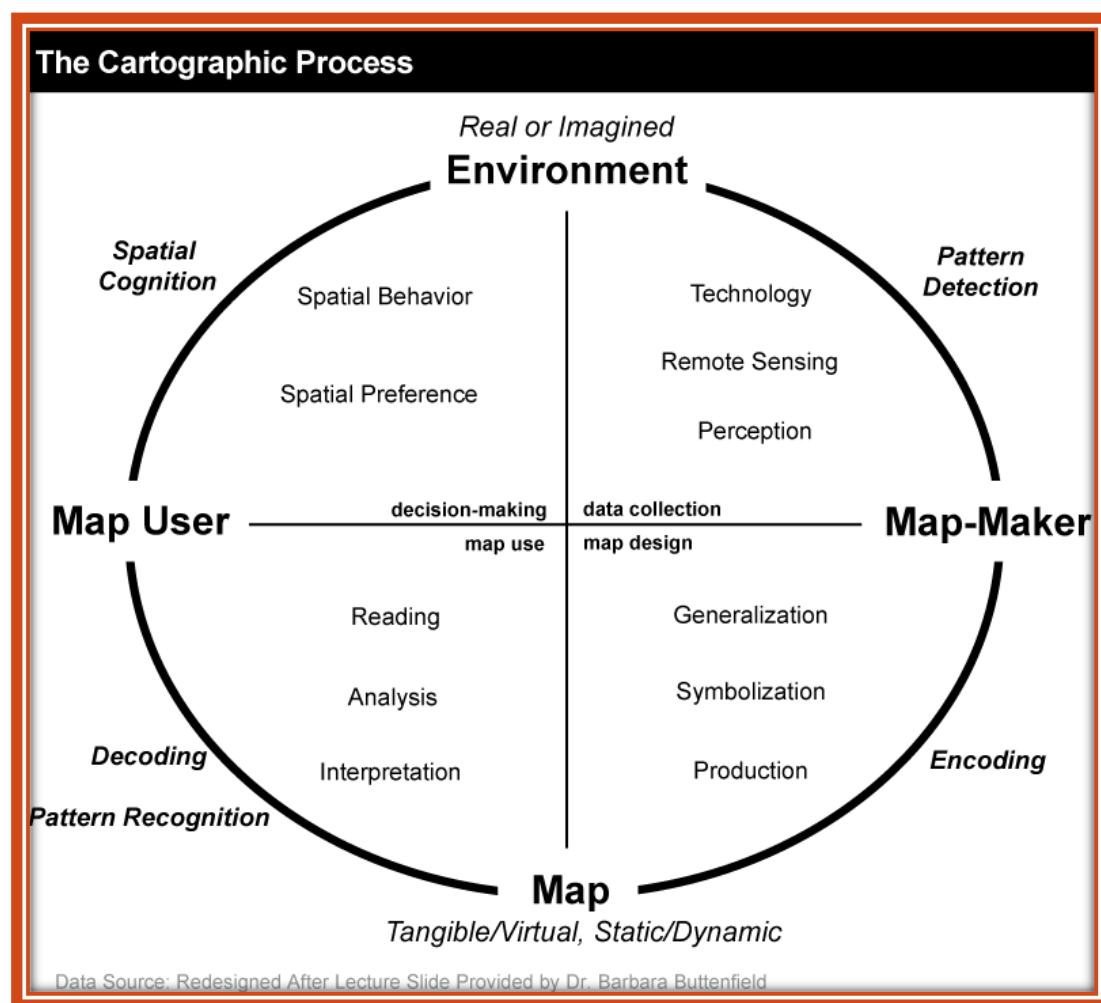ng data, some of them, the most relevant for the project, were already described in the previous chapter (describing the process of enumeration).

Second stage of mapping is a map design, also called encoding. Information gathered in the field or from satellite photos is then visualised and symbolised on the map. All actions which are taken to present the information and to make a map clear and understandable in perception are taken at this stage of cartographic process.

The third phase of mapping the analysis of the outcome map. Interpretation of data presented on the map can give answers on questions which caused the process of surveying and mapping. According to the topic of the following project information which might be seen at the map is location of different types of facilities, and after the interpretation it could be seen, where particular facilities are missing. There are also huge possibilities of other types of analysis, which could answers for large group of questions connected with space, location and development.

The last phase of the mapping is decision- making process. Making map always has some purpose. Map is a visualisation of the earth surface and let reader see things and patterns which are not clearly seen in scale 1:1. According to the topic of the following project, the decision making processes based on maps are all decisions made by municipalities, regarding development of slums, but also all decisions of local societies, which were impacted by created maps.

As it is seen, enumeration is a part of mapping process. Gathering data is only one phase of making maps, and does not have to always be followed by map creation. Thus it is impossible to use these term as synonyms as such. However in the following project there are used cases, which even when called examples of enumeration, they have a map as an one of outcomes of projects, thus using cases which are not called 'mapping project' but 'enumeration projects' is possible as long, as it is sure that there was made some the of visualisation of the data collected during the enumeration project.

The history of enumeration slum's mapping

Enumeration is gathering statistical data about the place or phenomena. In spatial data collection enumeration goes usually together with GPS marking and creating maps and spatial analysis based on collected data. In the rest of the project there will be mostly used word 'mapping' however it is understood by the author as a synonym of word 'enumeration'[4].

The history of the mapping slums is not long. The project which is seen as a first ever case of putting slum on the map is a case of slum in Pune- seventh most populated city in India [Joshi, Sen and Hobson 2002]. In 1994 the Shelter Associates[5] in cooperation with Baandhani[6] organisation started a survey which goal was creating a map of the slum, which could be used by city authorities and in the same time, could make the slum existing in the municipal planning [Joshi, Sen and Hobson 2002]. Using GIS gave an opportunity to create set of thematic maps showing e.g. water supplies and sanitation infrastructure. What is more, demographic survey was also made for the purpose of the project [Joshi, Sen and Hobson 2002]. During four years (1994-1998) the whole necessary data was gathered and the project was finished successfully, achieving the goal of including slum into local planning system [Joshi, Sen and Hobson 2002]. During the years 1997-2000 the Shelter Associates and Baandhani made couple of more projects in India, giving necessary information of slums to municipalities [Joshi, Sen and Hobson 2002].

In 2000 United Nations introduced an initiative called Millennium Development Goals which purpose is to improve the development in different areas, mostly connected with poor societies around the world. Within these goals there was defined a need for monitoring slums [www.un.org]. In 2008 a group of surveyors and GIS analysts met on the conference focused on possibilities of identification of slums and simple survey which is possible using GIS with no need of survey on the ground, using VHR (very high resolution satellite imagery) images. It is the next

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[4] 3 cases, chosen for the analysis, are called mapping projects which outcome are maps of different themes, however case of DRC in Namibia is called an enumeration project.
However the part of the process was mapping, and gathering spatial information, thus for the purpose of the following project, the work 'mapping' will be used.
[5] Shelter Associates- NGO (Non- governmental organization) set up in 1993 in Pune, India. The organization brings together number of architects and planners. The focus of the organization is the improvement of daily life and housing of slums' societies within the state Mahrashtria in India [www.shelter-associates.org]
[6] Baandhani (Building Together) - an organisation of poor men and women living in slums in Mahrashtrian cities. Baandhani cooperates with Shelter Associates on improving settlements and building better housing within slums [www.shelter-associates.org].

step in the international fight with inequality and poverty. Easier way of identification and possible detailed map help to make ground survey much easier and faster [Sliuzas, Mboup and Sherbinin 2008].

The biggest boom of using GIS and mapping slums started after 2000. There are lot of cases from Asia, South America and Africa which might be examples of mapping slums, even though not all of them might be seen as successful and life changing projects. One of the loudest commented projects is a Map Kibera project used as a case in the following research. The other most popular and well known cases are slums in India: mentioned before slum in Pune and, made by the same organisation, map of slum in Sangli.

There are different methods of mapping and analyzing collected data. The most popular and successful is participatory enumeration which main goal is to involve local societies into projects and encourage them to take care of possibilities of development of the place they live. Within participatory enumeration there might be pointed out two main methods of gathering data.

First method is called Participatory Rural Appraisal (PRA) which was previously used in rural areas; however nowadays it is adopted for urban areas as well [UN-HABITAT 2010]. The aim of the PRA is not only gathering data and analyse it, but rather teaching local communities how to do this. This method is mostly focused on training in using GPS, doing questionnaires and other methods which are used for gathering data. What is more the ways of analysing and possibilities of using the outcome of analysis are shown to the people. Organisations using this method want to be sure that even though the project is finished, people are still able to run it by themselves [Chambers 2002]. The PRA method uses interviews, discussions, mapping and modelling as tools for achieving the goal [UN-HABITAT 2010].

The second type of participatory enumeration is community mapping which main focus is creation of maps which could be used by community. The purpose of this method is to give people living in slum information about the place, which they could use for improving their daily life [UN-HABITAT 2010]. When PRA teaches how to create and use maps of all kind- deliver them to local officials and participate in decision making process, community mapping mostly try to make local community informed and through this knowledge improve daily use of the place they live [UN-HABITAT 2010]. The main activities and tools which are used for achieving the goal

are: community survey, map drawing (hand drawn maps), and interviews [UN-HABITAT 2010].

Apart from methods which are described above, there are seen different purposes of enumeration and mapping, which affect the method, tools and expected outcome and impact of the project. Purposes of enumeration are divided on two groups. First group is used mainly by NGOs for mapping issues of importance of slum communities [UN-HABITAT 2010]:

- Enumeration for community empowerment
- Enumeration in case of eviction
- Enumeration in case of relocation and resettlement
- Enumeration for rights recognition
- Enumeration to support savings and credit

Second group of enumeration types is mostly used by government and local authorities to include slum in local LAS and to improve development [UN-HABITAT 2010]:

- Enumeration for land administration
- Enumeration for land adjudication
- Enumeration after conflicts
- Enumeration for planning and development
- Enumeration for taxation
- Enumeration for wide slum upgrading

Enumeration for community empowerment

The purpose of this enumeration is to give people feeling of power to participate in development and decision making process regarding the area they live. To be able to fight for rights it is crucial to know the place of living and to be aware of needs, weaknesses and possibilities of the place. The main tool in this type of enumeration is to encourage people to get information and data themselves (location of infrastructure and facilities) and helping them to map and to spread the information to make the society informed. It also help to get people organized fighting for common goals. Informed, united society sure of its needs has more power to influence authorities to invest in the place they live [UN-HABITAT 2010]. Examples of enumeration for community empowerment are case of slum

communities in Abuja in Nigeria [UN-HABITAT 2010] and, analyzed in the following project, case of Kibera Map project.

Enumeration in case of eviction

Slums and informal settlements are not registered in the system thus people living there do not have any rights to the land they live. Lack of policy and regulations for low cost housing and lack of any kind of permission to use the land causes massive evictions and expropriations when the city authorities need an extra land for development purposes. Lacks of information about people who live in slums do not let to prevent evictions and making any registration of the land. Thus the purpose in this case is to get as much information about society and housing as possible. Methods usually used in this case are interviews and questioners which give detailed demographic information, and GPS measurements which give information about plots and land use [UN-HABITAT 2010].

Enumeration in case of relocation and resettlement

There are different reasons for relocation and resettlement. Some of them are caused by natural disasters, but other are caused by conflicts, and need for development which usually causes forces eviction. To be able to plan resettlement which will affect relocated society least, there is a need of information about the society: how many people live there, how many children and old people etc. on the other hand the same information could be used when fighting for compensation and in getting people together to fight for their rights [UN-HABITAT 2010]. Examples of enumeration with the purpose of ensuring safe and well planned relocation and resettlement are cases of slums in Magallanes in Philippines and Bossaso in Somalia [UN-HABITAT 2010].

Enumeration for rights recognition

As it was already mentioned in the description of enumeration for empowerment, the information about the place and awareness of weaknesses and strengths, needs and possibilities for development give local societies the voice in fighting for better future and development of their place. It also gives them chance to ask for basic rights to the land, which are a part of some local policies regarding upgrading slums and development of informal settlement. To have a chance of development basic rights are necessary, as long as people are not sure about the future of place they live, they do not want to invest in development and to risk everything for not certain and insecure future [UN-HABITAT 2010].

Enumeration to support savings and credit

Information about sources of income, expenses and all issues connected with budget of each household let to calculate capacity to pay back potential loans which could be used for building better quality houses or for development of businesses. To get the chance of getting loan there has to be land tenure improved basic land security ensured. If the basic rights could be given to the people, they could be able to accelerate the development of the slum by their own investments [UN-HABITAT 2010]. The Community Mortgage Program in Philippines is an example of programme for financing shelter security [UN-HABITAT 2010]. Programme which main goal is improving tenure and an access to credit is a case of Twahangana Fund in Namibia [UN-HABITAT 2010].

Enumeration for land administration

Knowledge about the people, housing, infrastructure and facilities, their number and location give information what and where is needed. Basic information, about these 4 aspects, is necessary to find the way of development and to be able to make plans of improvement of slums and any other area [UN-HABITAT 2010]. Social Tenure Domain Model in Ethiopia is an example of enumeration for land administration [UN-HABITAT 2010].

Enumeration for land adjudication

Adjudication is, according to the dictionary [www.thefreedictionary.com] a judicial decision or act made a court. In land administration land adjudication is a document saying who has rights (and what kind of rights) to the particular piece of land. To be able to create this kind of document and make registration of land rights possible, it is necessary to investigate boundaries of parcels and land use in slum areas. It can be done using GPS or (how it had place in some cases) using satellite photos and cooperate with local society for recognition of users of each parcel [UN-HABITAT 2010]. One of very important cases of the land adjudication is a case of Aceh in Indonesia, where the programme was held after the tsunami which hit Indonesia in December 2004 [UN-HABITAT 2010].

Enumeration after conflicts

Enumeration after conflicts is necessary in case of displacement and later coming back to previously settled parcels. During the conflict houses and boundary markers are often destroyed and it is necessary to draw boundaries again. These actions have a purpose of coming back to the place from before the conflict, to be

able to rebuilt destroyed area as fast as possible [UN-HABITAT 2010]. East Timor the programme for increasing tenure security is one of examples of enumeration after conflicts [UN-HABITAT 2010].

Enumeration for planning and development

Enumeration for planning and development is connected with enumeration for land management. Important is to get information about demography of the place, housing, existing infrastructure and facilities which are necessary to live. To be able to develop the place it is necessary to keep the data base updated and expanded according to needs and directions of development. The information of quality and number of houses and population, give information about needs for houses of their renovation. Information about infrastructure and facilities show the level of life (if basic infrastructure is ensured) and help to make a list of crucial investments which are necessary to increase the level of life, which in slums is very low [UN-HABITAT 2010]. The best example of enumeration for planning and development is a CLIP held in Namibia, which is one of cases analyzed in the following project [UN-HABITAT 2010].

