DSPACE

https://dspace.org/

Disaster planning and preparedness : The case of Protea-South, Johannesburg

Tebid, Theophilus Nji

2008-12-04T11:44:58Z
http://hdl.handle.net/10539/5866

Downloaded from a DSpace repository. https://dspace.org/

CHAPTER FOUR: ASSESSING DISASTER PREPAREDNESS AND VULNERABILITY IN GREATER JOHANNESBURG

Many disasters take place in urban areas affecting millions of people each year through losses of lives, serious injuries, loss of assets and many livelihoods. Poorer groups are generally the most affected. The scale at which these disasters impact and their contribution to poverty, may be described as under estimated as is the extent to which institutions /communities respond, and how disaster events repeat themselves in vulnerable communities (UNDP, 1995).

4.1 Introduction:

The City of Johannesburg (CoJ), like many other Metropolitan Cities in South Africa, faces lots of developmental challenges including conditions that lead to everyday hazards[29] which may increase levels of community vulnerability and could also possibly lead to disasters if not well managed and controlled.

However, even when these city hazards eventually become disasters, not all communities in the metropolis of Johannesburg that have experienced hazardous conditions of similar nature, are affected at the same rate, frequency and magnitude. Reasons emanate from; the spatial location of settlements, levels of information dissemination, the morphology of some areas, levels of income, and to an extent from unsound cultural practices and believes between and within communities largely as a result of the legacy of apartheid.

This chapter seeks to discuss generally, the conditions that influence differences in Johannesburg's community levels of vulnerability and also make an attempt to explain why these differences exist and how they differ from one community to another.

[29] Many families living in flood plains, pollution from mine dunes, over crowding, poverty, unemployment, HIV/AIDS, high population growth rate,climate change and a filthy environment.

4.2 Background of the City of Johannesburg

There are debates that South Africa is "number one" African country with a stable economy yet; there are high levels of poverty and income inequalities existing within the same geographical location, thus causing or influencing the differences in communities' levels of vulnerability to disasters even to grow wider than expected[30] Linked to South Africa's apartheid past, poverty has a strong racial dimension with 61% of Africans[31] classified as poor, compared to only 38% of coloureds, 5% of Indians and 1% of whites races (GJMC, 1997).

The latter three races are believed to have enjoyed better social assistance benefits and geographical location as a result of apartheid planning than the African race hence; they show a higher level of resilience to disasters than their African counterparts. It is estimated that *three out of five children* live in poor African households that are generally perceived to be more susceptible to disasters since African people were the most marginalised in the past (du Plessis et al., 2003).

This means that, future African communities are still likely to be made up of predominantly "poor" population composition and a small labour force due to low levels of skills which is detrimental to community's capacity to plan and prepare for disasters even though, disasters are large scale events that require substantial amounts of resources, skilled labour force and efforts for effective mitigation.

Therefore by implication, an uninformed population could also mean less prioritization of disaster preparedness because of the perception that disaster preparedness is the business of the government. This is worsened by the *cold feet attitude* that people generally show especially when it comes to relocating from one disaster-prone area, to another of "safety". This tendency is coupled to poverty, ignorance, cultural practices and the amount of structural investment that vulnerable community members argue to have put in place over time. For this

[30] World Bank report, (2002)
[31] Indigenous black population that makes up the majority population

reason and others, many family heads would want to remain in the same spatial location regardless of the amount of risks that is perceived to surround their families. This helps to explain at least partly, why some families in Johannesburg are highly vulnerable while others exhibit low levels of vulnerability.

Anti-apartheid opponents blame the old regime for this attitude portrayed by most African communities and the high levels of inequalities because, they argue that, during the nearly fifty year's reign of apartheid government in South Africa, 3.5 million people were forcibly removed from their land. Every level of life especially amongst the African community was pervaded by the government-sponsored racially discriminatory policies that had no concern for environmental issues, as well as the social and economic lives of the people. Although apartheid has ended they reiterated; South African cities have since then remain divided and new forms of segregation have also emerged due to high levels of income differentials and levels of environmental risks surrounding many communities (Harrison, Huchzermeyer and Mayekiso, 2003)

Supporting evidence lies in the fact that, the "Group Area Act, Act No. 41 of 1950", and other apartheid planning policies forced the physical separation of races by creating different residential areas for different communities[32]. This forceful removal and separation of people, led to the development of some communities in "marginalized areas"; "wrong places"; and "high risk areas". For example, the *coloured, Indians and Africans* who live in Lenesia, Ennerdale, Alexandra, Protea-South all in Johannesburg, are living under poor, *dangerous* and unhealthy conditions that may lead to disasters (Huchzermeyer, 2003)b.

Browett, 1982 does not see the conditions that lead to high levels of community vulnerability (inequality in income, wealth and well being amongst others) as something that can be limited to a local context such as the case of Johannesburg for he argues that, inequality is global, thus should be looked at from a holistic point of view such as understanding the origin of inequalities (Browett, 1982).

[32] ANC, 1994

The collapse of the apartheid rule in the early 1990's and the institution of a democratic government in 1994 have propelled the government of South Africa in to a growing global movement and competition. This means that, the government has to redefine and address in a collaborative manner the social, economic, political and environmental inequalities that had divided communities, institutions and the state as a whole such that, a sustainable and an integrated environment that has lesser levels of community vulnerability and susceptibility to disaster may be achieved alongside economic growth.

