DISASTER RESPONSE AND RECOVERY IN TWO INFORMAL SETTLEMENTS: A LOCAL GOVERNMENT PERSPECTIVE

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Abstract

Informal settlements in urban areas have long been afflicted by disasters and exposed to exploitation by politicians, shacklords, academics, journalists, non-governmental organizations (NGOs), tavern owners and government officials. This problem is caused to some degree by limited land for expansion which has resulted in the creation of highly densified and unplanned, irregular settlements using poor, combustible building materials. The purpose of the article is to investigate whether eThekwini Municipality's strategies are sufficient to respond to and recover from the impact of disasters.
The research was undertaken at the Foreman and Kennedy Road informal settlements located in Clare Estate, under Ward 25, in Durban within eThekwini Municipality in KwaZulu-Natal (refer to Annexure 1). These areas are very important politically as they are densely populated and highly contested between political parties and local resistents organizations such as Abahlali baseMjondolo. Questionnaires were self-administered to a sample size of 220 of which 140 respondents completed the questionnaires, thereby generating a response rate of 63.6%. Semi-structured interviews were also conducted with municipal officials. The findings indicate that 44.3% of the victims of disasters received assistance from NGOs and regard civil society as playing an important role after disasters compared to 7.1% of the responding municipal officials.

Keywords: disaster management, informal settlements, New Public Management, Abahlali baseMjondolo

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Introduction

In developing countries, disaster response and recovery in the informal settlements is poor and fragmented, which is often a result of inadequate disaster response and recovery plans. These plans tend to focus on high-profile rescue operations, and are beset by political partiality, corruption, inadequate resources and financial mismanagement. Elo, Palm & Vrolijks (1995:6) aver that, given the rapid pace of urbanisation in Asia, Africa and Latin America, most governments have lacked sufficient financial and administrative resources to provide basic urban services. The authors further indicate that government funds have largely been allocated to provide basic services to planned settlements. Local governments have focused on their mandate to provide services to its communities which are profit-making or at least cost-recovery-based, taking into account that the emphasis on service delivery is in formal areas where revenue is collected through property rates and the sale of water and electricity.

eThekwini Municipality does not have response and recovery strategies and plans in the event of a disaster as required by section 53 (1) of the Disaster Management Act of 2002 (Act No. 57 of 2002). Section 53 (2)(k) states that a disaster management plan for a municipal area must contain contingency plans and emergency procedures in the event of a disaster, providing prompt disaster response and recovery. Furthermore, eThekwini Municipality has neither sufficient capacity nor communication links with other key stakeholders in the aftermath of disasters.

The Disaster Management Act of 2002 (Act 57 of 2002) defines disaster response as 'measures taken during or immediately after a disaster in order to bring relief to people and community affected by the disaster'. Syed (2008:153) states that 'disaster response is the sum total of actions taken by people

and institutions in the face of disaster'. The author further argues that disaster response includes the implementation of disaster preparedness plans and procedures, thus overlapping with disaster preparedness. Disaster response comes with the completion of disaster rehabilitation programmes. Each activity is formally or informally governed by a set of policies and procedures, and each activity is typically under the auspices of a lead agency. According to Perry (1985) and Vogt & Sorensen (1987), disaster response occurs when a disaster is predicted or is spreading, and often where evacuation is recommended, although this is not always followed. Disaster response activities are implemented by a myriad of government organizations, international and national agencies, local entities and individuals, each with specific roles and responsibilities.

When a disaster event such as a flood, fire, storm surge, thunderstorm or tropical cyclone occurs, the first government personnel to respond are often local police, fire department and emergency medical. According to Haddow & Bullock (2006:77), the first responder's job is to rescue and attend to those injured, suppress fires, secure and police the disaster area, and begin the process of restoring order. In South Africa, they are supported in this effort by government officials including the South African Police Service (SAPS), Metro Police, health care workers, municipal community mobilisers and emergency personnel.

Disaster recovery deals with activities undertaken after a crisis response period is over in an attempt to return an area to normal. In the short term the focus is on restoring infrastructure and service delivery and in the long term on restoring community life (Quarantelle, 2003:48). Geis (1996), Gawronski (1998), Olson et al. (1991) cited in Wu and Lindell (2003:44) found that recovery from a major disaster takes much longer and involves much more conflict than people expect. However, recovery is faster and more effective when it is based on a plan that has been developed before disaster strikes.

The full participation and involvement of all stakeholders during the recovery planning phases and clarification of roles and responsibilities could ensure that response and recovery is smoother. During the disaster recovery phase, a team-based approach is required in order to team people with diverse expertise, such as employees with technical skills (e.g. medical doctors, planners, engineers) and those with non-technical skills (e.g. problem-solving, interpersonal skills and political acumen).

Global approach to disaster management

Early disaster management strategies included, inter alia, the promulgation of the United State of America (USA) Congressional Act of 1803, which was passed to provide financial assistance to a New Hampshire town that had been devastated by fires (Haddow &

Bullock, 2006:2). Another notable example is that of the Cold War era, where nuclear war was seen as a potential disaster threat. Disaster management is a cycle of activities beginning with mitigating the vulnerability and negative impacts of disasters, preparedness to respond to operations, responding and providing relief in emergency situations such as search and rescue, and aiding in recovery, which includes physical reconstruction and the ability to return quality of life to a community after a disaster. The employment of recent advances in spatial data management and Geomatics Engineering Technology in disaster management, including Information Communication and Technology (ICT), Geographical Information Systems (GIS), Remote Sensing (RS), and Global Positioning System (GPS), has considerably improved disaster management through facilitating data capture, integration and analysis (Rajabifard, Mansourian, Zoej & Williamson, n.d:1).

Global approach to disaster response and recovery

Buildings in developing countries' informal settlements are often constructed using the cheapest available materials, thereby predisposing them to burning down in fires. McMahon and Faen (2007:95) argue that poor communities have few resources for sturdy construction, adequate disaster warning systems, communications technology or disaster response. Syed (2008:153) indicates that disaster response is the sum total of actions taken by people and institutions in the face of disaster. The author further argues that disaster response includes the implementation of disaster preparedness plans and procedures, thus overlapping with disaster preparedness.

Rehabilitation and reconstruction comprise most of the disaster recovery phase. This period, following the emergency phase, focuses on activities that enable victims to resume normal, viable lives and means of livelihood. It also includes the restoration of infrastructure, services and the economy in a manner appropriate to long-term needs and defined development objectives. Syed (2008:168) states that reconstruction must be fully integrated into ongoing long-term development plans, taking into account future disaster risks. It must also consider the possibility of reducing those risks by the incorporation of appropriate mitigation measures.