Enumeration for taxation

The information about households and demography of the place let authorities to create a taxation system which will be fair and will not overuse poor society of slums [UN-HABITAT 2010]. Somalia with its Hargeisa GIS-based property and taxation system is an example of enumeration for taxation purposes [UN-HABITAT 2010].

Enumeration for wide slum upgrading

Wide slum upgrading is the enumeration for planning and development addressed directly to slum areas. All previously described types of enumeration can be addressed to any area which is not well known. This type is used only in improving life and condition of slums and is a combination of some of previous types [UN-HABITAT 2010]. The household enumeration in Las Piñas in Philippines and Baan Mankong slum upgrading programme are examples of enumeration for slum upgrading [UN-HABITAT 2010].

From the above descriptions it is visible that some of types of enumeration, even though that have different purpose, require the same type of data and information. Thus even though the first purpose of making the enumeration is one particular, the information can be reuse later, or two or more purposes could be set for one

enumeration project. When talking about reuse, it is important to keep the data updated what will help to avoid making new enumeration from the scratch, which is an expensive and time consuming process.

LAS

Land administration systems are created for dealing with ownership, value, market and use of the land [Siriba and Mwenda 2013]. Developed countries have nowadays strong and well developed systems but it is still a problem of developing African countries. They are usually not efficient with lack of transparency what causes high level of corruption and bureaucracy [Siriba and Mwenda 2013]. Lack of sustainable and comprehensive approach causes big problems with e.g. unfair access to the land and food insecurity [IS Academy 2013].

The following chapters will focus on systems which were used in Kenya and Uganda in 20th and 21st century. To be able to understand development and changes within these systems, it is necessary to track them for about 50 or more years. Both of these countries were colonised by Great Britain thus there will be shortly presented land administration during the colony time and then here will be changes after becoming an independent country shown. Last decades are crucial for fighting in equality and forcing sustainable way of thinking, thus newest changes in the land regulations will be also presented in the following chapters.

Kenya

Kenya is an Eastern African country with an area of 582,646 square kilometres. 97,8% of the surface is a land and 2,2% is covered by water. Only 20% of the land is qualified as a land with medium or high potential which might be used in agriculture [Siriba and Mwenda 2013]. However the land used in fact in agriculture is a 48% of the area of the country, with only 1,8% of it irrigated [USAID 2010a]. There are 8 land use categories in Kenya. The percentage of each of land use type in presented in the table below (Table 2).

The population of the country was in 2008 38,5 million with 78% of it living in rural areas. In the beginning of 21st century over half of the population (54%) was living under the national poverty line [USAID 2010a].

Until 2009 Kenya was divided on districts and counties however after elections in 2013 the first level of administrative division are 47 counties. The old division of

districts and sub- counties is still used but they are not used in administration. What is more, old and new borders do not cover themselves thus old division is used only in daily life [USAID 2009].

Table 2: Land use categories in Kenya
Personal evaluation based on Siriba and Mwenda 2013

	Land use category	Area (km²)	% of total land and water area
1.	Trust Land	457,449	78.5
2.	Alienated Land	33,397	5.7
3.	Game Reserves	13,691	2.3
4.	Total Area of Water	11,230	1.9
5.	Forest	7,084	1.2
6.	National Parks	3,149	0.5
7.	Township	1,812	0.3
8.	Government Reserves	492	0.1

During the time when Kenya was a British colony, there was no private ownership for Africans. The only type of private ownership was possible for white settlers; original settlers did not have free access and rights to the land [USAID 2009]. When the country became independent in 1963 there were several changes in the land tenure and land administration made [USAID 2009].

The biggest problem in land policy is a fact that since colonisation time are is no one, comprehensive and clear National Land Policy. There is no document which combines all land laws into one, thus there is big room for corruption and misinterpreting the law [Republic of Kenya 2009].

According to the lack of unequivocal law there is a big fragmentation and disparity in land ownership seen. What is more lack of rules and unequal access to the land causes massive economic and social problems with land as a background [Republic of Kenya 2009].

In the 1963 there was a Ministry of Land[7] created, which was responsible for administration, valuation and registration of the land [IS Academy 2013]. Later the

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[7] Nowadays it is a Ministry of Land, Housing and Urban Development [Siriba and Mwenda 2013]

responsibility became also preparation of plans [Siriba and Mwenda 2013]. Under the Ministry there were two control bodies created: Local Land Control Board responsible for farm land transactions and County Councils who were trustees of community/ trust land [IS Academy 2013].

Until 2009 there were 3 types of ownerships: governmental, trust/community and private [USAID 2009]. The government land was a land owned by the State, which contain areas of reserves, forests, national parks and townships. Individuals had no possibility to apply for the urban land [USAID 2009, IS Academy 2013]. Trust/community ownership is a type of tenure when land is given to the farmers' communities or to the indigenous people [USAID 2009]. People do not have any land security and among the decades there were a lot of cases of eviction of indigenous societies and violent stealing and acquisitions of land between farmers [USAID 2009, IS Academy 2013]. The insecurity and violence, with no compensation, caused by wrong policy, provide to food insecurity and frequent protests [IS Academy 2013]. Private ownership allows private people to have the land registered as 'their' land. This type of tenure gives a registration cards, however lack of transparency and corruption within the system causes diminishing the meaning of the document and as follow- big land insecurity and unfair access to the land [IS Academy 2013].

What is more since 60's it is observed that amount of leased land is growing. Land grabbing made by domestic and foreign investors caused even more evictions and land loss, with no compensation. Due to the rules of urban areas, only rural areas can be leased by investors from state or private owners [IS Academy 2013].

The other problem with access to the land was the gender inequality and strongly limited access to the land for married woman. It was counted that only 1% of all private land is registered as owned by women and 5-6% is registered in joint names [IS Academy 2013, USAID 2010]. The numbers are very low especially when taking into consideration the high activity women have in agriculture and work in the field [USAID 2010a].

The system of registration was also very complicated and causing even bigger insecurity and opacity. After the time of colonisation there were mostly title system used, but there are still cases of deeds found [Siriba and Mwenda 2013]. There were formulated e.g. 2 property laws and 5 registration systems, which were

messing and misleading people interested in becoming and owner of the land [Siriba and Mwenda 2013].

National Land Policy

In the beginning of 21st century group of NGO organisations forced the Government of Kenya to preparation of proposal of National Land Policy (NLP) which would solve part of the problems seen in a land management and land policy in the country [Republic of Kenya 2009]. The document was made to replace the existing, not effective law, with rules ensuring sustainability and equality in land use and land management [USAID 2010a]. In 2004 works on united document began and in 2009 the proposal of the document was presented to the Kenyan Government [Republic of Kenya] which approved the document in December 2009 [USAID 2010a]. There are seen a lot of changes in land policy according to the previous, blurred and not comprehensive rules. In 2010 there was a also a change in National Constitution, regarding the changes in land policy in Kenya: *'Land in Kenya shall be held, used and managed in a manner that is equitable, efficient, productive and sustainable, and in accordance with the following principles: (a) equitable access to land; (b) security of land rights; (c) sustainable and productive management of land resources; (d) transparent and cost effective administration of land; (e) sound conservation and protection of ecologically sensitive areas; (f) elimination of gender discrimination in law, customs and practice related to land and property in land; and (g) encouragement of communities to settle land disputes through recognized local community initiatives consistent with this Constitution'* [IS Academy 2013, pp.3].

Proposed rules contained in the NLP touch upon many different issues within the land policy and management. Most of the rules are connected with rural areas, thus there is a need for developing the document for urban issues [USAID 2010a]. There were 6 reforms proposed, which are necessary to put into practice recommendations and propositions made in NLP [USAID 2010a]:

1. the reform of recognizing and protecting customary rights,
2. the reforms presenting principles, targets and guidelines necessary to achieve sustainable land use,
3. the reform of land management institutions which will ensure devolution of power, transparency, sustainability, justice and participation of society in planning and land management,

4. the reform creating new boards responsible for different levels of land planning and management:
   - National Land Commission,
   - District Land Boards- democratically elected, responsible for district level of responsibilities of Ministry of Land,
   - Community Land Boards- democratically elected, responsible for all transactions of community land;
5. the reform developing the law regarding resettlement and land restitution,
6. the reform ensuring protection of property rights for people obtaining land irregularly;

The NLP is a document made for total transition of land policy, which would ensure sustainability and transparency of the national and local system, what would fight inequality and corruption. Even though the document was made, there is still long way and necessity for the further changes, to achieve the goal of the NLP.

As it was written before, NLP is mostly focused on rural areas. The NLP is not an effect of projects analysed in the following project, but accepting the NLP took place right before analyzed projects, and it will be necessary to distinguish the differences further. It will be necessary to know the changes in the urban land law, to prevent the mistake of misinterpretation and increasing the influence of mapping slums projects in the national and local system.

Urban Planning in Nairobi

The entire country of Kenya faces the problem of fast urbanization and massive population movement from villages to cities [Omwenga 2011]. The problem grows even more when looking at uncontrolled and unplanned city sprawl and uncertified development of poor, informal areas [Omwenga 2011]. Movement of poor, unskilled and low educated people causes growing of poor areas, often informal, which also provides to inequality of living conditions [Omwenga 2011].

In general the whole problem is growing due to lack of long term development plans for urban areas. In the beginning of 21st century urban law and regulations were outdated and were not addressed to solve existing problems [UN-HABITAT 2005].

Nairobi as a capital and the biggest city in Kenya has even bigger problems than other cities. Until 2013 the law for Nairobi's development did not exist, and fragmented plan for development were outdated and not implemented [UN-

HABITAT 2005]. The last land use master plan has not been updated since 1973 [UN-HABITAT 2005]. What is more people living in Nairobi do not know their rights what causes society not empowered and able to participate in development. Lack of transparency, not well educated officials and lack of documents which could implement and develop local economy stops all possible movement and steps which could be taken to raise the potential of economic development of the city [UN-HABITAT 2005].

In 2014, as a result of cooperation between Nairobi City County (NCC) and Japan International Cooperation Agency (JICA), there has been created 'Integrated Urban Development Master Plan for the City of Nairobi' (NIUPLAN) [www.citymasterplan.nairobi.go.ke]. The document is the framework for the managing and developing the city of Nairobi for years 2014- 2030 [www.citymasterplan.nairobi.go.ke]. Due to the fact that the program started last year it is impossible, for now, to analyse the process of implementing and developing the city.

Slums in Nairobi

In 2005 over 60% of Nairobi's population has been living in slum areas [UN-HABITAT 2005]. There has never been created any policy or regulation which could let these areas to develop and to grow in economic wealth. There is a need of documents which could ensure slum dwellers an access to the land and to prevent evictions [UN-HABITAT 2005]. What is more, local rules with high feel for establishing businesses make people unwilling even more to invest in the place they live and let the slum develop naturally [UN-HABITAT 2005].

In 2001 there has been set up Kenya Slum Upgrading Programme (KSUP), initiated by Government of Kenya with UN-HABITAT as a key partner. The purpose of this project was to improve livelihood of slum society through ensuring basic land tenure and security, building better quality houses and investing in new infrastructures and facilities [UN-HABITAT 2008]. One of slums in Nairobi, which was designated to be a pilot project of the KSUP, was Sowelo, a village in Kibera slum [UN-HABITAT 2005, UN-HABITAT 2008].

Uganda

Uganda is a country with total area of 241,040 square kilometres with 197,100 square kilometres of land. 64.5% of the land is suitable for agriculture, however

only 0.1% of all rural area is irrigated, that causes big dependence on rainfall and weather conditions in agriculture [USAID 2010b].

The population of the country is estimated for 31,656,865 within which 82% works in agriculture, 5% in industry and 13% in services.

The administration is divided on 6 levels, which are presented below (Figure 8). There are 4 regions divided on districts and 1 city- Kampala. The lowest level of urban areas are municipalities, however rural area are divided on more levels- counties and sub-counties. Going further sub- counties are divided on parishes which are made from couple of villages. Village is the lowest administrative unit in Uganda [www.theguardian.com].
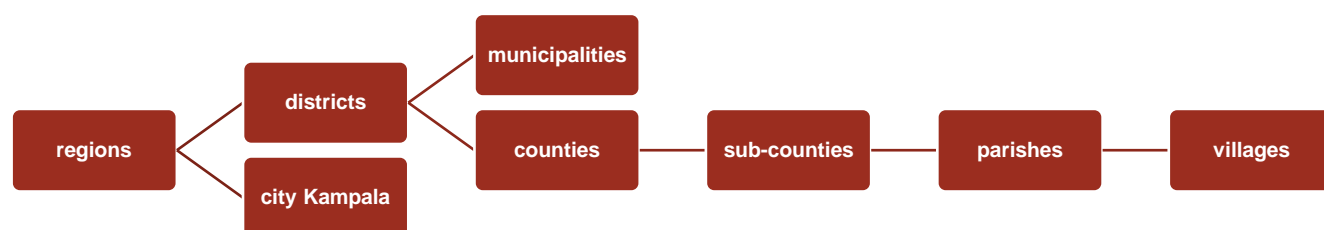

Figure 8: Administrative division of Uganda
Personal evaluation based on www.theguardian.com

The land administration in Uganda is mostly based on British rules, due to the fact that Uganda was a British colony until 1962 [USAID 2010b, Augustinus 2003]. New rules started to be implemented in the end of 20th century [Augustinus 2003]. In 1995 there was implemented new Constitution which contained several rules regarding land administration and land use e.g. making possible private ownership individually but also in groups[USAID 2010b]. In 1998 there was approved Land Act which touches upon land tenure and rights to the land. The document was made to be used as a tool for solving conflicts based on inequality of land division and land rights [USAID 2010b]. In 2008 there was implemented National Land Use Policy which contains rules allowing effective land use and development of the country. 2009 was a year of releasing 2 documents- National Land Policy and Land (Amendment) Bill [USAID 2010b]. The second of them by many is seen as a document that weaking property rights [IS Academy 2012].

There are several institutions on different levels, which are responsible for land management issues. The Uganda Land Commission is in charge of managing all land belonging to the state [USAID 2010b, IS Academy 2012]. Districts Land Boards are responsible for registration and transfer of land which officially is not owned by anyone in the district [USAID 2010b, IS Academy 2012]. The Uganda Land Registry is an institution which main responsibility is registering and titling the land [USAID 2010b, IS Academy 2012]. Until 2003, there were 700.000 titles given [Augustinus 2003]. Surveyor's Registration Board is a group of titled surveyors responsible for making measurements necessary for titling and registering the land. Until 2010 there were only 27 surveyors entitled to do this kind of work what, together with high costs of the measurements cause significant limits for registering rural areas [USAID 2010b, IS Academy 2012]. The last institutions are Land Tribunals existing on district, county and sub-county levels, responsible for granting, leasing and transferring the land [USAID 2010b]. The problem with land management institutions is their weakness. Even though the rules are made to develop and increase land management the lack of will of implementation and cooperation between different institutions causes their weakness and further limitations in using quite well prepared rules for managing the land [USAID 2010b].