This view is supported by Fosler, (1991) who argues that, "every state and local jurisdiction need to strengthen its economy's ability to create value, improve productivity, and compete with world market". In the light of his opinion, localities or communities must address deteriorating physical infrastructure, adequately prepared workforce, weaknesses in financial institutions and the uneven economic performance that exist amongst different classes of people through the process of Local Economic Development (LED).

The ANC's key election manifesto, the White Paper on Reconstruction and Development (RDP), is one of such policies that promised to form an integrated, coherent socioeconomic policy framework for redressing conditions that influence high levels of vulnerability and address this class distinction amongst communities. It plans to achieve this by reducing poverty levels, redefine spatial locations, reduce illiteracy levels and change the depriving systems of apartheid which may help to mitigate disaster impacts and boost community resilience amongst other benefits[33]. They also aim at developing human/natural resources, building and restructuring the economy and democratising the state.

A feasible approach to address the above challenges that is generally accepted by many schools of thought worldwide and from a South African perspective is the notion of Local Economic Development **(LED).** For example, Fosler, (1991)

[33] For more information, see RDP (1994) Policy Framework.

further states that, because local responsibility is an important factor in local economic development, national policies should be formulated such that, their impacts should be felt on any national, local, and social development due to limited resources.

Local Economic Development in this context can be defined as “a process by which local government and or community based groups manage their existing resources and enter into partnership arrangement with the private sector or with each other to create new jobs and stimulate economic activities in a well defined economic zone” (Blakely, 1989 cited in Fosler, (1991). According to Fosler, he compares local economic development to post-modernity, which rejects “state totality” but places emphases on the benefits of diversity, and localised actions as a means to promote democratic ideals hence advocating for a self managed society.

Disaster planning and preparedness therefore should not be the sole duty of the state as generally perceived, but should be a responsibility that is shared amongst different stakeholders (new role players) including the community. But in Johannesburg, disaster preparedness continues to receive a *lukewarm* position between communities and institutions. This might be as a result of the lack of capacity because, the concept of local economic development as a means to prepare local communities for disasters is a fairly new concept. Thus instead of seriously preparing for disasters by means of mitigation and prevention, institutions and communities react to disaster events. This “response oriented” approach has yielded very little results, as is the rate at which disasters occur.

This is evident by the increasing number of people that are living in hazardous conditions and suffer from disasters that could have been prevented had preventive measures such as LED amongst other measures been put in place despite the fact that, contemporary communities are living in a democratic society where government is for the people; of the people, and by the people and an era

where everyone has a constitutional right to have access to a clean, safe and protected environment.

The loss of lives and greater damage to property because of common hazards from a Johannesburg perspective, is still more prevalent amongst poorer and previously disadvantaged communities especially those living in informal settlements (just as in the pre-1994 era) than the middle-income communities who live in formal and planned settlements. A 2006 (EMS) disaster report shows that; Randburg, North of Johannesburg, between January-July 2006, had 23 fire out-breaks while Alexandra (previously disadvantaged settlement), within the same period had 68 fire out-breaks affecting more than 148 households[34].

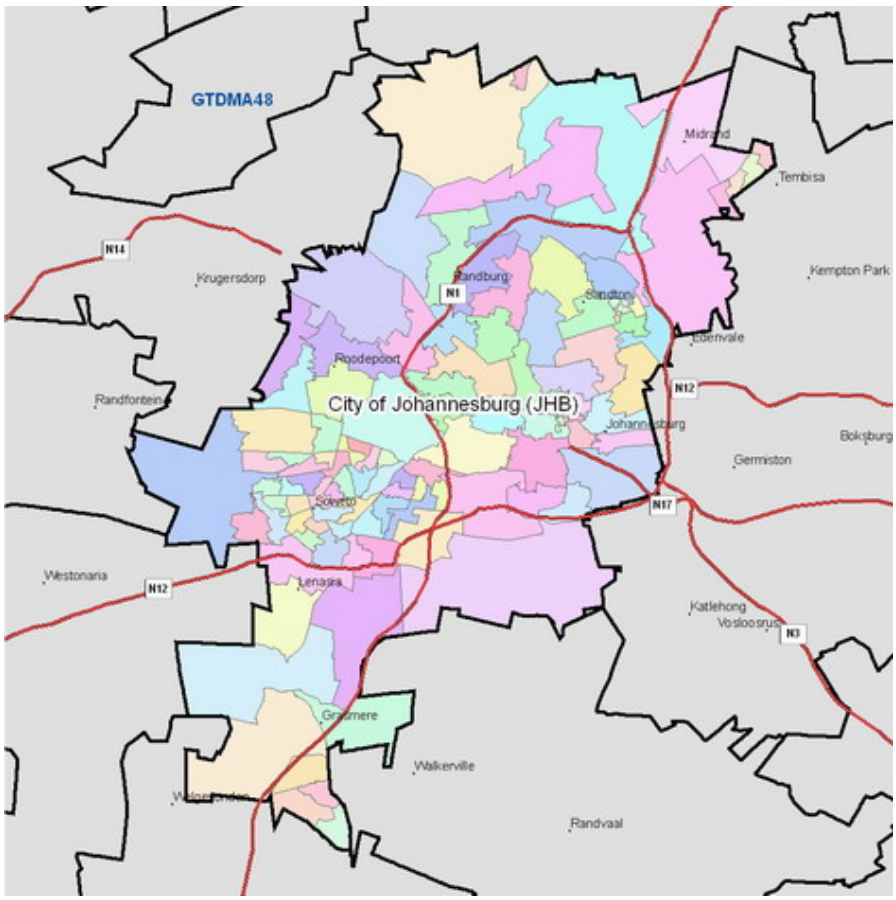
A better understanding of this discrepancy in levels of; vulnerability, preparedness and disaster impacts, could better be understood if we examine some of the conditions that determined the state of community readiness to fight and mitigate or prevent disasters. A high level of vulnerability indicates a poor state of preparedness or readiness and vice versa. This is done with the aim to create awareness, so that disaster preparedness and planning may become a key factor that could influence future developments, policies and better still, the realisation of a sustainable human settlement.