In September 1993 an earthquake struck the state of Maharashtra in India. Measuring 6.4 on the Richter Scale, it killed 7 928, destroyed approximately 27 000 houses and extensively damaged roads and water systems. The state government, with international assistance from the World Bank, the Asian Development Bank, the United Kingdom's Department for International Development (DFID), together with the national government, devised and implemented a disaster management plan. It

incorporated emergency and long-term strategies, with initial financial guarantees secured within two weeks of the disaster. Over the next five years 28 000 new homes were built, 200 000 houses strengthened, 157 km of road constructed and numerous dams and other engineering projects undertaken, each aimed at furthering economic development while reducing vulnerability and risk. South Africa should learn from and partner with other countries and international organizations that have previously provided assistance after disasters.

Local approach to disaster response and recovery

South African disaster management in the past was reactive and based on the Civil Protection Act No. 67 of 1997 and the Fundraising Act No. 107 of 1978. Both pieces of legislation were mainly responding to disasters occurring in formal settlements occupied by whites. The Civil Protection Act 67 of 1997 under traditional public administration could not promote a results-based management (RBM) model, which would ensure that a linkage between input–output outcomes is crystal clear and is implemented (Mthembu, 2001:4).

As a result of the floods on the Cape Flats in 2001 and the extreme hardship suffered by the poorest of the poor, government realized that the mechanisms espoused by the Civil Protection Act 67 of 1977 were woefully inadequate. Furthermore, after the historic elections of 1994, the South African government had applied for and received recipient status with the United Nations Development Programme (UNDP). As a result of consultations with government, the first Country Cooperation Framework for South Africa was agreed upon, covering 1997–2001. Between 1997 and 1998 the UNDP supported South Africa on the most significant activities which included: national policy development, establishment of a National Disaster Management Centre, a disaster management plan and a proposal which was later submitted to parliament for approval, and in 2003 the Disaster Management Act No. 57 of 2002 was promulgated.

The repercussions of disasters differ between developing and developed countries, as people in developing countries are often more severely affected since response and recovery strategies are poorly managed or not available. In the case of the 2000 Mozambique floods, response and recovery was poor due to a lack of adequate, comprehensive government response and recovery plans, as well as poor communication. According to Donohue, Masilela & Gear (2000:461), the southern African floods caused by the tropical cyclone El Nino in 2000 were not adequately reported in the first weeks. Initial images of broken bridges and raging rivers held limited interest, until television pictures showed helicopter rescues from trees and rooftops in Mozambique.

Recent global experience

New Zealand experiences more than 14 000 earthquakes each year as it lies on the Pacific Ring of Fire, one of the world's most seismically active regions, stretching from North America to the South Pacific and north to Japan. On 22 February 2011, New Zealand was struck by a 6.3 magnitude earthquake which resulted in damage, injuries and fatalities. An estimated 165 people were recorded dead and in Christchurch, the second-largest city, structures were badly damaged or collapsed completely. Then, on 11 March 2011, Japan was hit by a 9.0 magnitude undersea megathrust earthquake, which triggered a devastating tsunami. The Japanese National Police Agency officially confirmed 11 938 deaths, 2 876 injured and 15 478 people missing across eighteen prefectures, as well as over 125 000 buildings damaged. The earthquake and tsunami caused extensive, severe structural damage in Japan, including damage to roads and railways, as well as fires in many areas and a dam collapse.

The tragic events of 11th September 2001 in America powerfully demonstrated the value and utility of Geographical Information Systems (GIS) in emergency management. As has been noted elsewhere (Cahan & Ball, 2002, Thomas, Cutter, Hodgson, Gutekunst & Jones, 2002 and Bruzewicz, 2003), the use of GIS was extensive during the initial rescue and relief operations. Applications ranged from the positioning of logistical support and resources (such as the Urban Search and Rescue (USAR) teams) to public maps of the damage by the mass media (print and electronic). Remote sensing and GIS were used to develop preliminary damage assessments at gross scales, as well as by individual building and/or infrastructure. One of the noteworthy uses of GIS was communication to the public on the availability of services (electricity, subway, telephone), which were visualised in the form of daily maps published in the *New York Times* and other media outlets.

The *Mail & Guardian* (2009:14–20) reports how a collaboration between two civilian high-power computing centres in Africa can help improve disaster response and track epidemics. One partner is the Centre for High Performance Computing, based at the Council for Scientific and Industrial Research's Meraka Institute in Cape Town. The centre is capable of downloading information from satellites over the African continent within seven seconds. Another partner is Egypt's National Authority for Remote Sensing and Space Sciences (NARSS), which has a receiving station at Aswan, located 1 000 km south of south of Cairo. The chief scientist at Purdue's Rosen Centre for Advanced Computing (Indiana) indicated that the project should process bandwidth-hungry satellite data that can be used to monitor floods, drought and global warming (*Mail & Guardian*, 2009:14–20). New Information Technology (IT) systems can be invented in developing countries to

alleviate the catastrophic impact of disasters such as floods, fires, drought and soil erosion.

Disaster response and informal settlements in South Africa

Holloway (2003:34) defines disaster response as 'the provision of assistance and/or intervention during or immediately after a disaster to meet the life preservation and basic subsistence needs of those affected'. According to Nigg (1995:5), recovery is not merely an outcome, but is rather a social process that begins prior to disaster impact and encompasses decision-making concerning restoration and reconstruction. Holloway (2003:34) defines recovery as 'the decisions and actions taken after a disaster with a view to restoring living conditions of the stricken community, while encouraging and facilitating adjustments to reduce disaster risk'.

The disaster recovery period has immense potential for confusion and conflict as different stakeholders pressure government to take actions directed toward sometimes divergent purposes. Such conflicts can produce major difficulties for local government, including failure in recovery leadership (Rubin, 1995 and Spangle Associates, 1997:18), ad hoc decision-making (Rubin, 1995), and poor coordination between departments (Rolfe & Britton, 1995). Moreover, many reconstruction finance programmes neglect the needs of the poorest victims (Comerio, 1998 and Bolin & Stanford, 1998) and a rush to restore the community to its pre-impact pattern of social and economic functioning tends to reproduce its vulnerability to disaster (Schwab, 1998).

According to Lindell & Prater (2003:181) community recovery resources can come from a variety of individuals and organisations apart from the state. The victims themselves might have financial resources, such as savings and insurance, as well as tangible assets, such as property, which are undamaged by hazard impact. Low-income victims tend to have lower levels of savings, but they are more likely to be victims of insurance redlining (ineligibility) and have thus been forced into contracts with less credible insurance companies that go bankrupt after the disaster. Peacock and Girard (1997) assert that those who plan ahead for disaster recovery can still find themselves without the financial resources they need. The scarcity of financial resources is caused by the fact that disaster recovery plans are not aligned to the budget within the same financial year.

Alternatively, the victims may be able to promote their recovery by bringing in additional funds through overtime employment or by freeing up the needed funds by reducing their consumption below pre-impact levels. Friends, relatives, neighbours, and co-workers can assist recovery through financial and in-kind contributions, as can community-based organizations (CBOs) and local government. Informal

settlement occupants in developing countries often live on land illegally, in temporary, uninsured houses. The transfer of risk to the insurance companies is not possible in informal settlements, as the land is illegally occupied and the majority of the people are unemployed.

