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COMMUNITY RESILIENCE AND ADAPTATION TO FIRE: THE CASE OF PALMIET INFORMAL SETTLEMENT, ETHEKWINI MUNICIPALITY, SOUTH AFRICA

Abstract

Informal settlements within the eThekweni Metropolitan Municipal area are continuously increasing in size and numbers and, more than 238 households were living in informal settlements by 2018. The municipality is one of the top 16 municipalities in South Africa with the highest number of households living in informal dwellings. With the increasing mushrooming of informal dwellings in and around the city center of Durban and nearby industrial areas, shack fires have become a common occurrence. This has prompted the metropolitan to conduct a trend analysis of these shack fires. The trend analysis indicated that some informal settlements more frequently experience fires than others regardless of similar dynamics, such as lack of basic services such as electricity. Palmiet informal settlement is one such that does not experience many fires. Based on this trend, the study sought to investigate the factors that lead to adaptation to and resilience of the community to shack fires. The community livelihood framework formed the theoretical basis of the study that was predominately qualitative and to a lesser extent quantitative. The research sampling was a homogenous purposive sampling based on location, knowledge, and experiences. Sixty-five respondents from the L-Section of Palmiet and three municipal officials participated in the study. Strong community social networks that led to the adoption of internal fire risk reduction measures, the collective approach the community adopted of “coming back stronger and better positioned for the future” resulted in creating a resilient community of Palmiet. Getting back to the baseline is not enough in tackling informal settlement fires, but resilience could be enhanced through the bouncing forward factor. One of the recommendations is that the municipality needs to strengthen its collaboration with the local communities to improve community fire risk reduction measures.



Keywords: informal settlements, fire hazard, community resilience, adaptation, eThekweni municipality.

A KÖZÖSSÉG ELLENÁLLÓKÉPESSÉGE ÉS ALKALMAZKODÁSÁNAK LEHETŐSÉGEI A TŰZESETEK SORÁN: ESETTANULMÁNY A PALMIET INFORMÁLIS TELEPÜLÉSRŐL DÉL-AFRIKÁBAN

Absztrakt

Az eThekweni Metropolitan Municipal területén folyamatosan nő az ún. informális települések száma. A Dél-afrikai településen a legtöbb ember ezekben az informális lakásokban (kunyhókban) él, de ez nem csak itt, hanem Durban város környékén is jellemző. Ez a jelenség arra készítette a várost, hogy trendelemzést végezzen az itt keletkezett a kunyhótűzekekről. A trendelemzés során arra a következtetésre jutottak, hogy azokban az épületekben, ahol a létfontosságú rendszerelemek alapvetően hiányoznak gyakoribbak a tüzek. Palmiet informális települése azonban kivételt képez, ezért a szerzők megvizsgálták ezt a mintaterületet annak érdekében, hogy kiderítsék, mi eredményezi itt a hatékonyabb tűzmegeelőzést. A kutatás mintavétele homogén célzott mintavétel volt, amely a helyszínen, a korábbi ismereteken és egyéb tapasztalatokon alapult. A cikk eredményeként a szerzők javaslatot tesznek az önkormányzatok részére a helyi állampolgárokkal való szorosabb együttműködésre a tűzkockázat csökkentése érdekében.

Kulcsszavak: informális település, közösség ellenállóképessége, alkalmazkodás, eThekweni önkormányzata



1. BACKGROUND

Informal settlements, although fragile, display evolutionary resilience and adaptability to changes in the urban context. However, government structures fail to recognise this inherently resilience displayed by informal settlements and this will result in government having limited success in effectively engaging with informal settlements. This results in incompatibility of formal and informal structures. Seeliger & Turok (2014:184) suggest that the public sector can increase disaster risks through indifferences and poorly conceived actions, or they can build community resilience through constructive and integrated methods. The authors further argue that community resilience can be built by strengthening local capacity and propose adaptive governance as a framework to achieve this. The adaptive governance theory is a broad-based approach that combines local experiences with that of organisational theory.

Brown-Luthango, Reyes & Gubevu (2016:s.a), further argue that the upgrading of informal settlements through physical improvement and provision of full basic services indirectly reduces community vulnerability and improves safety conditions of informal dwellers. Harte, Childs & Hastings (2009), in their research findings established that social networks, community participation and resourcefulness of individuals were the most important factors underpinning community resilience in informal settlements. Their findings indicated that informal dwellers have the internal capacity and resources to adapt to their local challenges such as fire hazards. However, support from government is required to enhance and fully benefit from these internal capacities.