[34] See www.joburg.org/ems_services1.stm#rescue

4.3 Locating the city of Johannesburg within Gauteng

Johannesburg is the economic powerhouse of Gauteng province. It is situated in the central part of the province where from the North; the city is bordered by the city of Tshwane and from the south; Emfuleni and Midvaal; the East, Ekurhuleni. From the West, municipalities such as Mogale city, Ranfontein and Westonaria share their boundaries with Johannesburg.

Fig. 4.1 Johannesburg in the context of Vulnerability.



Source: SA. Demarcation board, 2006

4.4 Conditions the influence high levels of Vulnerability in Johannesburg.

The City of Johannesburg is a *landlocked* city as displayed on the above map and does not have any major river(s) or landmarks that in the past, could have served as the main source of attraction for human settlements like most cities in the world would; but for its gold and mild climate that attracted and ironically, is still attracting residents fare and near.

4.4.1 Migration

The influx of migrants from other cities and even outside the country into Johannesburg coupled with its natural growth of population means that, there will be over consumption and over production of waste by city dwellers. As a result, the basic infrastructure services such as water, electricity, sewage and roads would be overloaded more than the initial engineering capacity could permit. The lack of adequate resources by the municipality to provide for additional services to meet the growing demand in most communities on an equitable basis implies that, some communities will go without major basic services hence increasing their chances of vulnerability.

On the other hand, exponential population growth in Johannesburg more than available resources would also mean, some factions of the population (more especially the previously disadvantaged population) would be forced to locate on areas that are generally regarded as “high risk areas” (river banks, estuaries, at the foot of landfill, mine dunes etc because well located land prices are high hence reducing chances of many families to afford.

4.4.2 Spatial Location

Locating on river banks means that, river load profiles will generally be high because of the constant discharge of domestic waste from surrounding settlements such as: Diepsloot, Leeukop, Modderfontein, Alexandra, Bedfordview etc.

The gentle nature of the gradient of these areas has an effect on the rivers that passes through them to Johannesburg, (Klip and Jukskei river)[35] more especially around zone B and C, (Leeukop and Alexandra). Disposed waste from these communities then stagnates along the river course and forms pools of water that may form breading grounds for diseases vector carriers such as mosquitoes and fleas.

As a result, communities' vulnerability levels increase with increasing waste deposit as the river gradient decreases down stream. The consequences are: land, air and water pollution worsening as you move to communities residing further down stream e.g. Orange farm. The number of river tributaries also multiplies and hence flow slower, partly because the normal river channels are blocked with waste and also as a result of the river approaching low lying areas that have low gradient.