There are 5 types of land tenure: land belonging to state, customary tenure, leasehold, freehold and mailo which is a customary form of freehold [USAID 2010b, IS Academy 2012]. Customary tenure is seen mostly in rural areas with the level of over 70% of all tenure. The land in customary tenure is usually not officially registered (only 20% in rural areas), but some kind of certification is given. There are no general rules regarding customary tenure, the rules are made for each case [USAID 2010b, IS Academy 2012]. Leasehold is possible for all tenure types. Leasing is set for 49 or 99 years and it is certificated. Foreign investors have right to lease a land but cannot be an owner of the land [USAID 2010b, IS Academy 2012]. Freehold is a type which ensures registration and appears mostly in urban areas. Mailo tenure type is set mostly for tenants in urban areas [USAID 2010b, IS Academy 2012].

There is seen a big problem of land insecurity, mostly in rural areas, which is connected with lack of registration of the land. A lot of people (up to 90% of rural population) want to register their land but lack of knowledge, high costs and long time of processing (up to 227 days) causes effect of low level of registration and

certification [USAID 2010b]. The situation of land security in the urban areas gets better since 90's when renting became popular [USAID 2010b].

As it was seen in Kenya the insecurity and inequality is big problem when talking about gender. Even though Uganda's law set all people on the same level and give them the same rights to own the land, women are still marginalized. The old day's culture and traditions, still very strong in the country, limits possibilities for women as an owner, up to 90% of all ownership rights are held by men. The only exception elite and women within high class, who can own the land and have it registered and certificated without any problems [USAID 2010b, IS Academy 2012].

Another problem with security of the land is national policy of encouraging foreign investors to lease the land in Uganda. Land grabbing causes expropriation and dispossession of indigenous people. It also limits access to the land for local people [USAID 2010b, IS Academy 2012].

In general even though rules and law are made in a way to give people the access to the land and to encourage them to invest and develop, lack of will of implementation, corruption not transparent system, problem with access to the information and insecurity connected with lack of registration of most of rural areas cause lack of sustainability and put strong limits on potential development of Uganda [USAID 2010b, Augustinus 2003].

Urban Planning in Kampala

Similar to Kenya Uganda faces big problems connected with fast urbanization. The level of urbanization in Uganda is so high that it is predicted that until 2050 the country will be one of the most urbanized countries in Africa [UN-HABITAT 2012]. As it was seen in Kenya, high level of urbanization causes problems with uncontrolled and unplanned development of urban areas. There are numbers of new informal settlements with very poor conditions appearing all the time of the map of urban areas of Uganda [UN-HABITAT 2012]. There is also a problem with lack of urbanization policy and law regarding land use and planning urban areas in the country. There are no legislative rules and basis which could give the direction of dealing with the problem and using opportunity for the development [UN-HABITAT 2012].

One of solutions, which were implemented to allow better management of urban areas, was decentralization of power giving more responsibility to regional and local

authorities [UN-HABITAT 2012]. It is well known that decentralization can boost management and development however there is a need of capacity to deal with new responsibilities. Unfortunately the capacity in local offices in Uganda is not enough, and there is no chance to deal successfully with planning and management issues. Lack of capacity causes lack of people who could be able to prepare detailed development plans on local level, what provides to chaotic investments and lack of common goal which in the end could benefit with economic and social growth [UN-HABITAT 2012].

Situation in Kampala is similar to the situation in the whole country. The last master plan which was created for the city is dated on 1980 and since that time has never been updated. Last local development plans were established in 1994 and are outdated, without solutions for solving present problems of the city [UN-HABITAT 2010b]. There is no existing zoning plan which could have power to organize land use and land management if created [UN-HABITAT 2010b].

Slums in Kampala

As it was written before, slums in Kampala appear and grow all the time due to high level of urbanization and migration. In 2010 85% of 1.8 million population of Kampala were inhabitants of slums with very poor living conditions [UN-HABITAT 2010b]. There was created possibility for informal inhabitants to register the land they live, but high fee and complicated procedure cause this possibility unpopular and avoided [UN-HABITAT 2010b]. However slowly officials realize the potential which is hidden behind the land tenure and land security and there are going works on making the system of registration easier and cheaper to encourage people to make their settlements legal [UN-HABITAT 2010b].

Namibia

Namibia is a country of total area of 823,300 square kilometres. The population is about 2,100,000 what makes this country a place with second lowest population density in the world [USAID 2010c]. The economy of the country is based on mining, fishing and cattle ranching. Different than other cases described above, the agriculture and growing crops is not a big part of the economy. Low land productivity and one of the most arid lands in Africa makes this place not well suitable for the purpose of growing crops. However still 47% of the land is designated for agriculture and only 1% of it is irrigated [USAID 2010c].

The bigger part of population (63%) live in a rural areas while 37% live in urban areas. 50% of population of Namibia lives below poverty line with 13% being extremely poor. 41% of poor people are rural residents [USAID 2010c].

In 1990 Namibia became an independent country and from this time set of reforms and new laws were adopted for the purpose of development and more equal land distribution and land use. The Constitution of the new country was made in 1991 [USAID 2010c]. This is one of few documents in African countries, which includes indigenous people as a part of population and recognizes them a s a people who has the same rights to the land as the rest of population of Namibia [USAID 2010c]. The other significant documents which influenced today's land administration are listed below together with examples of issues contained in these documents [USAID 2010c]:

- 1995- The Agricultural (Commercial) Land Reform Act (women entitled to equal land ownership),
- 1998- Land Policy (equal right to land for everyone, regulations for: titles, licences, certificates, permits etc.),
- 2000- The Communal Land Reform (regulation of power of traditional authorities (chiefs, headmen)),
- 2000- The Traditional Authorities Act (giving traditional authorities legal rights to make decisions and to manage the land),
- 2001- National Resettlement Policy (resettlement of landless people);

Namibia is administratively divided on three levels: regions (14) and constituencies (121) and lower- municipalities, towns and villages [www.cia.gov].

There are 4 types of land ownership in Namibian law. The first one is freehold/ private ownership which covers 47% of Namibian land. Before 1990 the private ownership was possible mostly for non- black people whose ancestors were colonialists [USAID 2010c]. After 1990 the situation has changed and more black people own the land. Most of urban areas are privately owned. Communal tenure which covers 39% of the land is an ownership of the state which might be held in trust to local societies. The traditional authorities together with Land Board are responsible for the land held to the people [USAID 2010c]. This kind of land cannot be sold, it has to be registered and it is allowed to have a joint titling for married people. Conservancy, the third type of tenure is an ownership of communal of commercial land with additional rights to wildlife and tourism activities. To get the

land registered as conservancy it is necessary to set boundaries and to prove the ability for managing finances [USAID 2010c]. The last type of tenure is leasehold which is possible for communal and commercial land. The lease is possible for 99 years. Foreigners do not have a chance to own the land in Namibia however they do have opportunity of leasing the land. To protect and limit the problem of land grabbing, there are limits for leasing the land set. Maximum area which might be leased by one person or company is 25 ha of communal area [USAID 2010c].

There is also one type of land use which is not defined in any other case described above. The occupancy of informal settlements is seen as a problem which needs to be solved soon due to data which shows that 30% of urban residents live in informal settlements [USAID 2010c]. To solve the problem of informal settlements there was created a possibility of registration and further application for an ownership. Nowadays it was cut down and replaced with possibility of leasehold [USAID 2010c]. What is more there was created Flexible Land Tenure Act which formalizes rights of people living in informal settlements located on land belonging to the state. Residents of these places have rights to get a starter title which gives them common rights of ownership [USAID 2010c].

Land security in Namibia is seen as a smaller problem than in Uganda and Kenya. The biggest problems have members of indigenous group San (illiteracy and lack of knowledge of opportunities and possibilities to formalize their land rights), people with HIV/AIDS and women in some regions. Still over 40% of land rights are given for women or as joint rights for women and man. Private ownership is seen as a secure due to the fact that most of freeholds are registered officially [USAID 2010c]. Nowadays the biggest problem which is faced by authorities is connected with resettlement and expropriation. The problem of resettlement is mainly connected with farmland [USAID 2010c], thus it will not be described in the following project deeply.

As it is shown in the comparison of LAS of Kenya, Uganda and Namibia land tenure and land use issues are considered and solved in these countries significantly different. According to these differences, possibility of dealing with slums and their problems is also handled in different ways. Next chapters will show how the approach to the mapping, realisation of the projects and their outcome are handled and limited by rules which were described above.

Urban Planning in Swakopmund

Namibia, similar to previously described countries, faces big problem with rapid migration from rural areas to towns and cities. After 1990 when Namibia became an independent country, there were made big changes in the previous apartheid law, and people had now a chance to owe piece of land previously designated for white people. There was seen massive movement from poor rural north of the country to better developed, urban south [UN-HABITAT 2010a]. Cities were not prepared for such a big migration and did not have space for coming people. That caused settling people in backyards and unused areas which exchanged fast into slums. Authorities were not able to count and enumerate people and their houses, thus they were excluded from planning and management, causing problems in local planning policies [UN-HABITAT 2010a]. First successful way of counting informal settlements was a programme CLIP which is a subject of this project, thus will be described closely in following chapters [UN-HABITAT 2010a].

Swakopmund, opposite to previously described cities, is not a capital and the size of the city is much smaller. Thus naturally the scale of the problem with migration is not as big as in Nairobi and Kampala. The planning activities seem to be more developed than in e.g. Kampala. The need for the master plan is seen and works on detailed local plans for different parts of the city are actually run. Some plans are already made and started to be implemented [Municipality of Swakopmund 2013]. The size and smaller meaning for the country causes that there are not so many documents about the Swakopmund and its planning policy available thus the information given in this chapter are limited.

Processes of mapping projects

To understand the impact and possible benefits gained from mapping projects, it is crucial to analyze the process of the project itself. It will show if the approach taken for the project gave a chance for these benefits. If the approach and realisation of the project is not correct then positive outcome is also limited. What is more, looking deeper in the process of mapping slums will possibly let to find key points which might determine positive and negative outcome, or lack of any outcome of the project.

All cases chosen for the following project were run by different people and different tools and approach is seen. The detailed description of each process, starting from the idea for the project and ending on finish of them will give an understanding of possibilities, and will help to achieve the goal of the following research which is list guidelines for successful slum mapping giving benefits for local societies, on different levels. The first described case will be project Map Kibera, the second-Map Kibera Project, the third the case of Katanga in Kampala and as a last one there will be a case of DRC in Swakopmund analysed. The description will be divided on a process itself and steps which were taken during the project and second will show the project from citizens and local society's point of view. There will be their reaction and feelings about the project analyzed.

Kibera

As it was written in the case description, in the Methodology chapter, the project Map Kibera was fully addressed to local society of Kibera slum. The focus was to teach people how to get and use the information of the place they live and also how to visualise this information on the map [Hagen 2010]. The software which was used in the project is OpenStreetMap. OpenStreetMap is a software also called 'Wikipedia of maps' and is a platform which is managed and updated by a growing group of enthusiasts who created a map of facilities around the world [www.openstreetmap.org]. The access to maps is free [www.openstreetmap.org].

The first step of the project was choosing people who will create these maps and teach them how to use GPS devices. 13 people (one from each village of Kibera) were chosen for this project. The age of volunteers varied between 19 and 34. There were mixed genders and tribal affiliations to avoid conflicts and problems

connected with inequality [Hagen 2010]. People were very enthusiastic to participate in the project when they were told, what the purpose is and what the project can give to the society [Mapping power to the people]. In the same time when volunteers were taught about GPS devices, local media members were trained to use tools which allow them to collect more information and also to help them to share it for more audience [Hagen 2010]. This project as an additional outcome, not planned in the beginning, will be treated as positive outcome and will be closer described in next chapters.
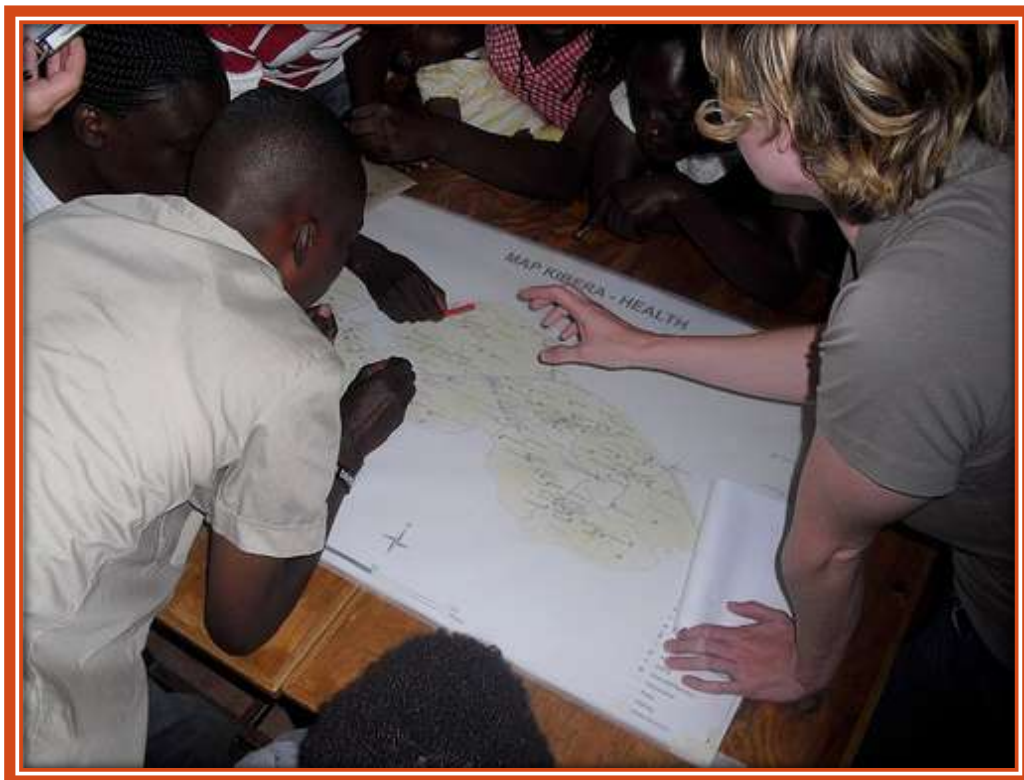

Figure 9: Participatory mapping of health facilities
Source: www.mapkibera.org

Kibera is a big community with a lot of necessary facilities- water points, schools etc., but the problem is a fact that often people are not aware where these facilities are located [www.tavaana.org]. The second phase of the project started with so called map of 'point of interest'. Members of mapping team created the list of facilities which, in their opinion, are important to be mapped [Hagen 2010]. Thus the list contained 8 types of facilities which supposed to be searched for, in the field:

- Water points,
- Toilets,

- Clinics,
- Pharmacies,
- Schools,
- Churches,
- Mosques,
- NGO's offices;

What is more, mappers had also some freedom in choosing additional facilities which might be important for society. They had a chance to mark also other, not contained on the 'points of interest' map, items [Hagen 2010]. In the end in addition to previously chosen points of interest there were also mapped e.g. markets, bars, clubs etc. [Putting Kibera on the map].