Harte *et al.*, (2015) stated that geographical, political, social, and environmental factors, stakeholder interactions, prioritisations, and decision making create barriers for government to implement disaster risk management policies and strategies. This supports the notion by Seeliger & Turok, (2014:184) that government can increase disaster risk through indifference and poorly conceived actions. Informal settlement dwellers have skills and formal education, as indicated by the study findings of research conducted at Kpirikpiri informal settlement in Ebonyi State, Nigeria. The skills and education possessed indicate internal resources and capacity (Pugalis, Giddings & Anyigor 2014).



According to Olorunfemi, Gbadegesin and Raheem (2006), the interaction of both socio-economic structures and government agencies is relatively important in order to develop community capacities to effectively respond to existing and emergent shocks and stresses. Community characteristics and the manifestation of political economy equally contribute to the vulnerability. Political marginalisation impacts efforts aimed at community resilience as decisions over major planning interventions at informal settlements are taken without involving residents and frequently undermines existing local-level adaptation initiatives. Most importantly, local institutions play an important role in enabling access to the types of resources that can build community resilience (Harte, Childs & Hastings, 2011).

Vulnerability and resilience in informal settlements have been a subject under discussion among many researchers (Seeliger & Turok 2013:online). However, there is still a gap in investigating internal capabilities and arrangements in building fire resilience and adaptation in informal settlements. There is a growing need to develop and upgrade informal settlements in order to create safe living environments. However, there is little documented evidence of how collective actions undertaken by communities living in these informal settlements can contribute towards community resilience and adaptation to the many hazards they are exposed to, such as fire, floods and disease outbreaks (Olorunfemi *et al.*, 2011; Harte *et al.*, 2015b:s.a).

In this view, this study is in accordance with the perspective advanced by different authors to investigate factors that enhance community fire resilience and adaptation, with a strong focus on internal coping capabilities. It further seeks to explain how these factors address the immediate needs of this community and significantly contribute to building resilience and adaptation at the levels of the individual, household, community and municipality. More so, exploring internal capacities and further support is crucial in order to enhance community resilience and for authorities to fully benefit from these internal adaptation strategies. In the quest of identifying and assessing the factors and conditions underpinning the adaptive capacity of the Palmiet informal dwellers to fire incidents, issues such as the community capitals and government interventions are considered.



2. INFORMAL SETTLEMENTS IN SOUTH AFRICA AND ETHEKWINI

In South Africa about 40% households live in informal houses, of which 7.8% are in the KwaZulu-Natal province (Brown-Luthango *et al.*, 2016). The eThekwini municipality, being one of the top sixteen municipalities with the highest number of households living in informal dwellings, records a considerably higher number of fire outbreaks at these settlements. South Africa Fire Statistics recorded about 4 000 shack fires at informal settlements in 2014. There are also well-documented reports of lives lost, and injuries and damages caused by such fire outbreaks. There are a number of factors cited for the mushrooming of informal settlements, particularly in the urban areas, the common reasons being lack of employment, poverty, and shortage of housing. Political conditions also play a role in this regard (Harte, Childs & Hastings, 2009). Informal settlements are households lacking improved water and sanitation, durable housing structures and insufficient living space. These are some of the tangible indicators of informal dwellings: their structures are not erected according to approved architectural plans (Seeliger & Turok, 2014).

Informal settlements within the eThekwini municipal area are continuously increasing in size and numbers. According to the municipality's Incremental Informal Settlement Upgrading (2011) over 250 households living in informal settlements. With the increasing mushrooming of informal dwellings in and around the city centre of Durban and nearby industrial areas, fires have become a great concern to the municipality, and disaster response agencies, such as the Red Cross, Social Development, and Non-Governmental Organisations (NGOs) (eThekwini Annual reports 2010-2017).

Due to the recurrent shack fires the EThekwini municipality conducted a trend analysis was conducted between 2010 and 2017 (See **Figure 1**), and according to the statistics the municipality recorded 483 informal settlement fire incidents, in which approximately 28 000 people were affected. Some of the affected settlements areas include Kennedy Road, Sea Cow Lake, Quarry Road, Claremont, Cato Crest, and Palmiet informal settlement. A closer look into the trend analysis indicated that the Palmiet informal settlement recorded only a few fire outbreaks during that period. According to the fire statistics, the settlement experienced only



one major fire incident between 2014 and 2016 (eThekwni annual reports 2010-2017). This indicated a degree of high fire resilience, despite the high risk of fire incidents. It is against this backdrop that this study sought to investigate community fire resilience and adaptation at the Palmiet informal settlement. The key research question underpinning this study is, “*What factors contribute to community fire resilience and adaptation at the Palmiet informal settlement?*” The key objective of the study was to determine the factors that create fire resilience at the Palmiet informal settlement, L-Section in Durban.

