

# **Why do people live in Guinaw Rails South?**

- a study of why people live in a high-risk community

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## **Abstract**

Guinaw Rails South is situated in the Dakar region in Senegal and is constantly exposed to dangers such as floods, insecurity and diseases. This study shows that people live in this high-risk informal settlement because of four main reasons. Those are *family, economic situation, own house* and *work or education*. The study was conducted with a Grounded theory approach and based on interviews with people living in the area.

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## Summary

In Senegal many people leave the poor rural areas in hope of getting a better life in the city, and today, around 50 % of Senegal's population live in cities. Around a fourth of this population live in the Dakar region, and especially in the suburbs of Dakar which are growing fast. Around 40 % of Senegal's population live in informal settlements.

The problem with settlements in hazardous areas is a current and very complex one. The rapid urbanisation along with the poverty in Senegal has led to many high-risk informal settlements, for example Guinaw Rails South in Pikine. The purpose of this study is to increase the understanding of why people live in these informal settlements, by studying Guinaw Rails South.

The study started with a general literature study on different methodologies, how to perform interviews and other necessary background information. Thereafter, a field study with semi-structured interviews with the residents of Guinaw Rails South was conducted. The structure of the interviews and the interpretation of the results were performed with a *Grounded theory* approach, where the transcribed interviews were coded into categories. The results were then analysed together with previous studies within the same research field and resulted in reasons for why people are living in Guinaw Rails South.

Our findings are that people live in Guinaw Rails South because of a combination of many factors. However, this thesis indicates that there are four major reasons.

- **Economic situation.** Many residents in Guinaw Rails South moved to, and stay in Guinaw Rails South, because of their economic situation. The houses and the rent here are cheaper than in many other parts of the Dakar region and Guinaw Rails South is often the only place where these people could afford to live.
- **Own house.** To live in your own house is valuable for many of the residents in Guinaw Rails South. However, our belief is that this is often strongly connected with peoples economic situation since owning your house means that you do not have to pay any rent.
- **Family.** To live with your family is important to people in Senegal and therefore many people moved to Guinaw Rails South because they followed another family member. Women often moved with their husbands and men came with their parents or other family members.
- **Work or education.** People migrating from rural areas around Senegal come to the capital in hope of better opportunities to make a living. Guinaw Rails South is not too far from Dakar city and by commuting; people can live in Guinaw Rails South and work in Dakar city.

These reasons may apply to other high-risk areas around the world, but it is important to note that this thesis and its results are limited to the area of Guinaw Rails South in Senegal.

## Sammanfattning

I Senegal lämnar många människor fattigdomen på landsbygden i hopp om att få ett bättre liv i staden och i dag bor omkring 50% av Senegals befolkning i städer. Omkring en fjärdedel av denna befolkning lever i Dakarregionen och särskilt förorterna till Dakar växer snabbt. Omkring 40 % av Senegals befolkning bor idag i informella bosättningar.

Problemet med bosättningar i farliga områden är ett aktuellt och mycket komplext problem. Den snabba urbaniseringen tillsammans med fattigdom i Senegal har lett till många informella bosättningar, till exempel Guinaw Rails South i Pikine och syftet med denna studie är att öka förståelsen för varför människor bor i dessa informella bosättningar genom att studera Guinaw Rails South.

Studien inleddes med en allmän litteraturstudie om olika metoder, hur intervjuer bäst utförs och annan nödvändig bakgrundsinformation. Därefter genomfördes en fältstudie med semi-strukturerade intervjuer med de boende i Guinaw Rails South. Strukturen på intervjuerna och tolkningen av resultaten utfördes med en så kallad *Grounded theory* metod, där de transkriberade intervjuerna kodades och sattes ihop i kategorier. Resultaten analyserades sedan tillsammans med tidigare studier inom samma forskningsområde och gav möjliga svar till varför människor lever i Guinaw Rails South.

Våra resultat visar att människor lever i Guinaw Rails South på grund av en kombination av många faktorer. Denna studie visar dock att det finns fyra huvudsakliga skäl:

- **Den ekonomiska situationen.** Många invånare i Guinaw Rails South flyttade till och bor i Guinaw Rails South, på grund av sin ekonomiska situation. Husen och hyrorna här är billigare än i många andra delar av Dakarregionen och Guinaw Rails South är ofta den enda plats där dessa människor har råd att leva.
- **Eget hus.** Att leva i sitt eget hus är värdefullt för många av de boende i Guinaw Rails South. Vi tror dock att detta ofta starkt förknippat med folks ekonomiska situation eftersom att om du äger ditt hus innebär detta att du inte behöver betala någon hyra.
- **Familj.** Att leva tillsammans med sin familj är viktigt för människor i Senegal och många människor flyttade till Guinaw Rails South eftersom de följde efter en annan familjemedlem. Kvinnorna flyttade ofta med sina män och män kom med sina föräldrar eller någon annan familjemedlem.
- **Arbete eller utbildning.** Personer som flyttar från landsbygden runtom i Senegal kommer till huvudstaden i hopp om att få ett bättre möjligheter att tjäna sitt uppehälle. Guinaw Rails South är inte alltför långt från Dakars centrum och genom att pendla kan människor leva i Guinaw Rails South och arbeta inne i Dakar.

Dessa skäl skulle kunna tillämpas även på andra högriskområden runtom i världen, men det är viktigt att notera att denna studie och dess resultat är begränsade till området Guinaw Rails South i Senegal.

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Lund, November 2012

Jenny Axelsson and Martin Linge

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# 1 Introduction

## 1.1 Background

When it comes to the impact of a disaster, a city could be the most dangerous place on earth for those who live in poor urban areas. Over half of the world's population live in cities and towns. Of these, more than 1 billion people live in poor and appalling conditions (IRFC, 2010). Moreover, this population is often exposed to the highest risks from natural hazards such as floods, cyclones and earthquakes. As the world's population becomes more concentrated to large cities, there is also an urbanisation of disasters and disaster risks. Today, people in low-income countries are four times as likely to die in a natural disaster compared to people in high-income countries (Douglas et al., 2008).

Disasters will never occur without a hazard or without vulnerability. As the former Secretary-General of the United Nations, Koffi Annan says (United Nations, 2004):

“...communities will always face natural hazards. But hazards only become disasters when lives and livelihoods are swept away, mainly as a result of human activities. The vulnerability and what disaster analysts call "risk burdens" of communities and countries are being increased through a myriad of everyday development decisions at individual, local, national and international levels. For example, populations are too often being concentrated in risky areas such as flood plains. Looming above all this is the threat of global climate change and rising sea levels as a result of increased greenhouse gas concentrations in the atmosphere caused by human activity”

Following this, the problem with settlements in hazardous areas is, perhaps more than ever before, a current and very complex problem. It is therefore important to strive to better understand why people live in high-risk areas. In Senegal, 50 % of the population live in urban areas and the majority of these live in the greater Dakar region (Utrikespolitiska Institutet, 2012). Unemployment is high and two thirds of this population lives on less than two US Dollars a day (Utrikespolitiska Institutet, 2012). Such poverty along with a rapid urbanisation has led to many informal settlements<sup>1</sup> in the suburbs of Dakar (Utrikespolitiska Institutet, 2012), for example Guinaw Rails South in Pikine. The informal settlement of Guinaw Rails South is a good example of a poor urban area where the inhabitants are living at high risk, predominantly in relation to floods, which is one of the greatest risks in the urban areas of Africa (IRFC, 2010).

The Red Cross in Senegal have done a lot of work in the area and this research will hopefully provide them with more useful information that they can use in their future work towards a better risk reduction in Pikine and the surrounding areas.

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1. According to OECD (2012) 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; unplanned settlements and areas where housing is not in compliance with current planning and building regulations (unauthorized housing)”

## 1.2 Purpose and research question

The purpose of this study is to increase the understanding of why people live in high-risk urban areas, and it intends to meet that purpose by studying Guinaw Rails South in Pikine, Senegal. Hence, the study intends to answer the following research questions.

Overall research question:

- Why do people live in the high-risk urban area of Guinaw Rails South, Senegal?

Specific research questions:

- Why do people move to Guinaw Rails South?
- Why do they stay in Guinaw Rails South?
- What is their risk perception and have they noticed any change over time?

It is important to highlight that the study is limited to cover why they live in, or have chosen, Guinaw Rails, not the reason why they moved from somewhere else in the first place. We do in other words not study the social causes that make people leave their original homes and come to settlements like Guinaw Rails South.

## 2 Methodology

This study was conducted with a qualitative research approach and based on *Grounded theory* methodology. According to this, little specific research should be done before the field study. However, the work started with a literature study to gain more knowledge about the principles of Grounded theory, how to perform interviews, the situation in Senegal and other background information.

### 2.1 Grounded theory

Grounded theory is a qualitative research methodology consisting of systematic, yet flexible, guidelines for collecting and analysing qualitative data. The theory is an iterative process that updates the researcher's knowledge as more data is collected. Grounded on the collected data, theories can then be constructed. The method was developed in the 1960s by the sociologists Barney G. Glaser and Anselm L. Strauss during their studies of dying in hospitals (Charmaz, 2006)

The first step in a Grounded theory methodology is to collect data and then try to place this data in its relevant situational and social contexts. This will help us to learn about how people make sense of their experiences and thereafter we will be able to make analytical sense of their meanings and actions. When rich and detailed data has been gathered, this will be coded by label bits of the data according to what they indicate. The coding phase is the first analytical step in the Grounded theory and creates an analytical frame from which an analysis can be developed. During the coding, we should remain open to exploring whatever theories we can see in the data. Data is compared with other data, and from this we can learn what is seen as problematic and begin to treat it analytically (Charmaz, 2006).

By writing memos on telling codes, ideas can be explored and developed further. Similar codes are also assembled into concepts that are used to create categories based on their similarities. By theoretical sampling the properties of the categories are developed until no new properties emerge, the categories are more saturated and this analysis forms the foundation of the theory. The procedure is illustrated in figure 1.

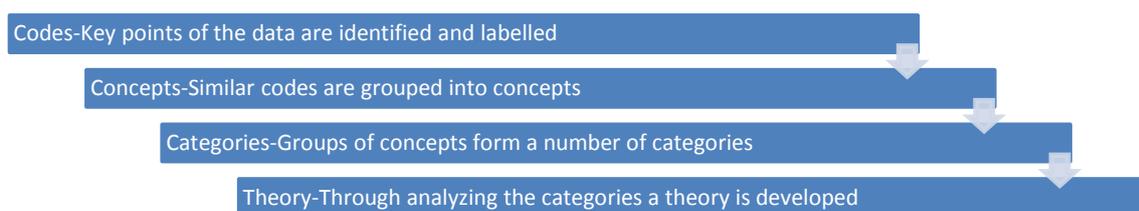


Figure 1. The Grounded theory method procedure

A Grounded theory is different from of a traditional deductive methodology; instead of beginning with a hypothesis that is incrementally tested, this qualitative approach starts with collecting data and then generates a theory as the study evolves. The methodology was chosen to be able to explore the situation in Guinaw Rails South from a wide perspective and because little or nothing was known about why people chose to live there. The results are not a reflection of the empirical truth but the reflection of the researcher's view (Roth, 2011). As Charmaz (2006) puts it:

“...theoretical rendering offers and interpretative portrayal of the studied world, not an exact picture of it”

The main advantage with a Grounded theory methodology, compared to other approaches, is that the gathered data does not have to be fitted into already existing frameworks. You are able to have a wide perspective and have an open mind about what you are studying and the methodology is therefore suitable when it is impossible to evaluate the validity of pre-set response categories.

## 2.2 Data collection

The main data for this thesis was collected through interviews with people that live in the area of Guinaw Rails South in Pikine. Other types of data have also been collected through interviews with different authorities and NGOs (Non-Governmental Organisations) and from documents and reports from these organisations. Last but not least, the authors of the thesis have gained a lot of knowledge about the situation through simply living in the country for two months, talking to people, watching the news etcetera. The conducted interviews were made with a *semi-structured* approach.

### 2.2.1 Semi-structured interviews

Interviewing is a two-way communication that is able to provide more rich data than a survey, and gives the researcher a chance to make sure that the respondent is talking about the same thing, and focus on the same dimension as the interviewer. However, Foddy (1993) highlights that an interview is a form of social interaction and has to be analysed accordingly. Furthermore, the questions and answers need to be seen in the social context they operate.

To be able to get as much information as possible from the respondents while at the same time not influencing their story about their lives in Guinaw Rails South, the authors wanted the interview to be as open and unstructured as possible. At the same time, one has to make sure that the research question is answered and a type of interview method called semi-structured interviewing was therefore used. A semi-structured interview has a lot of the informal qualities of an unstructured interview but uses an interview guide as an aid.

A guide is a must when there are multiple interviewers but is also an important tool in the quest of creating more reliable and comparable data. However, the interviewer may ask particular questions that come to mind and the wording of the questions do not forcefully need to be exactly the same in all the interviews (Sociology Central, 2011). As Oppenheim (1992) and Foddy (1993) points out, it is hard to achieve psychological similarity (i.e. the same conditions, stimulus etc.) between interviews, and an assumption of equivalence of stimulus is often falsely made by researchers. When there is a great chance that you will not be able to interview the respondents more than one time, a semi-structured interview is the best choice (Bernard, 2006).

The interview method uses open-ended questions which mean that the respondent has to answer more than simply “yes” or “no” to the given questions (the use of a few open ended questions is also suggested in Grounded theory by Charmaz (2006). This can be achieved by asking questions in the following manner: “Tell me more about...”, “Earlier you talked about...”, “Can you explain that further?” etcetera. The method allows the respondent to answer in a free manner without being bound by predefined questions (Sociology Central, 2011). Hence, a semi-structured interview is more conversation oriented and the goal is to

understand the respondent's perspective rather than to make generalisations about behaviour (Sociology Central, 2011).

A fundamental rule is to lead the respondent into a certain topic, without affecting the respondent too much (Bernard, 2006) (Oppenheim, 1992) and one of the key tools for successful interviews is probing (Bernard, 2006; Charmaz, 2006). To probe can be for example to stay silent or to give affirmative comments to let the respondent give the information he or she thinks is important (Bernard, 2006). However it is essential to understand that the interviewer will always affect the respondent and the interview must be seen as contextual and negotiated (Charmaz, 2006; Foddy, 1993).