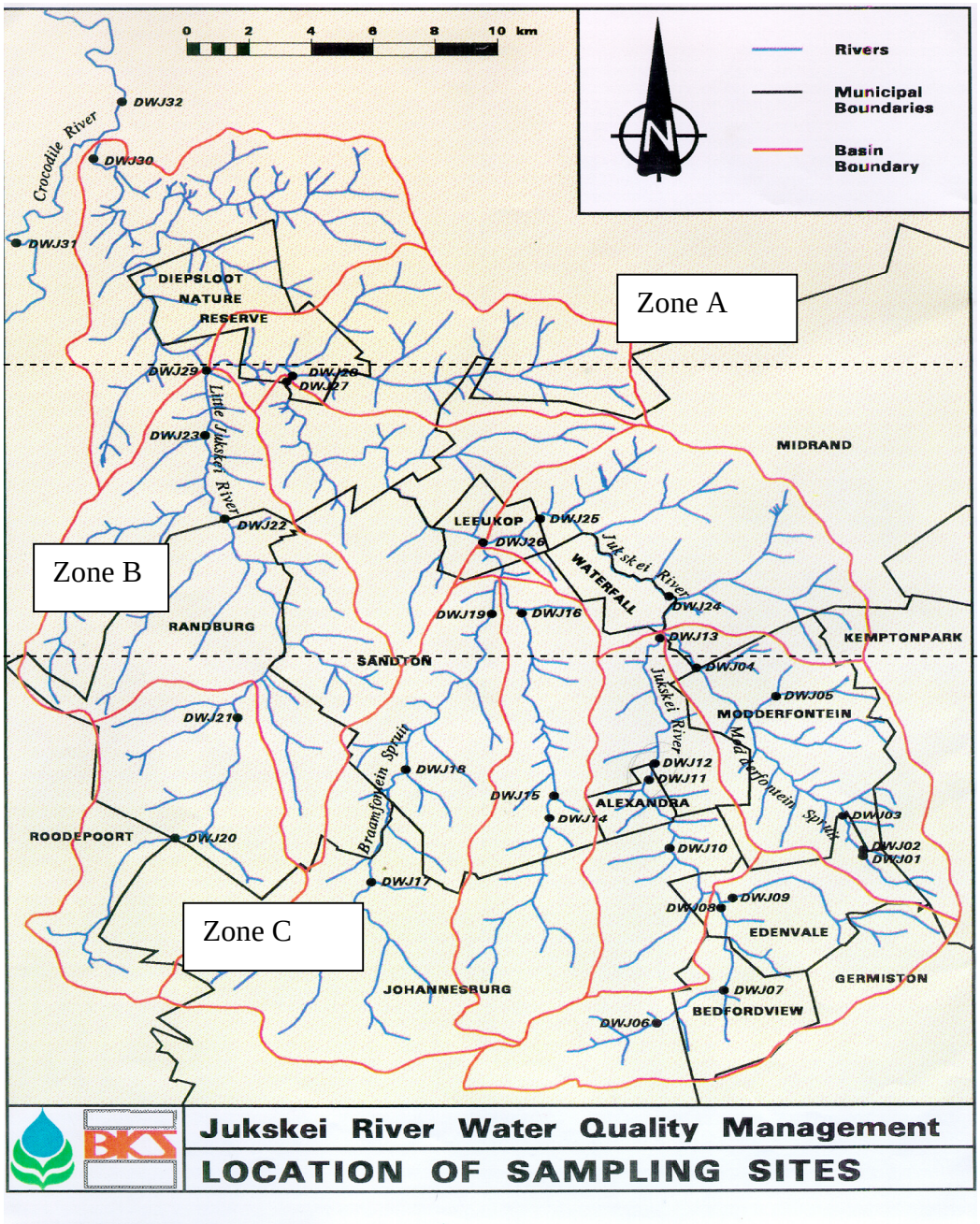
This slow process leads to the meandering of river tributaries and the development of swamps becomes very common hence increasing the levels of community vulnerability to a disaster such as flood in case of a heavy storm. A majority of the people who live in such swamps do not have access to formal housing or employment, which leads to further impacts on the environmental quality and increase levels of vulnerability. The limited availability of space for expansion aggravates vulnerable conditions which explain why such areas have the highest number of fire outbreaks every year according to the Johannesburg Emergency Services department, (2006).

Due to more pressing problems such as inadequate housing, caused by the large dense population and poverty, open space and conservation issues are relatively low priorities in such areas (Alexandra and Protea-South). As a result; respiratory, ear, nose and throat diseases are top on the list of diseases related to air pollution in most households located in these two areas. A combination of diarrhoea,

[35] See figure 4.2 below

vomiting, other gastro-intestinal and opthomological diseases are also other diseases said to be high in these areas due to bad water quality[36].

Fig. 4.2 Sketch map showing the gradient of river Jukskei in Johannesburg



Source: Adapted from the State of City Report, 2003

Zone "A" = Steep gradient, Zone "B" = Gentle gradient, Zone C = Low gradient

[36] Department of health annual report, 2002/2003. Online, www.dplg.gov.za/health

4.4.3 Population size of Greater Johannesburg.

Table 4.1 The population distribution per MLC in 1996 and 2001

Metropolitan Areas	Population Size in Thousands	Population Distribution in % 1996/ 2001	Land Size as per Metropolitan area
Eastern MLC	487 835	19 %	2183 hectares
Northern MLC	507 810	20 %	3428 hectares
Southern MLC	1 102 619	44 %	5761 hectares
Western MLC	423 089	17 %	2469 hectares
GJMC	**2 521 353**	**100%**	**13841 acres**