After 3 weeks of collection of the information (mappers had a GPS devices to mark facilities, but also cameras to document them and questionnaires to ask additional question to people living around [Putting Kibera on the map]), data was uploaded using Java OpenStreetMap editing software [Hagen 2010]. During this time volunteers participating in the process had a chance to get to know computers and basic information how to work with them. In addition to main map which is available on the OpenStreetMap there were also created couple of thematic maps which mapped facilities the most important for society. These thematic maps are:

- Security,
- Water and sanitation,
- Health,
- Education;

As an example of thematic map the education map is attached to the following project (Appendix 6).

Unlike the most of maps, security map was made with help of young girls who were asked to mark places where they do not feel safe or which are well known as dangerous places with high level of rapes and attacks [Mapping power to the people].

When the surveyed facilities were visualised on the map, there were held meetings with representation of local community who participated in 'participatory mapping'

which gave additional information for different types of thematic maps made during the process [Mapping power to the people].

In addition to maps available on OpenStreetMap there are also uploaded files in different extensions on the website of the project Map Kibera [www.mapkibera.org]. It is possible to download e.g. shapefiles containing information about: transportation, health, security, education, water and sanitation, religion, boundary and pooling places.

Figure 10: Security map painted on the wall, Kibera
Source: www.mapkibera.org

Apart from maps and information easy accessible online, there was a need to share the outcome of the project with locals. As it was written before, main focus of the project was a need for information and need for teaching how to get and use the data about the place. To give an easy access to the information, maps of different themes were painted on walls of buildings around the Kibera. This innovative way of sharing information does not require access to any devices or application what makes it accessible for everyone [www.terangaweb.com]. The problem with sharing map and all outcomes of the project appeared when facing licensing of data law. There were problems with legal sharing maps made in OpenStreetMap thus there was need for using other software and methods which could be approved by law and let to publish legally maps for the broad audience [www.transparency.globalvoicesonline.org].

Local society's reaction

Important part of any survey is to inform people who live in surveyed area, what is going on and why the project takes place. Map Kibera was a project supported by local organisations which were able to access large group of people to inform them that the survey would take place. In addition there were also announcements made via the community radio. The information about the project was also spread during the works, and reached even the most popular TV station in Nairobi [www.transparency.globalvoicesonline.org]. But it does not mean that everyone got the information and that everyone was positive and open for participation and helping in the process of gathering data. There were seen sceptical reactions and lack of trust when data was collected. People were afraid that gathered data will be used against them for eviction [Mapping power to the people]. Everyone who was asking or did not want to cooperate was informed about the purpose of the project [Putting Kibera on the map]. After informing that the project was made for them and will give them an access to information about the place they live, most of people were changing they approach and were willing to help. Very important issue seems to be cooperation with 13 volunteers [Mapping power to the people]. It gave people a feeling that they make maps themselves. Encouraging people to cooperation made them aware of their possibilities and future prospects which might take place after finishing the project [Putting Kibera on the map].

Broadly speaking people were enthusiastic to help after informing them about the goal of the project. They were willing to help and they wanted to participate in the process of creating brighter future for the place they live [Mapping power to the people, Putting Kibera on the map].

Cooperation with local authorities

The Map Kibera project was not invented by government and authorities, thus it is necessary to look into the relationship between project makers and authorities. In the interview taken in 2010 Erika Hagen and Mikel Maron talked about the cooperation with local authorities and they called them as good, with big support from officials. The support was an approval of activities and interest in the outcome but it did not affect any practical, technical or financial help to finish the project. Local authorities were in touch with government officials, who also did not participate in the project on any level, but were positive and looking forward to see the effect and outcome of the project [www.transparency.globalvoicesonline.org].

Kianda

Map Kibera Project started in 2008- 1 year before the project described above. Italian PhD Stefano Marras, after meeting Italian missionary working in Kibera, and after receiving funding for the research, decided to use the money for making survey which shows socio-demographic features in Kibera, which are necessary to be known, when talking about upgrading and development of slums [Appendix 1, Marras 2010]. The focus of the project was mapping the population and structures where the population live. Some part of the survey overlap with previously described project on Kibera. Some of features which are seen in both projects are water points, schools and health services. The Map Kibera from last chapter focuses more on services and their location what can improve the daily live of society, when Stefano Marras sin his project tried to enumerate a lot of features to see the level of life and to give basic information about the conditions of life of society in Kibera [Appendix 1].

Due to lack of information on the internet about the following project and its process, most of the information will be taken from interviews with Stefano Marras and emails exchanged with Kepha Ngito and Benson Sarago who were a field manager and a GIS assistant of the project [www.mapkiberaproject.yolasite.com].

The first phase of the project was the preparation of terrain map which shows structures of Kianda. Maps on Google Maps were not clear enough and could not be used as a base for the survey but The Ministry of Physical Planning held a map with structures of Kibera, which was clear and in high resolution. After georeferrencing and redrawing of all visible structures, the surveying at the field began [Appendix 1].

Stefano Marras invited 35 young people from all villages of Kibera[8] to train them in using GPS devices and to teach them how to make a survey. After short training there were 3 young people chosen to work in the field. None of them was a citizen of Kianda. Each of them got a map with piece of Kianda and went in the field to map structures and to questionnaire people living in a village. For 5 months they were working from 7.30 am until 6.30 pm talking with people and recording demographic data. Questionnaire used in the survey had questions about number of people living in a household, gender, age etc. The problem of the survey was an

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[8] The Kianda project supposed to be a pilot project of mapping the whole Kibera. Due to lack of funding and other reasons the project has never been continued [Appendix 1]

indirect information connected with a fact that a lot of people were at work during the surveying hours, thus the information about household were given e.g. by neighbours. Surveyors needed to trust in the information which was given to them, without any chance to confirm it [Appendix 1].

After 5 months of walking around the village the whole data was collected and using QGIS software it was transferred into different type of thematic maps in 2D and 3D (Figure 11, Figure 12):

- Population
- Schools and children
- Women
- Single adults
- Single parents
- Terrain
- Structures
- Sewage system
- Water points
- Electricity supply
- Public toilets and lavatories
- Building materials
    - Mud
    - Iron
    - Wood
    - Concrete and bricks
- Business distribution
- Rent

Figure 11: Population of Kianda, 3D
Source: www.mapkiberaproject.yolasite.com

In opposite to the case of Kibera maps were not published and there was no easy access for local society to the outcome of the project [Appendix 1]. However the focus of maps was not so important for the society, it would be rather interesting for local authorities to get access to data gathered and visualized by mappers during the Kianda project [Appendix 1].
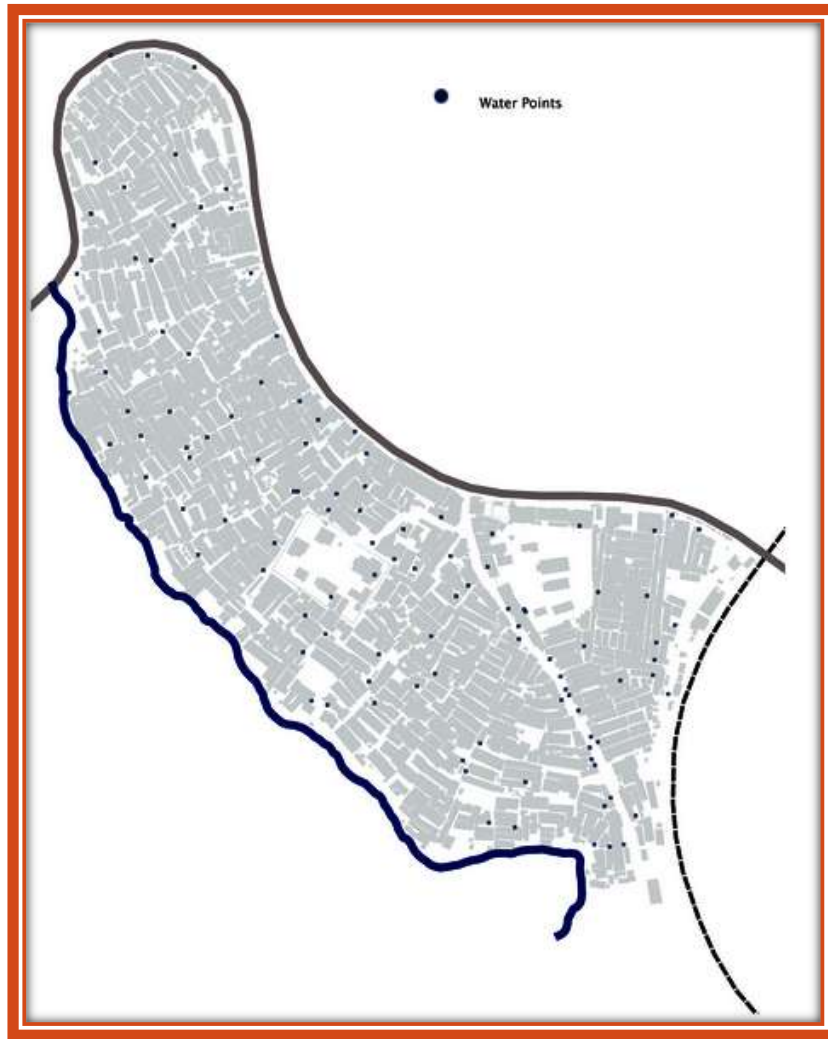
Volunteers and local society's reaction

People participating in a group of 35 potential mappers were willing to be a part of the project and to cooperate for achieving a goal and give an opportunity for Kibera to develop. They were asked to inform their villages[9] about the survey to avoid surprises and negative comments and behaviour [Appendix 1]. Due to the lack of funding enough to hire all 35 mappers, it was necessary to choose only 3 the best among them. People who did not get a job had a feeling that they were used and that they were cheated. None of chosen volunteer was from Kianda, what raises negative opinions and reactions among surveyed citizens [Appendix 1]. To calm down people Stefano Marras decided to hire some people from Kianda and to cooperate with young local grassroots politician, who is respected person among the society. It gave a chance to minimize conflicts and to present possibilities of

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[9] In the beginning it was not clear which village will be chosen as a pilot one [Appendix 1].

development from the local authority's point of view [Appendix 1]. After starting the cooperation the number of negative opinions decreased intensively and people were more willing to give information about their household. Before that they were afraid that the survey takes place to get the information about the village for the purpose of eviction and resettlement, however after setting up the cooperation with local authorities the uncertainty was much smaller and people were much more open to share information about their life and household [Appendix 1].

Cooperation with local authorities

According to Stefano Marras authorities were informed about the project. The basic map of the area was taken from Ministry of Physical Planning, thus there was information given to the Ministry about the purpose of getting the map and the planning enumeration. On local level officials were informed about the planned project but did not participate in it at any level. There were involved people from Kibera who were listened and respected by local society, but they are not representatives of local authorities on municipal level [Appendix 1].

Katanga

The project of mapping Katanga is an example of mapping with an approach significantly different than two projects described above. Mapping Katanga is a case from bigger project called: Mapping Slums around the world. The idea of the project came up during the conference in India. The project was made in cooperation with Google who invented the idea of the project. The software used for mapping was the Google Map Maker [Appendix 3].

The project of mapping Katanga started when the contact with local professional map makers was set. They got a proposition of voluntary participation in the project which goal was to get information about slums, which could be background for improvement of life of locals living in the area. The focus of the project was to map different types of facilities from water point to different types of businesses [Appendix 4].

In the beginning volunteers were very enthusiastic and ready to map Katanga. They got a GPS devices and cameras to take photos of mapped facilities. From satellite photographs there were made small maps for each volunteer, where the location of different structures was seen and their job was to map them with information what kind of facility is it. They were uploading the information gained in the field to the

Google Map Maker. However after 3 month the interest was lost, and volunteers stopped going in the field and gathering data. The effect of the volunteers' job is seen at Google Maps (Figure 14). The project has never been finished and there are couple of reasons of failure seen. According to Max Adoko, a volunteer map maker who participated in the project, the reason of failure of the project was fact that it was voluntary job and people did not have time for it anymore and did not have any encouragement to continue their work [Appendix 4]. Richard Sliuzas, the head of the project, has seen also another reason which was lack of interest from Google to continue with the project and to improve it by making new tools in Google Map Maker, which were necessary in the case of mapping slums [Appendix 3].

Figure 13: Mapping existing businesses of all kind was one of the purposes of the project
Source: Adoko and Sliuzas 2012

For now there is no plan to continue with the project because the need for the information which could be gained from project this type, has not been raised among local authorities and society.