Informal settlements are deemed by the United Nations to be areas where groups of houses have been constructed on land to which the occupants have no legal claim. These areas are characterised by rapid, unstructured and unplanned development. They are common features of developing countries and are typically the product of an urgent need for shelter by the urban poor (Huchzermer, 2001, Mason & Baltsavias, 1997 and United Nations, 2004).

According to information from the 1996 South African census (Statistics SA, 1997), 11.6% of households lived in freestanding informal settlements, and a further 4.5% lived in shacks in the backyards of formal houses in townships. Over 16% of households were living in urban informal housing, and a further 18% lived in traditionally constructed houses located mainly in rural areas (Statistics South Africa, 1996). Napier & Rubin (2002:4) argue that these figures are only broadly indicative of exposure to risk, because the location of the settlements and the quality of the construction materials are not evident. Informal settlements have grown in the metropolitan areas of South Africa as a result of the abolition of legislation implemented by the apartheid government that prevented urbanisation (Ferreira, de Meyer, Loots & Keyise, 2002:23). As a result of the sudden post-apartheid increase in urbanisation, metropolitan areas in South Africa saw very rapid change in the spatial patterns and land use associated with such areas.

As of the early 1990s the 11.6% of households living in freestanding informal housing are most often located on the peripheries of cities (Statistics SA, 1997). Vulnerability to disaster is increased as a result of certain qualities of the location, such as settlements on steep slopes (as in the case of Inanda, Durban), in flood plains (e.g. Alexandra, Johannesburg), close to mine dumps (e.g. the East Rand, near Johannesburg), close to heavy industrial areas (e.g. Wentworth, Durban), or even on landfill sites (e.g. Foreman and Kennedy Roads, Durban). According to the National Disaster Management Centre (Department of Provincial and Local Government of South Africa, 2006:12–13), natural disasters such as devastating floods, violent hailstorms, heavy snowfalls and gale-force winds are regular occurrences in South Africa. Other hazards arise from the nature of the settlement itself, such as risks of rapidly spreading fire, or health risks from rising dampness, poor indoor air quality and collapsing structures. A high proportion of residents of informal residential areas which constitute the bulk of housing units do not possess legal title to their plots. This constitutes an important constraint to service provision, and since service provision amounts to de facto recognition of property

rights, it is a step that technical agencies are neither willing nor authorized to take. This means that there is no place for informal settlements in terms of service provision. The municipal council only comes in where such a place seems a potential area for investment.

The nature of Foreman and Kennedy Road informal settlements

Foreman and Kennedy Road informal settlements are mired in squalor on the periphery of society. An estimated 14 000 people who live in these settlements have long attracted predators such as politicians, shacklords, academics, journalists, NGOs and tavern owners to make a quick buck and gain career advancement from human misery. Foreman and Kennedy Road informal settlements are characterized as a transitional space, where people only intend to stay temporarily, in the hope of getting jobs and then formal houses to which they can bring their families from rural areas. Many of these families came to find better schools to send their children in the nearby Indian area where the schools opened their doors to black children when school segregation ended. Furthermore, some families migrate to these areas in the hope of meeting basic needs such as shelter, clean drinking water, electricity, proper sanitation and access to health care. Some suggest that this precipitated the demographic shift in the settlement from mostly migrant labourers to entire families (Bryant & Pithouse, 2005:10).

These settlements are represented by an organisation called Abahlali baseMjondolo (People living in shacks), which acts as their mouthpiece. At Foreman and Kennedy Road, the movement began with a culmination of people's frustration over a series of events which they saw as resulting from broken promises by eThekwini Municipality. Abahlali baseMjondolo marched frequently as a movement representing the residents of the area by voicing 25 grievances, ranging from ownership of houses, employment, HIV/AIDS treatment and other health concerns, access to basic municipal services and disasters such as fires.

The KwaZulu-Natal Elimination and Prevention of Re-emergence of Slums Bill of 2006 was aimed at the elimination of informal settlements in the province, but did not provide for adequate alternatives in the opinion of its opponents. It was imposed on the people living in the informal settlements throughout the province. Abahlali baseMjondolo resisted the Bill based on what it saw as fundamental flaws in the positioning of the Bill, as there is no consensus in South Africa or internationally as to the desirability of introducing measures which seek to enable the control and elimination of slums, and the prevention of their re-emergence. The purpose of the Bill was to focus on fulfilling constitutional state obligations as the provincial government perceived them, rather than

trying to achieve the elimination of slums. Consequently, on 14 October 2009, the South African Constitutional Court found the Bill to be in conflict with the Constitution of South Africa (Act 108 of 1996) and struck it down. Costs were awarded to Abahlali baseMjondolo. According to the judgment, the legislation would have allowed for the possibility of mass evictions without providing suitable alternative accommodation and would have therefore violated the Prevention of Illegal Evictions Act (PIE Act 19 of 1998) and South Africa's Constitution (Abahlali Basemjondolo Movement South Africa V. Premier of KwaZulu-Natal (2009). These developments account for the continued existence of the informal settlements in South Africa.

Disaster management and public management: service delivery

The Constitution of South Africa places a legal obligation on the government to ensure the health of people, environmental protection and the safety of its citizens. Section 24 (1996) refers to the protection of the environment which, if not implemented, can and will cause disasters.

Moreover, section 41 (1) (b) states that all spheres of government are required to *'secure the well being of the people of South Africa'*. It further provides, in section 152(e), that *'the objects of local government are to encourage the involvement of communities and community organisations in the matters of local government'*. Municipalities have an obligation to capacitate civil society through training and skills (such as first aid, fire-fighting and communication) related to different hazards.

The changes in South Africa's disaster management policy and legislation unfolded during a period of massive legislative reform in post-apartheid South Africa. Disaster management legislative reforms in South Africa took 11 years, from June 1994 to April 2005 and there may still be more to do. There were a number of distinct phases in this development of policy, namely, the Green Paper on Disaster Management (February 1998); White Paper on Disaster Management (January 1999); Disaster Management Bill (58-2001 in September 2001); Disaster Management Bill (B21-2002 in May 2002); Disaster Management Act (No. 57 of 2002 promulgated in January 2003) and the National Disaster Management Framework (April 2005).

The major accomplishment of the legislative and policy reform process in South Africa was the transformation of the policy of disaster-risk management (NDMC, 2006/2007:25). Influenced by New Public Management (NPM), the South African government embarked on legislative transformation with the promulgation of the Disaster Management Act 57 of 2002. NPM has selected applications which include decentralising disaster management from national government down to local government.