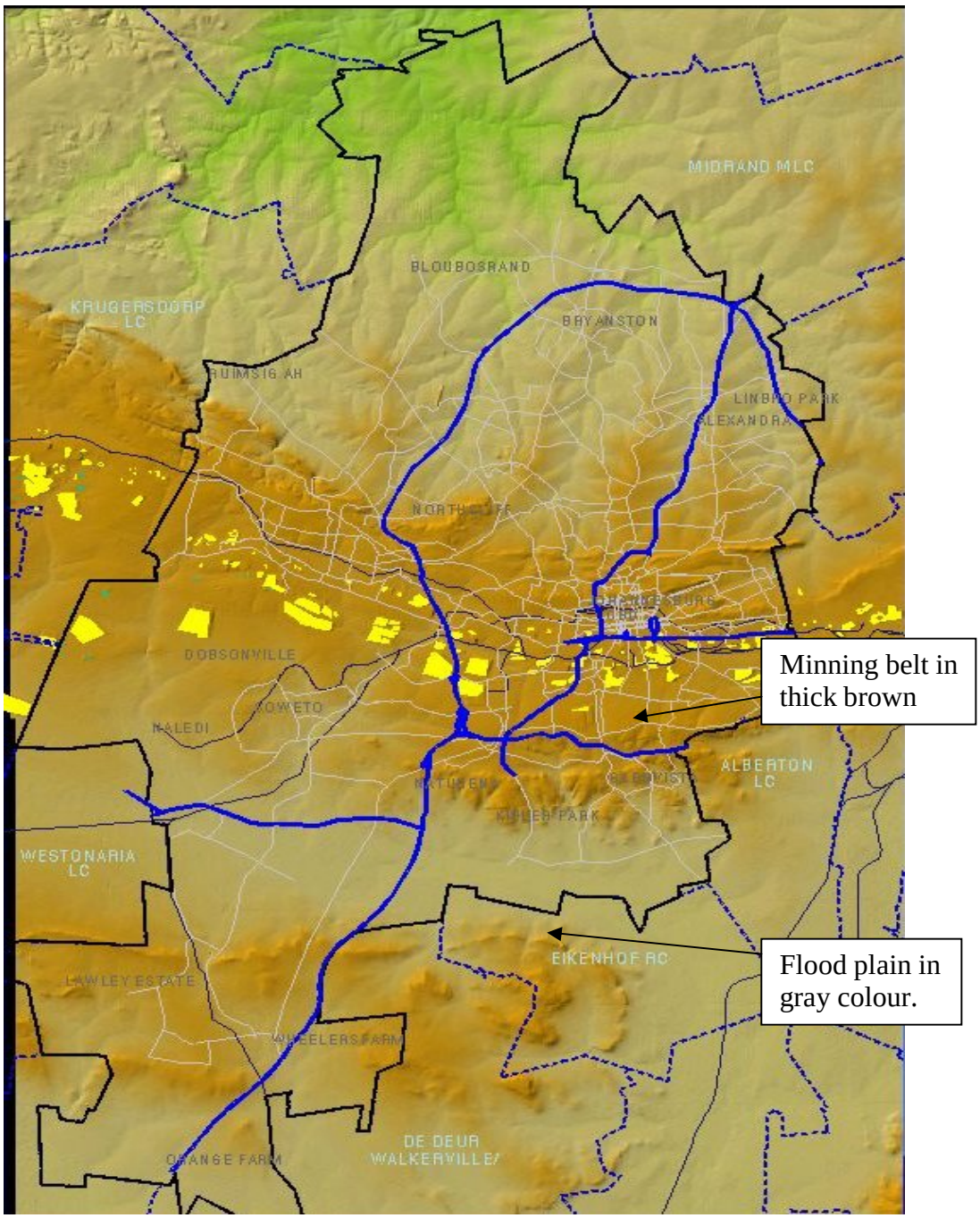
Sources: Adapted from GJMC, Planning Information Services, 2003.

The above table shows that a greater proportion of the population lives in the Southern Metropolitan Council occupying a total land size of about 44% out of a total of 13841 hectares. It should be noted that this land size although it is the biggest comparatively to other metropolitan areas, it is actually the smallest in terms of habitable land because, a large proportion of the land is located on the mining belt which is a high risk area.

Even though the actual land area that is covered by the past and current mining activities in the SMLC is not covered in this report, there are evidence that remaining portions of land that can be termed fit for human habitation are relatively smaller than those found in areas such as Randburg and Sandton in the NMLC. This means that, communities in the SMLC have a higher population

density than most communities located in the NMLC (with Alexandra as an exception), which creates greater chances for disaster events to occur. This therefore reiterates the need for disaster preparedness in communities residing in the southern region, for example, Protea-South.

Figure 4.3 Map showing SMLC location on the mining belt



Source: Adapted from Mondi Wetland Project, 2005

4.5 Environmental inequalities in Johannesburg

Although community vulnerability levels differ from one region to another[37] in the city of Johannesburg, their causative agents are practically the same. These rages from high level of noise from national highways; to water pollution from industrial effluent, domestic solid waste, durst from mine dunes, mass poverty etc. These elements have led to the push and pull factors that many argue to be the cause of the uneven nature of population distribution, resources, and socioeconomic activities in Johannesburg hence, influencing differences in levels of community vulnerability.

However, how these elements have influenced environmental inequalities and different levels of community vulnerability will be examine using few examples such as; water pollution, solid and liquid waste pollution and high population growth rate because, these are some common characteristics that are found in most areas located in the Greater Johannesburg Metropolitan Council.

Environmental inequality in the context of GJMC means, the state of environmental issues, environmental awareness, ecosystems, population size and densities, the distribution of incomes, soil quality, unemployment levels, poverty levels and environmental systems that support life in the built environment which are all influenced by the unique demographic and socio-economic factors of the city of Johannesburg.

4.5.1 Water Pollution and Scarcity in Johannesburg

Water is generally scarce and highly polluted in the City of Johannesburg. This is because the city is not situated on any major watercourse on like; Lagos-Nigeria, Brazzaville-Congo, London-Britain etc. There are few water catchments areas within the metropolitan area as we earlier examined. The Jukskei and the Upper Klip River catchments. The average annual rainfall in the Klip River catchment is estimated to ranges from about 650mm near the Vaal Barrage to 750mm on the

[37] Differences in vulnerability levels indicate a regional inequality.