There are many strengths and weaknesses with semi-structured interviews. As mentioned earlier it has informal qualities and thus can easier create a positive rapport between the interviewer and the interviewee (Bernard, 2006; Sociology Central, 2011). Semi-structured interviews have a relatively high validity since the respondent is able to talk about the topic in depth and detail and with little interaction from the interviewer (Sociology Central, 2011). Under such circumstances the meanings behind different actions may be revealed. However, it is difficult to be sure if the respondent is giving correct information. He or she could be lying, withholding information or unconsciously give incorrect information due to for example imperfect recall of events (Foddy, 1993; Sociology Central, 2011). It is important to remember that the quality of the interview depends strongly on the skill of the interviewer (Sociology Central, 2011). The interviewer may for example unconsciously direct the respondent to answer certain things by giving out signals.

### 2.2.2 Selection of respondents

The goal of a Grounded theory, as stated above, is not to generate statistical representativeness and the respondents in a small survey are unlikely to be properly representative of the survey population. However, if it is possible, the objective is to interview respondents of every kind and background, i.e. a sample whose precepts, attitudes and experiences are likely to cover a similar range and variety (Oppenheim, 1992).

In this thesis, the studied population was restricted to people living in the areas of Guinaw Rails South in Pikine. Since it was not possible to interview the entire population, a smaller sample from each of the population groups was interviewed. Ideally, a *single stage probability* sampling method should be used, which means a random sampling method where each individual in the population has an equal chance of being selected (Blaikie, 2000). In this study this was impossible due to the lack of proper registration of inhabitants in the irregular parts of Pikine.

Instead a combination of a two single-stage non-probability sampling method called *quota sampling* was used. Quota sampling means that you set up certain criteria for people to interview and then fill a quota in each selection category (Blaikie, 2000). Given that the sampling is not random, any general conclusions about the population in Guinaw Rails South cannot be withdrawn, but however, a deeper qualitative understanding about the subject can be held (Höst, Regnell, & Runesson, 2011).

In this study, the goal was to make the quota for each category as proportional as possible to the prevalence in the population. Pikine has 49 % female and 51 % male inhabitants (Seyni

Ndione, 2009). The population is extremely young and 60 % is under 20 years old and still active adults, age 21 – 59, represent 37 % of the population (Seyni Ndione, 2009). Hence the goal of the quota sampling was to cover these demographic groups.

After the first few interviews, however, it was observed that people younger and around 20 did not have much to say regarding our questions and the age groups were therefore slightly modified. Another issue concerning interviewing younger people was that their parents often interrupted and in the end, the parents answered more questions than the child who was supposed to be interviewed. In addition to this, young people are often born in the area or did not participate in the decision process of either moving to, or staying in, Guinaw Rails South.

The different age groups used were 18-30, 31-40 and 40+. As we were interested in getting information from both women and men and different age groups, we realised that it was better to try to interview an equal number from each group even though the demographic picture was different.

In Grounded theory data is collected and analysed continuously, and decisions about sample size are decided accordingly. Using this method does not give the researcher the ability to draw statistical conclusions; nonetheless it is possible to make a *judgment* about how well the data represent the population and if generalisations could be made (Blaikie, 2000).

The choice of respondents was in part given to the volunteers when we were in the field. We let them help us find household and respondents which had different levels of vulnerability. This is something really subjective but we found it important to have a mix of different vulnerabilities, and it was often hard for us to determine how bad some people's situations actually were. Moreover, the volunteers had more experience about the life in Guinaw Rails South so we believe that this was necessary to get a good diversity in our selection.

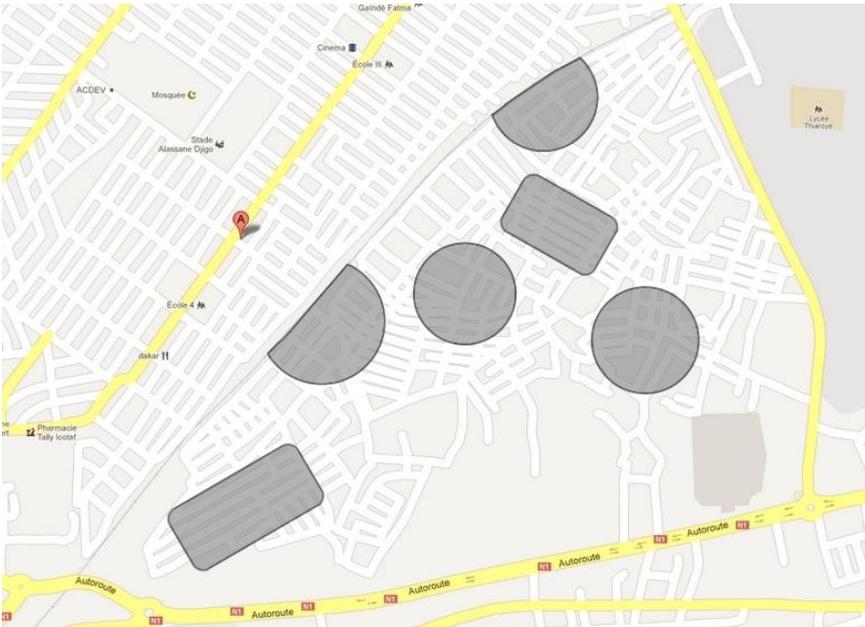
### 2.2.3 The interviews

The interviews were conducted in the informal settlement Guinaw Rails South in Pikine, during the period from the 27th of August until the 20th of September 2012. Given most of the people in Guinaw Rails only speak the African language Wolof; we had to use interpreters for the interviews. These interpreters were two volunteers from the Senegalese Red Cross who speak Wolof, French and some English. The questions in the interview guide were written in English and then translated to French, together with the interpreters, giving an interview guide in both English and French. During the interviews, the interpreters directly translated the questions into Wolof. Before the first interviews were held, a couple of test interviews were made to mitigate any alternations in the translations.

Before the interviews a short education was held about Grounded Theory and Semi-structured interviews. However, the volunteers' knowledge and understanding about how the work was supposed to be carried out was limited (mainly because of language problems and different education), and unfortunately this will affect the quality of the research. During the first seven interviews, a person from the Senegalese Red Cross in Pikine was also present to assist with knowledge about the people and where to conduct the interviews.

The goal was to cover the area of Guinaw Rails South by making interviews in one sub area per day. The sub areas were chosen in a manner so that interviews were conducted in

scattered places, covering the different parts each day, see figure 2. When the area of the day had been chosen, the Red Cross workers helped us make a judgement about which families to interview, while trying to cover different grades of vulnerability. While in the house, we tried to cover the different categories from the quota sampling as well as possible. Most of the interviews were made between 10 and 14 o'clock, but to be able to interview as many different people as possible, a few were also made later in the afternoon. Given some people are away working during the weekdays, some of the interviews were also held on a Saturday. No interviews were held later in the evening due to safety reasons.



**Figure 2. The six areas in Guinaw Rails South were the interviews were conducted.**

To better be able to participate in the interviews, and to keep them in a free-flow manner, a recorder was used with the respondents consent to record the conversations. However, some general notes were taken during the sessions. Some pictures were also taken to keep the interviews traceable and the participating respondents’ characteristics and conditions fresh in mind.

The interviews were made in two steps. During step one, interview 1-20, the goal was to get a broad understanding of the situation in Guinaw Rails South and what people think about their lives there. After these 20 interviews, an analysis was made. From this, it could be seen that the answers to some of the questions were clear. However, regarding peoples risk perception and changes in the area, more information was still needed. The focus of the second part of the interviewing, interview 21-40, was therefore to get a deeper insight in these two areas. Some of the questions also needed to be changed, because the respondents had not fully understood the context of the questions. For this part, it was also a greater focus on covering different grades of flooding, from no flooding at all to a lot, see appendix D.

It should be noted that the original interview guide was written in Sweden, before the arrival in Senegal, and is therefore based on the authors’ views of risks, dangers and the world in general. However, the inhabitants of Guinaw Rails South did not share this view, and things that the authors took for granted were not always obvious to the respondents. Their strong

religious faith is also something that differs from how the authors look at life, and probably influenced their answers in ways that were not considered while writing the interview questions.

Because of this problem, even the first interview guide was updated along the way, while the authors gained more knowledge about the life of the inhabitants of Guinaw Rails South. The two interview guides used can be seen in appendix B and C.

### **2.3 Sources of errors and biases**

Except the sources of errors and biases that are mentioned throughout the report the fact that this report was based on interviews, have also unfortunately, affected the results. The interviews were held in Wolof and we did not have the opportunity to interrupt during the interviews, which also was a source of errors. Moreover, sometimes the interpreters have explained the questions in different ways that we do not know of and while transcribing the interviews from Wolof to French and then English; some information was inevitably lost.

There might also be a chance that the respondents believed that we as foreigners might have the power to change the situation and therefore adjusted their answers to highlight certain problems, or steered the interviews towards certain subjects. The respondents might also have been interviewed by help organisations before and have learned what to answer to get help. However, we asked most of the respondents if they had been interviewed before and only a handful said that they had, and even fewer had got any specific help after these interviews.

One shortcoming is that we did not have the time or the opportunity to interview people that had already left Guinaw Rails South. Interesting information could have been drawn from people who had lived in Guinaw Rails South but then, for various reasons, chose to leave the area.

### 3 Theoretical foundation

This chapter focuses on what makes a hazard event, such as a flood or an earthquake, a disaster. What are the underlying root causes and how do they develop into a disaster? Unsafe conditions such as social relations and physical environment play an important role and the progressions of people's vulnerability from root causes, dynamic pressures and these unsafe conditions can be explained by the so called *Pressure and release* model, see further below. When discussing disasters, one important thing is to understand how people experience and react to them. Therefore, this chapter also presents some basic knowledge about risk perception.

#### 3.1 The Pressure and Release model

Disasters are a result of the interaction between a hazard and vulnerability. A hazard cannot result in a disaster if there is nothing there to be affected (no vulnerability) and in the same way, the vulnerability will not cause a disaster on its own if there is no hazardous event.

According to Wisner et al. (2004) a hazard is said to be the natural event that may affect different places at different times. Vulnerability refers to different forms of loss in a particular event, such as destruction, damage or disruption. Furthermore, Wisner et al. (2004) states that vulnerability is:

“The characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard”

The vulnerability only refers to people, while for example a house is unsafe and a settlement's location is hazardous, not vulnerable. Based on what is said above and according to Wisner et al. (2004):

“A disaster occurs when a significant number of vulnerable people experience a hazard and suffer severe damage and, or disruption of their livelihood system in such a way that recovery is unlikely without external aid”

This is also close to other disaster definitions by for example Oliver-Smith (1999) and Quarantelli (1998).

The use of the Pressure and release model, developed by Wisner et al. (2004), can show how disasters occur when natural hazards affect vulnerable people. The basis for this model is the idea that a disaster emerges from two different forces; the progression of vulnerability on one side and the natural hazard event on the other. The pressure on the people increases from either side, from the vulnerability and from the impact and severity of the hazard. To relieve the pressure, to release, the vulnerability has to be reduced.

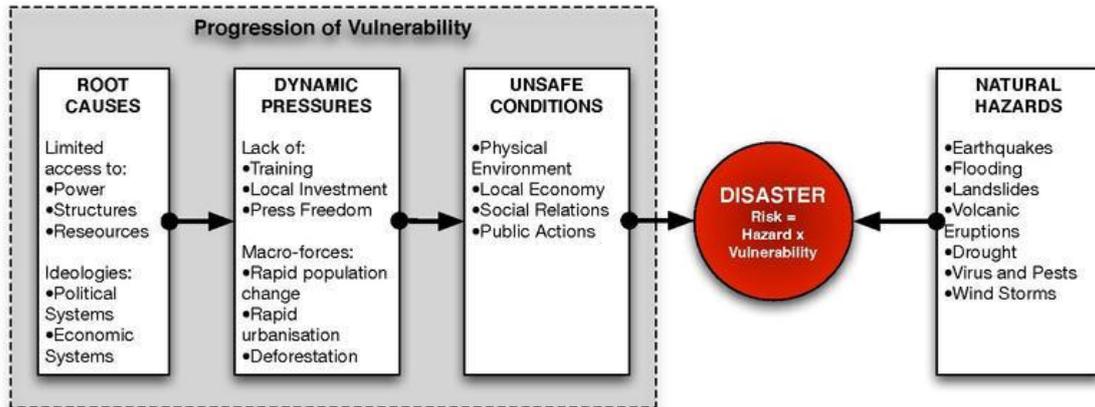


Figure 3. The Pressure and release model (Wisner et al., 2004).

The explanation of vulnerability has three sets of processes and factors that are linked to the impact of a hazard. Root causes are “located” furthest away from the people impacted by a disaster and refer to the processes within a society and the world economy. These processes are often invisible or taken for granted.

The effects of the root causes can be translated into unsafe conditions by the more immediate dynamic pressure processes. These processes can for example be rapid urbanisation or an epidemic disease that can then result in an unsafe condition such as hazardous locations or unsafe buildings.

### 3.2 Urbanisation and poverty

According to the United Nations Population Division’s projections (IRFC, 2010), almost all population growth in the world in the next few decades will be in urban areas in low and middle-income nations. Today, much of this population growth is in informal settlements where the infrastructure and housing conditions are poor and in cities at risk from the increased frequency and intensity of extreme weather events due to climate change (IRFC, 2010; United Nations, 2004). Over three quarters of the world’s largest cities are exposed to at least one natural hazard and the greatest concern is for the 50 fastest growing cities, which are all located in developing countries (United Nations, 2004).

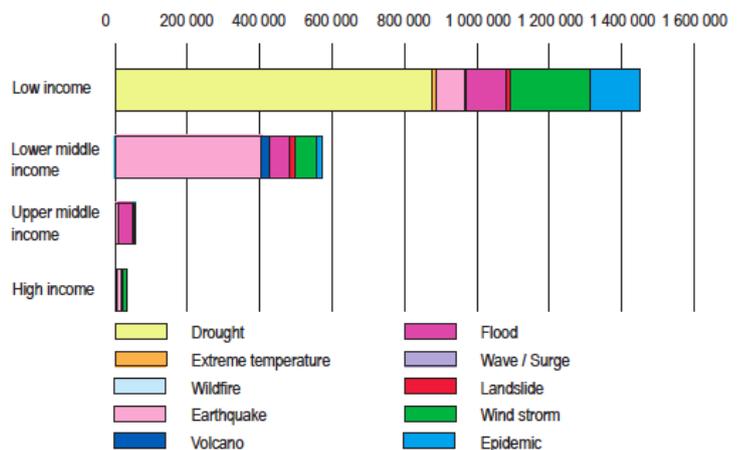


Figure 4. Number of people killed (income class/disaster type) between 1973 and 2002.(IRFC, 2010)

With this rapid urbanisation comes a great need for housing all the incoming migrants. Informal settlements often provide an initial point of access to the urban environment and this at a very low financial cost (Misselhorn, 2008). Even if not all informal settlements are well located, they typically still afford a better access opportunity than the next best option, for example the rural area where some people move from. Some people even argue that informal settlements are a must and if they did not exist, the incoming migrants would have nowhere to reside and would not been taken care of (Misselhorn, 2008).

