

# Environmental conflicts in the South Durban Basin: Integrating residents' perceptions and concerns resulting from air pollution

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## **Abstract**

With a complex mix of large scale industries and major transport networks, the South Durban Basin (SDB) residential area has been subjected to a considerable amount of environmental impacts and conflicts. A major concern in the area is the effects of air pollution on human health and ecology that are caused by the emissions of unacceptable levels of toxins, chemical waste and a large content of sulphur dioxide, which are characteristic of industrial processes and activities. Perceptions regarding environmental conflicts in the area were recorded by eliciting residents' concerns. Fieldwork in the form of questionnaires was undertaken. These were administered to 200 households in Merebank and Wentworth in the SDB to determine residents' knowledge, perceptions and concerns about industrial activities and potential impacts. This paper therefore explores residents' perceptions of environmental impacts and highlights the key issues which contribute to community conflicts – including those conflicts related to government, employment, race and community health.

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## **Introduction**

The Durban Metro Council stipulates that the South Durban Basin (SDB) is environmentally degraded, and experiences high levels of air pollution and waste disposal problems, and that the problems are additionally compounded by the loss of important natural resources (KMT Enterprises 2004). The SDB was a thriving market garden area until 1938, after which the Durban City Council decided that the area be developed into an industrial zone with the Black residential area providing the workforce (Peek 2002). According to Peek (2002), the SDB is seen as an industrial hub which fences two major petrochemical refineries, several hazardous waste dumps, fibre plants, the Mondi paper mill, hazardous chemical storage facilities, a major airport and more than 150 industries which are dependent on crude oil. Once separated along racial lines, as a result of discrimination policies of the past (Sivest 2004), the SDB has a total residential population of approximately 400 000 (Council for Scientific and Industrial Research 2002). Prior to the draining of the area for industrial development and the airport construction, the area was swampy land at or near sea level. Poverty in the SDB is relatively high with 52% of the adult population not economically active and 79% of those who are economically active earning less than R15 000 per annum (SRK Consulting 2004). The area is susceptible to low cost housing and informal settlements that develop around industrial areas such as those surrounding Clairwood and the airport (Sivest 2004).

Scott and Ridsdale (1997) assert that the SDB is a locality where the status of the social environment is a product of the interaction between individual and group capacities and macro-scale economic, political and cultural aspects. These Black residential areas of the apartheid era were traditionally situated in close proximity to, adjacent to and sometimes in industrial zones. Consequent to this situation, the quality of life of the people has been severely impacted upon due to frequent environmental problems that result from industrial activities in these areas. These communities have been forced to endure and continue to endure socio-economic and environmental conditions that impact negatively on their health and wellbeing.

Due to the close proximity of the residential area, which lies adjacent to the industrial area, the residents of Merebank are discontented about environmental pollution. The three large plants located in Merebank are an Engen refinery,

a Mondi paper mill and a Sasol fibres plant. The Mondi and Sasol factories are both located next to the Umlaas canal which runs between Merebank and the airport. Heavy industry and residential development are located in close proximity to each other in the SDB. Air quality in the South Durban Industrial Basin is a complex issue due to the concentration of industries found in the area. These range in complexity from boilers to much more complex industrial processes (Sivest 2004). Air quality in this area is characterised by meteorological conditions that may either assist or retard air pollution dispersion. As a result of the high levels of pollution emitted by industries in the area, residents in the community are subject to extreme levels of environmental stress and health issues (KMT Enterprises 2004). Globally, pollution in the South Basin is viewed to be one of the highest. Bisset (1995, cited in Matooane and Diab 2001) pointed out that in a report ranking all South African air pollution monitoring stations four of the most polluted are present in the SDB. Other serious environmental problems in the SDB are heavy transport invasions of residential roads, accidents caused by trucks, noise pollution and the illegal dumping of hazardous wastes in the area (Wiley et al. 2002). Since the residents are one of the key stakeholders, this article focuses on their perceptions of the problem.

### **Air quality conflicts**

Concerns about health and environment among communities in the SDB and the increased demand and expansion of industry have resulted in many serious disputes and conflicts between residents and industry (Van der Merwe 2004). Underlying such conflicts were disagreements between communities and industries, based on perceptions and concerns regarding the undesirable distribution of consequent costs, so that most of the cost often had to be borne by the communities (Ozawa 1996). Furthermore, conflicts arise because of the absence of sound political control and in order to prevent further bad decisions in the future. Ozawa (1996) postulates that environmental disputes and conflicts arise not only from residents' perceptions and concerns about potential undesirable consequences of proposed developments and upgrades of industry, but also from a perceived disregard of the legal rights of individuals and groups, which are institutionalised in national legislation. According to Engelbrecht and Van der Walt (2007), responses to the negative impacts of air pollution have often been delayed due to social, political and economic factors. However,

people's awareness, their interpretation of the impacts of air pollution and their willingness to endure a certain degree of air pollution have gradually altered.