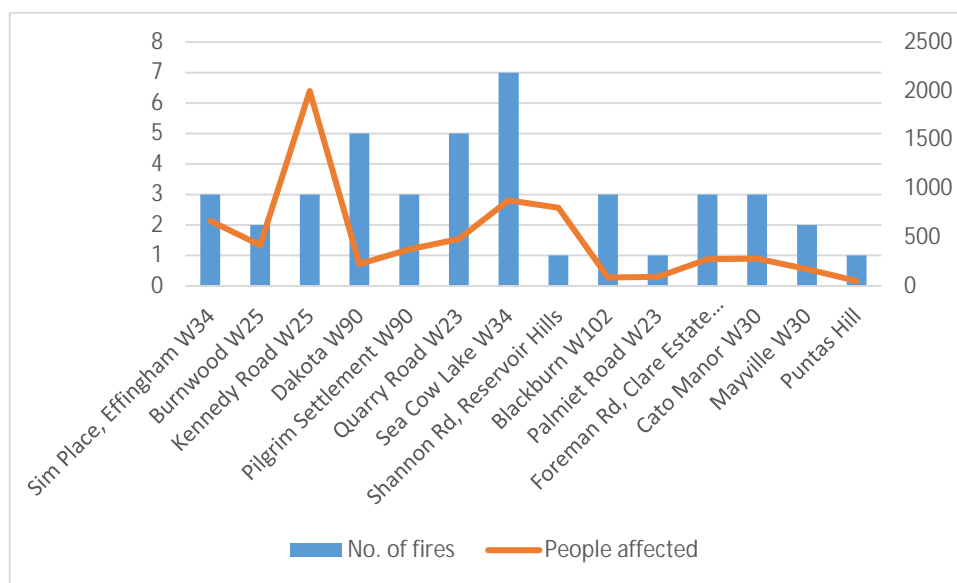


Figure 1- Fire trend analysis of EThekwni municipality between 2010 & 2017. Source: eThekwni Disaster Management Statistics 2014-2016

Description of study area

The eThekwni municipality is located on the east coast of South Africa and is the largest city in the province of KwaZulu-Natal. Palmiet informal settlement, near Westville, was established in the late 1980s. It is made up of three sections, namely Section 1, Section 2 and L-Section. L-Section and has a population of approximately 2 000, with 327 dwellings. The settlement, like all other informal settlements in the municipality, has a dense setup with minimum space between the dwellings. In terms of the basic services, the settlement has limited access to water and sanitation facilities. The settlement lacks safe electricity, as there are many



illegal electrical connections. The municipality is in the process of installing electricity at most informal settlements around the city.

The settlement is within a historical Indian settlement area, and although much has changed in terms of racial composition in the area. However, it is still dominated by the Indian population. Many people living under marginal conditions migrate to Palmiet for better employment opportunities. Politically the African National Congress (ANC) leads the eThekweni metro, however Palmiet settlement falls under Ward 23 and has a Democratic Alliance (DA) ward councillor. An active and vocal movement called *Abahlali baseMjondolo* (informal dwellers) works with the informal settlement communities within the municipality in fighting for better living conditions and improvement of the lives of informal dwellers (Umhlaba Izindlu neSithunzi: Land Housing Dignity 2016).