However, when it comes to the impact of a disaster, a city could be the most dangerous place on earth for those who live in poor urban areas where there are not enough resources such as running water, sewerage, and basic social services etcetera. Today, over half of the world's population lives in cities and towns, and of these, more than 1 billion people live in poor and appalling conditions (IRFC, 2010). This population is often exposed to the highest risks from natural hazards such as floods, cyclones and earthquakes. As the world's population becomes more concentrated in large cities, there is also an urbanisation of disasters and disaster risks. According to Douglas et al. (2008), people in low-income countries are four times more likely than people in high-income countries to die in a natural disaster.

A city could be a safe place when for example a storm hits. In high-income nations (which are highly urbanised) extreme weather events rarely result in fatalities. The vulnerability therefore seems to be linked with urban poverty, not the urban city itself. IRFC (2010) states that:

“Urban poverty can dramatically increase premature deaths and serious injuries due to dangerously, overcrowded housing lacking infrastructure and services”

The links between urban poverty and disaster risk are also likely to increase even more by the change of the climate. Unfairly enough, it is often the people that have contributed least to this changes that are exposed to the greatest risks (IRFC, 2010).

In practice, different aspects of poverty contribute to different implications of risk, both in the everyday life and for a disaster. For example, an inadequate and often unstable income can result in a limited capacity to pay for housing which means that these people have to live in the worst-quality homes and dangerous sites (IRFC, 2010). These places are also at a high risk for flooding which can cause a disaster. Another example is inadequate provision of basic services like day school, health care and communications that can result in an unnecessary high health burden from a disease, and in case of a disaster, the lack of rapid response from emergency services (IRFC, 2010).

The poor are also forced to use the natural resources, to a greater extent than the richer, to survive and therefore they increase both their risk and exposure to disasters, especially floods, droughts and landslides (United Nations, 2004).

### **3.3 Risk**

There are many ways of defining the word risk and different people will mean different things while using the word. In the engineering world, the word often refers to a combination of the probability that an event will occur and the (negative) consequences of

this event. According to Kaplan (1997) risk can be defined as the answer to the three questions: *What can happen? How likely is it to happen? and What are the consequences?*

However, this definition does not answer why some events are acceptable while others are not and why some people have different ideas about what can be a risk and the importance of this. Another approach is the so-called social constructivist where, for example, the interaction between human activities and consequences is being considered and also what influence peoples acceptance of risks. Uncertainty about the probability or consequence of an accident, lack of experience of the risk and accidents caused by human error (compared to for example nature related) are all examples of factors that influence peoples acceptance in a negative way (Otway & Von Winterfeldt, 1982)

### 3.3.1 Risk perception

To be able to understand why people live in hazardous areas and settlements it is important to understand how aware they are of the risks and what their perception of these risks are. People are more vulnerable if they are not aware of the hazard that poses a threat to their lives and property and this awareness varies among individuals and communities. Someone's risk perception is of course influenced by the knowledge of a hazard and the available information about it, but there are also other factors that can influence this perception. Gender is usually said to be a major factor that influences how one perceives risks. However, according to Becker (2011) when it comes to the ranking of hazards in their community, there is no difference between men and women. Other factors that influence peoples risk perception are for example age (Sjöberg, 1998; Hermand et al., 1999), education (Sjöberg, 2000) and income level (Johnson, 2004). Cultural differences also plays a significant role in affecting peoples risk perception (Lam, 2005), which is important to have in mind when discussing the subject with people from different cultures.

### 3.4 Flooding and disasters

Some people argue that small and medium-sized disasters, such as many floods, are not given enough attention. These are far more common than the dramatic super disasters that often win the media attention and are a frequent experience for excluded, marginal groups. Wisner et al. (2004) state that the key point about a disaster is not its scale, but the impact of a hazard of whatever intensity on a vulnerable population. Here, the boundary between disaster and everyday life can be very thin, as vulnerable people are at risk from normality as well as the exceptional. As Jan Egeland said

“Many people here [in Africa] live on the edge even in normal times, so if there will be a dramatic climate change, as many predict, they will go over the cliff if there is no investment in adaption” (Ham, et al., 2009).

Flooding in less developed countries seems to be happening more frequently and is causing more serious consequences than before (Wisner et al., 2004). There is also a great discussion whether this is due to a climate change and the global warming or not.

Even though floods have long been considered to affect more people than any other hazard, floods are also normal and an essential component of agricultural and ecological systems. Areas that are at risk of floods have attracted farmers for thousands of years and also industrial and commercial developments for the past two hundreds, just because of the flood-associated benefits. People have learned to cope with floods to be able to use their

benefits in return. However, in many countries today, people with few alternative livelihoods or low income are forced to put themselves at risk to these floods because they have no option but to try and survive in flood-prone areas. In this case, the vulnerability to flood is not determined by the existence of the flood hazard, but by people's position in society (Wisner et al., 2004).

One of the most common types of urban flooding is the so-called localized flooding, and occurs many times a year in slum areas (Douglas et al, 2008). The lack of drains is a major reason, or if there are drains, these are often blocked with waste because the slums lack adequate garbage collection (IRFC, 2010).

## 4 The context

This chapter will give a brief introduction to the situation in Senegal in general and in Pikine and Guinaw Rails South in particular. It will also describe some of the problems that the city of Dakar faces.

### 4.1 The country of Senegal

Of Senegal's around 13 million inhabitants (Utrikespolitiska Institutet, 2012) 50 % of these live in cities. Many people leave the poor rural areas in hope of getting a better life in the city. Around a fourth of the population live in the Dakar region, and especially the suburbs of Dakar are growing fast. Around 40 % of Senegal's inhabitants live in informal settlements even called *shanty towns* (UN Habitat, 2011).

Most people in Senegal make their living outside of the formal sector, by agriculture or selling things on the street. No more than 6 % of the working population has got a formal employment. The unemployment is a big problem and because of this, many people move abroad (Utrikespolitiska Institutet, 2012) and Pikine has become a transit zone for people who try to leave the country (Enda Graf Sahel, 2009).

Hand in hand with the unemployment goes the poverty, which is another major problem in Senegal. Two thirds of the population lives on less than two US Dollars a day and Senegal is listed 155 out of 187 countries on the United Nations Humanitarian Development Index (United Nations Development Programme, 2011).

Health care is regarded better than in many other West African countries, but is still far from sufficient. One in ten children dies before they reach the age of five, mainly because of malaria and diarrheal diseases. However, the AIDS epidemic has been fought with success and only 0.7 % of the population is affected (Conseil National de lutte contre le SIDA, 2012). The life expectancy in Senegal is 59 years (United Nations Development Programme, 2011). The adult literacy is 50 % and the mean years of schooling for adults over 25 years is no more than 4.5 year (United Nations Development Programme, 2011).

The social security system looks good in theory but does not work well in practice. Health care, maternity leave and retirement is only given to those with a formal employment, which means that few people will get this. Social networks therefore count for a great importance, both within the greater family and within the neighbourhood (Utrikespolitiska Institutet, 2012).

To get more money to the family, it is common for children to work or beg. This work is mainly within the informal sector, which means street selling, shoes polishing or working within the family farming process (Utrikespolitiska Institutet, 2012). Equality between men and women is far from accomplished in Senegal. Polygamy is common where one man can have more than one wife. Abuse against women is also common, especially within the marriages (Utrikespolitiska Institutet, 2012).

The climate in Senegal is tropical and Sahelian which means a rainy period between July and October and a dry period between November and May. During August and September, the rains are most frequent. The average monthly rain between 1950 and 2008 in Dakar was 171 mm (Evaluation des besoins post catastrophe, 2009).

## 4.2 Pikine and the situation there

In Wolof, one of the autochthones languages in Senegal, the word *Pikine* means “Nothing” and the city is also referred to as a “*ville champignon*” which means boomtown (Enda Graf Sahel, 2009).

Pikine is a recently established city and became a full-fledged community as late as in 1990. The city, situated 15 km east of Dakar, consists of 16 districts on an area of 95 km<sup>2</sup>. In 2009, the population reached almost 1 million inhabitants, which mean that half of the people in the Dakar region lives in Pikine. The urbanisation is astoundingly rapid and the population is expected to reach two million inhabitants by 2015. In addition to a strong population growth the city presently faces several challenges regarding infrastructure, education, employment, city development, land management, environmental problems etcetera (Enda Graf Sahel, 2009).

A major part of Pikine is situated in the depression called Niayes and a large area also covers dry sea beds. During the rainy periods over the last decade, however, the ground water level is rising and the water is transported to normal pounds, where people now have built their house, and this is the reason for the annual floods that have been taken place since 2005 (Enda Graf Sahel, 2009).

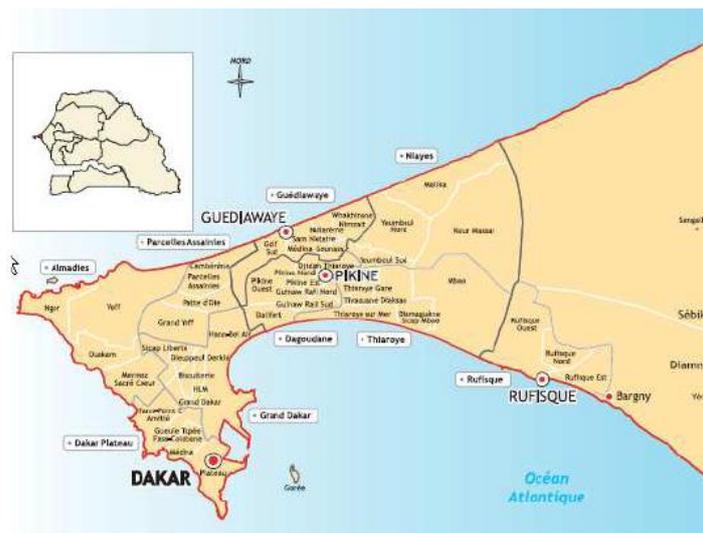


Figure 5. The greater Dakar region with Pikine in the middle.

After the Second World War, a rapid and unexpected population growth took place in Dakar. The authorities had to find a solution which lead to the establishment of Pikine. Many people were against the decision to move tens of thousands of people to a non-friendly desert area far from the city without any plans for transport, education or medical services. Although, the solution was mainly seen as temporary, and no one thought of Pikine as a future suburb of Dakar. During the '70s, Pikine grew a lot and has continued to do so since (Enda Graf Sahel, 2009).

The reason for the rapid urbanisation since the '70s is mainly due to the drought period between the '70s and 2005, when thousands of people moved to the Dakar region. During the crises in the '80s and '90s, for example the degradation of the West African franc (CFA), many companies had to shut down or became privatized. This led to fewer resources to the social sector and people could not get paid as much as before (Enda Graf Sahel, 2009).

The rural population and smaller enterprises were the worst affected by this national situation, which led to an even higher migration and workers who had been forced away from the city centre overwhelmed Pikine. This was done under almost anarchistic ways and no attention was taken to fundamental rules for urban development regarding roads, building codes, electricity and water supply, sanitary and waste management and so on. The lack of drainage systems increases the vulnerability towards flooding in many areas of Pikine (Enda Graf Sahel, 2009).

Today, the work done by the authorities in Pikine is nowhere near what is needed for the city and is not proportional to all the challenges that Pikine faces. The city has no clear vision for the future, while, at the same time, modernisation is a must (Enda Graf Sahel, 2009).

#### 4.2.1 Guinaw Rails South

The Guinaw Rails South community was created in 1996 and consists of 24 blocks. The area is 1.15 km<sup>2</sup> and 72 % of this is occupied space. The area is limited to the south by highway No 1, to the east by the Thiaroye station, to the north by the railway to Niayes and to the west by the Pikine Bridge, see figure 7 (Presentation de la commune de Guinaw Rails Sud, 2012).

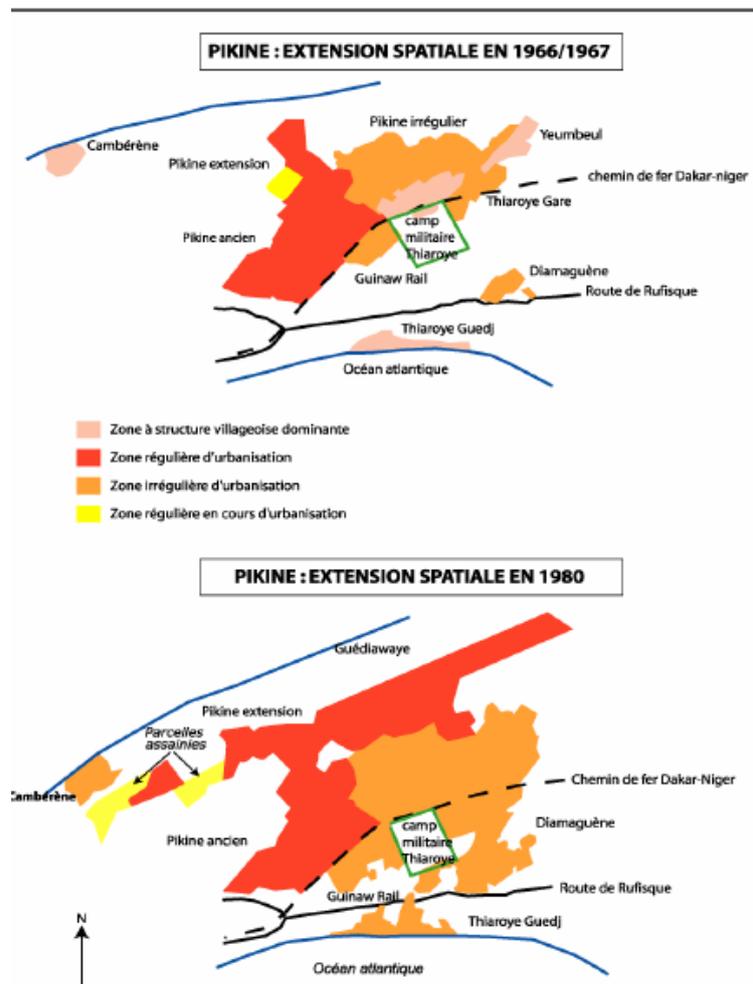


Figure 6. Pikine's extension between 1966 and 1980. Guinaw Rails South is located next to the military camp (Camp militaire Thiaroye).