Decentralising management and the disaggregating and downsizing of public services are strands of NPM derived from 'managerialisms' (Mellon, 1993; Hood, 1991 and Ferlie, Ashburner, Fitzgerald & Pettigrew, 1969). The public sector in general and public officials in particular are also expected and encouraged to be results-oriented. Governmental managers are increasingly required to evaluate and make necessary adjustments to all developmental projects so that they are able to deal with risks, vulnerabilities and capacities (Dwivedi, 1994:4). Government will have to consider all other aspects of disaster management, which include relief operations, rehabilitation, reconstruction, mitigation, development and preparedness planning, should their developmental projects be affected by any disaster. They further have to participate in joint consultation and cooperation with other departmental heads, NGOs and other stakeholders to ensure that every disaster management issue is addressed. The argument made by Thornhill (n.d.), in his discussion on the prerequisites for improved service delivery, is that officials in managerial positions should be able to operate within a sound administrative system, supported by equally sound managerial practices. Furthermore, managers should be capacitated to perform their managerial functions efficiently, for instance, they should be enabled to take decisions, to exercise discipline and to demand accountability from all their staff.

The Disaster Management Act of 2002 (Act 57 of 2002) provides disaster management officials with a new focus on disaster management. The Act presents new challenges in not only negotiating and writing up disaster management plans, but also in developing these disaster plans for general public scrutiny. Public scrutiny and acceptance of disaster management plans, prior to implementation, has become a legislative requirement (Municipal Systems Act 32 of 2000). In section 25 of the Municipal Systems Act 32 of 2000, it is indicated that each municipality should adopt a single, inclusive and strategic plan for the development of a municipality. The plan referred to is the Integrated Development Plan (IDP). Chapter 26(a) of the Municipal Systems Act stipulates that an IDP must reflect the municipal council's vision for long-term development of the municipality with special emphasis on the municipality's most critical development and internal transformational needs. The same Act, in section 26(g), dictates that 'applicable disaster management plans' are a core component of the IDP of a municipality. The problem with the Disaster Management Act of 2002 is that it does not provide detailed guidance for the preparation of disaster management plans, which can be included in an IDP. This leaves municipal disaster management departments or offices in a quandary.

The main challenge exists in deciding which of the disaster management components should be included in the IDP. The provision of section 26(g) of the Municipal Systems Act 32 of 2000 is clear to a limited degree: applicable disaster management plans are required in an IDP document as it is legislated as a core component of an integrated development plan.

Disaster response and recovery by eThekwini Municipality

eThekwini Municipality is a Category A municipality, as enshrined in section 155 (1) of the Constitution of South Africa (Republic of South Africa, 1996), and thus has exclusive municipal executive and legislative authority in its area. Therefore, eThekwini Municipality is the local government body responsible for governing and managing the city of Greater Durban.

Section 23 of the Local Government: Municipal Systems Act, 2000 (Act No 32 of 2000) prescribes that a municipality must undertake developmentally-oriented planning to ensure that it strives to achieve the objectives of local government set out in section 152 of the Constitution (Republic of South Africa, 1996). The municipality has an eight-point plan for sustaining the natural and built environment, economic development, job creation, quality living environments, safety, healthy and secure environment, empowering citizens, celebrating cultural diversity, good governance and financial viability and sustainability (eThekwini Municipality, 2008:40).

Disaster management is encapsulated under Plan 4 (Safe, healthy and secure environments) whose main goal is to promote and create a safe, healthy and secure environment. Moreover, disaster management and fire departments fall under the Safety and Security cluster managed by the deputy city manager reporting to the city manager.

eThekwini Municipality has developed 15 programmes to address the causes and effects of the threats to a safe environment for its citizens. Programme 3 (Safe from fire and emergencies) outlines two strategies covering two broad areas: community fire safety education including fire prevention and management, and extending emergency services (eThekwini Municipality, 2008:42).

According to the Municipality's IDP Review (eThekwini Municipality, 2008:48), uncontrolled fires have a serious impact on the lives of all communities. Citizens, businesses and public infrastructure are all affected by incidents. Loss of lives and the destruction of property and possessions are difficult, if not impossible, to quantify. People living in densely-populated informal settlements, without personal insurance, are particularly vulnerable to the effects of uncontrolled fires. Between 2008 and 2009, 12 natural disasters such as thunderstorms and 11 fires (man-made disasters), damaged informal settlements, including those at Foreman and Kennedy Roads

(n.d.). Through providing effective fire and emergency services, fire department aims to ensure that all communities have a level of confidence that the department recognises its duty of care, and is able to provide an acceptable level of safety (eThekwini Municipality, 2008:49).

The main plan of the fire department is to prevent fires by promoting community education and awareness, promoting fire safety in buildings, developing appropriate regulations and ongoing research. The plan of the fire department includes community training and equipping of municipal staff to respond quickly and effectively to disasters. The department works collaboratively with other agencies whose work helps to prevent fires and improve response times, for example, rapid road access, road naming, house numbering, providing fire-fighting water hydrants, street lighting, and telecommunications (eThekwini Municipality, 2008:48).

In addition, Section 43 of the Municipal Systems Act, 2000 (Act 32 of 2000) prescribes key performance indicators which are included on the municipality's performance scorecards. Based on the legislation on Performance Management from the Department of Provincial and Local Government (Municipal Systems Act, 2000), the municipality's scorecard has been redefined. The project matrix under the rubric of Plan 4 (Safe, healthy and secure environments) within the strategic focus area of the 'Promoting the safety of citizens' programme (Safe from fire and emergencies) reveals the following projects to be implemented from 2010 (eThekwini Municipality, 2008:48–49):

- Extend fire and rescue service to under-serviced areas;
- Expanded Public Works Programme (EPWP) for community-based emergency response services;
- Community safety havens – develop a disaster risk-reduction plan for the jurisdictional areas of community safety havens; and
- Maintain acceptable levels of service delivery.

Programme 4 of the IDP focuses on establishing disaster management within the municipality. The programme embodies concerns over the human suffering and economic loss that results from disasters. The disaster management department's response is guided by a three-phase approach which includes (eThekwini Municipality, 2008:49):

- Preventing disasters where possible;
- Responding to disasters when they do occur; and
- Assisting communities to recover from the effects of a disaster.

eThekwini Municipality says that it aims to prevent disasters by developing risk and vulnerability profiles. Once it has identified vulnerable areas, it will develop prevention plans and strategies. Furthermore, training for communities will be carried out to improve understanding of risks and how to respond to disasters and ensure as a preparedness and response.

Training municipal officials in effective disaster response is critical for ensuring that they are able to respond quickly and effectively to disasters (eThekwini Municipality, 2008:49).

Meanwhile, the project matrix for Plan 4 (Safe, healthy and secure environments) under the strategic focus of 'Promoting the safety of citizens' programme (Safe from disasters) has the following projects that are to be implemented in 2010 and beyond that financial year:

- Develop a disaster-risk reduction plan for the jurisdictional areas;
- EPWP: community-based emergency response services;
- Community safety havens: South Durban Basin (SDB) emergency and disaster management response centre planning; and
- Inanda, Ntuzuma and KwaMashu (INK) disaster-management and prevention programmes

The above projects will be difficult for eThekwini Municipality to implement, in light of the recent dismantling of the disaster management department due to a lack of relevant resources and a shortage of qualified staff. Furthermore, non-compliance of this municipality with the Disaster Management Act of 2002 reduces the likelihood of the above initiatives being implemented within the set timeframes.