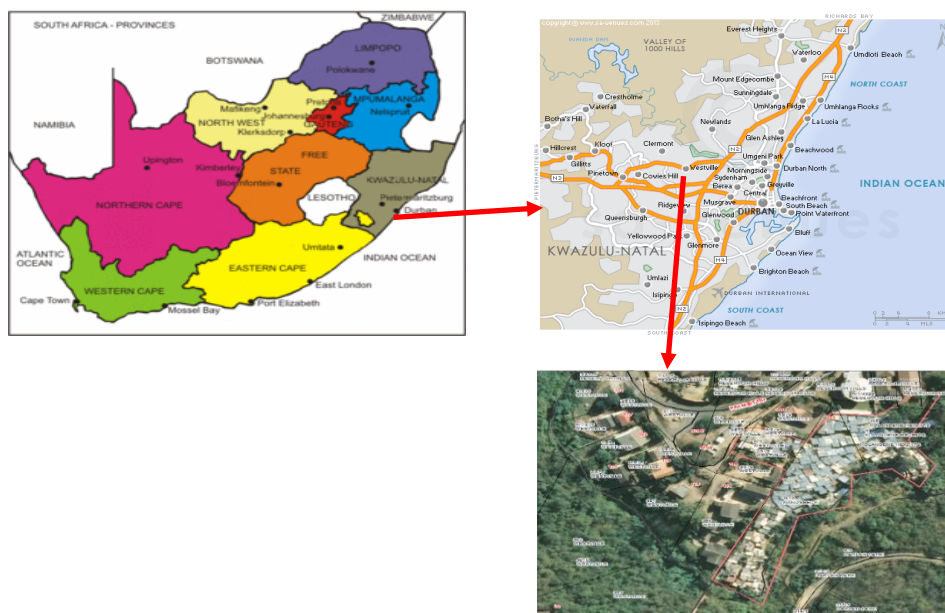


Figure 2 - Map showing KZN, eThekweni & Palmiet informal settlement. Source: Google maps, 2017.

The conceptual and theoretical framework

The study adopted the Sustainable Livelihood Framework (DFID, 1999), a framework originally developed by Robert Chambers in the mid-1980s. The framework has been adopted by a number of development agencies, including the United Kingdom Department for



International Development (DFID), which has been an advocate of applying this framework in various developing countries (Mayunga 2009:28). The framework's livelihood assets, which are portrayed as the pentagon of assets, are suitable for this study. The assets in the community's possession are used to analyse their situation. The asset pentagon is the core of the Sustainable Livelihood Framework (Mayunga 2009:30). It consists of five capitals, namely human capital, social capital, natural capital, physical capital, and lastly financial or economic capital. The five types of capital are important assets in building disaster resilience and sustaining livelihood (Mayunga 2009:31).

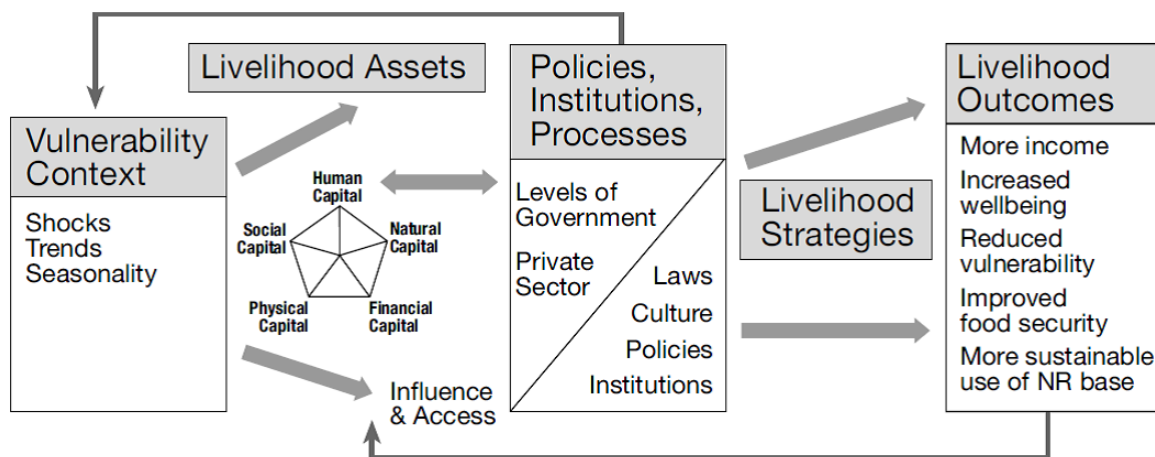


Figure 3 - Sustainable Livelihood Framework. Source: DFID, 1999

Community resilience and adaptation

Globally, community resilience is the key to disaster management. Resilience allows communities to adapt quickly to the impact of disaster events. Community resilience is built through proper preparedness planning (Ambrusz 2016) and effective response and recovery strategies (Thornley, Ball, Signal, Lawson-Te Aho & Rawson 2014). Thornley *et al.* (2014) argue that, while there is a great deal of work done on individual resilience globally, community resilience has been underestimated. Using a model of resilience, they indicate that community resilience is not simply the total sum of individual resilience but there are distinct community-level factors that promote post-disaster adaptation.



Community resilience should be prioritised locally. Since the promulgation of the South African Disaster Management Act no. 57 of 2002, the disaster management approach has focused on preventing, mitigating and reducing the impacts of disasters. This proactive approach, centred on disaster preparedness, building community disaster resilience and adaptation. Despite the emphasis on the need to build community resilience and adaptation, there is a huge lack of knowledge among government institutes and relief organisations regarding the resilience and indigenous knowledge of those directly affected by disasters. There is inadequate literature that captures the knowledge about the resilience and adaptation of communities especially in the informal settlements.