Figure 7: Map over Guinaw Rails

The first migration phase to Guinaw Rails South took place between 1963 and 1968. The first people came from the area of Medina in Dakar city. During the second phase, between late 60s until the late 80s, the population increased dramatically with an annual rate of 14.7 % and most people moved into informal settlements. Between 1988 and 2002, Guinaw Rails South had an average annual growth rate of 1.5 %. This is lower than the national growth rate due the lack of space in the area. Today, around 45 000 people live in Guinaw Rails South (Presentation de la commune de Guinaw Rails Sud, 2012).

The urbanisation process in Guinaw Rails South is, just like in the rest of Pikine, characterized by a lack of a formal framework for the planning and housing management. The streets are narrow and many of them are inaccessible by car, which leaves the inhabitants without proper waste management or emergency services (Presentation de la commune de Guinaw Rails Sud, 2012).

## 5 Results

The results are presented in this chapter under the research question's three sub-questions:

- Why do people move to Guinaw Rails South?
- Why do people stay in Guinaw Rails South?
- What is their risk perception and have they noticed any change over time?

These questions are then linked together to answer the research question; why do people live in Guinaw Rails South? The main focus was on the first two questions, why do people move to, and stay, in Guinaw Rails South. When we have discovered differences between, or trends within, age groups or sex, these have been noted under the different categories. When coding the results for *why people move to Guinaw Rails South* and *why people stay in Guinaw Rails South*, only the reasons directly related to these two questions have been considered. If people have mentioned other factors or advantages in Guinaw Rails South, but not that this was their actual reason for moving to or staying in the area, these factors have not been coded under these two questions. However, these other attributes that people value in Guinaw Rails South have been summarized in section 5.4.

### 5.1 Why do people move to Guinaw Rails South

While analysing the data for why people move to Guinaw Rails South, the coded data resulted in five different categories. These are *family*, *good place*, *economic situation*, *work or education* and *own house*. People that have moved to Guinaw Rails South also talk about their thoughts concerning the move and decision-making, and some of these thoughts are presented here. Five people did not answer this question and seven respondents were born here and can therefore not state reasons for moving here. This leads to that totally 28 people have valid answers to this question.

Many of the respondents give more than one reason for moving to Guinaw Rails South and their answers are presented under both categories. For example, 18 respondents said that *family* was a reason for moving to Guinaw Rails South, but of these 18, some people can also have mentioned *good place* or *money*. The sum in the diagram below, figure 9, will therefore add to more than 28.

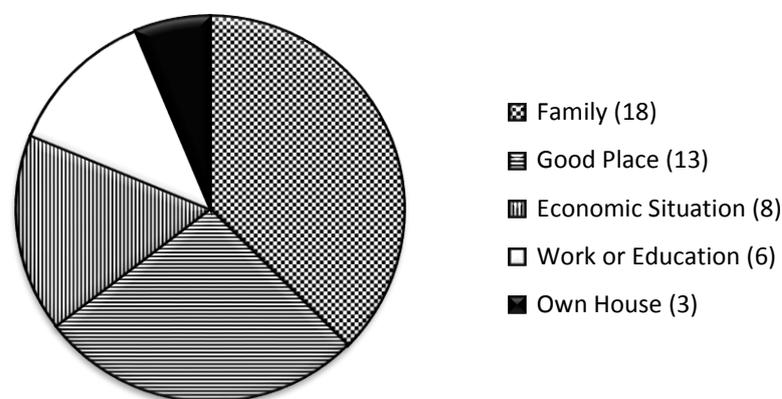


Figure 8. Reasons for moving to Guinaw Rails South. The seven respondents who said that they were born here are not included in the diagram.

### 5.1.1 Family

Among those who mentions family as the reason for moving to Guinaw Rails South, the majority of the women say that they moved here with, or to join, their husbands. The rest of the women came here to join, or moved with, other family members, which also is the prevailing reason amongst the men. When they talk about joining other family member one woman (nr 22) says:

“We chose Guinaw Rails because this is where my father-in-law had his house. We built it and then we moved here”

and one man (nr 37) says:

“I was with my uncle in Guniaw Rails. He had his house here. I lived with him in his house and at the same time I worked here until I got married and then I went to live in this house as a tenant together with my wife”

As can be seen in the figure below, all of the women older than 40 years say that family was a reason for moving to Guinaw Rails South whereas among the men, this reason is more common in the age group 31 – 40 years. Regarding the decision making, many respondents did not choose themselves to come to Guinaw Rails South, it is often someone else who made the decision for them.

Nr.	Sex	Age	Family	Good Place	Money	Work	Own House
9	F	18 - 30	X				
22	F	18 - 30	X	X			
5	F	31 - 40	X				
35	F	31 - 40	X	X	X		
14	M	31 - 40	X				
20	M	31 - 40	X		X	X	
23	M	31 - 40	X	X		X	
37	M	31 - 40	X		X	X	
31	M	31 - 40	X	X			
2	F	40 +	X				
4	F	40 +	X	X			
10	F	40 +	X			X	
12	F	40 +	X				
15	F	40 +	X	X	X		
21	F	40 +	X				
28	F	40 +	X				
19	M	40 +	X				X
30	M	40 +	X			X	

Figure 9: This figure shows the 18 respondents (11 female and 7 males) who mentioned *family* as a reason for moving to Guinaw Rails South and what other reasons these respondents have mentioned.

### 5.1.2 Good Place

13 people mention that they moved to Guinaw Rails South because, at that time, they thought Guinaw Rails South was a good place to live in, and some also mention that it seemed to be better than the place they moved from. However, if they would have known in what condition Guinaw Rails South would be today, they would not have moved. Some people do not say in what way they thought Guinaw Rails South was a better place, but some mention that it was not flooded back then. The place they moved from was flooded

and because Guinaw Rails South was not, it seemed to be a good place to move to. One woman (nr 35) says:

”It is because before, Guinaw Rails was not a flooded area and I did not know that it would be. If I only had known that this was going to be a flooded zone, I would not have bought the house.”

Two people also mentions the sand aspect as a reason why they thought Guinaw Rails South seemed to be a good place to live in, another woman (nr 34) said:

”At that time, this is where I chose to live and it was a wonderful place to live in. It was beautiful white sand. I never thought of going anywhere else. If I would have known, I would not be living here”

There are more women than men that say that they moved to Guinaw Rails South because it seemed to be a better place than where they moved from. Among the men who mention that they thought Guinaw Rails South was a good place to move to, one man (nr 26) says that an advantage is that Guinaw Rails South is accessible and it is easy to go in to Dakar from here.

**5.1.3 Money**

Regarding money, many people say that it was less expensive to live in Guinaw Rails South than where they lived before. All people who say this talked in the same way and say that Guinaw Rails South was the only place where they could afford to buy a house or pay the rent. Some people say that they thought of moving to other places, but since Guinaw Rails South was cheaper, they chose to move there. One man (nr 24) says:

”The main reason is that my means did not allow me to go to a better place than Guinaw Rails. I could only buy land in Guinaw Rails. I thought about Parcelles Assainies for example, but finally I preferred Guinaw Rails”

Nr.	Sex	Age	Family	Good Place	Money	Work	Own House
25	F	18 - 30			X		
35	F	31 - 40	X	X	X		
20	M	31 - 40	X		X	X	
37	M	31 - 40	X		X	X	
15	F	40 +	X	X	X		
34	F	40 +		X	X		
24	M	40 +			X		
26	M	40 +		X	X		X

Figure 10: This figure shows the 8 respondents (4 female and 4 males) who mentioned *money* as a reason for moving to Guinaw Rails South and what other reasons these respondents have mentioned.

**5.1.4 Work or education**

Four people mention that they moved to Guinaw Rails South because of work or education. It was easier to find a job in the Dakar region than in their home village, or as one man (nr 20) says:

”I left my native village to go to the capital in hope of finding work, because in my native village there are only fields and they do not yield anything, there are neither markets nor buyers to buy your harvest or products, and this won’t give you any money”.

One man says that he wants to move further away from Guinaw Rails South but his younger sisters were still in school, so they had to stay close to Guinaw Rails South, and another says that he came here to continue his studies. “Here” could be anywhere in Dakar, and does not specifically have to be in Guinaw Rails South.

There are more men than women that mention work or education as a reason for moving to Guinaw Rails South. The only woman (nr 10) who does say that she came to Guinaw Rails South because of work came here together with her husband. So if she moved to work or if it was her husband’s work that made them move to Guinaw Rails South is unclear.

Nr.	Sex	Age	Family	Good Place	Money	Work	Own House
20	M	31 - 40	X		X	X	
23	M	31 - 40	X	X		X	
37	M	31 - 40	X		X	X	
10	F	40 +	X			X	
3	M	40 +				X	
30	M	40 +	X			X	

Figure 11: This figure shows the 6 respondents (1 female and 5 male) who mentioned *work or education* as a reason for moving to Guinaw Rails South and what other reasons these respondents have mentioned.

### 5.1.5 Own house

Only three men older than 40 mention that the possibility to have their own house was a reason for moving to Guinaw Rails South. The answers are in all cases connected with the aspect of paying rent. As an example one of them says (nr 39):

“It’s in Guinaw Rails I could have a house that I would never have had anywhere else...  
...where I lived before, it was never my own house, it was rented apartments”

Nr.	Sex	Age	Family	Good Place	Money	Work	Own House
19	M	40 +	X				X
26	M	40 +		X	X		X
39	M	40 +					X

Figure 12: This figure shows the three (all male) respondents who mentioned *own house* as a reason for moving to Guinaw Rails South and what other reasons these respondents have mentioned.

### 5.1.6 Born here

People have lived in Guinaw Rails South for more than 40 years and therefore, some of the respondents did not have a choice whether they wanted to move to Guinaw Rails South or not, because they are born here. All of the interviewed men younger than 30 are born in Guinaw Rails but only one women in the same age group. The majority of these people do not know why their parents chose to move to Guinaw Rails South and for example one man (nr 29) said:

“Because I was born here. My father never told me why they moved here”.

## 5.2 Why do people stay in Guinaw Rails South

Of the 40 people that were interviewed, only a few say that they do not want to move from Guinaw Rails South. Given this, we want to answer why people do stay in Guinaw Rails South, even though they want to move. While analysing the data for why people chose to

stay in Guinaw Rails South, the coded data resulted in six different categories. These are *economic situation, own house, no alternatives, family, work or education* and *good place*. Just as for *Why do people move to Guinaw Rails South* many of the respondents have given more than one reason for staying in Guinaw Rails South and their answers are again presented under all these categories. The sum will therefore again add up to more than 40 (which is the number of interviews that had been made), see figure 14.

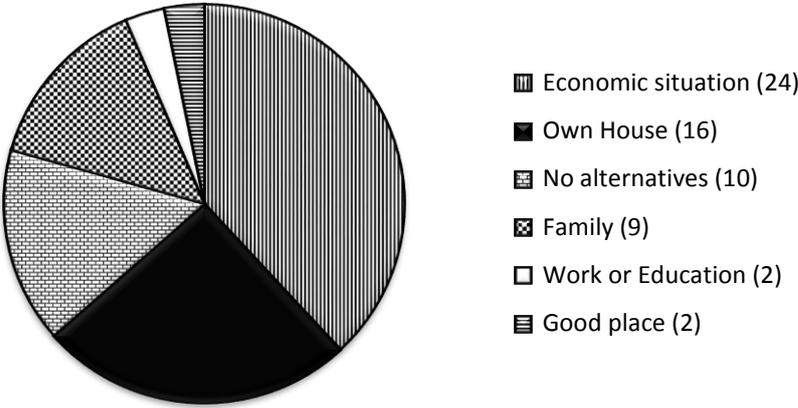


Figure 13. Why do people stay in Guinaw Rails South.

**5.2.1 Money**

Half of all the respondents said that they stay in Guinaw Rails South because of their economic situation and because they do not have enough means to move somewhere else. If they only had the money, they would move. For example one woman (nr 13) says:

“To move from here, that is my highest wish. But how can you do that when you do not have any money in your pockets and no one here to help you move? What can you do except to stay and live with the water?”

and another man (nr 11) says:

“We are short of money. Because, even if you have the social life here, the help between the neighbours and the peace and quiet, it is, at the same time, difficult to live under these conditions. So, if you stay in these conditions, it is because you don’t have the money to move”

All women in age group 31 – 40 give money as a reason for staying however the frequency is similarly distributed in the rest of the groups.

Nr.	Sex	Age	Money	Own House	No alternatives	Family	Work	Good place
7	F	18 - 30	X					
17	F	18 - 30	X	X				
25	F	18 - 30	X	X				
33	F	18 - 30	X	X				
36	F	18 - 30	X	X				
6	M	18 - 30	X	X	X			
11	M	18 - 30	X					
27	M	18 - 30	X					
29	M	18 - 30	X		X	X		
38	M	18 - 30	X					
1	F	31 - 40	X					
5	F	31 - 40	X		X			
13	F	31 - 40	X					
32	F	31 - 40	X	X	X			
35	F	31 - 40	X		X	X		
20	M	31 - 40	X					
37	M	31 - 40	X					
2	F	40 +	X					
21	F	40 +	X					
28	F	40 +	X	X				
3	M	40 +	X					
19	M	40 +	X					
24	M	40 +	X					
30	M	40 +	X			X	X	

Figure 14: This figure shows the 24 (13 female and 11 male) respondents who mentioned *money* as a reason for staying in Guinaw Rails South and what other reasons these respondents have mentioned.