Methodology

Research approach

The researchers used a quantitative method whereby questionnaires were administered to residents of the Foreman and Kennedy Road informal settlements. A qualitative approach using semi-structured interviews was also used with municipal officials working directly and indirectly on disaster management with these communities, to obtain their observations based on their experience of disasters or emergencies.

Research participants

The total sample population within the Foreman and Kennedy Road informal settlements was 220. The total number of questionnaires collected was 140 and there were no errors. In addition, semi-structured interviews were conducted with ten municipal disaster management officials. A pilot survey was executed and its main intention was to obtain some assessment of the validity of questions and the likely reliability of the data that was considered. Nominal, ordinal and Likert or interval scales were used to analyse the data obtained. The study employed stratified random sampling. The purposive sampling technique was used. This technique enabled the researcher to use judgement to select suitable cases to answer the research questions and to meet the researcher's

objectives. A very satisfactory response rate of 63.6% was achieved.

Research procedure

The data was collected over a four-week period between June and July 2010. A combination of quantitative and qualitative research methodology was used:

Quantitative: A questionnaire was administered by the researcher at the Foreman and Kennedy Road informal settlements.

Qualitative: The researcher used semi-structured interviews with eThekwini Municipality officials; questions varied because their duties were not the same (for example, the councillor and the disaster management manager have different roles).

Statistical analysis

The questionnaire was analysed statistically using Statistical Packages for Social Sciences (SPSS) version 18.0. In this article, descriptive and inferential statistics are used as a measure for the chosen sample of respondents. The nature of the research required the researcher to use Microsoft Excel and SPSS for data capturing, analysis and interpretation. Chi-square tests were also conducted.

Results

Research findings on recovery and response were analysed using frequency tables, graphs and cross-tabulations.

Quantitative analysis
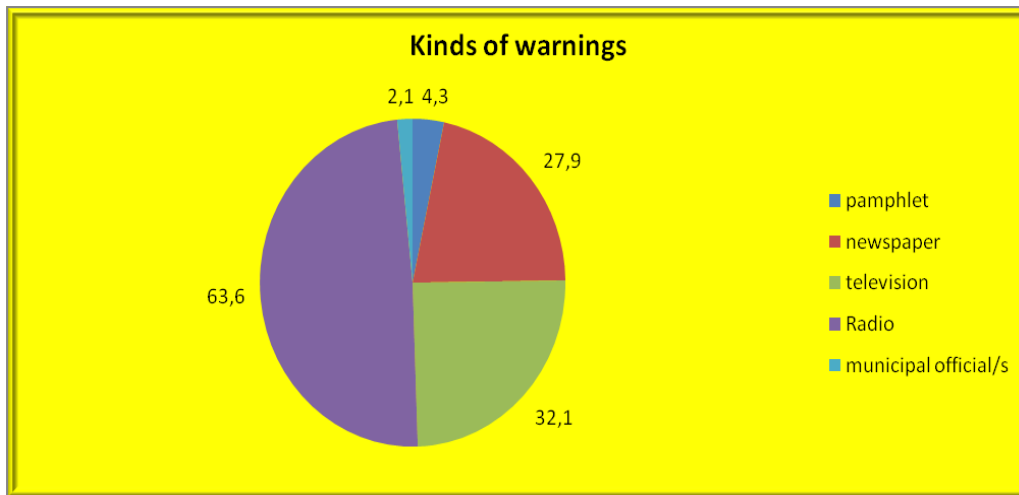
Figure 1. Kinds of warnings

Figure 1 above indicates that 4.3% of the respondents agree that pamphlets are distributed to communities as a response strategy to disasters. The research findings further indicate that 27.9% of the respondents receive disaster warnings from newspapers, 32.1% from television, 63.6% from radio and 2.1% from municipal officials, respectively. The low percentage of respondents who receive pamphlets and warnings from municipal officials to alert them about response strategies compromises the readiness of the inhabitants to respond and recover from disasters. Poor media relationships which are not consistent or accessible confuse the victims and cause overreaction after disasters.
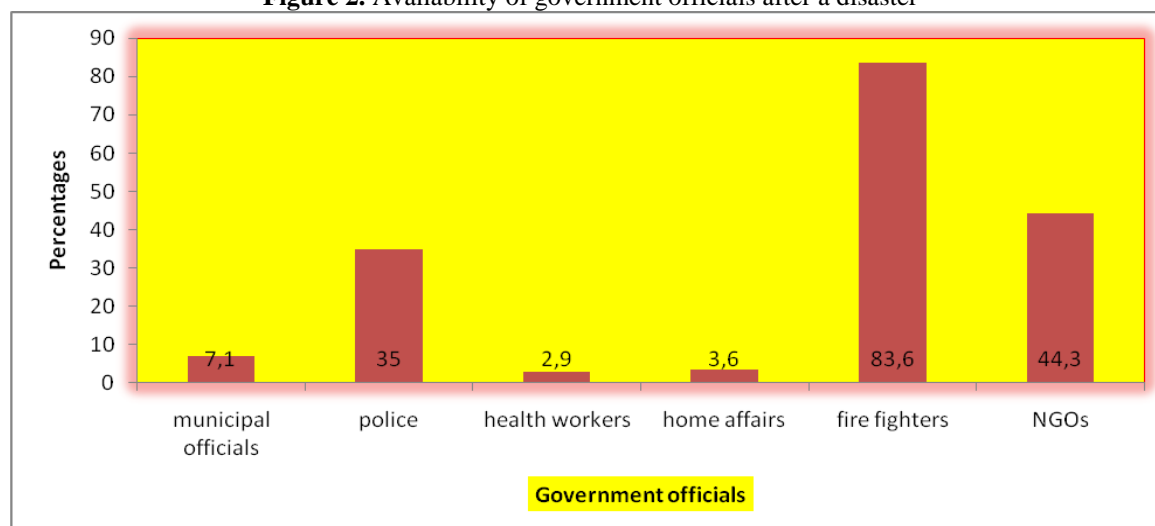
Figure 2. Availability of government officials after a disaster

Figure 2 above indicates that 83.6% of the respondents agree that fire fighters visit areas affected by fires. It also reflects that 44.3% agree that NGOs are available during disasters, 35% the police force, 7.1% municipal officials, 3.6% Home Affairs officials and 2.9% health workers, respectively. The investigation findings show vividly the low reaction role played by municipal officials (7.1%) after disasters, even though they are the custodians of preparedness response and recovery. These findings show that eThekwini Municipality has no plans in place to assist victims to recover from disasters.