According to Peek (2002), conflict between industries and local communities arose when Mondi purchased land from the Durban Council during the apartheid era, and began its operations without consulting surrounding communities. Wiley et al. (2002) indicate that there are inadequate measures in place to mitigate poor operational practices in industries that have resulted and continue to result in oil spills and industrial accidents in the SDB. This has led to distrust of Mondi among community members. This article therefore investigates residents' perceptions and concerns in the SDB in an effort to understand the attitudes of residents towards longstanding environmental conflicts in the area.

## **Environmental racism**

Race is seen as an important variable that shapes residents' perceptions of environmental hazards (Guhathakurta and Wichert 1998; Mix and Shriver 2007). Lopez (2002) theorises that racial tensions can be attributed to the disproportionate risk of exposure to environmental stressors endured by Blacks. The distribution of environmental risks and hazards and their disproportionate distribution and impacts on low-income groups, racial minorities, and other marginalised groups have been the focal point for environmental justice research in recent years (Grineski et al. 2007). Environmental justice has been defined by the Environmental Protection Agency (EPA 1998) as the equal treatment and participation in decision making of all people regardless of their race, colour, nationality or income status. Bullard and Johnson (2000) state that the equal treatment of all people maintains that no group of people, including racial, ethnic or socio-economic groups, should be subjected to a disproportionate share of the negative environmental impacts resulting from industrial, municipal and commercial operations. Morello-Frosch (2002) indicates that socio-economic and political forces unavoidably create a situation in which overlapping pollution plumes, emitted by various sources into our air, soil, food and water pose a range of health risks to diverse surrounding communities. Bullard and Johnson (2000) postulate that industries and governments have often exploited the economic vulnerability of Black communities with their unsound and hazardous operations.

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Environmental struggles in South Africa emerged in light of the longstanding legacy of apartheid politics and spatial planning discourse and practice (Durning 1990). Durning (1990) further states that apartheid, despite being an example of political injustice, was also the most reprehensible example of environmental injustice. Apartheid's zoning policies and its racialised separate development philosophy forced Black South Africans to be placed in overcrowded Bantustans/Homelands and townships that were located downwind or downstream from industrial complexes (Kalan undated). As a result, communities of colour in South Africa are unequally exposed to industrial pollution and socio-economic deprivation, since many individuals are forced to live and work in hazardous industries due to their poverty status. The South African Constitution (Section 24) states that all people irrespective of their race, colour or ethnic differences has the right to an environment that is not harmful to their health or well-being and to have the environment protected not only for the benefit of the present generation but also for future generations, which can be achieved through reasonable legislative and other measures that help prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development (Department of Environmental Affairs and Tourism 2005). However, these rights have been ignored by most industries, if not all, and pollution continues to infringe on the environmental rights of poor Black populations. Environmental assessments should consider evaluating the impact of segregation on health. Furthermore, environmental factors should be included in research on race disparities in health, since the bulk of segregated Blacks are generally situated in close proximity to hazardous industries (Lopez 2002).

### **Methodology**

Survey questionnaires were used to retrieve data (based on individual perceptions, concerns and issues) pertaining to environmental pollution and conflicts in the sampled community. Questions were designed to elicit socio-demographic information (age, sex, ethnic background, length of residence in the area, job location, education, home ownership, etc.), knowledge and perceptions of polluting industries and environmental health conditions in the household, as well as evaluations of environmental issues and concerns that are

experienced by the respondents based on their awareness of industries' present development status and upgrades in the study area.

A systematic sampling approach was used to select households. Systematic sampling is one in which selection is made at regular intervals. A systematic sample of 200 households adjacent to the Mondi paper mill and the Engen oil refinery were interviewed. The focus was placed on households that were situated closest to Mondi and Engen. Every tenth household was interviewed – starting with a household that was deemed to be closest to the industries and then moving further away. The interviews were conducted during four consecutive weeks in 2009. The interviews were carried out on a face-to-face basis.