### 5.2.2 Own house

Many people that mention money as a reason for staying in Guinaw Rails South have also said that another reason is that they are living in their own house, and because of that they cannot, or do not want to, leave. They have either invested a lot of money in the house, they do not have to pay rent because they own the house, or this house is where their children have grown up and therefore this is the only place they know. One man (nr 8) says:

“The main reason for staying is that it is my property and I cannot leave it and go away.”

Among both women and men, it is more common to give *own house* as reason for staying in Guinaw Rails South for people younger than 31 and older than 40 years.

Nr.	Sex	Age	Money	Own House	No alternatives	Family	Work	Good place
16	F	18 - 30		X				
17	F	18 - 30	X	X				X
22	F	18 - 30		X		X		
25	F	18 - 30	X	X				
33	F	18 - 30	X	X				
36	F	18 - 30	X	X				
6	M	18 - 30	X	X	X			
32	F	31 - 40	X	X	X			
14	M	31 - 40		X	X	X		
10	F	40 +		X				
28	F	40 +	X	X				
34	F	40 +		X	X			
8	M	40 +		X				
26	M	40 +		X		X		
39	M	40 +		X				X
40	M	40 +		X				

Figure 15: This figure shows the 16 (10 female and 6 male) respondents who mentioned *own house* as a reason for staying in Guinaw Rails South and what other reasons these respondents have mentioned.

### 5.2.3 No alternatives

To not have anywhere else to go and giving this as a reason for staying in Guinaw Rails South is more common for people younger than 40 years. A typical answer is that they feel that they have nowhere else to go, for reasons that are somewhat unclear. As an example one man (nr 31) says:

“As a matter of fact, it’s that, we have nowhere to go; when you leave here, where would you go. We don’t know, because Dakar has become closely packed, tiny”

Nr.	Sex	Age	Money	Own House	No alternatives	Family	Work	Good place
9	F	18 - 30			X			
6	M	18 - 30	X	X	X			
18	M	18 - 30			X	X		
29	M	18 - 30	X		X	X		
5	F	31 - 40	X		X			
32	F	31 - 40	X	X	X			
35	F	31 - 40	X		X	X		
14	M	31 - 40		X	X	X		
31	M	31 - 40			X			
34	F	40 +		X	X			

Figure 16: This figure shows the 10 (5 female and 5 male) respondents who mentioned *no alternatives* as a reason for staying in Guinaw Rails South and what other reasons these respondents have mentioned.

### 5.2.4 Family

The category *family* includes both people that mention that they stay in Guinaw Rails South because they want to stay with their actual family, but also people that talk about good relations with neighbours. During the interviews, family is mentioned five times as a reason for staying in Guinaw Rails South. These people want to stay as a family and do not want to leave either the whole family or a specific family member. One woman (nr 22) says:

“The main reason for staying here is because this is where my family-in-law lives and I have joined them so we can stay as a family”

Twice as many men than women give family as a reason for staying in Guinaw Rails South. Apart from that, the respondents are similarly distributed between the age groups.

Nr.	Sex	Age	Money	Own House	No alternatives	Family	Work	Good place
22	F	18 - 30		X		X		
18	M	18 - 30			X	X		
29	M	18 - 30	X		X	X		
35	F	31 - 40	X		X	X		
14	M	31 - 40		X	X	X		
23	M	31 - 40				X	X	
15	F	40 +				X		
26	M	40 +		X		X		
30	M	40 +	X			X	X	

Figure 17: This figure shows the 9 (3 female and 6 male) respondents who mentioned *family* as a reason for staying in Guinaw Rails South and what other reasons these respondents have mentioned.

### 5.2.5 Work and education

Only two persons, both are men, mention work and education as a reason for staying in Guinaw Rails South. The first one (nr 23) says that he stays because many of his family members either work or study in Pikine. The other man (nr 30) answers this when asked if there are any other reasons for staying:

“Like I just said, my family is here and my business too”

Nr.	Sex	Age	Money	Own House	No alternatives	Family	Work	Good place
23	M	31 - 40				X	X	
30	M	40 +	X			X	X	

Figure 18: This figure shows the two (both male) respondents who mentioned *work and education* as a reason for staying in Guinaw Rails South and what other reasons these respondents have mentioned.

### 5.3 Other factors that people value in Guinaw Rails South

When asking the respondents about why they stay in Guinaw Rails South, only a few mention any advantages or other reason that make them want to stay. Therefore, a specific question was asked about what advantages they see in Guinaw Rails South and people then mentioned some good things about living here. However many (13/40) of the respondents said that there are no advantages at all and immediately started to talk about disadvantages instead. Even though they do not see any advantages at this time, it is interesting to know what they would find as an advantage and what they would value in a community like Guinaw Rails South. This information could perhaps be found while asking about what disadvantages they see in Guinaw Rails South, or in other words, what they would want to have.

Apart from the reasons for staying in Guinaw Rails South that were shown in the previous section, things that the respondents value in a community are:

- Accessibility
- Good education for the children
- Social and tranquil life
- No overpopulation

- Cleanliness and fresh air

While talking about accessibility it is either to be close to the city of Dakar or to be close to daily important activities such as a market place or a mosque. To have a good social life means that people in the neighbourhood help each other and that there is solidarity between the people living in the same house.

Six people say that they do not think about moving from Guinaw Rails South, five of these are older than 40. All of these also mention own house as a reason for staying.

## 5.4 People's risk perception

The three most common dangers that people see in Guinaw Rails South are *floods*, *insecurity* and *health problems*. What people think about these dangers, what their causes and consequences are and if they have changed over time are presented below. In interview 21-40, we specifically asked for cause and consequence and therefore, while talking about this, these facts are predominantly from the last 20 interviews.

### 5.4.1 Floods

39 out of the 40 respondents talked about flooding and the water in Guinaw Rails South. People generally believe that the problem is due to the lack of proper land distribution and a canal system that could lead away the rainwater. Some people also mention that the place where Guinaw Rails South is situated is not suitable for housing since it is a "water-zone" and a couple say that the flooding situation is due to a natural disaster or divine intervention.

The respondents say that the fact that they are always in contact with the water leads to sicknesses such as malaria and cholera. Another consequence is that the water prevents the people from going where they want and doing their daily activities. For example, one woman (nr 9) says:

"Before, it was easier because we could sell things at the market but since the floods started, all our activities have stopped because we do not have access to our work place anymore, because of the water".

The respondents often say that the kids play in contaminated areas, and it is difficult for the parents to always have control over the children and doing their daily chores at the same time. As a protective measure some respondents have sent away their children to keep them safe from the floods and the health risks they impose.

Many of the respondents also say that they have to spend a lot of time trying to evacuate the water and therefore they sometimes do not have time, or the possibility, to go to work during the days or to sleep during the nights. A physiological aspect of the flooding is that people worry about the water and the flooding consequences, even when they are not at home. One woman (nr 13) says:

"When you think about it, you get stressed when you think about that you live under these risks and it is hard and difficult at the same time to be in a situation like this".

Regarding protecting themselves from the flooding, the respondents say that they evacuate the water from their houses, sometimes using a pump. Another measure is to rise the floors

in the house, which some of the respondents say that they have done, or thought about doing.

The respondents often say that the situation has become more difficult compared to how it used to be. Before 2005, the rains were not that heavy and they did not lead to floods like they do today. For example one woman (nr 4) says:

“The situation has become more and more difficult. Each year, the water covers a larger area”

#### 5.4.2 Insecurity

When the people in Guinaw Rails South talk about insecurity, they predominantly talk about criminal activity. This can be anything from the worry of being affected or smaller robberies to actual murders. A few also mention the unsafe buildings, and say that the houses are old and poorly built, and some foundations have been undermined by the floods. The number of respondents who mention insecurity during the interviews was 32 out of 40. According to the respondents, Guinaw Rails South is often infamous for being an insecure place to live or stay in. For example one woman (nr 26) say:

“There are many [criminal] networks in Guinaw Rails, everybody knows that. It’s this scourge of criminality that creates an increase in insecurity here”

Regarding the cause of the insecurity, the majority believes economic issues such as unemployment or poverty is the cause of the criminality, for example one woman (nr 33) says:

“The unemployment, the people are not working, it’s because of that they do the assaults and things like that. The insecurity is because of the unemployment, the young doesn’t have a job, that’s why they commit to aggressions”

Another belief is that infrastructural properties are contributing factors to the present criminality, such as abandoned houses where criminals can hide and insufficient lightning in the streets. A few mention that the criminality itself is a cause. That is, that the criminality is a vicious circle, crime breeds crime, and some respondents are afraid that the criminals could become role models for the younger inhabitants. Less common responses addressed the lack of a police station, drugs and different cultural ethnicities as a cause.

The consequences of the insecurity are affecting the population in several ways. The most common answer, that almost every respondent mention, is that his or her daily activities are inhibited. As a measure to protect themselves against this danger most people avoid being in the streets during certain times and prefers to stay at home in general. Some even send away their family members to protect them. For example, respondent 10 says:

“This [criminal activity] prevents us from doing our normal activities and it’s impossible to go out at night and our kids have to stay in the house to avoid that they should be aggressed”

The respondents also describe the insecurity as something physically tiring, for example the lack of freedom or worrying about being victim of crime. Many people mention murders as something that worries them and some actually mention a friend or neighbour that have

recently been killed. However, only a few of the respondents or their families have been victims of criminality themselves.

Regarding the change of insecurity over time, many respondents say that the criminal activity, such as assaults and burglaries, has increased both in frequency and gravity. For example one woman (nr 21) says:

“When I was younger, we did not hear about the aggressions like we do today. At this time the young ones did not dare to be aggressive or to steal”

And one man (nr 25) says:

“I believe that the assaults have intensified compared to before because during these last three years the assaults have been worse. Today they kill more than before”

### 5.4.3 Health problems

36 out of the 40 respondents mention health problems as a risk or danger in Guinaw Rails South. The health problems often goes hand in hand with the flooding danger itself, since the flooding often causes health problems such as malaria or other sicknesses, and people often mention these two dangers together. Except for the floods, the dirtiness is also something that people say is causing the health problems together with the lack of waste management and the garbage that is everywhere, see figure 20.

Another factor affecting the health is the fact that people’s septic tanks<sup>2</sup> are often full, which means that they do not have anywhere to put their wastewater. Many people do not have any septic tanks, and just throw their wastewater on the streets. Those households who actually do have septic tanks often mentioned that sewage vehicles cannot enter the neighbourhood to empty the tanks due to narrow streets or excessive water. This then results in a much worse situation as the rainwater mix with the contents of the full septic tanks, which might spread disease.

When the respondents talk about consequences of being sick some mention that it prevent them from going to work and therefore not earning as much money as they would have if they were not ill. Another consequence of the sicknesses is that people die and a couple of respondents talked about relatives that have passed away because of the unhealthy conditions in Guinaw Rails South. For example, one woman (nr 32) says:

“At this moment, we are in a three day mourning my sister’s son passed away. I can say that it is because of the water that causes the dirty smell and provoked the death of this child”

To protect themselves from the sicknesses people say that they sleep under mosquito nets, try to evacuate the water and, when necessary, go to the hospital. Only one respondent say that he washes his hands as a protective measure against disease. However, while talking about going to the hospital, people also say that this is difficult because of the prices for medication and also the inaccessible roads and the lack of transportation.

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2. A septic tank is a key component of the septic system, a small-scale sewage treatment system common in areas with no connection to main sewage pipes.

For example one woman (nr 12) says:

"If someone gets sick you put him or her on the back until you find an accessible road where you can find a car"

Another health issue that people talk about is the fact that they cannot sleep properly. This can either be because the majority of their rooms are flooded so everyone has to sleep in the same bed, or because they have to get up in the middle of the night to evacuate the water. One woman even says that the smell is preventing her to sleep so she puts on perfume before going to bed.

Regarding changes in health risks, some people mentioned the longstanding population growth. Today entire families are often crammed into one room in tenant houses that are filled from top to bottom. One man (nr 23) says:

"It's the building of the turnpike. At that moment, all that were living over moved to this sector. There was much change in some houses, instead of finding a room for example up to 3 people per room, now in some villas you will find more than seven or eight people per room or ten people crammed into one room"

Many respondents also describe Guinaw Rails as much dirtier and polluted than before and that the health issues have increased.

## 5.5 Situation and change

Most of the respondents describe their situation as difficult but that they somehow manage to get by. A few say that they cannot complain about their life. However, these respondents are predominately older people that live with big families in non-flooded areas. A common philosophy is that the situation is similar in other neighbourhoods and therefore they are able to accept life here, a life situation that some believe originate from God. A woman (nr 13) in a real severe situation says:

"I do not work. I guard the house. My dad is dead, my mum too and my sister. And for a living, I stay in the house and if I find something to eat, I eat, and if not, I don't. God is great. I am divorced, but I did some selling, but because of the floods, I stopped"

The majority of the people think that life has become more difficult since the flooding begun in 2005. Before this, they say that life was easy and Guinaw Rails South was a good place to live in. Nowadays, however, the water is everywhere and for example a woman (nr 1) says:

"Before the situation was easy because when it rained, there was no flooding in the house or in the neighbourhood"

Almost a third of the respondents fail to give any information about climate change, either they misinterpret the question or they simply do not have any information to give. For example respondent 37 do not talk about climate change when he answers:

"I do not know how it is in the rest of the world but I can say that in Guinaw Rails, sometime it is hot and sometimes cold"

Regarding climate change, a reoccurring answer from the respondents is that the temperatures have risen and that the rains have become more abundant and frequent in the last years and many points out 2005 as the year when the heavier rains started, which is also

confirmed by officials from the Red Cross and political direction of Guinaw Rails South. A few also mention that the air in Guinaw Rails South has become polluted and that there were more winds and freshness in the air before. Some say that they have heard a lot about climate change in the media and a couple of respondents also talk about the ozone layer and the greenhouse effect.

## 6 Analysis and discussion

In Guinaw Rails South we met a vulnerable population where the majority expressed the desire to leave the area. Even though they expressed this desire, many of them have been living there for several years, some even up to 40 years. So why have they not yet moved? Just by walking around in the neighbourhood during the rainy season, one understands the dire conditions that many of these people live under. Wastewater, unhandled garbage, malfunctioning infrastructure and overpopulation are conditions that are obvious to an observer even the first time they visit the township.

The few who want to stay in Guinaw Rails South are mostly people that are more than 40 years old and have lived here for several years, but as we mentioned earlier the majority wants to leave. In this chapter we try to explain what we have learned about why people do live in Guinaw Rails South, even though the majority wants to leave. This is done by exploring the data that we have collected during the interviews and relating this to our own experiences and existing literature in the field.