Table 1. Relationship between availability of government agencies and civil society during and after disasters

Availability of government officials and civil society		How do you rate the role of civil society during and after the disaster?										Chi-square	df	P
		Very important		Somewhat important		Not at all important		Don't know		Total				
		N	%	N	%	N	%	n	%	N	%			
Municipal officials	Yes	3	2.1%	1	0.7%	5	3.6%	1	0.7%	10	7.1%	7.923	3	**0.048***
	No	71	50.7%	19	13.6%	39	27.9%	1	0.7%	130	92.9%			
Police	Yes	18	12.9%	8	5.7%	22	15.7%	1	0.7%	49	35.0%	8.476	3	**0.037***
	No	56	40.0%	12	8.6%	22	15.7%	1	0.7%	91	65.0%			
Health workers	Yes	2	1.4%	1	0.7%	1	0.7%	0	0.0%	4	2.9%	0.450	3	0.930
	No	72	51.4%	19	13.6%	43	30.7%	2	1.4%	136	97.1%			
Home Affairs workers	Yes	2	1.4%	1	0.7%	2	1.4%	0	0.0%	5	3.6%	0.476	3	0.924
	No	72	51.4%	19	13.6%	42	30.0%	2	1.4%	135	96.4%			
Fire fighters	Yes	61	43.6%	18	12.9%	37	26.4%	1	0.7%	117	83.6%	2.322	3	0.508
	No	13	9.3%	2	1.4%	7	5.0%	1	0.7%	23	16.4%			
NGOs	Yes	39	27.9%	12	8.6%	9	6.4%	2	1.4%	62	44.3%	16.770	3	**0.001***
	No	35	25.0%	8	5.7%	35	25.0%	0	0.0%	78	55.7%			

**p<0.01; *p<0.05

Table 1 above reflects a significant association between the ratings of civil society and municipal officials, police and NGOs at the 95% level (p<0.05) respectively. Furthermore, Table 1 indicates that there exists a significant relationship between the rating of the role of civil society and NGOs respectively, at 1% level of significance. A total of 3.6% rated municipal officials as not at all important, while 2.1% rated municipal officials as very important. A total of 15.7% rated police as not at all important, while 12.9% rated police as very important and 5.7% rated police as somewhat important. A total of 27.9% rated

NGOs as very important, while 8.6% rated NGOs as somewhat important and 6.4% rated NGOs as not at all important.
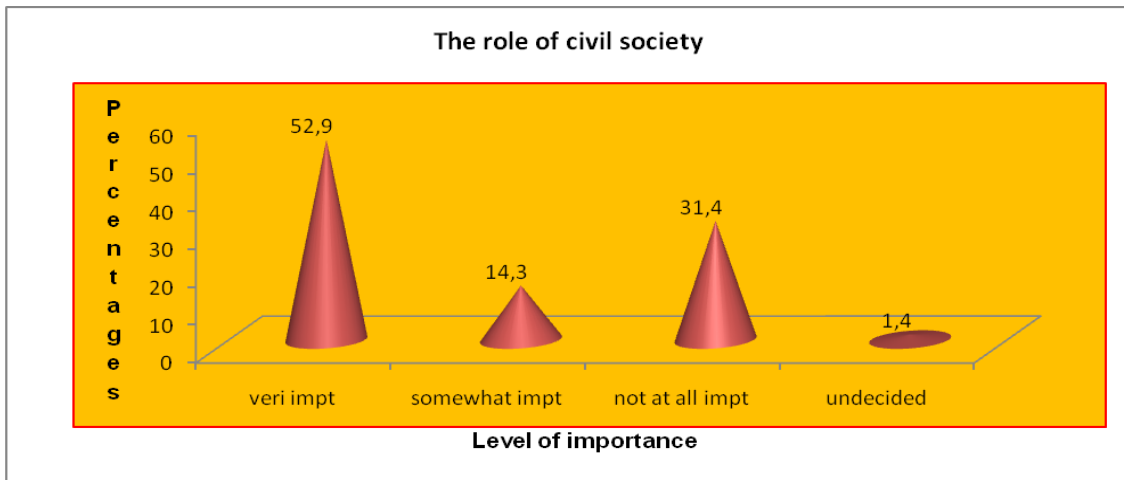
Figure 3. The role of civil society

Figure 3 indicates that 52.9% rate the role of civil society as very important, 14.3% as somewhat important, 31.4% as not at all important and 14% are undecided. The article findings depict a trusting relationship between the victims of disasters and CBOs, church-based organizations and NGOs. The victims of disasters tend to trust and recognise the role played by civil society, which suggests that government departments should empower, capacitate and resource these organizations with a view to be their eventually becoming self-sufficient.

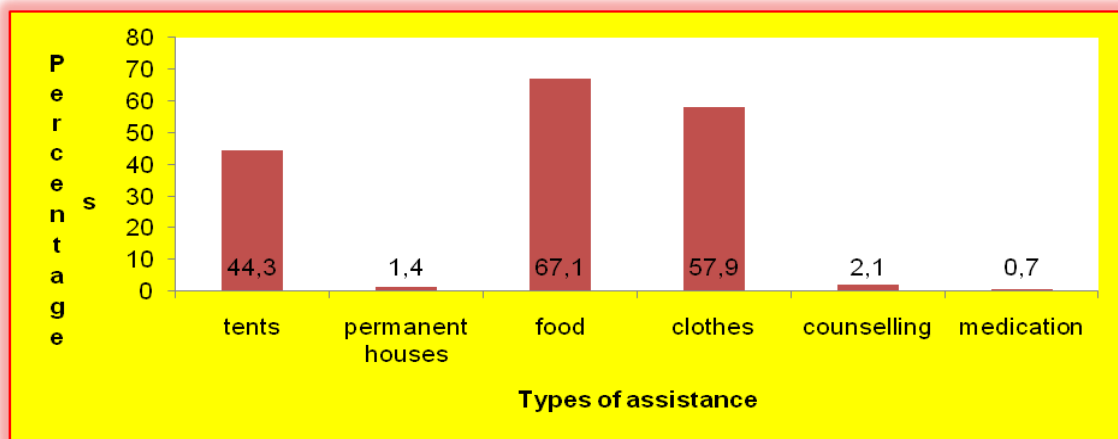**Figure 4.** Assistance received after disasters

Figure 4 above indicates that 67.1% of the respondents agree that food is distributed to the victims after disasters, 1.4% that permanent houses are provided, 57.9% clothes, 2.1% counselling and 0.7% medication. Figure 4 further indicates that 44.3% of the respondents agree that tents are distributed to the victims after disasters, 14% permanent houses, 67.1% food, 57.9% clothes, 2.1% counselling and 0.7% medication. The study findings indicate what remedial response and recovery strategies are employed by eThekwini Municipality. Failure to provide sturdy RDP houses perpetuates disasters, as the inhabitants continue to use combustible building materials which are susceptible to disasters.