Local society's reaction

 According to Max Adoko [Appendix 4] there has not been set up any meeting with locals to inform them about the project, thus people seeing volunteers in the field

did not have any idea, why they were surveying the place they live. The uncertainty of the reason of volunteers' jobs went so high that some of people living in Katanga went to visit a local council to ensure that they would not be evicted and left homeless. Because the project has never been finished, there was no approval for final outcome of the project and no reactions to information which was gathered and shown on the map [Appendix 4].
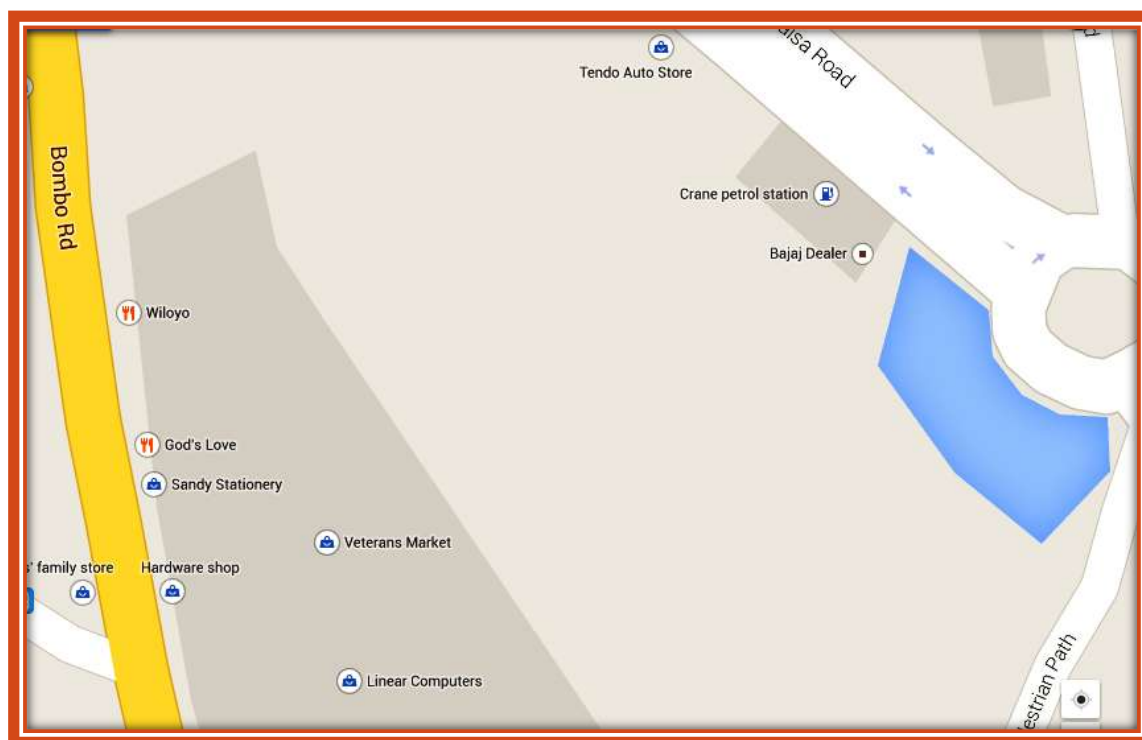

Figure 14: Facilities located in central part of Katanga
Source: Google Maps

Cooperation with local authorities

Local authorities were informed about the project of mapping Katanga; however they were not involved in the process at all. According to Max Adoko [Appendix 4] the political situation was that time complicated and most of officials' effort was addressed to the crucial and the most important issues of the city of Kampala and mapping Katanga was not the one of them. On the other hand agreeing on involvement of officials could give them benefits and raise their electorate, what was not the purpose of the project, thus it was needed and willed to have a help from officials [Appendix 4].

According to the opinion of inventor of the project [Appendix 5] the future and outcome of the project could be significantly different if there would have been

chosen different approach for the project. Public participation could, in Sliuzas' opinion impact more will to finish the project and afterwards to impact local development or community life. What is more, the lack of participation and interest from Google to continue and to develop some tools to make them suitable for purpose of mapping slums and informal settlements, caused technical problems with marking several infrastructure types and what follows, to gather full data significant in planning and developing poor areas of African slums [Appendix 5].

DRC

DRC is a case which opposite to other projects used in the following project, was governmental initiative. The Ministry of Regional and Local Development established a project Community land Information Programme to get an information about each informal settlement in the country [The Shack Dwellers Federation 2009]. This information was planned to be used in further local planning and including informal settlements in development of urban areas in Namibia. Another goal was to encourage inhabitants to participate in a development give them information about the place they live, to be able to improve the daily life of community [The Shack Dwellers Federation 2009].

The first phase of the project was making profile of the area. In the whole country the procedure looked the same. The main goal of this phase was to get information of informal settlements' location and registration of shacks and households. There was also a need to get basic information about infrastructure and facilities available on the area of informal settlement. Making profile of DRC started in 2007 [The Shack Dwellers Federation 2009]. CLIP team had a meeting with council and local authority's officials of Swakopmund to explain them the idea and the planned process. Afterwards, together with chosen officials, there were held meetings with leaders of local communities, including DRC. The purpose of the project was to inform and explain about the whole project and to ask leaders to encourage inhabitants to help and participate in the project [The Shack Dwellers Federation 2009]. Leaders helped to share information and to choose volunteers who were trained to do profiles themselves. The same time there were held meetings with the rest of DRC community to explain the role of volunteer groups and the goal and possible outcome of the programme [The Shack Dwellers Federation 2009]. To get detailed information about the past, history and development of the settlement, there was a group of older inhabitants chosen, to be interviewed. In every case it

was emphasised that women should be a part of the interviewed group. When interviews were made the information gathered from it was presented to the rest of community giving the chance of participation and debate about the known facts and information which, in their opinion, was missing [The Shack Dwellers Federation 2009].

The result of the first phase of the project in DRC was the number of households (1300), population of DRC (10000), access to fresh water and sanitation facilities, information about electricity infrastructure (no individual electricity for households), number of schools (0), clinics (0), kindergartens (3), shops (0), sport facilities (0) and public halls (0) [The Shack Dwellers Federation 2009]. As it is seen, there is need for a lot of basic facilities, which could improve the daily life of people and let them to develop their community.

Second phase of the CLIP started in 2010 and DRC was one of first informal settlements which participated (and finished) this part of the project [The case of DRC community]. The goals of second phase of the programme were [The case of DRC community]:

- mapping,
- collection of data of structures,
- collection of information about inhabitants and their needs;

In the beginning of May 2010 there was held a meeting in Municipality office to inform community leaders and inhabitants about the plan and programme of second phase of the project. After this meeting group of inhabitants met again and without waiting for organisations cooperating in the project, they made a plan and chose groups who should get information needed for achieving the goal of this phase [The case of DRC community, Muller and Mbanga 2012]. Within 2 months over 80% of DRC settlements were surveyed [The case of DRC community, Muller and Mbanga 2012]. After the data was collected there was a time inspection (to make sure that collected data is valid and real), calculation (members of surveying groups made it manually) and presentation preparation [The case of DRC community]. In the beginning of August 2010 there was a held meeting with local and regional officials and with inhabitants. During this meeting the result of the second phase of the project was presented [The case of DRC community]. During this meetings there took place an exchange which helped to share the effect of the project internationally. The representation from South Africa participated in this

meeting and valued the outcome of the project very high, hoping to adapt the concept and use it in their country [The case of DRC community].

Volunteers who participated in the project were rewarded with certificates given them by Major of Swakopmund in gratitude for the hard work and involvement in the development of DRC.

After the presentation there were couple of meetings with officials and inhabitants held (in August and September 2010) to discuss the biggest needs and the most important improvements which, in community opinion, were crucial and urgent. There were 3 groups of issues valued the highest [The case of DRC community, Muller and Mbanga 2012]:

- electricity- with the focus on renovation of old infrastructure which had high fire risk,
- better houses- with focus on better materials and quality,
- land security- with focus on preventing evictions and expropriations;

There were many other issues raised up and discussed, but after couple of meetings it was clear, that these 3 issues were the most crucial for society [The case of DRC community, Muller and Mbanga 2012].

There are no official maps made to show the effect of the inhabitants work. Opposite to the other cases there was no technology used, and the final results with information about inhabitants and their household were not uploaded for general use. The presentation was made by community and it was made manually, on paper, without using computers and any technology (Figure 15). The lack of map and visualisation of the outcome of the process raises a question if the case is relevant for the topic of the project. In author's opinion the case is still relevant; what is more, by the method of 'no map' might strongly influence final outcome and conclusion of the following project.

Even though there was no map as effect of the project, the process as such, purpose and outcome still qualify DRC project and a suitable for the following report. As it was written in theoretical framework the enumeration is a type of mapping method. In the case of DRC there was an enumeration method used, what is more there was spatial data collected, however in the end it was not officially mapped for the broad audience. The purpose of development and land security also fits into framework set by the author.

Local society's reaction

There has been seen big interest in the project. A lot of people wanted to participate, but those he did not have chance to participate during enumeration still were participating information meetings and were very active during the process. People were open to cooperate and share their knowledge and experience to have a chance of improving the situation in DRC. Large protests regarding lack of changes and visible development also shows that how much people were aware of scale, purpose and possible impact of the project [The case of DRC community, Muller and Mbanga 2012].

Cooperation with local authorities

The project itself was held by local, regional and national authorities and officials. There is no need to dig deeper into relations between different levels of power

however it is significant to mention reactions of local officials who said that impact and involvement of community was so big, that sometimes it was seen as working without the supervision of officials what could lead to wrong and misinterpreted outcome. The problem was mostly seen in the situation of meetings made by community without presence of any official. During these meetings there were decisions about next steps taken, and there was no agreement between officials and community about taking these steps [The case of DRC community].

The chapter presented above touched upon the projects and their processes, which shows how the projects were handled and how the cooperation with local societies looked like. To get an understanding of benefits and positive outcome of the project it is necessary to dig deeper into that what happened after the project was closed. Next chapter will be focused on local authorities and improvements which were proposed by them, to develop slums in Kenya, Uganda and Namibia.

Development of slums after mapping projects

There are two ways of looking at benefits which were gained by local communities after project which were described in the previous chapter. First way to understand the impact is looking deeper into local authorities' actions and investments to see what changed in the slums. There is a focus on new infrastructure built, new events invented by officials, and all other kind of activity which was initiated by authorities. Some of them might be initiated by locals and their new gained power and involvement into decision making process. It is crucial to understand what and how was made, to understand the new role of locals and their impact in new management and development of the area they live. There might be also considered changes and improvements proposed and made by NGOs and humanitarian organisations. Creating a map of the slum with all information about existing infrastructure and services shows how much improvement is needed. It is generally well known that situation is bad, but with map and all facilities calculated it is possible how bad is the situation and how much and what kind of help is needed. Projects like ones described above can show what kind of facilities and where, should be located to help and improve community's life.

The second way to look at this impact is analysis of changes which impact daily life of slum. Some of these changes will be caused by development made by local authorities but some of improvements are caused directly by the project and its outcome itself.

The development caused by local authorities will be described in the following chapter when the improvement of daily life will be analysed in the next chapter. This particular order of analysis is caused by the possibility of improvement of daily life which was caused by local officials' actions. To be able to distinguish the cause of improvement it is necessary to firstly analyze the actions of local authorities.

Kibera

The Map Kibera project was made mostly for empowerment of local society of slum Kibera. The knowledge about the place suppose to give them strength and power to participate in decision making process regarding the development of Kibera. There is no available documentation describing the influence which outcome of the

project has on planning and developing the place, but there are indicators showing the movement and changes in planning. After mapping the area and enumerating facilities it was finally possible for local government to engage Kibera in system of the city.

In 2014 there was released a Draft Master Plan for the city of Nairobi (NIUPLAN) and for the first time Kibera has been included as a part of the city. Kibera located in the central part of the city, called Greater Nairobi, has been until now omitted and forgotten. After mapping the place and visualising the structure which allow further analysis and making decisions, it was possible to include information gathered during surveying into Master Plan for Nairobi [NIUPLAN 2014].

Most information given in the Draft Plan is mostly connected with actual situation (e.g. number of schools and heath facilities) [NIUPLAN 2014]. There are also pointed out the most necessary changes and improvement regarding transport infrastructure, sewage system etc. The list of running and planned investments for the area is also given as a part of development of Kibera [NIUPLAN 2014].

Kibera does not appear as a one of main areas which need changes and development, however it is stated in the document that the area is a home for large amount of people and it is crucial to renovate it and create better life conditions, especially when city faces big chances of development and it is predicted that even more low skilled people will come to Nairobi where is predicted growth of work places for low educated and low skilled workers [NIUPLAN 2014]. It is predicted that big part of these people will find a shelter in Kibera, thus it is necessary to improve significantly the place. There are no detailed planes for the development and renovation of the place given [NIUPLAN 2014].

Strategic Environmental Assessment (SEA) as a document accompanying NIUPLAN also contains information about Kibera. The most significant statement it this document is description of a problem which is unplanned growth of the area and lack of plan for its development. There are also given potential solutions which could be adopted in the area to control its sprawl and to improve the life of local societies [SEA 2014].

Generally speaking, even if there is no access to documentation of already made improvement, which might have not taken place yet, the first step into the direction of development, improvement and better management was already taken. The need

of changes and the problem caused by uncontrolled growth were highlighted and possible solutions were given. NIUPLAN is a document which is dated to be fulfilled until the end of 2030, thus it is impossible now to see if the fact of including Kibera in the planning system changed anything or not.

Kianda

According to Stefano Marras, there has been no impact of the project, on the planning and development of Kianda [Appendix 1]. As an author of the project Stefano Marras has not been aware of any influence which his project had on planning of the development of the village Kianda. However, according to emails received from Kepha Ngito and Benso Sarago, the Map Kibera Project had strong influence and significantly impacted changes which took place recently in Kianda [Appendix 2, Appendix 3].

Local government uses maps and analysis made during the project for planning issues connected with Kibera and Kianda [Appendix 2]. Security analysis which was made based on information gathered from questionnaires and created maps, let to find dangerous places and led to locating police posts and to more policeman patrols in the village. What is more, more street lamps were built to keep security on higher level [Appendix 2].

The outcome of the project has also been used in discussion which ended up with development of strategic plan for Kibera for years 2013- 2017 [Appendix 3].

Moreover there were new facilities built. New water points were constructed and new sewage infrastructure was built [Appendix 3]. There were also constructed new houses, however, this necessary investment causes also problems connected with resettlement and choosing people who supposed to be relocated and moved to newly built houses. High level of corruption caused unfair allotment and division of houses between people [Appendix 3].

There were also made changes in education system in the village [Appendix 3].

 In addition, the outcome of the project has been used by several NGOs to plan their projects and works. They used the already existing information to avoid duplicating data which was already collected and to save time and finances which could have been used for different purpose instead [Appendix 2].

Generally speaking, the Map Kibera Project had strong influence into development and planning changes and investments in Kianda. The outcome of the project has been used for improvement of couple of crucial issues in Kianda.

Katanga

Katanga project was the only project among the analyzed ones, which was not finished. Lack of any outcome of the project causes uselessness of data and information gained by volunteers. Any kind of analysis or statistical calculations is impossible when the data is gathered partially. Any kind of authority's actions is impossible due to lack of enough information.

On the other hand the project was not raised by authorities, and they did not to show an interest in using the outcome of the project, what could be an impulse to continue with the Katanga Project. The time when the project was started, the uncertainty of the power and upside downs in local politics caused lack of interest in anything what was among the most important issues for authorities [Appendix 4]. As it was already said and seen, the development of Katanga was not an idea invented by authorities and was not supported by uncertain officials. Even when situation has changed and the problems of local politicians were solved there was no interest in continuing the project shown. Local authorities did not contact with anyone responsible for the project and did not show the need for continuation with the mapping of Katanga [Appendix 4]. If need for the further mapping is not raised it is wasting of money and time to continue with something what might not be used by anyone. The project has been given up so fast, that there was no chance for any visible, positive outcome and effect, which could cause and raise up need for continuation [Appendix 4].