In the result chapter we presented the data separately, dividing the research question into two sub questions: “Why move to” and “Why stay in” Guinaw Rails South. However in this chapter we have chosen to present the analysis in a more holistic way. The categories that were found under these two sub questions serve as categories to answer our research question in an analytic manner. That is to say, *economic situation*, *own house*, *family*, *work and education* and *good place* contain both sub questions. This analysis and discussion will then lead to the conclusion of this research.

### 6.1 Economic situation

Poverty is often the predominant reason for why people live in high-risk areas (IRFC, 2010), and our data shows that Guinaw Rails South is no different. We also believe that the economic situation is a predominant factor that permeates many of the other categories that we have found as reasons for living in Guinaw Rails South. For example for people who mention that they have moved here to join family members, an underlying reason can be that they had to move to relatives because they could not afford anything else. Simply put, a multi-millionaire would probably never stay here with his or her family; he or she would probably move and bring the entire family.

Further on, we got the feeling that the respondents are often very humble. They understand their situation and often accept it as it is, and therefore they might not mention money as a reason because that is obvious to their social level. Therefore answers under the category *no alternatives* might have economic root causes. For example one man (nr 11) said:

“We are short of money. Because, even if you have the social life, the help between the neighbours, the peace and quiet, it is, at the same time, difficult to live under these conditions. So, if you stay in these conditions, it is because you don’t have the money to move”

The fact that people move to informal settlements like Guinaw Rails South because they could simply not afford to move somewhere else corresponds well with what have been said in other literature. For example, IRFC (2010) says that poor people do not want to live in informal settlements with poor-quality housing; they do so because it is the only place

where they can afford accommodation. Cheaper living expenses have also been found by Smith (2008) to be a reason for moving within urban areas to an informal settlement.

There is a big difference in occurrence of economic reasons for moving to Guinaw Rails South and for staying there. The total number of respondents who says economic reasons for moving to Guinaw Rails South is 8 whilst 24 respondents mention this as a reason for staying. This might be explained by the fact that people moved here before the floods. They then settled down in Guinaw Rails South and invested in a house that cannot be sold today and as a result they have lost the means to move. This in combination with more expensive prices due to for example overpopulation in non-flooded areas leaves the poor inhabitants of Guinaw Rails South with no other options than to stay. Some respondents also says that those who had the money have already left.

## 6.2 Own House

We were quite surprised when we realised that 16 out of 40 people mention that ownership of a house is a reason for staying in Guinaw Rails South. *Own house* can in most cases be seen as a sub group to the category economic situation as it often is about not having to pay the monthly rent. However, we wanted this to be elevated to a separate category due to the high prevalence in the interviews.

In addition to the economic aspect of *own house*, people owning a house might have invested in both money, time and affection and might also be tied to a social context (such as social networks) which is connected to the house's location. For example one older man said (26):

“It's in Guinaw Rails I could have a house that I would never have had anywhere else, and I've had it for 20 years, and my children, well, my big children are not born here okay, well they grew up here so they know this place better than anywhere else and where I lived before, it was never my own house, it was rented apartments”

To not be willing to leave your own house is probably not unique for people living in Guinaw Rails South. We believe that people all over the world have strong ties to their homes, especially if you have spent a lot of time and money in it, and the same should apply for Guinaw Rails South. However, the fact that these ties are stronger than the fact that people live with great dangers, are somewhat out of place. We therefore believe that the fundamental essence of the meaning own house is an economic reason. If *own house* is interpreted in this way, 33 out of 40 actually stays because of economic reasons.

People talking about having a place of their own as a reason for living in informal settlements have also been found by Smith (2008). It is then either because of a lack of privacy in their former location or in conjunction with not having to pay rent.

It is more common among people younger than 30 and older than 40 to say *own house* as a reason for staying in Guinaw Rails South. This might be because most young people probably need to start with a rented house and feel the owning of an own house as more urgent than the people between 31 and 40. The old ones have lived a long time in their house and often have children and other things connected to the house. Since they are older, they have probably also invested more time and money in the house, compared to younger people. An

own house as a reason for moving to Guinaw Rails South is however more unusual, and for a similar reason, this might be because the ties to your house build up over the years.

### 6.3 Family

*Family* is a common reason for moving to Guinaw Rails South. People often mention that they came to Guinaw Rails South because they followed their husband, parents or other family member. Similar factors can be seen in studies of personal networks in migration that reveals the importance of social relations, especially within families, in migratory behaviour (Boyd, 1989).

Further on, according to psychologists a group is an important constellation for human beings and families are the most common and significant constellation among groups in the human society (Kaufmann & Kaufmann, 1998). Small wonder, the reason for living in Guinaw Rails South is often connected with things related to family. The *family* as a reason for living in informal settlements is also mentioned by Ljungberg and Wier (2012) and Smith (2008).

Here it is important to understand that the aspects of *family* are different when talking about moving to respectively staying in Guinaw Rails South. For example, when people mention family as a reason for moving to Guinaw Rails South it is often because they have joined other family members such as their husband or their uncle. When they talk about family as a reason for staying it is often about a social context and keeping a family together.

*Family* seems to be a more important factor regarding why people moved to Guinaw Rails South, than why they chose to stay. However, if they did not have to stay in Guinaw Rails South because of the other factors, for example money, they would probably have wanted their whole family to move with them. From what we have seen and experienced in the area, family bounds are very important and people predominately live together in large families.

All interviewed men younger than 30 are born in Guinaw Rails South. This is not the case amongst the young women and, since women and men are still far from equal in Senegal (Utrikespolitiska Institutet, 2012), this could show that men in general stay longer with their family, whereas the young women are married off and goes and live with their husband and his family. The majority of the women also said that they moved to Guinaw Rails South to join their husband, whereas no man came here to join his wife.

More men than women mention family as a reason for staying in Guinaw Rails South, which we believe can be due to the fact that it is often the men who have the overall responsibility as head of the family.

All women older than 40 say *family* as a reason for moving to Guinaw Rails South. Even though family is important to the Senegalese people today, this might have been even more important before and hence, the older ones may find family as an even more important factor while moving somewhere, compared to the younger people.

### 6.4 Work and education

When moving to Guinaw Rails South because of *work or education*, this is for example because people who migrated from the rural areas in Senegal believed that there would be a better chance to earn their living in the Dakar region than in their hometown. This can also

be seen in migrating studies where an underlying factor for migration from rural areas to a city is often said to be the movement towards jobs (Todaro, 1999). One woman (nr 10) said:

“I moved here because i was in company with my husband, and because Dakar is the capital, it was easier to find work in Dakar than in our home village”

However, as a reason for staying in Guinaw Rails South, work is not a common reason. This is probably because many people do not work at all, and those who do work commute to working places in Dakar city (Enda Graf Sahel, 2009). More men than women mention *work or education* as a reason for moving to Guinaw Rails South, which probably can be explained by the simple fact that it is more common among men to work at all, or to study.

To be close to a working place is according to the IRFC (2010) an essential attribute when finding a new place to live, which somewhat goes against our findings. However, since many people are unemployed and therefore those ideas might not be applicable here. The situation is so bad that people only try to survive and get some money for the day, and sometimes relies on God in this matter.

## 6.5 "Good place"

The category *good place* is a bit indistinct as it may be due to various attributes in Guinaw Rails South appeal to the respondents. However when they mention that Guinaw Rails South was a *good place* to move to it is often in conjunction with the aspect of regrets. That is to say that Guinaw Rails South is referred to as a place that was in a good condition but has, by time, become a bad place to live in.

While the living conditions that people encounter in urban areas may be more difficult than expected, in most cases urban areas still provide greater security and opportunity than their areas of origin (IRFC, 2012), and this is probably also what people thought about when moving to Guinaw Rails South because they thought it was a good place.

To summarize, many people moved here before the current risks and problems that characterize Guinaw Rails South today emerged. Guinaw Rails South might before have been seen as a good enough place to live in, or a better place than where they lived before. Most of the respondents did not know about the risks before moving here and many of them mentioned that they would never have moved to Guinaw Rails South if they knew. For example one woman said (nr 35) said:

“It is because before, Guinaw Rails was not a flooded area and I did not know that it would be. Even the person who sold us the house wanted to live here. If I only had known that this was going to be a flooded zone, I would not have bought the house”

Many of the respondents mention that they chose the area because the ground was covered with sand, and even mention that it was hard to walk properly. As they highlight this as an advantage, we believe that the sandy conditions refer to a situation without floods. However, if that is an after construction is hard to determine.

The fact that women often moved to Guinaw Rails South to follow their husband and that it is also more women than men say that they moved to here because they thought it was a good place could be explained by that the men, who probably made the final decision, told their wives that it was a good place and that they should move there. Sometimes, the

women did probably not know why it was a good place, and this could be why they more often than men say this some unclear reason as an answer to why they moved to Guinaw Rails South.

## 6.6 Perceived risks

To be able to understand why people live in hazardous areas and settlements it is important to understand how aware they are of the risks and what their perception of these risks are. That is because it is the perception of a risk that affect how people act rather than the actual risk (Riskkollegiet, 1993). The simplest answer to the question why people live in places like Guinaw Rails South could be that they are not aware of the risks there. According to Smith (2001) settlements in high-risk areas are often seen as behaviour fault with a poor perception of the hazards among the victims. However, this is not a conclusion that can be drawn from our data. Even if people did not know of the dangers before moving to Guinaw Rails South, they are well aware of the dangers that they are facing today.

### 6.6.1 Flood

Guinaw Rails South does not have any rainwater drainage and, together with for example the rising groundwater level and the excessive rains, this is one major reason for the recurrent floods in the area. When people talk about floods and the problems around this, they see the problem both as a natural disaster but mostly as a problem caused by the authorities' mismanagement leading to lack of land distribution and proper canalization systems. The flooding problem can then be seen as something caused by human "errors" and according to Otway and Winterfeldt (1982), this is increasing people's negative view of the problem.

According to Douglas et al. (2008) one of the most common types of urban flooding is the so-called localized flooding, which occurs many times a year in slum areas. The lack of drains is a major reason, or if there are drains, these are often blocked with waste because the slums lack adequate garbage collection. This is also the case in Guinaw Rails South and something people talks a lot about when they mention the flood problems. Today, some people in Guinaw Rails South take their own initiatives and dig their own channels. Sometimes they can borrow pumps and other equipment from the government. The respondents do not get any other help from officials and all the work is one by the inhabitants themselves.

For people in Guinaw Rails South to be worried about the floods and to mention this as one of the greatest dangers in the area is well justified, see figure 19. Floods are both the most widespread of all natural hazards and also lead to the greatest loss of life, either immediately through drowning or later through illness and famine (Wisner et al., 2004). Rainfall floods and other slower flood related disasters generally result in lower direct fatalities but, however, the risks of disease and malnutrition can cause effects that last for months or even years. The people in Guinaw Rails South are severely affected and their financial situation faces losses for months or sometimes years. One man (nr 11) said that he has to use his savings for repair work etcetera.



Figure 19. One typical street in Guinaw Rails showing the flooding situation there.

Some people in Guinaw Rails South also talk about the psychological aspect of the floods. A common thing is that the respondents say that they are not able to get enough sleep or rest as beds or entire bedrooms are unsanitary because of the floods. They also say that it is stressful to live under these conditions and that they think about the water all the time. This is also something that Wisner et al. (2004) talks about as a consequence for people living with recurrent floods. While conducting the interviews in Guinaw Rails South we could also feel that there was a great difference in the atmosphere and in how people behaved, when it had been a major flash flood just recently compared to how it was after a longer period without rain. Interview 1-7 were conducted the day after the worst rain fall in ten years in Senegal, and this day, the people seemed really tense.

The floods are an obvious contributing factor to the health problems as wastewater spreads disease, such as cholera and stagnant water serves as a breeding ground for malaria mosquitoes (Enda Graf Sahel, 2009). The respondents often talked about the health issues when they talked about floods, which indicate that health problems could be seen as a sub group to the flood phenomenon.

### 6.6.2 Health problems

Health care in Senegal is far from sufficient and one of ten children dies before they reach the age of five, mainly because of malaria and diarrheal diseases (Utrikespolitiska Institutet, 2012). The problems regarding health is also something people in Guinaw Rails South find as a major danger, especially when it comes to the children. Subsidized health care is only given to those with a formal employment, which means that few people will get this and social networks therefore counts for a great importance, both within the greater family and within the neighbourhood (Utrikespolitiska Institutet, 2012). People in Guinaw Rails South often talk about the problems with going to hospital when needed due to insufficient infrastructure and some also mention the lack of sufficient health services around Guinaw Rails South. In Pikine, there are only one medical centre for every 180 000 inhabitants, compared to one for every 50 000 that is recommended by the World Health Organisation (Enda Graf Sahel, 2009).

Just as Wisner et al. (2004) writes, that the floodwaters bring an increased risk of diseases such as cholera and malaria, people in Guinaw Rails South talk about these and can tell of family members or friends that have been affected, or even died because of these. Apart from these two, other common sicknesses in Pikine are dermatitis, scabies and diarrhoea (Enda Graf Sahel, 2009).

The water and waste management, or more the lack of this, is a big problem affecting people's health in Guinaw Rails South, see figure 20. No wastewater disposal is present, and the majority of the respondents say that they just throw their wastewater on the street in front of their house. For an outsider, this may seem "stupid" and something that is just increasing the problems. However, for the people living in Guinaw Rails South, this is normal and what everyone does. On respondent (nr 29) said:

"We throw it [the wastewater] on the streets like most people do".

Regarding peoples risk perception and how people perceive risks that are unknown, Riskkollegiet (1993) describes that people, because of lack of information or fantasy, act in ways that, at that time, seems reasonably. However, afterwards or for an outsider, these actions seem incomprehensible.



Figure 20. Garbage on the street. A common view in Guinaw Rails South.

### 6.6.3 Insecurity

The rising incidence in urban areas of conflict or localized violence by armed gangs, drug cartels and crime syndicates constitutes particular threats to vulnerable populations (IRFC, 2012). The impact of violence can be visible with injuries and scars but it can also be emotionally damaging and lead to low self-esteem, self-harm and worse health conditions (IRFC, 2012).