Inadequate infrastructure and surrounding environment, high and uncontrolled population densities, poor access to health and educational facilities, lack of effective governance and management and the inadequate individual dwellings are some of the factors contributing to community vulnerability in Palmiet. Informal settlements often do not comply with local requirements for conventional (formal) urban planning and development, consequently remaining as areas of increasingly high risk with regard to fires.

3. RESEARCH DESIGN AND METHODOLOGY

This study adopted a case study strategy to investigate the community's fire resilience and adaptation at the Palmiet informal settlement. This research design is relevant to the study as it allows for robust methods and a holistic in-depth investigation of community resilience at the Palmiet informal settlement. The study followed a predominantly qualitative and lesser quantitative case study approach as most of the information gathered from the participants was in text form. A semi-structured questionnaire was designed, piloted and used to interview the participants. Observations and informal conversations were also used as part of the triangulation method to get more meaning to the study. The data collection tools were used concurrently in no particular order. The approach was considered to be more appropriate for studying the issues of concern as it further provided opportunity for extensive recording of field notes through visual aids, photographs, and recordings in order to produce well-versed findings. Much interaction was undertaken with the participants to understand and interpret



their views. The study further drew on formal statistical reports and documented evidence from municipal departments such as Municipal Housing, Fire and Rescue Services, and the Disaster Management and Emergency Control Unit.

The population of Palmiet, L-Section was used in the study. L-Section has a population of approximately 2 000, with 327 households. A non-probability sampling technique was used, as the participants were selected based on the subjective judgement of the researcher, assisted by the councillor. The criteria for selection was the location, knowledge and experience of participants. These individuals were considered knowledgeable in matters to do with the settlement living conditions so that they would effectively respond to the questionnaires, conversations, and informal interviews in order to provide the necessary information required for the study. A sample size of 65 households was used as community representatives for the study. All the participants were briefed on the objectives of the study. Ethical considerations were observed during the data collection process.

4. RESULTS AND DISCUSSION

Most of the surveys in the topic of firefighting focus on the firefighters. Three research assistants were recruited, trained and provided with the necessary tools to collect the data. The researcher assistants worked with a community field worker who were familiar with the area. The questionnaires with the community consisted of 43 questions, divided into five sections, namely community demographics, community fire risks, community fire resilience factors, economic activities and financial resources, and lastly social and community engagements.

The community semi-interviews were conducted over a period of two days. The first visit to the settlement was on 14 December 2018 and the second visit took place on 18 January 2019. Sixty-five (65) community members responded to the questionnaires. The data analysis process involved organising the data received, categorising the data, interpreting the data to be meaningful information, making sense of the information by identifying underlying patterns and drawing a conclusion out of the information. The data was analysed using an Excel spreadsheet.



The discussion with the community representatives yielded the following results:

Table 1 - Community demographics. Created by the Authors. Source: Survey results, 2018.

| Demographic | Category | Number of respondents (n=65) | Percentage |
|-----------------|----------------------|------------------------------|------------|
| Age (years) | 18-24 | 9 | 13.9 |
| | 25-34 | 20 | 30.8 |
| | 35-44 | 22 | 33.9 |
| | 45-54 | 11 | 16.9 |
| | 55-64 | 3 | 4.6 |
| | 65 or older | - | - |
| Gender | Male | 37 | 56.92 |
| | Female | 28 | 43.08 |
| Language spoken | Zulu | 48 | 73.85 |
| | Xhosa | 13 | 20 |
| | Sotho | 1 | 1.54 |
| | English | 1 | 1.54 |
| | other | 2 | 3.08 |
| Education level | Primary | 14 | 21.54 |
| | Secondary | 44 | 67.69 |
| | Tertiary | 2 | 3.08 |
| | No Education | 5 | 7.69 |
| Marital status | Single/never married | 33 | 50.77 |
| | Cohabiting | 12 | 18.46 |
| | Domestic partner | 10 | 15.38 |
| | Married | 5 | 7 |
| | Separated | 2 | 3.08 |
| | Widowed | 2 | 3.08 |
| | Divorced | 1 | 1.54 |



Almost fifty-seven percent (56.92%) respondents were male and 43.08% were females. The majority of the respondents were aged between 35 and 44 years (33.85%). The second highest age group was 25-34 (30.77%). There was a small difference between the majority age group and the second highest age group. The next age group was 45-55 years of age (16.92%), followed by the age group 18-24 years of age (13.85%) and the smallest age group was 55-64 years of age (4.62%). There were no respondents in the age group 65 years or older. All 65 respondents were of Africans origin. In terms of home language, 73.85% were Zulu speaking, which was the majority. Xhosa speaking respondents were 20.00% and the rest were Sotho speaking (1.54%), English speaking (1.54%), and 3.08% were speaking some other language.