DRC

The project of mapping the informal settlements in Namibia was invented by Government and in cooperation with local authorities and organisations connected with housing and improving the living conditions, was implemented in all regions of the country. The goal was to get a deep insight in the life of informal settlements with all information needed for successful development of the place.

DRS as a one of first finished projects was seen as a great example of encouraging local communities to take care of themselves and to fight for rights to improve their

living conditions. Unfortunately after the project was over, the development did not start as fast as it was predicted.

In 2010 there was set up a DRC School Project which main goal was to give a DRC's possibility of getting basic knowledge. As it was written before, until this project there was no school in the DRC at all. The project was not held by municipality but by organisation Terra- Nova, a Destination Management Company [www.terra-nova.com.na]. There was built a Community Centre when lectures for children are held. In addition the place is also used for providing the health information (with focus on HIV/AIDS information) and as a community centre. The place is available for everyone, but it is addressed mostly for mothers and children [www.terra-nova.com.na].

First investment in DRC, which was made by local authorities, was building an open market in 2011. The DRC did not have any market before. Goods have been sold on the ground, next to streets. The need for business friendly environment led to creating 40 stalls which are rented to locals. The market is not very advanced. There is no access to the electricity and running fresh water, however it gives an opportunity for development and focusing the business part of DRC in one location [Swakopmund News archive 2011].

Figure 16: New open market in DRC
Source: Swakopmund News archive 2011

Another investment which was highly needed was a clinic, which could take patients from the area of DRC. The distance between DRC and previous clinic used

by people was very big and most of people were avoiding and resigning from health care [Swakopmund Newsletter 2014a]. In May 2014 there was officially open a clinic in the area of DRC. One of main goals of building this clinic was to encourage pregnant women to antenatal care and to provide proper help with labour to reduce the number of children dying because of lack of proper health care [Swakopmund Newsletter 2014a].

DRC area as a low developed and poor part of the Swakopmund is dangerous area with a lot of robbery and other crimes. The security is important issue when developing and managing the place, thus there are plans to build these years the first police station in DRC [Swakopmund Newsletter 2014b].

Figure 17: New clinic in DRC
Source: www.staticflickr.com

The main goal of the CLIP and was gathering information which will let to formalize informal settlements around Namibia and through that the possibility of development would be created. Unfortunately, even thought it was a top priority in Swakopmund municipality, the process of formalising DRC was seen as a very slow. In February 2011 there was created a 5 years strategic plan for the municipality, and one of the top most important issues was to formalise DRC [Swakopmund News archive 2011]. However local communities did not see any progress in the development of the area and in 2011 and 2012 they were protesting against lack of visible outcome of the project they participated [www.namibiansun.com]. There were couple of meetings with council and local

community held, to explain them the process of preparation for formalisation and a need of cooperation which is necessary to finish the process. DRC is fast growing area and dynamically changing boundaries and population do not help municipality to finish the process.

Figure 18: Protest against lack of permission for formalization settlements in DRC
Source: www.thevillager.com.na

Finally in the end of 2012 the first phase of formalising process begun - surveyors went on streets of DRC to map parcels and boundaries [Swakopmund News archive 2013]. In December 2013 all data was gathered and analysed and the real plan of building new houses and new infrastructure was created. Sources say that it is planned to build to 3000 new houses in the area [New Era 2013, New Era 2014]. In 2013 there took place protest when there was released an information that Erongo Council did not agree for formalization of DRC's settlements. After couple of meetings there was a permission given and works could have started again [www.thevillager.com.na]. In the beginning of 2014 there was initiated a mass housing programme of building water and sewage installations [New Era 2013]. In November 2014 the first phase of the project of formalising was over and the time for building houses begun. There was a plan to use materials for building from local business and to hire workforce from Swakopmund and DRC [Swakopmund News archive 2013]. Unfortunately there is no recent information about the

progress of the works in field, thus it is impossible to say if building really started and how far is the progress of the project.

Looking at the actions of local authorities it is seen that outcome of the CLIP project impacted decisions made in municipality. The preparation for the last phase of building houses took a lot of time, but it is necessary to be aware that before the project can start there are a lot of decisions, on local and national level, to be made, to be able to run and finance the project.

Changes in communities' daily life

The previous chapter shows changes which took place in decision making processes and involving slums into spatial planning on local level. It was shown how municipalities with their authorities, and NGOs used the information gained and analysed during the slum mapping process. Investments and development which were done using this information directly influence daily life of local societies, however the following chapter will focus on issues which happened after projects and which affected daily life of locals, without influence from authorities. Everything what affected communities' life and was an effect of project, but not effect of decision making process and involvement of any level of authority will be described below.

Kibera

Map Kibera is a project which main focus and goal is to improve the life of local societies by giving them knowledge about the place they live and the power to manage their place. Kibera is a small city within city. There are schools and hospitals located, but the problem is lack of knowledge and orientation where these facilities are located. First of advantages of the project was showing people that they do have access to these facilities, and showing them a map how to get there. The same situation is with other facilities: churches, pharmacies, water tanks. People are now informed about necessary services and places and they are able to use these which are the closest [Putting Kibera on the map, Mapping power to the people].

Knowledge about the location of facilities gives also knowledge of facilities which are missing. People living in Kibera get information and a power to ask for locating e.g. new water tanks. In previous chapter there was described a role of WASUP in locating missing water tanks. It was made without involvement of locals, but there is now an opportunity for community to ask for more necessary facilities and infrastructure [terangaweb.com].

Another group of advantages are benefits which were gained by people participating in the programme. Group of young people chosen to walk around the slum and map all facilities got experience in using GPS devices and computers [Hagen 2011]. They also got new social skills and were trained in public speaking. All of these

aspects give them bigger chances to get a job outside Kibera. What is more all people working full time for the project, were hired, thus they were able to support their families [Hagen 2011].

For the rest of society the advantage is a feeling is being a part of powerful society which can fight for their better future. Every person who participated in the project, doing the smallest thing, felt proud of helping and working for improving their life. People feels united and empowered to change their lives [Putting Kibera on the map, Mapping power to the people].

Creating a security map let people to feel safer. Map created with a help from young girls and women let them to avoid places which are signed with 'black spot'[10]. They are now aware of all dangerous places even in areas where they have never been before. They are now informed how to move around all Kibera and feel safe [Hagen 2011].
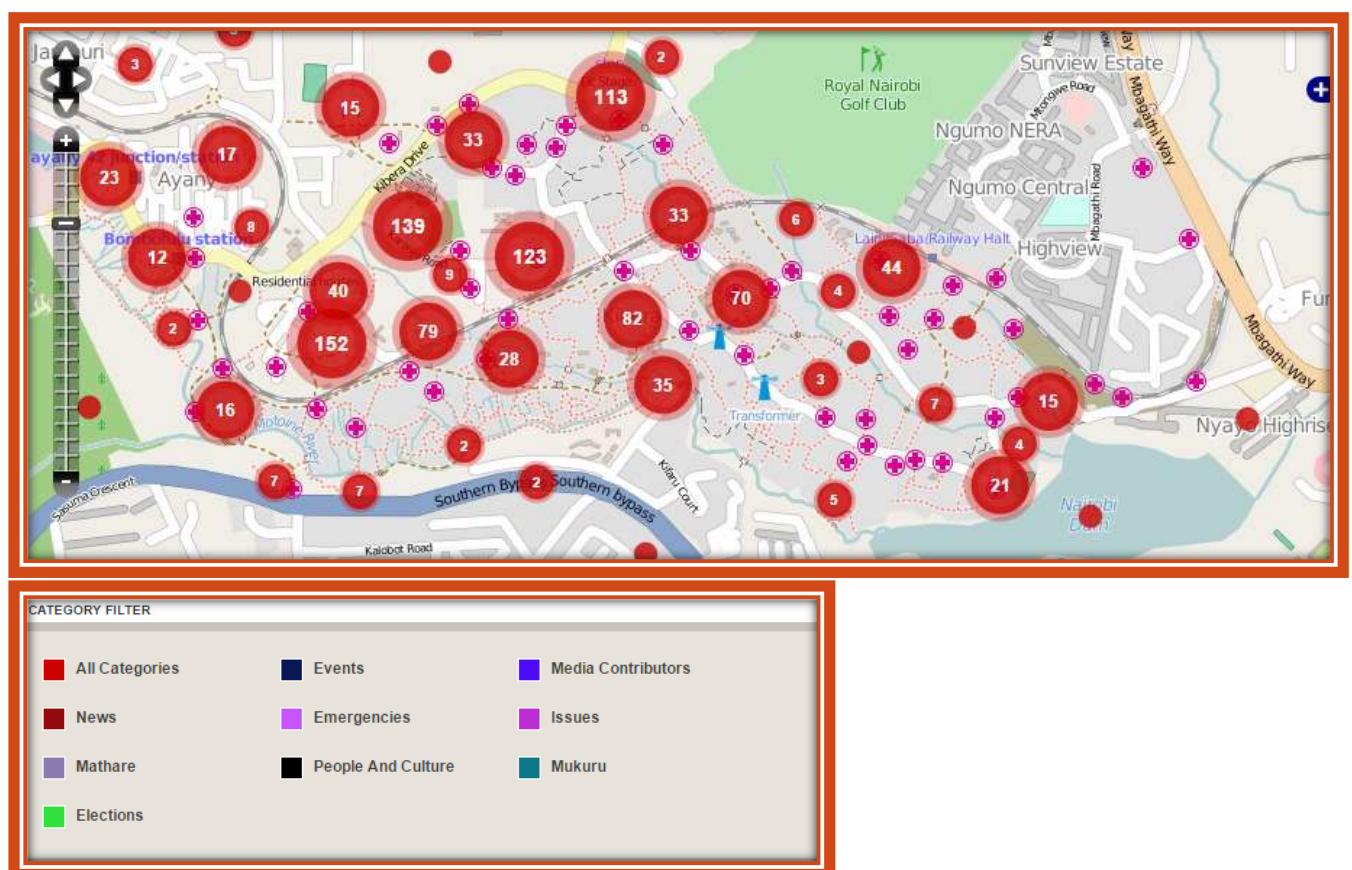

Figure 19: Emergency map run by SMS reporting system
Source: www.voiceofkibera.org

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[10] Black spots are places with high rate of crimes and places where the biggest amount of girls marked as a location where they do not feel safe [Hagen 2011].

The power of society cannot be used if they are not informed about changes and new events or emergencies. To keep people informed and to let the Map Kibera project to survive and to be sustainable there was created a platform The Voice of Kibera [www.voiceofkibera.org]. The website is a second product of the Map Kibera Trust organisation and it is fully addressed to Kibera's community. There are 2 purposes of creating this platform. First is to have a chance of informing society about emergencies and accidents happening in the area. There is an SMS reporting system set. People who are witnesses of accident, fire etc. send information which is immediately posted and mapped on interactive map presented on Figure 19 [www.voiceofkibera.org].

Reports: in Voice of Kibera Showing page 1 of 9 pages

MEDIA	REPORT TITLE	DATE	LOCATION	VERIFIED?
	Fire Claims Five lives from one family A man his his wife, their two children and the man's sister all perished last night when fire erupted at Laini Saba at 10pm. "illigal electricity connections...	2014-12-05	Laini Saba	YES
	The Governor Kidero in kibera This afternoon saw the Nairobi Governor in Kibera to launch the building of some more new classrooms at Olympic Primary School, this is hoped to ease...	2014-10-02	Olympic Primary School	YES
	President Uhuru to Visit Kibera A lot of cleanings have been seen in Kibera by the National Youth Service, today will confirm part of the reason for the thorough cleanings, The president...	2014-09-19	Kibera DC grounds	YES
	One Million Signatures This afternoon, one of the CORD principle Hon. Kalonzo Musiyoka is leading the CORD team across Kibera, to mobilize the residents to submit their signatures...	2014-09-05	Kamkunji Grounds	YES
	Fire! Fire! This afternoon at around 3 pm saw a section of Kibera on fire. The area near CDC (Tabitha health Center)in Gatwekera went a blaze leaving hundreds of...	2014-07-31	Kibera, Gatwekera,	YES
	CULTURAL DAY FOR THE NUBIAN COMMUNITY TO BE HELD AT BOMAS OF KENYA The Nubian community found in Kibra will be celebrating its first Nubian cultural festival in style at Bomas of Kenya on sat 21st of september 2013,There...	2013-09-15	Bomas of Kenya	YES
	M-Maji picks up in Kibera M-Maji a mobile application that uses the widely accessible mobile phones to empower under-served communities with better information about water availability,...	2013-05-27	Gatwekera	YES
	Destruction along the DC road There has been destruction of kiosks and selling stalls along the DC road for the expansion of roads. The structures were been demolished since Wednesday...	2013-04-18	DC road	YES

Figure 20: Reports on Voice of Kibera platform
Source: www.voiceofkibera.org

The other purpose of the Voice of Kibera is to keep people informed about newest events and changes which take place in Kibera. There is a blog run by 3 young man, who were previously participants of Map Kibera project. They write articles which give information about meetings with municipality officials, opening new schools, decisions on local level concerning Kibera and its issues etc. All important issues, which are connected with Kibera and its future, are explained and described on the website [www.voiceofkibera.org].

The success of Voice of Kibera is very big. People finally have a platform which is focused only on their neighbourhood. The success was so big that the same solutions of informing people were adapted in 2 other slums located in Nairobi: Mathare and Mukuru [www.voiceofmathare.org, www.voiceofmukuru.org]. The Map Kibera Trust is responsible for all of these projects; however each slum created its own team who run the platform and post news [voiceofmathare.org].

Kianda

The information collected during the project in Kianda village is mostly data about demography and housing. The information about these issues is not highly needed and useful for local societies. They do not have chance to improve their daily life using this kind of information [Appendix 1].

There was also collected information about some infrastructure facilities (water points, units supplied by electricity [www.mapkiberaproject.yolasite.com]), which might be used by community to improve or to have a possibility of being a part of decision making system. Similar to the case of development made by local authorities Stefano Marras [Appendix 1] stated that the result of the project has never been released, published and given to people. In opposite to Map Kibera project informing people was not a main goal of the project, thus delivery of the result and possibilities connected with informing people about the place they live, have never been used [Appendix 1].

On the other hand Kepha Ngito states that the project and its outcome gave similar impact to the effect of project Map Kibera [Appendix]. Local community, after the project, is more aware of the neighbourhood and local important issues. They also feel more united and empowered as community. What is more, more people is willing to participate in decision making process and the voice calling for justice is much louder due to more participants and people who would like to actively fight for better future [Appendix 2].

In general, the project and its effect impacted people strongly and empowered them even though the purpose of the project was different.