The fear of the criminal activities is palpable when we talked with the inhabitants of Guinaw Rails South. Even though only a few of the respondents themselves have been victims of

criminality, many of them have friends or family who has been the victim of assaults or burglaries and many people talked about having witnessed criminal activities. This means that the thought of assaults stay fresh in mind and according to Tversky and Kahneman (1973) risks that are easy to remember tend to be perceived as more probable than they actually are. However, we believe that there would not be any smoke without a fire and the measures many of the inhabitants take are probably well justified even though they heavily affect their daily lives.

A representative from the Red Cross in Dakar also believes that the fear of aggression is exaggerated. Although there is yet no police station in Guinaw Rails South, and hence no reliable criminal records that can be used to determine the actual exposure, we believe their fear to be justified. During an interview, a politician from the political direction in Guinaw Rails South also verified the problem with the insecurity by saying:

“...there are security problems. There is a lot, all the time you hear about assaults, there is a security problem. There’s also a problem at the social level, because the people that live in Guinaw Rails don’t have much means on the social level, and that’s how the situation is”

People’s behaviour towards different risks is affected by how they perceive risks and not the actual risk (Riskkollegiet, 1993), which is an important aspect in this case. This means, regardless if the criminal actions are frequent or not, that the perceived insecurity causes great concern for the inhabitants of Guinaw Rails South.

Even though the health issues in Guinaw Rails South probably claim far more lives than the insecurity issues does, the prevalence of statements related to insecurity in the interviews is almost as frequent as the health issues. A reason for this can be that the causation between personal threats and their effects are more obvious and direct than the risks associated with floods and health that might be unseen or stretched out over time. This time effect is also noted by for example Riskkollegiet (1993). Damage or threats caused by human actions or of malice is often believed to be much worse than risks with more natural causes, which is also noted by Enander (2005). According to Riskkollegiet (1993) the consequence of different risks cannot easily be compared.

#### **6.6.4 Changes**

According to most of the respondents, the risk picture has changed for the worse during their time in Guinaw Rails South. One of the major changes for the inhabitants is the end of the dry period and the heavy rains that returned after several years of drought surprised many of the inhabitants. In addition to the inconveniencies such as relocation problems, the floods caused an increased health risk and over the years it has probably likewise become a contributing background factor to increased crime. We believe that during these hard times with a high level of unemployment, overpopulation and a high cost of living, it is no surprise that people resort to this kind of behavior.

Many of the older respondents mention that the young people in the old days did not dare to assault people, but nowadays the young people show less respect. Some have also witnessed assaults during daytime in front of other people, something that was inconceivable in the past. That people get killed because of burglaries also seem to scare the

inhabitants in Guinaw Rails South, something that the respondents believed to be very uncommon in the past.

The social situation is very difficult and indirectly contributes to many risks. For example the fact that higher prices might influence the income of the population might lead to that the people starve and hence become more vulnerable for various risks such as disease. Therefore the population has become extremely vulnerable to most type of changes that might occur over time.

The respondents often answer that there has been no change during their time in Guinaw Rails, but when they say this they often refer to progress or mitigation deriving from the government. When we asked further questions, they often mention that the situation has become worse for certain reasons. However, many people believe that there are no new risks, just old ones that have increased because of higher frequencies or severity.

Our goal was also to investigate the respondent's beliefs about climate change. However, many of the respondents have nothing to say about the subject, even in the second part of the interviews where they were given a simple definition for climate change, see appendix C, information after question 12. Moreover, many respondents misinterpreted the definitions and the interpreters' explanations and still talked about short term weather changes or gave answers that gave no real information. A reason for the low number of respondents who could give any information about climate change could be that when you live under these circumstances you simply do not put much attention to how the weather has changed over the years. As one woman puts it (nr 5):

"You know when you find yourself in difficulties like these it's not important to think about climate change"

However, a couple of respondents give more sophisticated answers and talk about the destruction of the ozone layer and the greenhouse effect but the answers were rather thin and were not investigated further by the interviewers. The little people know seems to stem mostly from their own evident observations such as that the rains have started to cause more floods and that the temperatures at the same time have risen, or what they have heard in the media.

## **6.7 Reflection**

The reasons why people decide to move from where they lived before Guinaw Rails South have not been explored in this study. The main focus has instead been the reasons for choosing Guinaw Rails South, and not any place else, and why people chose to stay. These reasons vary among the inhabitants and are often based on a combination of many factors. This thesis tries to sort out separate information about these factors but it is important to understand that many of the respondents had more than one reason for moving to Guinaw Rails South.

Most of the people living in Guinaw Rails South today moved here before the major problems with the floods started. Earlier Guinaw Rails was seen as a good enough place to live in; from an economic point of view it was affordable and it was close enough to the capital and all the advantages that brings. We believe that the majority of the people living

here today are poor people who came here in order to live with a family member, often in combination with the hope to find work or to conduct studies.

Among those who moved here before the floods started in 2005, no one said that they knew about this risk before coming here and many of them regretfully said that if they would have known, they would never have bought a house or moved here. On top of that many were born here or moved here because of a parent's or another family member's decision, which did not leave the respondent much choice but to move to Guinaw Rails South.

This leads to the conclusion that probably few people knew about the risks before coming to Guinaw Rails South and consequently they did not even consider these aspects when choosing to live here. There is however a possibility that when the respondents talked about Guinaw Rails South as a wonderful place before, this might be in relation to how bad the situation is today. Some people that have moved here after 2005 also say that they have accepted the risks when moving here, for example insecurity, because they believe that the burglaries are omnipresent in the Dakar region, or floods because they have moved to a place that not yet have been flooded and that they believe will not be flooded in the future.

Many respondents told us that life in the suburb is hard everywhere but it is especially difficult in Guinaw Rails South where it is in conjunction with floods, it's subsidiary risks and the imminent insecurity. This means that the perception of how good things were before might be a bit exaggerated. However we believe that most people came here without apprehending the gravity of the upcoming situation. Many respondents also moved here because the situation was worse in their former location, for example more flooded, which also indicates this relativity. This somewhat also boils down to choosing the least of a number of evils, but here it is important to note that we, the authors, inevitably are coloured by our own opinions about living standards.

The inhabitants of Guinaw Rails South may also feel that they have had enough problems and are always neglected by the government. As Guinaw Rails South do not have a police station and also lack many of the basic social services, people might feel that the problems stems from governmental mishandling. This injustice is also something that might wake the urge for illegal activities, which is also mentioned by the IRFC (2010). The people are constantly in contact with the water and are psychologically exhausted and on top of that they have to live in this insecurity with frequent burglaries and even murders. This might be the straw that breaks the camel's back and makes the insecurity problem perceived as something worse and more frequent than the actual risk it entails.

It is also fair to say that it is possible that the insecurity is a subsidiary risk to floods due to the social situation that the floods cause for many people, even though insecurity might be something common in the Dakar region in general.

### **How they handle the risks**

The three risks that are constantly recurring in the interviews are the floods, insecurity and health issues. The health issues are mostly interpreted by the respondents as a subsidiary risk to the floods which is also the belief of the authors. In our data we see that the inhabitants are well aware of the risks in Guinaw Rails South. However we believe that their protective measures and their knowledge about the risks themselves are a bit poor. For

example, one representative from the Senegalese Red Cross said that there are easy measures for taking care of the household's wastewater by digging pits. However many of the respondents said that they throw their wastewater directly into the streets. Perhaps, this can be seen as a lack of knowledge about the fact that the waste water actually spread disease, it could also be that they have lost the sense of being able to control the situation or that they simply do not care.

Only one of the respondents said that they wash their hands before eating as a protective measure against disease. This might be something that is more common but the occurrence in the interviews is probably low due to the fact that the respondents believe that these kinds of actions are obvious. Washing your hands before eating is a strong must in custom and also common in Senegal and this kind of lapsus might be frequent in the interviews as we were not able to do in depth interviews in our own language. Some cultural differences might also take its toll as the interviewers and the respondents found some information obvious or trivial, which to us would have been considered as new information or interesting for our research. Although, after all we believe that spreading information about how the inhabitants better can protect themselves would be appropriate.

In summary, the inhabitants are well aware of the risks and the people who moved here before 2005 did not know about the future dangers that would occur in Guinaw Rails South. The few people who still move here today mostly know about the risks in the area but choose to move here as they believe that the place that they have chosen will not be affected by floods or that the situation in other areas will be as bad (or as good) as in Guinaw Rails South.

### **Despite the risks, why do they stay?**

When the floods started to occur, some respondents say that most of the people who had the means moved from Guinaw Rails South. Our data also shows that up to (if own house is included) 32 out of 40 mentioned economic reasons for staying. We therefore believe that the majority of the people in Guinaw Rails South stay here mainly because of economic reasons or because their families or houses are not that affected by the floods, that is that their situation is good enough in relation to their means. Many respondents mentioned the aspect of owning their house as a reason for staying but as we explained we believe this to mainly be an economic reason.

We also realized that among the respondents, work is seldom a reason for staying in Guinaw Rails South. However Ljungberg and Wier (2012) mention that this often is the case, which is also mentioned by the IRCF (2010). This might be explained by the fact that our data shows that 22 out of 40 respondents are unemployed and four are students. Moreover, the respondents that define themselves as working mostly work outside the formal sector and make their living by selling things at the market. This can be a motive why people did not mention work as a reason for staying, either because they do not have fixed jobs or that their working place is not really tied to Guinaw Rails South itself.

A possible source of error here is that when creating the interview question "Can you please tell us about your profession, what do you do for a living?", we did not realize that the level of unemployment was this high and that they did not consider small businesses, such as selling things, as a real working activity. Some respondents also answered that it was God

who gave them money. However, for the second part of the interviews, this question was changed into “What are your current means of subsistence?” which was more appropriate for getting the information we needed.

If the people would move from Guinaw Rails South, their situation would probably be worse in other places. This means that giving up their house to go somewhere else, probably more expensive or not close to opportunities to make a living, might result in not being able to satisfy some basic needs such as food for the family. Many respondents have also mentioned the high cost of living and that the prices have increased, especially in the first 20 interviews when we specifically asked about economic risks in Guinaw Rails South. As mentioned before, family is an important thing for the Senegalese people and one does not easily abandon your relatives. That means for example that a young man with a job probably will not leave his unemployed family behind to pursue his own dreams. This example shows why there can be many interlaced and complex reasons why people still live in Guinaw Rails South and each individual probably has his or her own story to tell.

## 7 Conclusion

The problem with settlements in hazardous areas is a current and very complex problem and it is therefore important to strive to better understand why people live in high-risk areas. This thesis tries to explain factors for why people are living in these areas, by studying the informal settlement Guinaw Rails South, Senegal. The results shows that people live in Guinaw Rails South because a combination of many factors. However, the four major factors are:

- **Economic situation.** Many residents in Guinaw Rails South moved to, and stay in Guinaw Rails South, because of their economic situation. The houses and the rent here are cheaper than in many other parts of the Dakar region and Guinaw Rails South is often the only place where these people could afford to live.
- **Own house.** To live in your own house is valuable for many of the residents in Guinaw Rails South. However, our belief is that this is often strongly connected with peoples economic situation since owning your house means that you do not have to pay any rent.
- **Family.** To live with your family is important to people in Senegal and therefore many people moved to Guinaw Rails South because they followed another family member. Women often moved with their husbands and men came with their parents or other family members.
- **Work or education.** People migrating from rural areas around Senegal come to the capital in hope of better opportunities to make a living. Guinaw Rails South is not too far from Dakar city and by commuting; people can live in Guinaw Rails South and work in Dakar city.

Many people moved to Guinaw Rails South without knowing the future problems that would befall the area, which leads to that most people did not consider the risks before coming here. However, people living in Guinaw Rails South today are well aware of the hazards and do not live there because a lack of knowledge or information about these. The benefits of living in Guinaw Rails South somehow overweight these hazards and that is the reason why people live here.

*Family* and *work or education* are major reasons for why people move, but not necessarily explain why choosing Guinaw Rails South over other places. *Economic situation* however, is a factor that makes Guinaw Rails South unique and the low prices here is something that attracts its inhabitants. The fact that the economic situation is such a big factor for why people live in Guinaw Rails South also means that the majority of the inhabitants are very poor. In a disaster point of view, urban poverty increases the risk (IRFC, 2010), and together with the other hazards in Guinaw Rails South, this makes the inhabitants of Guinaw Rails South extremely vulnerable to a disaster.

Many people that have mentioned *money* as a reason for staying in Guinaw Rails South have also said that another reason is that they are living in their *own house*, and because of that they cannot, or do not want to, leave. They have either invested a lot of money in the house, they do not have to pay rent because they own the house, or this house is where their

children have grown up and therefore this is the only place they know. We believe that *own house* in most cases can be seen as a sub group to the category *economic situation* as it often is about not having to pay the monthly rent. However, as said before, when people talk about owning a house it is sometimes also about the fact that they have invested in both money, time and affection around the house and therefore not want to give it up, but since living in Guinaw Rails South comes with so many dangers, we believe that in the end, it is the *economic situation* that are forcing the people to stay and *own house* comes down to being an economic question.

*Family* has been found to be an important factor when moving to a new place in many other studies and this is also a common reason for moving to Guinaw Rails South. People often mentioned that they came to Guinaw Rails South because they followed their husband, parents or other family member. *Family* seems to be a more important factor regarding why people moved to Guinaw Rails South, than why they chose to stay. However, if they did not have to stay in Guinaw Rails South because of the other factors, for example *money*, they would probably have wanted their whole family to move with them. From what we have seen and experienced in the area, family bounds are very important and people predominately live together in large families.

When moving to Guinaw Rails South because of *work or education*, this is for example because people who migrated from the rural areas in Senegal believed that there would be a better chance to earn their living in the Dakar region than in their hometown. To be close to a working place is often seen as an essential attribute when finding a new place to live, which somewhat goes against our findings since not that many people have mentioned this as a reason for moving to Guinaw Rails South. However, many people are unemployed and therefore those ideas might not be applicable here. The situation is so bad that people only try to survive and get some money for the day, and sometimes relies on God in this matter.

Following the theory behind the Pressure and release model from the Theoretical foundation chapter, a disaster emerges from two different forces (Wisner et al., 2004). It is the progression of vulnerability on one side and the natural hazard, for example floods, on the other. There are also underlying root causes, for example the current politics and situation in Senegal, which leads to unsafe conditions by the more immediate dynamic pressure processes. These processes can for example be the rapid urbanisation in Dakar and to be able to relieve the pressure, the vulnerability has to be reduced. For Guinaw Rails South, this could for example be by reducing the poverty. This is of course an enormous challenge, but the authors believe that this probably is the best way of making sure that the people of Guinaw Rails South do not continue to live in a disaster.