The education level of the respondents was required in order to determine the relationship between education and knowledge about fire risks and the management of fires at household level. The education level of the respondents was according to different levels. The table illustrates that the majority of the respondents, 67.69%, obtained secondary school education, 21.54% obtained primary school education, and 3.08% of the respondents had tertiary education. Only 7.69% of the respondents had no education at all. The basic levels of education is a contributing factor to good communication between officials and the residents and also increases the chances of better job opportunities.

Half of the respondents (50.77%) are single or never married, 18.46% are single, but cohabiting with a significant other, 15.38% are in a domestic partnership, 7% are married, 3.08% are separated, and another 3.08% are widowed. Only 1.54% are divorced. Most participants have been living in the settlement for more than 8 years, 55.38%, and 23.08% have been living in the settlement for 5 to 7 years and 20% have been at the settlement for 2 to 4 years. Only 1.54% of respondents have been staying in the settlement for 6 months to 1 year. None of the participants had been living in the settlement for less than a month.

Fifty-six (56) of the respondents said they lived in the settlement for better employment opportunities. The rest said they lived in the settlement with families (5) and for study purposes (3). Only one gave another reason for living in the settlement.



Table 2 - Community fire risks knowledge. Source: Survey results 2018.

| | Category | Number of respondents | Percentage |
|-------------------------------------|---|------------------------------|-------------------|
| Fire incidences experienced | Yes | 50 | 77 |
| | No | 15 | 23 |
| Causes of fire incidents | Illegal electricity connections | 26 | 40 |
| | Candles | 23 | 35.38 |
| | Arson | 15 | 23 |
| | domestic fights and negligence | 13 | 20 |
| | sleeping while cooking, the use of paraffin stoves, and ignorance | 5 | 7.69 |
| Lighting and cooking equipment used | Electricity for lighting | 64 | 98.46 |
| | Electricity for cooking | 63 | 96.92 |
| | Paraffin for lighting | 1 | 1.54 |
| | Paraffin stove for cooking | 1 | 1.54 |
| Knowledge on potential fire hazards | Yes | 36 | 55 |
| | No | 29 | 45 |
| Knowledge regarding fire safety | No basic Fire training | 60 | 92.31 |
| | Fire awareness training | 5 | 7.69 |
| | Aware of the safety measures to be taken during a fire | 45 | 69.23 |
| | No knowledge of safety measures during a fire | 20 | 30.77 |



| | | | |
|----------------------------|--|----|-------|
| Fire equipment on site | No fire equipment in the house | 59 | 90.77 |
| | Fire blankets | 2 | 3.08 |
| | Fire extinguishers | 2 | 3.08 |
| | Sand buckets | 2 | 3.08 |
| Knowledge of fire hydrants | YES (have knowledge and exact place where the hydrants are located) | 17 | 26 |
| | No (Have no knowledge and they do not even know what a fire hydrant is) | 48 | 74 |

Opinions on the impacts of fires

Opinions on the impacts of fires were asked and the respondents demonstrated a good understanding of the devastating consequences of fires. Each responded stated a number of responses to question with some of the common responses to the impacts of fires being as follows:

- life becomes very difficult
- the poor get poorer
- loss of lives
- loss of income
- injuries and death
- lose everything
- damage to food
- damage to property and belongings
- leads to fights
- destroys children's school uniforms and books
- displacement of families
- suffer from trauma and depression

The participants were asked how soon after detecting a fire would they call the fire department.

Table 3 - Reporting of fire incidents. Source: Survey results 2018.



| Responses | No. of Responders |
|--|-------------------|
| As soon as possible | 18 |
| Report fire immediately and then try to extinguish the fire | 10 |
| Extinguish the fire and then call when overpowered by fire | 4 |
| Extinguish fire because I don't know the fire department number | 1 |
| Extinguish the fire and even demolish dwellings that are on fire in order to stop the spread of the fire | 1 |
| Call for community help and put out fire, report fire later | 23 |
| Remove staff than put out fire | 1 |

Twenty three respondents said they would call the community for help and then attempt to extinguish the fire. They will only report the fire when it escalates. Eighteen respondents said they would report the fire incident immediately and eight respondents said they would report the fire and then attempt to extinguish it. Four of the respondents said their first reaction, when detecting a fire, will be to extinguish the fire and only report it when they had overpowered it. One respondent said he does not have the fire department's number; therefore, he would extinguish the fire and not report it. Another respondent (1) said he would extinguish the fire and even demolish the house that is on fire in order to prevent the fire spreading. One respondent indicated that he would remove his belongings first and then attempt to extinguish the fire.