Witwatersrand ridge in the north[38]. The average total monthly rainfall recorded at Johannesburg International Airport for the year 2003 is shown on table 4.3 below

Table 4.2 Rainfall, evaporation and Temperature change in Johannesburg

	Rainfall (mm)	Evaporation (mm)	Temperature (° C)
January	125	221.8	25.6
February	90	182.4	27.4
March	91	171.9	26.3
April	54	135.0	23.2
May	13	129.4	20.7
June	9	109.0	17.7
July	4	123.2	18.5
August	6	169.9	21.4
September	27	217.9	24.9
October	72	246.1	26.0
November	117	222.7	26.6
December	105	230.9	27.7
Annual Average	**713**	**2 160.0**	**23,8**

Source: JHB Airport Weather Bureau, 2003

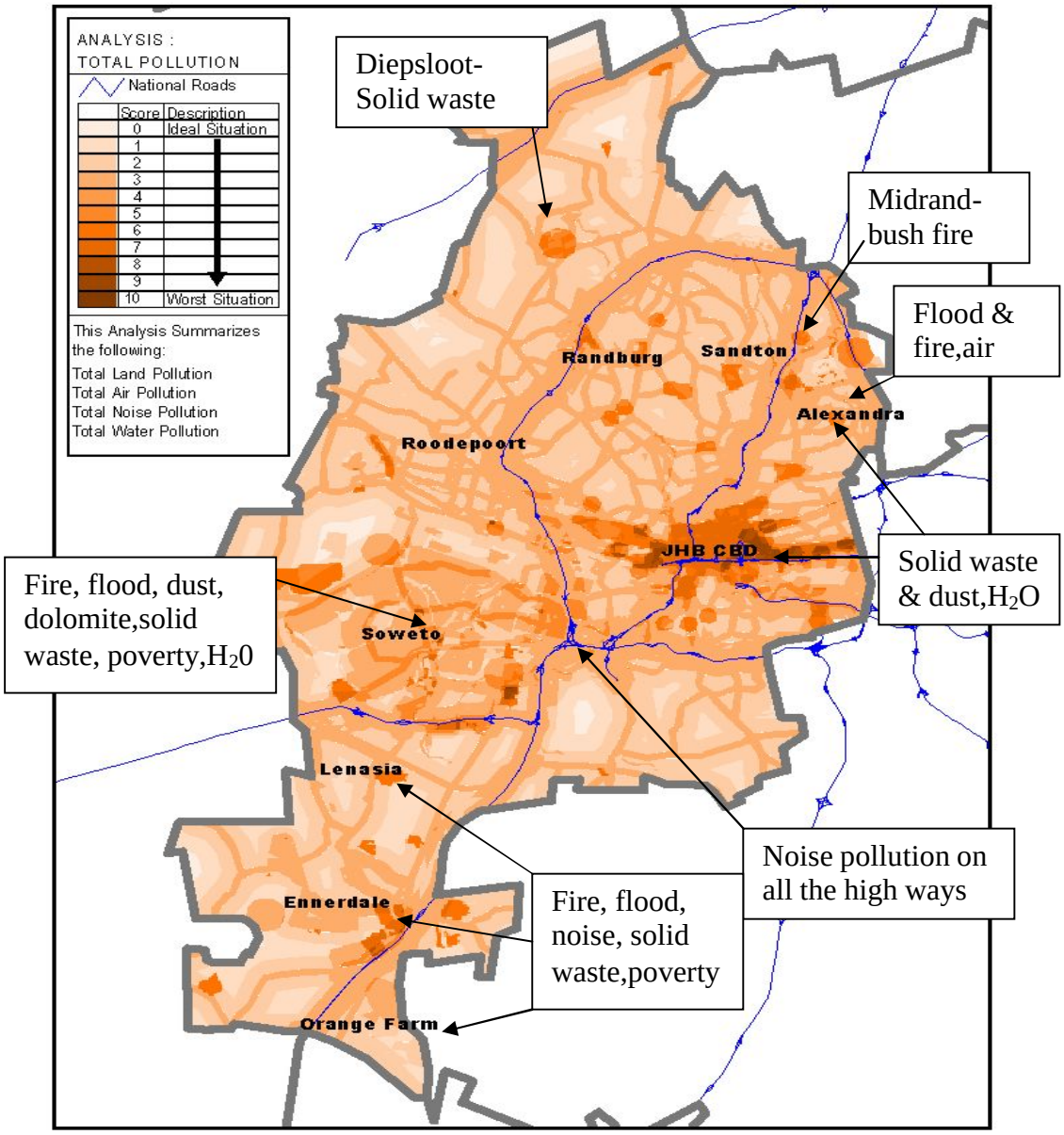
The above table shows that, within the year 2003, the total amount of rainfall was **713mm** in Johannesburg, and the total amount of evaporation was **2160.0mm**. This implies that more water is lost into the atmosphere than being conserved and as a result, portable and drinking water become scarce and expensive to families that can barely afford a daily meal.

Also, remnants of surface water that are available, constitute high levels of pollutant worsened by the limited numbers of rivers that flow and meander around the city of Johannesburg, while passing through many informal and industrial settlement areas. As a result of these high toxic river contents, its water is not fit for drinking. But, because many residents of Johannesburg do not have alternatives water sources, they are force to drink from these polluted sources of

[38] Johannesburg Airport Weather Bureau, 2003

water and hence become vulnerable to diseases such as cholera, Typhoid, and diarrhoea in cases there is an epidemic outbreak which may become a disaster affecting many people due to generally high levels of poverty and unemployment. For example the cholera outbreak in the Jukskei (Diepsloot) area in 2001 forced the municipality to transfer people from Deipsloot in to new homes in Alexandra (Tomlinson, 2005).