This thesis has tried to answer why people live in high-risk communities, like Guinaw Rails South. If the four factors that we have come up with are general and can be applied to other similar places around the world is however unknown. A similar study conducted by Ljungberg and Wier (2012) also indicates family and work as major reasons but not economic situation or the ownership of a house. The community where that study was conducted is also a high-risk area, but apart from that, the two communities have a lot of differences. (Bernard, 2006).

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## Appendix A – List of respondents

The respondent's names are left out to protect their integrity. Note that people answering that they are unemployed might still have an informal business, which to them is not concerned as a real job. Totally 40 respondents were interviewed, 21 women and 19 men. Age group 18 – 30 consists of 8 women and 6 men, age group 31 – 40 consists of 5 women and 5 men and age group 40+ consists of 8 women and 8 men.

**Table A1: Classification sheet of the respondents. \*We are unsure if the respondents really meant or Guinaw Rails South or the Dakar region in general.**

Resp.	Sex	Age	Age Group	Occupation	Years in GRS
1	Female	40	31 - 40	Unemployed	40*
2	Female	56	40 +	Unemployed	41
3	Male	66	40 +	Unemployed	51*
4	Female	53	40 +	Unemployed	3
5	Female	32	31 - 40	Unemployed	8
6	Male	28	18 - 30	Student	28
7	Female	26	18 - 30	Yes	15
8	Male	88	40 +	Unemployed	30
9	Female	22	18 - 30	Yes	10
10	Female	60	40 +	Unemployed	---
11	Male	24	18 - 30	Yes	24
12	Female	42	40 +	Unemployed	20
13	Female	40	31 - 40	Unemployed	35
14	Male	37	31 - 40	Yes	25
15	Female	55	40 +	Unemployed	0
16	Female	23	18 - 30	Unemployed	15
17	Female	25	18 - 30	Unemployed	1
18	Male	18	18 - 30	Student	18
19	Male	46	40 +	Yes	26
20	Male	40	31 - 40	Unemployed	---
21	Female	42	40 +	Unemployed	7
22	Female	24	18 - 30	Unemployed	1
23	Male	32	31 - 40	Yes	7
24	Male	53	40 +	Yes	7
25	Female	30	18 - 30	Yes	13
26	Male	62	40 +	Unemployed	20
27	Male	21	18 - 30	Student	21
28	Female	60	40 +	Unemployed	24
29	Male	21	18 - 30	Student	21
30	Male	45	40 +	Yes	31
31	Male	35	31 - 40	Unemployed	14
32	Female	32	31 - 40	Yes	32
33	Female	30	18 - 30	---	4
34	Female	55	40 +	Unemployed	35
35	Female	40	31 - 40	Yes	8
36	Female	20	18 - 30	Unemployed	20
37	Male	32	31 - 40	Yes	20
38	Male	19	18 - 30	Unemployed	19
39	Male	42	40 +	Yes	32
40	Male	68	40 +	Unemployed	10

## Appendix B – Interview guide 1

The following interview guide was used for the first 20 interviews.

### Situation et vie

1. **Main Question: Can you please tell us about your life here?**  
Question principale : Pouvez-vous s'il vous plaît nous parler de votre vie ici?
2. **Can you please tell us about your profession, what do you do for a living?**  
Pouvez-vous nous parler de votre métier, de quoi vivez-vous ?
3. **Where do you work and what hours?**  
Où travaillez-vous et quelles heures ?
4. **Are you born here or did you move here?**  
Est-ce que vous êtes né(e) ici ou avez-vous déménagé ici?
5. **If you moved here, what were the main reasons for moving here?**  
Si oui, pourquoi avez-vous déménagé ici, quelles étaient les raisons principales ?
6. **How long have you lived here? Have you moved within Pikine?**  
Pour combien de temps avez-vous vécu ici? Avez-vous déménagé entre les régions de Pikine?
7. **What are the advantages regarding living here?**  
Selon vous, quels sont les avantages à vivre ici?
8. **What are the disadvantages?**  
Quels sont les désavantages?
9. **What are the main reasons for staying here, have you thought about leaving?**  
Quelles sont vos raisons principales pour rester ici, avez-vous pensé déménager?

### Risques

**Now let's talk about risks, when we talk about risk we mean all types of risks not only with the floods. That can be economical risks, for example loss of income or property, health issues.**

Maintenant, parlons des risques. Ça veut dire toutes types des risques/dangers, pas seulement les inondations. Ça peut être des dangers qui concernent l'économie, par exemple perte de revenu ou perte des biens, ou des dangers sanitaires, maladies etc.

10. **Main Question: What risks do you see regarding life here?**  
Question principale : Quels risques voyez-vous concernant votre vie ici à Pikine?
11. **What do you think about these risks? Which do you find most relevant?**  
Que pensez-vous de ces risques? Quels sont les risques vous sentez-vous les plus pertinents?

**12. How do they affect your daily life and family?**

Comment affectent-elles votre vie quotidienne et la famille?

**13. Which of the risk concerns you the most? Why?**

Lequel des risques vous inquiète le plus? Pourquoi?

**14. What do you do to protect yourself from these risks?**

Que faites-vous pour vous protéger contre ces risques ?

## **Changements**

**15. Main Question: Have you noticed any change over time about the situation here?**

**Concerning everyday life, risks etc.?**

Question principale : Avez-vous remarqué un changement au fil du temps sur la situation ici ? Concernant la vie quotidienne, les risques etc. ?

**16. Have the situation become more difficult or easier?**

Est-ce que la situation est devenue plus difficile où plus facile?

**17. How have things become more easy/difficult?**

Comment est-ce que les choses devaient plus difficile/facile ?

**18. What work have you noticed to mitigate risks here?**

Avez-vous remarqué de travail fait pour atténuer les risques ici? Par exemple par des organisations de secours, du gouvernement ou autres organes ?

**19. By your opinion, have you noticed any climate change during your years in Guinaw Rails South? If yes, how? By climate change we mean that the weather has changed, for example temperature changes, more rain etc.**

Selon vous, avez-vous remarqué des changements climatiques pendant votre séjour à Guinaw Rails South? Comment ? C'est à dire, est-ce que vous pensez que le temps a changé, ça peut être des changements de température, plus de pluie etc...

**20. If you could decide, what changes would you make in the area?**

Si vous pouviez décider, quels changements apporteriez-vous dans la région?

• **What is the size of the household?**

Quelle est la taille du ménage ?

• **How many rooms do you have?**

Vous avez combien de pièces ?

• **What are the means of subsistence for the people here?**

Quels les moyens de subsistence actuel des gens ?

• **Do you have access to a water source?**

Avez-vous accès à une source d'eau ?

• **Do you have toilet?**

Avez-vous une toilette ?

## Appendix C – Interview guide 2

The following interview guide was used for the last twenty interviews (interview 21 - 40).

### Introduction

1. **To start with we would like to know a little bit more about your life here in Guinaw Rails. We are interested in everything regarding your life here and what you think about living here.**

Pour commencer, nous voudrions savoir un petit peu de plus sur votre vie ici à Guinaw Rails. Nous sommes intéressés à tout qui concerne votre vie ici et qu'est-ce que vous en pensez de vivre ici.

- a. **Have you been interviewed regarding the floods before?**

Est-ce que vous ont été interviewé(e) par rapport aux inondations avant ?

- b. **Name ?**

Nom ?

- c. **Age ?**

Age ?

- d. **Where are you born ?**

Où êtes-vous né(e)?

- e. **For how long have you been living in Guinaw Rails?**

Pour combien de temps avez-vous vécu(e) à Guinaw Rails ?

- f. **For how long have you been living in this house?**

Pour combien de temps avez-vous vécu(e) dans cette maison ?

2. **What are the current means of subsistence for the people here?**

Quels sont les moyens de subsistance actuels des gens?

- a. **And you, what are your means of subsistence?**

Et vous-même, quels sont vos moyens de subsistance ?

3. **Why did you choose Guinaw Rails, what was the main reason?**

**(If they say: It was a good place-ask what was good)**

Pourquoi avez-vous choisi Guinaw Rails, quelle était la raison principale ?

- a. **Were there any other reasons? Which ones?**

Est-ce qu'il y avait des autres raisons ? Lesquelles ?

- b. **Did you have other places in mind when you moved? Where?**

Quand vous avez déménagé, avez-vous pensé à d'autres endroits ?  
Lesquels ?

c. **Was it your decision or somebody else's? Whose?**

Est-ce que c'était votre propre décision ou quelqu'un d'autre ? De qui ?

4. **According to you, what are the advantages regarding living here? [If they start talking about disadvantages straight away, try to ask for advantages again]**

Selon vous, quels sont les avantages à vivre ici? [Si les gens commencent à parler de désavantages, essayer de demander encore une fois]

a. **Are there any other advantages?**

Est-ce qu'il y a d'autres avantages ? Lesquels ?

5. **What are the disadvantages?**

Quels sont les désavantages? Préciser.

a. **Are there any other disadvantages?**

Est-ce qu'il y a d'autres désavantages ? Lesquels ?

6. **What are your main reasons for staying here?**

Quelles sont vos raisons principales pour rester ici ?

a. **Are there any other reasons? Which ones?**

Est-ce qu'il y a d'autres raisons ? Lesquelles ?

b. **Have you thought about leaving Guinaw Rails? Where to?**

Avez-vous pensé déménager de Guinaw Rails? Où ?

## Dangers

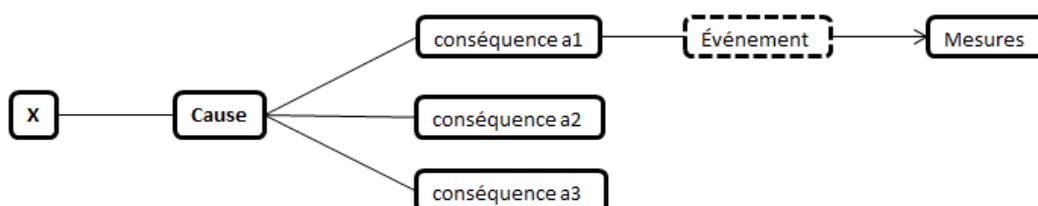
**Now let's talk about dangers regarding living here in Guinaw Rails. When we talk about dangers we mean all types of dangers. We are interested in what you think could *possibly* be dangerous about living in Guinaw Rails.**

Maintenant, parlons des dangers concernant de vivre ici à Guinaw Rails. Ça veut dire tous types des dangers. Nous sommes intéressés à savoir ce qui *pourriez être* dangereux concernant votre vie à Guinaw Rails.

7. **By your opinion what is the greatest danger regarding living in Guinaw Rails?**

Selon vous, quel est le plus grand danger en concernant vivre ici à Guinaw Rails ?

Quel est le plus grand danger à Guinaw Rails?	Que pensez-vous est la cause de ce danger?	Quelles sont les conséquences de X?	Avez-vous, ou votre famille, été exposé à ce sujet? Comment?	Que faites-vous pour vous protéger contre ces risques ?
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**8. Are there any other dangers? (Yes = Do the schedule again)**

Est-ce qu'il y a d'autres dangers ?

**9. Rank these dangers according to how afraid you are of them.**

Classez (hiérarchisez) ces dangers en fonction de la façon dont tu as peur d'eux.

**10. Did you know about the dangers before moving to Guinaw Rails? Which ones?**

Saviez-vous au sujet des dangers ici avant de déménager à Guinaw Rails? Lesquels ?

**a. If yes, why did you move here anyway?**

Si oui, pourquoi avez-vous déménagé quand même?

## **Changement**

**Now we would like to talk about changes here in Guinaw Rails. We are interested in both short term and long term changes.**

Maintenant, parlons de changements ici à Guinaw Rails. Nous voudrions savoir de changements à long terme.

**11. Tell us about how life was in Guinaw Rails when you first came here? Or when you were a kid/younger?**

Parlez-nous de la façon dont la vie était à Guinaw Rails quand vous êtes arrivés ici? Ou quand vous étiez enfant / plus jeune?

**a. How is your life today? How has things changed?**

Comment est votre vie aujourd'hui ? Comment les choses ont changées ?

**b. Have any dangers disappeared or diminished? (Which ones, when and how?)**

Est-ce qu'il y a des dangers qui sont disparus ou diminués ? (Lesquels, quand et comment ?)

**c. Have any dangers intensified? (Which ones, when and how ?)**

Est-ce qu'il y a des dangers qui sont aggravés ? (Lesquels, quand et comment ?)

**d. Have any new dangers appeared? (Which ones and when?)**

Est-ce qu'il y a de nouveaux dangers ? (Lesquels, quand et comment ?)

**12. Do you know the expression "climate change"?**

Est-ce que vous connaissez l'expression « Changements climatiques » ?

**a. If yes, can you explain the word?**

Est-ce que vous pourriez expliquer le mot ?

**Info:** By climate change, we mean that the weather has changed over a long period of time, that is to say, a few years or even longer than that. Changes can mean changes in temperature, more or less rain or other things regarding the weather.

**Info :** Par les changements climatiques nous voulons dire que le temps a changé au cours d'une *longue* période de temps, c'est-à-dire quelques années ou même plus longue que ça. Les changements peuvent être changement de températures, plus ou moins de pluie ou autre choses en ce qui concerne les conditions météorologiques.

**13. Have you noticed any climate change/variability during your time in Guinaw Rails?**

Avez-vous remarqué des changements ou variabilités climatiques lors de votre séjour dans Guinaw Rails ?

- **What is the size of the household?**  
Quelle est la taille de votre ménage ?
- **How many rooms do you have?**  
Vous avez combien de pièces ?
- **Do you have access to a water source**  
Avez-vous accès à une source d'eau ?
- **Do you have a toilet?**  
Avez-vous une toilette ?
- **What do you do with your waste water? (from the toilet, the kitchen etc.)**  
Qu'est-ce que vous faites avec vos eaux usées ? (De la toilette, la cuisine etc.)

## Appendix D – Photos of floods

Photos from Guinaw Rails South showing different grades of flooding.



Figure D1 and D2: A street and a house seriously affected by the floods.



Figur D3 and D4: A house and a street not directly affected by the floods.