5. COMMUNITY FIRE RESILIENCE AND INDICATORS

Cooperation with local fire station

The cooperation of the community with their local fire station assists in quick response and reduces the impact of fires. Respondents were asked if they knew the number of the local fire stations and in response, 89% participants indicated said, they did not know the fire



department's emergency number and 11% confirmed that they knew the fire department's emergency number. Most of the respondents said they only know the 10111 (Police) number. They also raised the concern of the number not being a toll free number. They normally ask a neighbour at the nearby formal residential area to assist in calling the fire department.

Effective fire response

Sixty-eight percent (68 %) of the respondents felt that the firefighters' response to fire incidents was not effective and 32% were happy with the response. Through further discussion, some respondents indicated that not all fires are reported to the fire call-centre, as the community sometimes extinguishes the fire themselves. They only call the fire department when the fire escalates and it overpowers them. Another respondent acknowledged that the fire department has a great challenge when responding to fires in the settlement since there are no access roads for the fire engine. When further asked why they do not consider opening access roads for fire engines, he said the opening of access roads will provide the opportunity for opportunists to erect their dwellings on the open space.

Management of fires between local authority & the community

Nearly a third of the respondents (27.69%) strongly disagree that there is collaboration between the local authority and the community in managing fires, while 16.92% of the respondents disagree. A number of respondents (16.92%) strongly agree and 30.77% respondents agree that there is collaboration between the two parties. Only 7.69% of the respondents remained neutral.

Rolling out of fire awareness programmes

Most of the respondents felt that there was a lack of fire awareness programmes in the settlement. Most of the respondents (38.46%) strongly disagree that the municipality conducts fire awareness programmes and 35.38% respondents disagreed. Only 6.15% of the respondents strongly agree that there are fire awareness programmes conducted by the municipality, while 15.38 % respondents also agrees. Only 4.62% of respondents were neutral.

Involvement of community in fire safety

The majority of the respondents indicated that the municipality does not engage or involve them in any fire safety issues. Forty per cent (40%) of the respondents strongly agree while



23.08% of respondents agree that they are not involved. Some (7.69%) of the respondents disagree with the statement and 27.69% respondents disagree. Only 1.54% respondents were neutral. Community further indicated that they try as a community to implement measures to protect themselves against fires, such as reporting and addressing individuals that are negligent and cutting the electric lines for households where they suspect potential fire risks. Another respondent pointed out a water pipe running underground, confirming that as a community they rerouted the water from the main water standpipe to areas further away in order to ensure access to water for firefighting purpose. They also run the illegal electricity lines above ground level for the safety of the community.

Communication during fire incidents

The respondents were asked if there is good communication between the community and the fire teams during response to fire incidents. Most (36.92%) of the respondents strongly agree, and 32.31% respondents agree that the communication is very good. Respondents indicated that they assist firefighters with the rolling out of fire hoses and they guide them through the settlement. The respondents also confirmed that they use the bucket line system (passing buckets of water from one person to the other) to fight fires and reach areas where the firefighters fail to reach.

Early fire warnings

The majority of the respondents strongly disagree that the municipalities give early fire warnings and they also strongly disagree that they have an understanding of fire warning codes. Eighty six per cent (86%) of the respondents agree that there is good communication during fire incidents. One respondent gave an example that they are able to guide and assist the firefighters in rolling out fire hoses during fire incidents. However, after the fire incident there is no communication until the next fire incident.



Table 4 - Economic activities and financial resources. Source: Survey results 2018.

| | Category | Number of respondents (n=65) | Percentage |
|---|------------------------|-------------------------------------|-------------------|
| Employment status | Temporary employment | 34 | 52.31 |
| | Unemployed | 18 | 27.69 |
| | Permanent employment | 8 | 12.31 |
| | Fixed term contracts | 5 | 7.69 |
| Main source of income | Wages | 22 | 33.85 |
| | Salary | 17 | 26.15 |
| | Stipend | 13 | 20 |
| | Income from piece jobs | 6 | 9.23 |
| | Government grants | 7 | 10.77 |
| Monthly household income | >R1150 | 28 | 43.08 |
| | R1100-R900 | 6 | 9.23 |
| | R600- R850 | 12 | 18.46 |
| | R300- R550 | 18 | 27.69 |
| | < R300 | 1 | 1.54 |
| Financial support after a fire incident | Government support | 33 | 50.77 |
| | Monthly income | 23 | 35.38 |
| | Family and friends | 9 | 13.85 |