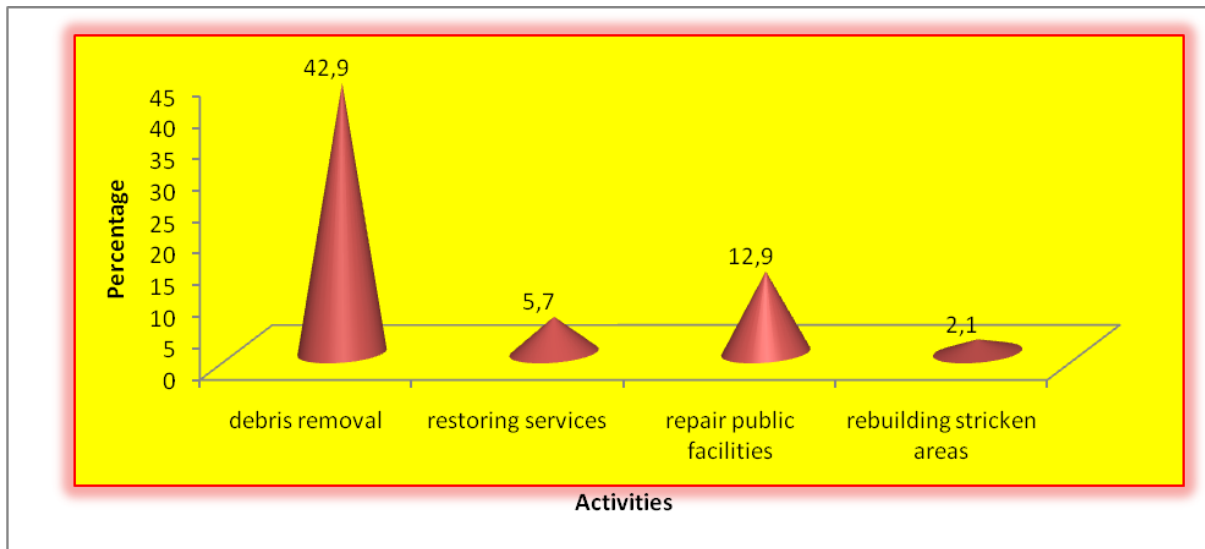**Figure 5.** Activities performed by eThekwini Municipality

Figure 5 above indicates that 42.9% of the respondents agree that after a disaster eThekwini Municipality remove debris, 5.7% that they to restore services, 12.9% that they repair public facilities and 2.1% that they rebuild stricken areas.

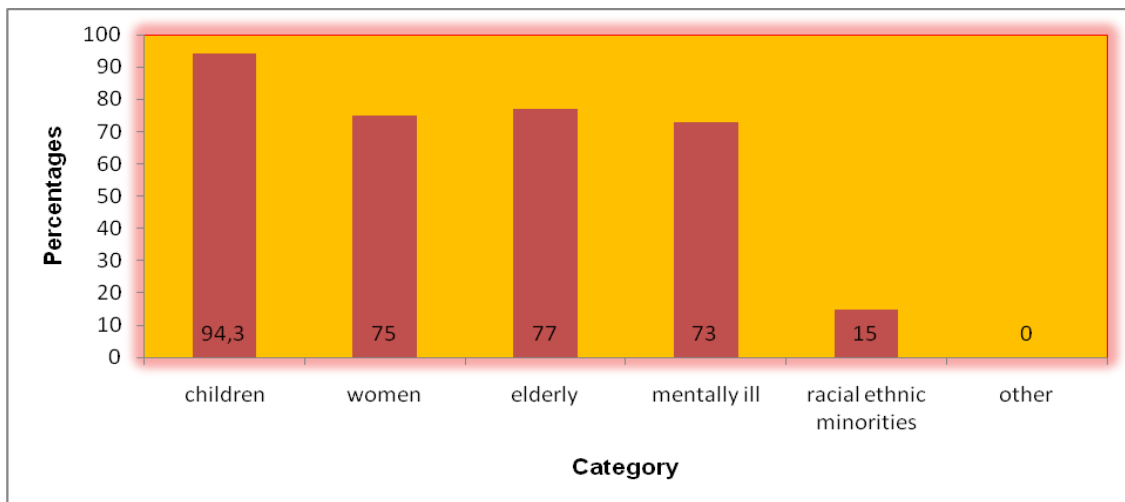**Figure 6.** Categories needing special attention

Figure 6 above indicates that 94.3% of the respondents agree that children need special attention during a disaster, 75% women and 77% the elderly, 73% the mentally ill and 15% racial ethnic minorities. The above results show the most vulnerable categories of people in society to be the main victims during response and recovery. Such groups in society are still marginalized by the men in power and who control resources. It is apparent that after disasters in these informal settlements, response and recovery systems could not follow predetermined disaster plans as these were not in place, leading to disproportionately adverse effects among already vulnerable citizens who could not evacuate.

Qualitative analysis

The councillor of the ward 25 in question stated that the disaster management department plays an active role in the community as it provides blankets and tents after a disaster. He further indicated that in his ward the community receives food for five days until shacks are rebuilt. As far as assistance is concerned, the councillor ensures that victims of disasters receive blankets, school uniforms, and also pays school fees and negotiates with schools for latitude in order for the students to get uniforms and shoes.

The councillor mentioned the following NGOs who come to their rescue at short notice during and after disasters:

- **The Soofie Mosque** (located in Sherwood, Durban) provides food, blankets and clothing;
- **Jamaitul Ulema** (based in Durban Central Business District (CBD) often provide blankets, clothing and food;
- **Al-Imdaad Foundation** built corrugated iron houses at Foreman Road after the last devastating fires.

The councillor also mentioned businesses that contribute and provide continuous assistance, such as Spar, Ohlanga Cash and Carry, Alamin Bakery in the city and Star Butchery in Sparks Road.

The disaster management concept is defined as a continuous, integrated, multisectoral and multidisciplinary process. The disaster management coordinator agreed on the above statement as sectors involved in preventing and reducing post disasters are the South African Police Services (SAPS), South African National Defence Force (SANDF), non-governmental organizations (NGOs), community-based organizations (CBOs) and faith-based organizations (FBOs).

Despite the absence of a dedicated disaster management centre, a framework and a plan, eThekwini Municipality's disaster management team has successfully managed international events, such as the 1996 Non-Aligned Movement (NAM) Conference, the 1995 Rugby World Cup, the 2003 Cricket World Cup and the 2010 FIFA World Cup. The disaster management coordinator explained their future expectations for both urban and peri-urban areas of the city. He mentioned that they are in the process of drafting a disaster management plan including a risk profile, which is part of a business plan. He said that there is a draft framework for disaster management attempting to comply with the act. The most crucial point he made is that the disaster management team is in the process of organizing existing structures within the community to expand awareness and education.

According to the manager (fire department), the Expanded Public Works Programme (EPWP) and Social Sector Programme will be recruiting community volunteers through CBOs to ensure community-based responses to emergency services. The Fire Safety Officer stated that the volunteers will be trained as Basic Ambulance Assistants or Paramedics to ensure efficient and effective response to various types of emergencies.

Observations from the fieldwork

It was discovered that there are other contributing factors to the incidence of fires in the informal settlements besides combustible building materials. Poor refuse collection was seen to exacerbate fires in the informal settlements as fires spread faster due to the fact that informal settlements are clustered with waste including plastic and paper.