Katanga

Similar to last chapter and development forced by authorities, there are no visible improvements in Katanga's community daily life. According to the fact that project

has never been finished, the outcome (map) has never been released and published for the society [Appendix 4]. The information which was gathered is only available online at Google Maps and Google Map Maker. For people who can barely afford to fulfil basic needs, access to the computer with internet is often impossible [Appendix 4]. What is more, people do not know how to use computers and software which is used for creating these maps. What is more gathered information is not significant enough to change strongly the life of local society.

On the other hand, lack of public involvement and cooperation with community causes lack of interest from the community side, on improving and continuing the project. If the project would be run by locals, situation might be similar to that DRC. People would be willing to work for the project without permanent control from authorities; they could have their own initiative. Unfortunately the form of the project did not need locals to participate in it, thus it did not make them aware of possibilities which this kind of programme brings to the society. The chance of empowering Katanga's society was lost and disappeared as fast as volunteers lost an interest in continuing the project of mapping Katanga.

DRC

In opposite to Katanga case, local community of DRC was strongly involved in the project of mapping, from the very beginning. The involvement gave people feeling of being united in achieving common goal which was development of DRC. Involving older people and women and as these who know the area the most, gave the feeling of equality [Swakopmund News archive 2011]. The project was very transparent thus people knew what is going on at each phase and were able to participate on every step of the project, what also gave them feeling of power strong enough to change their future. The feeling of power was visible during protests in 2011 and 2012 when community went out on the streets insisting formalisation of their settlements to open new possibilities for development [New Era 2013]. The unity and power was also shown in their independency which appeared after consultation meetings with municipality officials, when community members divided themselves and created plan of surveying households by themselves. Involvement and strong participation gave them confidence and strength to fight for brighter future [Swakopmund News archive 2013].

Similar to Kibera participants, people who were strongly involved in the programme gained also knowledge of doing surveys, analysing data and preparing presentation.

It also made them more confident in contacts with other people and in giving speeches. These skills can help them in getting job also outside the slum.

Figure 21: Meeting of DRC's community with city council
Source: www.namibiansun.com

DRC is much smaller that Kibera thus from the beginning people knew the place much better, but still there was a possibility to get an information about the issues they did not know before.

After highlighting the need for making electricity infrastructure safer with smaller possibility of fire, people were also taught how to use the existing infrastructure to prevent accidents and also how to behave and what to do in case of fire accident. It gave them feeling of safety which might be even bigger after building Police Station which is planned for 2015 to be built [Swakopmund Newsletter 2014 b].

Discussion

Last three chapters described the situation of mapping process and different benefits gained by local societies in four, previously chosen, slums in Sub- Saharan Africa. The following chapter will be focused on extracting from last chapters answers for sub questions which will lead to general answer on research question which was asked in introduction to the project. Each question will be answered according to each analysis chapter.

How did the local societies participate in the process?

Public participation in an important part or all kind of planning, and has even more meaning if the purpose of the project is improvement of the standard of life of involved society. Cases chosen for the project had different purpose but all of goals set by authors of projects lead to improving the life of local society, however there are created different paths to achieve the goal.

Kibera

The purpose of the project Map Kibera was to empower people and to make them know the place they live and to be able to use the knowledge they gained and to get included in planning and developing Kibera. The purpose was not only to give them actual information about the place but to teach them how to collect and analyze data, thus informing could last after the project makers leave the place.

Local community was then involved in the project since the beginning and they were part of each phase and step of the project. Group of young enthusiasts were taught using GPS, gathering data and interviewing people. During later phases there were also taught how to use GIS software for analysis and map making.

There were also involved people taught to be journalists and run the platform 'Voice of Kibera' which contains blog with newest information and announcements and SMS report system for informing about emergencies.

Another group of people (mostly young girls and women) were invited to help with creating security map of Kibera by marking places where they do not feel safe.

People who were not directly involved in the project were informed, via radio and announcements, about the project and were invited and encouraged to cooperation by answering questionnaires and supporting surveying group.

In general, surveying main group had 13 members from Kibera's society but much more were involved indirectly in the process of mapping Kibera. In the end the outcome of the project was presented to broad audience, what is more, safety maps were painted on walls around the slum, to keep people informed about the most dangerous places.

Kianda

Opposite to Kibera case, project held in Kianda was not directly addressed to local society, but by using outcome of the project, local officials were able to improve the life of locals. Even though the goal was different, public participation was strong and took place from the beginning of the project. There was a group of young people chosen to do surveying and later to be taught how to make maps using gathered data. Directly involved group was not big- in the end 3 local surveyors (trained for the purpose of the project) and additional representatives of respected group of Kibera's activists who were able to convince community to cooperate and answer honestly on questionnaire's questions.

After finishing the project there was no continuation and no other actions took place to keep the project going, however from the beginning there was no plan to continue with Map Kibera Project after getting answers on previously asked questions.

Katanga

The main purpose of the Katanga project was to get information about businesses and facilities located in Katanga. This knowledge could be later used to develop the place by locating missing services and by improving or proving missing infrastructure and facilities. The implementation of the project was however significantly different than Kibera and Kianda cases because there was no public participation at all during the process. All works were made by volunteer mappers, Google workers, who were already trained in gathering data and there was no reason to teach them, from the beginning, how to do the mapping. What is more local community was not informed about planned project and was very suspicious during the surveying. Project failed due to lack of interest from volunteers side,

however it is believed, that the biggest reason f failure is lack of public participation and involvement of local community into the process. Their interest and deep understanding of the place and its needs could have a great impact into success of the Katanga project.

DRC

The purpose of the project was formalization of informal settlements and general development of the place. Public participation and involvement was seen as a key tool to achieve the goal, thus community has participated in the project since the beginning. The information about the project was broadly shared and announced, thus everyone has heard about it. A lot of people wanted to participate in the process. There was a group of volunteers for surveying and analyzing gathered data chosen and trained. What is more, different groups (women, older representation of society) were involved in determining the most needed and necessary investments. People were empowered by to project to so big extend that were not afraid to protest when works were going too slow, and were not afraid of taking actions into their hands, to accelerate the process and to get outcome faster.

Surveyors who were gathering data were trained how to analyze and map collected data and were responsible for presentation of the outcome to the broad audience, including officials and representation of South African slums authorities.

How do municipalities use collected data for improving the life and environment of slums?

One of ways to improve the life of local societies and develop slum area is on the side of local government. Planning decisions and investments in needed facilities can significantly change slums' reality. Projects described in this report do have a power to be a tool for local officials in decision making process regarding development of each slum. However, it is important to analyze if that what was done and a ways how these projects were used, are enough or there should be done something more to improve slums' reality.

Kibera

According to the purpose of the project, the focus of all sources describing the case of Map Kibera project is narrowed to local society and its empowerment given through this project. There are no accessed sources showing development of the place after the project. The only visible change is existence of Kibera as a part of

the city and inclusion in new Master Plan for the city, together with information about facilities and infrastructure (party taken from outcome of the Map Kibera project) existing and needed in the area. For the first time needs and problems of Kibera were highlighted and included in documentation focused on the whole city of Nairobi.

Kianda

The demographic enumeration with additional mapping of infrastructure and facilities strongly impacted planning of Kianda and creating strategies plans for the village. Using findings of the project local authorities were able to improve safety by locating in strategic places police posts and street light. The quality of roads, sewage and access to fresh was improved. What is more, new houses for local community were built.

Katanga

As it was written in previous parts, the project has never been finished thus there is no existing outcome which could be used by authorities in planning process. It is believed that one of reasons why the project has never been finished is lack of interest from officials' side, due to unstable political situation on local level which forced authorities to focus on the most important issues of the city. However, after the political problems were solved, there has never been raised up the idea of continuing with the project.

DRC

The main purpose of the project- formalization of informal settlements in DRC is still ongoing process, thus it is impossible to state if the goal is achieved. Apart from works on formalization there were couples of other investments made by municipality and NGO's. There were an open market and clinic build by authorities and school together with meeting center constructed by NGO. There is also planned for 2015 construction of first police station which is highly needed according to high crime statistics and general insecurity of the place.

During the process of the project, local community highlighted three the most important issues, which need to be taken care for first. The highest ranked problem- high fire risk electricity infrastructure had not been solved until the date of writing the following project. Renovating and building new houses is an ongoing process. Together with official formalization of settlements there is also a plan of

building new, better quality houses. The problem of land security has not been solved, however it is also closely connected with formalization which will allow registration and basic land tenure and land use rights for local community.

Broadly speaking, in the case of DRC there are still visible positive effects missing, but according to different kind of sources, the process of formalization is ongoing, and when it will be finally achieved, there will be possibility of further investments and development.

In general, finishing project does not mean that the goal of the project is achieved, how it is seen in DRC case. It also does not mean that municipal officials will be willing to use the outcome of the project and to participate in development based on projects' findings, what could be seen in a case of Kibera with very detailed analysis of Kibera's facilities and lack of improvement and development of admittedly needed facilities and infrastructure. However it is necessary to be aware that the process of development is very long process, thus the real outcome of cases chosen for this report might be seen in couple of years.

How do the land use and daily life of slums' societies change?

There are seen also other advantages of mapping slums than development and investments initiated by authorities. The outcome of the project of mapping can also affect local community directly, regardless the purpose of the mapping project.

Kibera

The empowerment of local community of Kibera was a main goal, and was expected to be a biggest and the most willing outcome of the project. Definitely looking at this goal, the project was successful and gave people power for participation in decision making process, regarding Kibera. The power given to people is hidden behind the knowledge about the place. It is not only about knowing the location of facilities, but also about getting news and being aware of events, emergencies and plans regarding Kibera, which are made in municipality. All this information are available on portal 'Voice of Kibera' which is used for updating the present information about all important issues connected and located in Kibera.

What is more, the level of safety was raised by keeping people aware of dangerous places in the area.

The feeling of unity and strength hidden behind fighting together for better future and other common goals is also a great outcome of the project. People had given a chance to combine their skills and abilities to work together for something what can improve their life. Community learnt that setting common goals and achieving them together, makes it possible and easier to improve their lives and to get what t hey need to develop their neighborhood.

Kianda

The type of enumeration and the data gathered during the process does not seem to be very useful for improving the daily life of community; however it did change people's life. Similar to case of Kibera, society of Kianda has been informed and more aware of the surrounding environment, its needs and potential. They also became more united and connected in active participation in decision making system. They were empowered through the project which main focus was to calculate the population and other demographic issues of the village. Accompanied enumeration of and mapping of main infrastructure gave people knowledge necessary to feel powerful and strong enough to ask and to expect authorities to improve the environment they live. The same type of awareness and usefulness of knowledge about the place of living is seen in the whole Kibera after the project Map Kibera.

Katanga

As it was written in previous parts of discussion, lack of finishing the project and lack of full data made it enable to analyze and use the outcome of the project. The information gathered by volunteers is available on the internet but the survey and its effect does not cover the whole area of Katanga, thus it cannot be used in 100%.

On the other hand it would be possible for local community to use the information which was gathered during the survey, but lack of public hearing before the project and lack of information about accessibility makes the outcome of the project rather unreachable for people. Firstly, people do not know that project took place, and where they could eventually get the information. Secondly, Katanga is one of the poorest parts of the city, with people who do not have access to the internet, and often do not know how to use computer.

DRC

Similar to Kibera case, during the project in DRC people were strongly empowered and their awareness of strength hidden by common goal and cooperation was strongly raised. The power of group was used during protests showing dissatisfaction from slow improvement and decision making process, which has been seen as a lack of proper focus on the case of DRC in Swakopmund municipality. People wanted to see the effect of their cooperation and hard work during the process of the project.

There was also improved awareness of contraception and HIV issues, by holding meetings in new built school. What is more, security and health of pregnant women was increased by addressing to them special programs in new built clinic.

Construction of first school in DRC, which was made by NGO and included in benefits in previous part of the discussion, gave children better access to basic education, what causes good impact in their future life and job opportunities.

How projects of mapping slums are used to improve life of slums' societies?

Looking at the following project it is easy to see that mapping projects made in proper way can give benefits to local communities, on two levels. First of them is indirect impact, which is caused by investments made by municipalities and other investors, based on finding from the project. The examples of it are locating new water points in Kibera, location of new school in DRC, building new clinics and police stations.

What is more, information about housing and the infrastructure can lead to formalization of informal settlements, and can be a mile stone in development of slums. Actions which main goal is to formalize the area are seen only in DRC, but formalization and security of land tenure was a main goal only in this case. In other cases, except Kianda case, there would be need for further survey to be able to formalize settlements.

The other types of benefits gained by locals are benefits gained directly through participation in the project and by outcome which is addressed directly to the community. The feeling of unity and empowerment, caused by access to the information about the slum, make people stronger participant in planning and decision making process. The information about the place give them possibility for

better usage of available facilities, for possible business, using the information of missing facilities and services, feeling of safety according to the information of dangerous places in neighbourhood etc.

There might be extracted two factors which strongly determine success and usefulness of projects made in slums. First of them is public participation, which throughout the following project, and all analyzed cases, is proved as a strong indicator in projects addressed to improve slums. When people are informed about possibility of improvement and development, and are engaged to do them by themselves, they are willing and ready to work hard to achieve the goal. They have a feeling of participation in life changing event and are not afraid to work intensively to achieve the goal. Katanga case with missing participation proves additionally, that the best way to get information about slum and to be able to analyze and use the data is to engage people who would be directly and indirectly affected by the outcome of the project. Using volunteers, who do not see benefits for themselves, might make them not interested in the project for long enough to finish it and to deliver final analysis. Exactly that happened in Katanga.

The second indicator which might be seen as a strong factor in slum mapping and slum development is an interest from local authorities' side. If municipality is interested in the outcome (do not need to be involved in the project) it is possible to gain a lot of benefits which can be provided by officials. Kibera case shows it mostly in engagement Kibera in Master Plan and to final realization that Kibera is a part of the city with big potential and big needs. It is necessary to wait to see if theoretical interest will be exchanged into practical investments, but the first step towards improvement and development of Kibera was already taken, even though it was indirect goal of the project.

Kianda, and its project about demography, shows similar impact. The outcome of the project has been used by local authorities and by several NGOs to develop and improve the area of Kianda. There were made different investments impacting different spheres of Kianda community's life.

Katanga was a project with no interest from authority's side, due to political problems officials did not will and push to continue the project and to use later possible outcome.

DRC project, as a part of CLIP, was initiated by Government of Namibia and was held by local authorities who engaged local communities to cooperate. Thus it is obvious that there was a big interest from official's side and that the outcome would be used by them to develop and formalize settlements. The process of formalization is ongoing and in the middle time there were located the most important and needed facilities.