Fig. 4.4 Map showing vulnerable areas in Johannesburg



SOURCE: Adapted from the state of City report, 2000

4.5.2 Waste Production in Johannesburg

Excessive waste production is another condition that is gradually but surely leading to high levels of vulnerability thus a threat to most communities living in Johannesburg. This waste includes both solid and liquid waste. Their sources are mainly from domestic used products and end products from associated industries. This problem is compounded by the limited number of waste sites- insufficient waste removal by designated companies that are presently available in Johannesburg, let alone sites fit for hazardous substances. Illegal dumping in open spaces and informal settlements in Orange Farm, Ennerdale, Poortjie and Lenasia areas, are as a result of little or inadequate waste removal.

Illegal dumping in most open spaces in Soweto and irregular refuse removal services especially northeast of Soweto, Orlando, Diepkloof and Protea-South areas are some common places with high solid waste presence. The area of Johannesburg CBD experiences illegal dumping and littering as well, in recent years due to overcrowding, urbanisation and informal traders who are virtually present on every street.

Hazardous waste is another condition that could cause high level of vulnerability. They can be very flammable, corrosive, radioactive or chemically unstable, making it a non-safety hazard especially during transportation. In Johannesburg, hazardous waste is transported on the major high ways (N1, N2, N12 etc) and the rail way lines that passes through settlements that are highly dense.(e.g. the main line that leads to Ranfontein and Germiston). This implies that, during the transportation process, in the case of a major accident, those communities residing along these transport routes are at high risk and hence may lead to a disaster.

The cost of incineration, the preferred method of hazardous waste disposal, is too high to warrant it feasible for the disposal of most hazardous wastes. As a consequence, impacts on health could be very serious, since hazardous waste has been known to cause cancer and infections because of its radioactive nature. Moreover, hazardous waste is also poisonous and could be a source of danger if

these wastes accumulate in the food chain. For example, the recent jet fuel leakage from the Oliver Tambo airport killed birds and other species that were breeding in the surrounding lake (SABC, news 2006)

Vulnerability levels both from community and from environmental perspective, therefore becomes very high thus requiring communities and institutions responsible for these waste substances to prepare and plan for disasters. But effective planning is hampered for example, water and waste removal, by the culture of non payment of council rates which poses difficulties of service provision by the council. This forces the council to abandon some areas without water installation while other areas experience a slow process of facility maintenance and waste removal.

Some communities hence, have resorted to illegal dumping on open spaces that are suppose to be used for recreational purpose and thus, exhibiting higher levels of environmental risk. The consequences are; the increase in parasitic diseases as well as hide outs for mice, increased environmental health diseases, and littering. These are all factors that reduce community resilience and expose them to high levels of vulnerability to disaster.

One of the most frequent environmental health complaints from the Alexandra area for example, is related to; mice, rats and bedbug infestations. The spread of disease is also known to be common with rats especially amongst poor households. The bubonic plaque for example, is said to have been a disaster that was caused by rats. Community preparedness by way of local economic development hence, remains the sole reliable solution because the Johannesburg council, faced with many problems of the same magnitude from all angles has run out of funds.

The southern most part of Johannesburg is generally regarded as the most vulnerable region. This area is made up of the South Western Townships (SOWETO). The environmental quality around this area is low with high water

pollution levels due to high levels of industrial effluent from areas upstream like Devland; as well as sewage pollution from the informal settlements in the area.

Air quality is poor due to the amounts of coal burning taking place in the whole of Soweto and the Orlando Power Station. Littering, unmanaged waste and illegal dumping are the main causes of land pollution, whilst noise mainly emanates from the Devland industrial area and vehicles entering and leaving the area on a daily basis. High poverty and pollution levels mainly exist in the Freedom Park, Goldev, Mofolo, Diepkloof, Nancefield and Protea South areas (Miller, 1993).