In addition, the lack of refuse collection contributes to poor health as refuse attracts rodents to the area, which spread disease and can even kill children. The researcher further observed that there are many illegal and semi-legal activities in the informal settlements, such as electricity connections, the selling of drugs (e.g. dagga), alcohol and sex. It was observed that the density of the informal settlements was extremely high, with the space in between dwellings often being less than half a metre.

The investigation revealed that many people in these informal settlements have sources of income through some of the illegal or semi-illegal activities mentioned above. The research finding show 75% of males and 71% of females in the sample are unemployed. However, this is probably not statistically accurate, as legal and semi-legal sources of income may not be reflected in the data as respondents would be reluctant to disclose such information. Females are more likely to have legitimate employment than males. This difference is caused by the fact that women are employed as domestic workers in the nearby formal settlement of Clare Estate.

DISCUSSION

Participatory observation by the researcher revealed that poor refuse collection often aggravates fires in the Foreman and Kennedy Road informal settlements, requiring both the municipal departments concerned and volunteers to conduct health promotion programmes. The literature reviewed quotes section 24 of the Constitution (Republic of South Africa, 1996), which places a legal obligation on the government to ensure the health of people, environmental protection and safety of its citizens. Furthermore, the high incidence of illegal electricity connections which pass through uncollected piles of refuse requires whistleblowers in these informal settlements to alert the police.

The response to disasters in the informal settlements cannot be seen as the responsibility of eThekwini Municipality alone. Addressing disaster management in South Africa will also require interventions to be undertaken in a coherent manner across all three spheres of government (national, provincial and local), as well as through effectively managed intergovernmental relations. Furthermore, political, economic, social, technological, ecological and legislative professionals will be required to work together, in response to community experience including that of NGOs. This article shows clearly that there is no coordinated approach to developing disaster response strategies and plans for future crises. According to Clarke, Chess, Holmes & O'Neill (2006:165), a triangulated risk communication effort between the media, the advocacy-oriented arm of public health organizations, and the public-serving function of government-sponsored health agencies

will help present a single clear message to protect vulnerable populations and emphasize prevention, preparedness, and immediate-response efforts. Intergovernmental coordination will increase the efficient flow of data and other business processes.

This study shows that responses from eThekwini Municipality officials are often insufficient. Fire fighters only started responding to shack fires after the struggle by Abahlali baseMjondolo, which attracted the attention of media and academics. Another hindrance to speedy response to the informal settlements highlighted in the article is that disasters are caused by the absence of basic facilities and the lack of roads and physical addresses to locate the victims of disasters in an efficient manner.

This study also shows that the Municipality tends to focus on remedial response actions such as supplying residents of informal settlements with blankets and food parcels after disasters. The Department of Housing in 2004 unveiled a housing strategy which indicates a new direction and includes a programme specifically for informal settlement upgrading (Department of Housing, 2004). This new approach 'envisages that municipalities will play a significantly increased role in the housing process' (Department of Housing, 2004:10) and are intended to be the primary implementing agents of the programme, following a national trend towards local government development (Republic of South Africa, 2000 and Parnell et al., 2002).

The findings indicate the considerable trust displayed by the respondents in the active role of civil society, whilst volunteers do not play a conspicuous role in these informal settlements. However, the literature shows that volunteers, such as community members and local graduate students with diverse skills, e.g. in GIS, can play an extremely important role in damage assessment and recovery and response efforts, through extensive data collection and the creation of maps.

The findings further indicate that the Municipality has failed in the past to restore services and rebuild stricken areas after disasters. The literature shows that GIS can be used during disaster recovery as the decision-making tool to rebuild destroyed properties, ensure re-employment and repair of essential infrastructure, and implement mitigative measures. Alexander (2002:7) indicates that an important aspect of effective recovery efforts is taking advantage of a 'window of opportunity' for the implementation of mitigative measures that might otherwise be unpopular.

This article shows that the management of disastrous events tends to focus on disaster response and relief, usually in the aftermath of the events. Van Niekerk (2001:8) avers that terms such as prevention and mitigation were foreign, misunderstood or a burden to implement. The absence of the disaster management plans in the IDP signals potential future inefficiencies and discrepancies. At local level

government needs to acknowledge that efforts to reduce disaster risks must be systematically integrated into policies, plans and programs for sustainable development and poverty reduction (Geis, 1996).

Conclusion

Poor communication links and strategies at Foreman and Kennedy Road informal settlements during the disaster response and recovery period have contributed to negative social, economic and physical impacts to the victims of disasters. Furthermore, the absence of disaster response and recovery within eThekwini Municipality reveals the significant role played by the civil society organisations during and after disasters in these areas. eThekwini Municipality needs sustained, systematic strategies for disaster response and recovery, which will reduce the risk of disasters to people and property.

GIS is an impartial technology with the potential to save lives during disaster recovery and response. The generally accepted idea that GIS can be used as a tool to respond to and recover from the impact of disasters requires further study, especially in the informal settlements. Arising from the literature study, the empirical evidence and discussion of results, the following recommendations are proposed:

- eThekwini Municipality should redefine disaster recovery to include major stakeholders from land-use and building construction agencies, business groups and civil society organizations.
- The council should recognize the recovery period as a unique time to enact policies for hazard mitigation and incorporate this objective into recovery planning.
- Reconstruction must be fully integrated into ongoing long-term development plans, taking into account future disaster risks. It must also consider the possibilities of reducing those risks by the incorporation of appropriate mitigation measures.
- eThekwini Municipality must establish an effective disaster management centre as enshrined in section 43 of the Disaster Management Act. Furthermore, it should disseminate all types of warnings on time, as section 44(1) (b) of the Act states that the municipality must act as a repository of and conduit for, information concerning disasters, impending disasters and disaster management in the municipal area.
- Municipal employees and volunteers with GIS expertise in map production, analysis, data management and operating GPS equipment, should be used to provide systematic response and recovery strategies after disasters.
- GIS should be utilized to identify where children, the elderly and disabled live to allow for easier evacuation or rescue efforts in future emergencies.

- The council should work collaboratively with other agencies whose work helps to prevent fires and improve response times, for example, rapid road access, road naming, and house numbering, providing fire-fighting water in hydrants, street lighting, and telecommunications.
- eThekwini Municipality should allow the shack settlers to modernize or convert their shacks into permanent (formal) housing subject to approval from the Town Planning Department.
- After the disaster, shack settlers must be supplied with tents or fold-up houses including chemical toilets with access to running water.
- NGOs such as the Red Cross and Salvation Army must be mobilized to provide medical attention for smoke inhalation and other minor injuries incurred in the fire.

To alleviate vulnerability associated with the impacts of disasters in the informal settlements, eThekwini Municipality should comply with the Disaster Management Act by involving all stakeholders in the development of response and recovery plans.

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Annexure 1. eThekwini municipal area