In general, slum mapping projects are great initiative and great possibility of formalization and development of slums and local communities. There are different indicators and factors which need to be ensured to have a proper project with proper and useful outcome, and there is need for interest from local authorities to engage findings form projects in development investments. Involving people who live in slums, let to get the best possible information and to make the feeling of unity and community strong enough to empower them to fight for their better future. If the project is not well planned, do not use the strength of local society and does not attract local officials, it would be very hard for project makers, to really influence and improve the life of local societies of slums.

Conclusions

In the beginning of the following project there were pointed out two main goals of the analysis and the report. First of them was investigation of processes of mapping and finding out what kind of benefits are gained by local societies from mapping processes made for different purposes. In general, when the project is successful, communities can gain benefits through widely understood investments and changes in planning, which are made in slums. Kibera, Kianda and DRC show that gathering data about the place influence planning and impact local authorities to invest in improvement of the place. Basic infrastructure is built or improved. In all successful cases (all except Katanga) there is also seen growing safety through locating police posts etc.

Another type of benefits, gained by locals, is connected with people and the way how they see the place where they live and other people who live there with them. Local communities after mapping projects became more aware of their environment, location of needed facilities and generally about the place they live. The awareness of the place and cooperation in the mapping process gave them firstly feeling of unity and power coming from cooperation, and later strength for participating in decision making processes and active taking part in development of their neighbourhood. They were also shown benefits which come from cooperation, which can be done in all necessary situation according to different issues.

The second goal of the project was to extract from the analysis aspects which might be seen as key factors in successful mapping slums and achieving the goal of development and improvement of the place and society living there. As it was mentioned in the last chapter of discussion, there are two key factors which might be seen in the following project. Public participation and interest from local authorities in outcome of the project seem to be most important issues which determine success of the project. Cases of Kibera, Kianda and DRC even though generally different, share strong public participation and local governments' will to use the outcome of the project. Authorities do not need to participate in the project (Kibera and Kianda), but it is important that they are aware of the run project and do support the idea even if do not take a part in the process as such. The case of Katanga, which is seen as failure due to lack of any outcome and unfinished process, did not have any of these two indicators, and it was even highlighted by

initiators of the project that public participation and interest from Kampala authorities' side could significantly impact success of the project.

The analysis presented in previous chapters was focused on generally different cases with different approach and goal of projects. To get stronger proof for findings highlighted in previous paragraphs it would be necessary to investigate more cases. On one hand there could be investigated another significantly different cases, to see if public participation and interest from local government is always an issue determining success and failure of the project. On the other hand there should be made an investigation of potentially similar cases, to find if there might be seen another factors determining project with similar goals or made in similar environment.

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Appendix 1: Interview with Stefano Marras

I.K.: How did you start the project? Why did you decided to take Kibera?

S.M.: It was by chance. I got in touch with Italian priest who worked there. After couple of months I got funding so I decided to use it in Kibera to do this project.

I.K.: I would like to start with asking about the difference between you project and the other project made in Kibera- Map Kibera. Could you tell me why two projects took place in the same location?

S.M.: I started my project in 2008 and right after in 2009 two Americans came with their own project. They do not aim to do the same thing. Basically we tried to take through GIS the population map with real census and structures, while them aimed to map services. As you can see on our website we did a lot of different maps of demography of the area but not of the whole slum. It is huge area and during 5 moths we were able to map only 1 village, which is Kianda. In that village we found around 15-16 thousand people and 5 thousand structures where these people live. There were only me and 3 other people helping me with mapping. The first step was process of training in GIS basics of 30-35 local young people. On that basis I selected 3 of the best people. I did not have much funding to take more people. I was working on my own research funding.

I.K.: Do you have planned to map the whole slum?

S.M.: After the first project I was willing and trying to go on with my project. I came back to Milan to go on with my work at university. The same time I was trying to find funding to continue with my project in Kibera, but then I had to change my focus of the university work and afterwards I started working with totally different topic. So, unfortunately I am not going to do anything else in Kibera.

I.K.: How did the process of the project looked like? How did you collect the data?

S.M.: First of all I went to Google Maps to get as close as possible terrain map of Kibera. I saved one portion of the area, and then another portion and another. Later I combined them together and I uploaded the raster in QGIS software. I georeferrenced

them and then I started drawing the whole structures. The picture was fuzzy and not clear it was not a high definition map. I had to get a map other way. I contacted with Ministry of Physical Planning in Ministry of Kenya. There, fortunately, I found the pdf made by someone working in the Ministry. I don't know how it was done, but there was available a shapefile of the whole slum.

I.K.: I have heard that there was no map of the area made and the Kibera is a blank space on the map?

S.M.: Yes, officially Kibera does not exist on any official maps. But now, if you will go to Google Maps or Google Earth you will see that there are some streets mapped. On the official maps there is nothing. Now this was the map drawn by some technician from Ministry and I have no idea on which funding they did it and how official was it. The map was very clear and precised. Then I asked them for original shapefile but they were not really happy of giving the original shapefile out, but I managed to buy a pdf. What they give me was a pdf which I georeferrenced and I redraw the whole area of Kianda. From there I printed maps with portions of Kianda and went in the field with my colleagues. Each of us was responsible for one portion of Kianda at that time. And on the map you had to figure out which building was here. When you figured out the first building it was quite easy to identify the rest. We realised that we have to be careful because on the map which we printed buildings looked like one huge building but in fact often there were many buildings covered by one common roof. With that map and very easy questionnaire we just talked to the people we met. We were working from 7.30 in the morning until 6.30 in the evening every day. We walked throughout the slum and stopped next to each building. We were asking first person we met if they live there, how many people live in household and then rest of questions from questionnaire. There were very big limits because during the time of our work many people were not at home working or being in the school. We had to trust that what people we met told us. So our survey was based on indirect information.

I.K: How people reacted to your survey? Did you inform them before that there will be survey?

S.M.: During the first training of 30- 35 people I tried gather 2-3 people from all villages, because I didn't know in the beginning that I am going to work with Kianda,

so I could have access to each village. They were asked to inform people, dwellers in their villages about the survey so locals could be prepared and be more willing to participate and answer honestly on questions in questionnaire. At the beginning when I stared mapping in Kianda I did not cooperate with any local from this village, I chose people from other villages because they shown more potential during training. But then I realised that it was not easy for them. There were some people who were very conflicted; they were hard for me and for the rest. They said 'You are here trying to use our people' 'You are westerner, you are rich'. So I was actually forced to hire some people from Kianda, they were good people helping me. And from that time no problems appeared. They were able to calm down people and prevent potential problems and conflicts. I have to say that not all 30 people were selected to go on with the project. We didn't like it but we didn't have funding to hire all of them. They felt used and not useful. Some of them were not really able to do that job coming back from field with totally fake information. They were not happy when they have heard that they are not chosen to work with us. I cooperated with one man, grassroots politician, very young community leader who was able to calm down the people and to explain them peacefully why they were not chosen for the project. He managed to settle all the things down. That is about people I worked with.

On the side of population I have to say that people were very easy going. There were about 1% of people who were not happy about the project and didn't like fact that we were asking them so many questions. These people, when you go there, wanted to know what is the research about so we were telling them what is the purpose and letting them know that hopefully result of it might be used to design and develop the place. They were very willing to give information.

I.K.: When you finished the map, was the map used by locals or authorities to improve the life of people in Kianda?

S.M.: I am not aware of anything. Theo only official reference which I know about is used in UNHABITAT urban report from 2010. Neither official institutions nor local government have never used or even referenced our project. Two or three years later the Government of Kenya made its own census of Kibera. They released information which was going into direction of my findings. When I finished my project I was trying to guess, estimate total number of people possibly living in Kibera. 1 million which

was a number believed to be, was totally out of range, impossible. There was no enough space. I estimated the population between 215 and 275 thousand. The government ended up estimated with 175 people so even less. I tried to understand how they mapped and boundaries of Kibera used, but I have never been able to figure it out. However no one is using information the information me and government of Kenya have given. When the population is not 1 million but 1/5 of it, it means that Kibera is no longer the biggest slum in Africa. Kibera does not attract any longer all that attention, with money and help from NGOs which government and locals want.

I.K.: So it actually ended up with some bad outcome right? The help was lost?

S.M.: Well I don't think that they lost the help. If we go to Wikipedia and look for Kibera we have given that census estimated that population in 2010 was 175 thousand but other sources says about 500 thousand or even 1 million. So you can see that this is only 1 source giving this relatively small population. On big sources there is still given that it might be much bigger.

Appendix 2: Email from Kepha Ngito

I.K.: Did your project affect local planning and local officials' decisions? Were there any investments made based on your findings?

K.N.: Yes it did. Police posts were constructed in Kibera slums after we made a compelling security analysis using the maps. As a result, more street lamps were put up and more policemen deployed to patrol the area. In addition, the maps were used by several nongovernmental organizations to plan their work better, avoid duplication and enhance networking. Government and political representatives used the maps for their planning. The Map particularly was used in the discussions leading to the development of the 2013-2017 strategic plan for Kibera constituency.

I.K.: Did the project change somehow their life apart from investments made by municipality? Did they become more empowered and able to fight for their rights etc.?

K.N.: Yes, as a result of the awareness raised by the maps, people became more aware of their surrounding environment and more concerned about the larger community. More voices were added to the calls for justice.

Appendix 3: Email from Benson Sarago

I.K.: Did your project impact anyhow the community of Kianda and development of the place?

B.S.: Yes, our work has brought about a turn arround both for the people of Kibera and the geographical newness to the place. I have plenty to demonstrate to you about the new road construction, water and sewerage. Education system, security and rural to urban migration settlements. Houses have also been constructed but ressetling people in this house has become a challenge due to corruption.

Appendix 4: Interview with Max Adoko

I.K.: What was your role in the project?

M.A: Some years ago I used to do a lot of mapping on Google Map Maker. Google looks for volunteer mappers who map different places. When Google want to improve the map with new information they take volunteers who log on the website and add places, draw features on the map etc. So at the time there was an effort to map slums. There was a man- Richard Sliuzas who was in charge of that project. That what we had on the ground was couple of enthusiastic mappers who set up a little mapping party. During one weekend we went out together and we were able to gather some relevant information about water drains, businesses etc. located in the Katanga slum in Kampala. There were other efforts to do the maps on another platforms e.g. Kibera slum at the same time.

I.K.: I am writing my project about social issues and how this project changed the life of local societies, if changed at all.

M.A.: The impact of the map on people's life was not seen. There was no community involvement and there was no public hearing to talk and inform locals that we are going to make project like this. People did not know what could be a benefit from the project and there was no map printed in the end to give it to people so they can use it.

I.K.: You said that there was no public hearing to inform people about the project. Could you tell me how people reacted on you and you colleagues?

M.A.: When you are doing maps you have to gather a lot of information about the place, type of business etc. You also have to take photographs. These actions raise eyebrows and interest of people observing you. Some people thought that the purpose of the survey is their eviction. There were even people going to local council to ask and say that this is their area.

I.K.: Could you tell me, why local society was not informed about the project and why they were not involved?

M.A.: From the map making point of view it was not needed to involve people in the mapping. Google Map Maker wants product to drive itself. There was no permanent employee who could be hired to walk around and map each facility on the ground. The group of volunteers did the whole work. However that was also the biggest problem and reason why the project was not successful. After some time volunteers lost an interest and were involved in different projects.

I.K: For how long this map was being updated?

M.A.: Around 3 months.

I.K.: The map you were making was the map of different types of facilities. Did you have any plan to make a map of households or properties, which could be used in municipality?

M.A.: When you use Google Map Maker you have already some features shown and you can draw on it other features: roads, water points, service places etc. Than you can change it

I.K.: What kind of features did you have on the map in the beginning?

M.A.: There were main roads, but nothing more. You can draw roads from satellite photo like it was done, but even though you can see other features, you cannot say what type of feature it is, and that was the purpose of our project. Using satellite to see features we were identifying them.

I.K.: Do you know if your map was used in any way by local authorities? Were they interested in that project to improve it and be able to use outcome of it?

M.A.: The time of the project we had a lot of upside downs in local politics. Only main and the most important issues were solved, thus there was no interest from their side to use the effect of our work. However I think that if the situation could be normal, they would be interested in using it.

I.K.: Do you think that this project might be finished one day?

M.A.: Definitely, if the need will arise, it is possible and I am open to continue with the project. Until now there were no voices raised that the project should be finished, but I hope that one day we will continue with it. From the way how the project was done there is no clear benefit seen for now. And you cannot do something if you don't have any benefit from it. For example people living there are too poor to use the application, so they cannot use our work in anyway.

Appendix 5: Interview with Richard Sliuzas

I.K.: How did you find people to work with you on the project 'mapping slums around the world'?

R.S.: I should explain briefly that the idea of mapping slums with Google Map Maker came up when I was talking with one colleague who had association with Google Map Maker. He was preparing some training materials for them. And he was asking me if I have any possible applications for doing it. It was discussed with people from Google and I said, yeah, we can settle it up. After that, very quickly Max and few other people, especially from Kampala and India, got involved. Some people from my network were doing some things as well. But generally I think that the whole experience was very unsatisfactory. There were couple of reasons for it. Firstly we didn't really think what exactly we want to get, we want to achieve. We also generated a lot of negative reactions from different sources. The critique was mostly made by open urban mapping platforms like Open Street Map and GIS communities. The criticism was- why to do this with Google? Because when you make map in Google Map Maker, the data becomes theirs, Google. Generally, there was big negative opinion about the project, among participants and mapping community.

I.K.: Were the other cases of the 'mapping slums around the world' successful? The Katanga case was not even finished, what about other cases?

R.S.: We did not have projects as such. We organized in India a workshop together with UN-HABITAT and other groups. We talked about the need for doing slum mapping and how it could be done. The idea of this project just came up and we took it as I just briefly explained.

One of big issues and reasons why it actually did not work and I shut it down recently was no real interest from Google. That what we wanted to do was not necessarily mapping individual building but put a boundary around it, saying that this is a slum community. And then to maybe collect some other information about community. Google Map Maker works with group of certain categories with certain feature classes. There are buildings which can have boundaries, but there is nothing called *a slum*. We asked Google officials that we would like to add an additional category but they did not

response until today. It means that we had to misuse the category of administrative area because slum is not necessarily an administrative area. It causes problems when in some cities are already mapped administrative areas and you add another one which is not real administrative area. It causes problems and misinterpretation.

I.K.: you told me that the lack of success might be seen in lack of interest from Google side. Do you think that another reason for unsuccessful project might be lack of public participation?

R.S.: Of course, this is also a reason why the project in Kampala has not been successfully finished. But the way how the plan for the project has been made, there was no need to engage local community. However they might be a power to continue and successfully finish the project for sure.

Appendix 6: Education map of Kibera

MAP KIBERA - EDUCATION