## **Results**

### **Characteristics of the sample population**

Sixty one percent of the respondents were female and 39% were male. A possible reason for these figures is that interviews were carried out mainly during the day when it was more likely that the male population was at work. Eighty one percent of the respondents were younger than 50 years old. Sixty five percent were of the Indian historical racial category and 35% were Coloured. This is due to the fact that apartheid planning had separated individuals among racial lines and the areas under study were historically designated for Indians and Coloureds. The results indicate that the racial composition of the area has not changed significantly after the apartheid era. Fifty five percent of the respondents had a total yearly income below R50 000 per household, while 44% of the respondents had a total yearly income that is above R50 000. One respondent indicated that he/she earns less than R1 000. This indicates that low to middle income households are found in the area.

The majority of respondents surveyed resided in close proximity to industries situated in the area (an intended consequence of the sampling strategy employed), with 86% estimated to be located less than 2 km away. Fourteen percent of respondents indicated that they were not sure, however, and they estimated the distance from their household to Mondi to be between 2 and 5 km. This trend in responses suggests that industries are situated in close proximity to residential areas, thus resulting in numerous impacts on individuals and households.

**Residents’ perceptions on environmental impacts**

Eighty five percent of households surveyed indicated that industries cause environmental instability, and 75% stated that industrial activities pose a threat to the health and safety of the community and those that are employed at the mill. A further 75% anticipated an increase in pollution levels in the area, 69% felt that the environment will degrade further, while 23% feared the increased devaluation of property with the increase in the use of land for industrial purposes. Twenty six percent of the respondents anticipated increases in job opportunities at the industries, while 2% felt that industries contributed to the overall upgrade of the community. Seventy two percent of the respondents did not indicate any positive impacts resulting from industries in the area. Clearly, more negative aspects are linked to the industries in the area than positive attributes. Additionally, most of the respondents associate the industries in the area with negative environmental and economic impacts.

**Table 1: Problems associated with industries in the area (n=200)**

<b>TYPE OF ENVIRONMENTAL PROBLEM EXPERIENCED (Multiple responses)</b>	<b>In %</b>
Air Pollution	96
Soil Pollution	6
Water Pollution	11
Noise Pollution	4
Land degradation	17
<b>DESCRIPTION OF AIR POLLUTION PROBLEM EXPERIENCED (Multiple responses)</b>	<b>In %</b>
Toxic/Pungent odour prevalent in the air	44
Black smoke visible in the air	27
White vapours visible in the air	22
Black ash particles visible in the air	29

The above table indicates that in relation to environmental problems experienced in the area, almost all (96%) of the sampled population asserted that their primary concern was air quality, since air pollution is characteristic of most if not all industrial processes. This is indicative of the pervasive nature of poor air quality perceptions in the community. Other environmental problems identified related to land degradation (17%), water pollution (11%), soil pollution (6%) and noise pollution (4%). It is important to note that many of the environmental problems identified are interrelated. For example, the noise, water and soil pollution referred to are generally in relation to the industrial activities in the area which are also the main air polluting sources. Specific examples provided by the respondents refer to the Mondi mill and Engen oil refinery creating visual intrusions, and state that rivers, streams and the canal joining Treasure beach are being polluted by the effluents discharged from these industries. With regard to the description of the air pollution problems experienced, 44% of the respondents described the pollution prevalent in the air as having a toxic or pungent odour, while 29% said that black ash particles were visible in the atmosphere. Black smoke is visible to 27% of the respondents, with a further 22% indicating that white vapours from the steam generated at Mondi are visible both during the day and at night. It is important to note that industrial air pollution is not only emitted from industrial processes and activities at the industry, but also occur as a result of the heavy industrial vehicles that are used to transport raw materials to and from industries. A study on the impact of forced reduction in traffic volumes on urban air pollution carried out by Yuval et al. (2007) showed that reduced traffic volumes from industrial vehicles resulted in lowered levels of nitrogen dioxide, hydrocarbons and particulate matter.

A key concern with regard to health considerations is air quality linked to industrial development in close proximity to or within residential areas. There are many health problems or conditions that are prevalent in the area. Significant percentages of respondents indicated that a member or members of the household suffered from asthmatic bronchitis (47%), allergies (44%), hay fever (26%), eczema (23%) or wheezing (9%). A possible reason for this trend may be the concentration of heavy industries in close proximity to the residential area, emitting toxic gases or compounds of heavy metals that are characteristic

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of industries in the SDB. Health impacts resulting from industrial pollutants on people have serious consequences for the quality of life and livelihood options at the individual and household levels. Evidence revealed in epidemiological studies indicate that chemical compounds emitted from industrial processes have numerous adverse impacts on the respiratory system (Brunekreef and Holgate 2002; Grineski et al. 2007; Kampa and Castanas 2007; McGranahan and Murray 2003). Respondents indicated that the main causes that may have led to the specified health condition or problem are from industrial smoke (58%) and dust from industrial activities (29%). The remaining 13% of respondents felt that the main cause of the health condition/problem was pets, pollen, trees, fresh-cut grass, physical activity, colds/flu, stress, certain types of food, change in weather, or sprays of strong smells such as colognes, perfumes or detergents.