During the discussions, respondents indicated that government support takes very long to arrive. It was also indicated that the community has built a small hall (informal structure), to house displaced people following fire incidents. Fire victims stay in the hall for only a few days until they had rebuilt their houses. None of the respondents have savings or insurance to cover



the impact and unplanned costs caused by fire incidents. When asked if respondents have family or friends to stay with after a fire incident, 62% indicated that they do not have any family or friends that can assist and 38% said they do have family support following a fire incident.

Social and community engagements

Participants were asked whether they knew the ward councillor's office and if they attended ward meetings convened by the councillor's office. The objective was to ascertain the relationship, if any, between the participants and the ward councillor's office.

Table 5: Social and community engagement

| | Category | Number of respondents | Percentage |
|--|---|-----------------------|------------|
| Engagement with the councillor | Knew who their councillor | 43 | 66.15 |
| | Did not know | 22 | 33.85 |
| | Attend meetings with councillor | 29 | 44.62 |
| | Do not attend | 36 | 55.38 |
| Community structures & social networks | Do not know of any structures | | 50.77 |
| | Have seen community care givers | | 24.62 |
| | <i>Abahlali baseMjondolo</i> (present in the community) | 10 | 15.38 |
| | Community field workers | 6 | 9.23 |
| Belonging to any social group | Yes | 30 | 46 |
| | No | 35 | 54 |



| | | | |
|--|-----|----|----|
| Engagement on fire issues with the Field workers | Yes | 11 | 17 |
| | No | 54 | 83 |
| Voluntary work in the community | Yes | 16 | 25 |
| | No | 49 | 75 |

Source: Survey results, 2018.

Table 6 - Opinions on fire prevention and reduction measures. Source: Survey results 2018.

| No. | Opinions on fire prevention and reduction measures | Number of Participants |
|-----|---|------------------------|
| 1. | Municipality to conduct fire awareness | 17 |
| | Installation of electricity and removing of illegal electrical connections | 33 |
| | Municipality to build proper houses | 29 |
| | Open fire station closer to settlement | 3 |
| | Provide an emergency toll free number | 1 |
| 6. | Installation of fire hydrant at settlement | 2 |
| 7. | Municipality to provide them with fire extinguishers | 8 |
| 8. | Issuing of early fire danger warnings | 1 |
| 9. | Fire department to provide effective fire response by responding quicker to fires | 4 |
| 10. | Sufficient relief aid must be provided | 1 |
| 11. | Provide additional water standpipes | 2 |
| 12. | Open access routes for fighting | 4 |
| 13. | Provide basic fire training | 6 |



| | | |
|-----|---|---|
| 14. | Request for a skip for waste control purposes | 1 |
| 15. | Request that the fire department listens to their advice when coming to extinguish a fire as they know the settlement area better | 1 |
| 16. | They want nothing because the municipality failed them a long time | 1 |

6. CONCLUSIONS AND RECOMMENDATIONS

Informal settlements, due to their nature, are highly at risk of experiencing fire incidents. The use of highly combustible materials in the construction of these structures, along with the use of illegal electrical connections for lighting and cooking, contribute to the risk. The risks are further increased by the dense setup, which limits access for firefighting while increasing the spread of fires. There is also a challenge in terms of access to water for firefighting. Palmiet informal settlement is not different from all other settlements. However, noticeably less fire incidents are reported due to their human, social and economic capitals. It was also interesting to find out that the community built a hall to house those who could be displaced by fire or any other hazard. There are strong social networks in the community too. An example of the social network is *Abahlali Basemjondolo*, which has over the years challenged the government to pay attention to their plight countrywide. They may not have natural capital, however they are utilising the other assets to their best abilities in order to reduce the shack fire risks. They have adapted well and are more resilient than others in the informal settlements are.

The informal interviews and observations also revealed that the community and the local municipality are not working in collaboration, yet they share a common goal. The common goal is to prevent and reduce fire incidents in order to ensure the safety of the community. There is a great need for the integration of scientific knowledge with that of the local community, in order to develop effective and risk-free fire management strategies. It is evident that the community possesses vast knowledge of the settlement conditions and operations, which may be very useful to consider during the fire management-planning phase.



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