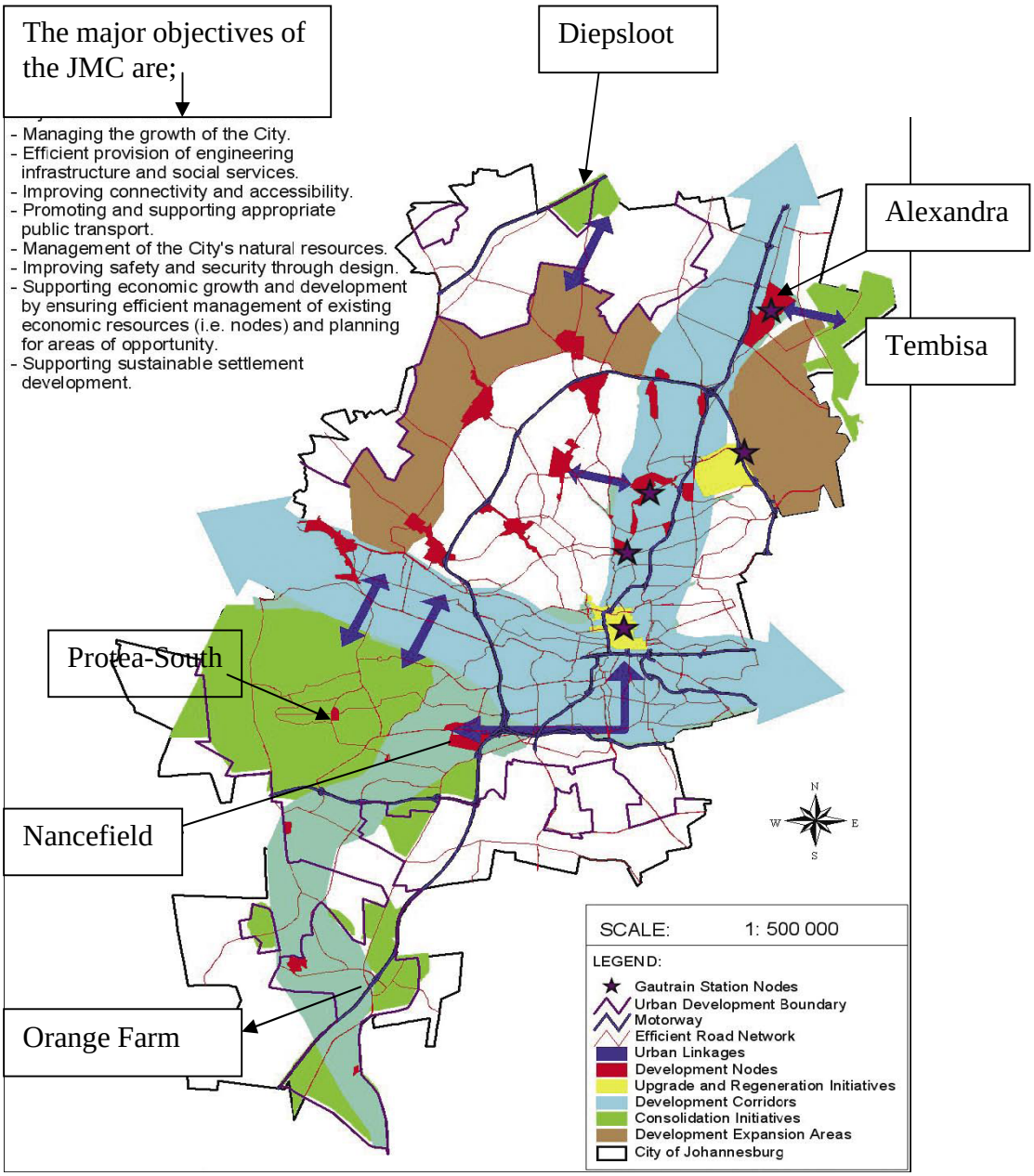
The large presence of waste is mainly due to informal settlements and insufficient delivery of services for example in places such as Alexandra and Diepsloot in the north. In the south, solid waste and sewerage from the Slovo Park area, as well as the discharge of industrial effluent from the Nancefield area cause waste disposal problems (see figure 4.3). There are insufficient parks in Soweto as oppose to the northern region and no open space system exists (Bremner, 2000).

Water conservation also needs to be upgraded in the southern most area. High numbers of diseases related to bacteriological water pollution is reported to have been experienced in the southern part of Soweto[39]. The above conditions give rise to high levels of vulnerability in the southern region above all other areas in Johannesburg. This therefore indicates how the population is susceptible to hazards of varying forms thus need to be prepared in advance to mitigate any disaster that may occur

These vulnerability differential trends in this region compared to others in the metropolis, have been acknowledged in a policy document "the Strategic Metropolitan Development Framework", since 2002 by the Johannesburg City Council which has specifically identified; Soweto, Alexandra, the Southern Development Corridor and the Klip River area, as Priority Intervention or Consolidation Zones as seen in the figure 4.4 below in green[40].

[39] Also see "the state of city report" 2003.
[40] See Johannesburg state of city report, 2003.

Fig 4.5 Conceptual Pattern of development in Johannesburg aimed at reducing levels of vulnerability.



Source: Adapted from the Johannesburg IDP, 2006

The green areas on the map are the areas that have been selected as consolidation area with the bid to reduce levels of community vulnerability. See the key for more information about the representatives of the different colours.

4.6 Conclusion:

The above overview of the conditions that influence high levels of vulnerability in different parts of Johannesburg show that, these conditions generally and directly affect mostly the previously disadvantaged communities who are located at high risk areas although other city dwellers are equally affected because of the externality factors. Although some of the reasons for vulnerability differences are attributed to the apartheid legislation and planning policies that had located African communities on unstable land and deprived them from well located areas, the present situation according to the researcher's view is largely due to inadequate service deliveries, institutional incapacity and abject community poverty. This is compounded by the rapidly growing trends in; population, immigration, globalization and low levels of environmental education.

As a result, the Greater Johannesburg Metropolitan City has to develop practical solutions amongst which include disaster planning and preparedness of communities through local economic development initiatives and other majors, so that it could enable the city's economic status to have a positive impacts on addressing the problems of poverty, homelessness, inequalities and disintegration which have influenced communities' levels of vulnerability to disasters.

The focus of the Metropolitan Council should be therefore to build a safe community that can encourage and motivate or attract investments through a partnership approach with the different stakeholders and communities so that, the city may unanimously, achieves the vision set forth by the Greater Johannesburg Metropolitan Council for 2030.