**Table 2: Challenges facing the community (n=200)**

<b>KEY COMMUNITY CHALLENGES (Multiple responses)</b>	<b>In %</b>
Environmental pollution	73
Health problems and high medical bills	17
Crime/drug abuse/violence	73
Poverty and unemployment	73
Devaluation of property	3
Concentration of industries close to residential area	3
Lack of proper infrastructure and government funding	9

Challenges facing the community (Table 2) proved to be largely due to environmental pollution (73%), poverty and unemployment (73%), and crime, drug abuse and violence in the community (73%). Seventeen percent of the respondents were faced with the challenge of high medical bills, while 9% found a lack of proper infrastructure and government funding in the community. Three percent identified the concentration of industries close to residential areas, while a further 3% feared devaluation of properties in the area as a result of the

expansion of industries. The trend in responses gives a clear indication that the challenges facing the community are associated with industries. This implies that community members are discontent with the concentration of heavy industries in close proximity to their households.

The importance of air pollution problems identified by the respondents was reinforced when questions were raised pertaining to the sources of conflicts in the area. Most respondents (78%) stated that unresolved air quality issues were the main sources of conflicts and tensions. Other sources of conflicts identified include lack of jobs (53%), crime (34%) and social problems linked to alcohol and drug abuse. Clearly, air pollution is regarded as a key source of conflict in the area. Respondents identified the main types of air pollution/quality conflicts in the area as disagreements between local government and the community (64%), disagreements within the community (68%), and disagreements between industries and communities regarding land use for additional developments and upgrades (71%). Some of the respondents also stated that the conflicts have from time to time also resulted in protest actions such as community demonstrations and shut-ins. Furthermore, the environmental conflicts had deteriorated into outright violent altercations, primarily between community members involved in the protest action and the police. Most of the respondents (81%) agree that air quality issues in the community have remained unresolved for decades, despite several attempts to address the problems faced by the community. They attribute this situation to the government being unable to remove the industries from the area and generally failing to address community concerns.

In a global context, government has been criticised for failing to effectively regulate and control the activities of environmentally hazardous industries in racially segregated areas (Van der Merwe 2004). Mix and Shriver (2007) state that residents' perceptions of government and corporate culpability vary widely. Depending on the severity of the environmental hazard, residents' perceptions of environmental hazards involve a combination of psychological, physical, scientific, and attitudinal factors that have been shaped by previous apartheid policies. This indicates that it is difficult to manage and redress environmental problems in communities where industries have a long history and are well established. In the SDB this is a major consideration since it is often argued that

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it will be too costly to remove the industries from the area and that it will be inappropriate to move them away from close proximity to the Durban port and other related industries.

Communication and information sharing are central to minimising conflicts in the first instance and addressing them if they already exist. This study shows that despite the close proximity of the sampled households to the industries, very few residents are informed of developments. Specifically, 79% of the respondents indicated that they are often unaware of industrial upgrades and only 21% indicated that they are made aware when industries propose any upgrades. Of those respondents that are made aware of proposed industrial upgrades, 14% became aware of the project through information brochures; 12% had attended public meetings; 11% were informed by their friends, family members or neighbours; and only 2% of respondents were made aware by newspapers (multiple sources were cited). Communication, information sharing and negotiation can occur with public consultation, which facilitates better decision making by the organisations and industries (Van der Merwe 2004).

Farina (1995, cited in Van der Merwe 2004) defines participation as a process in which stakeholders influence and share control over development initiatives, decisions and resources that affect them. Of concern was also the extent to which community members participated in public meetings which is the key manner in which communities engage with the public and private sectors in South Africa. Public participation is also seen as a key mechanism for resolving conflicts. Ninety one percent of respondents indicated that they did not attend public meetings that were held in respect to industries and air pollution issues, while 9% indicated that a member of the household did attend these meetings. Of the 91% of respondents that did not attend public meetings, 85% claimed that they were not informed about the meetings, 9% were informed about public meetings but were not interested, and 6% were unavailable when the public meetings were held. Of the 9% of respondents who attended public meetings, 4% rated the public meetings as having been satisfactory and 5% indicated that public meetings were unsatisfactory (poor). Those respondents who asserted that the public meetings were satisfactory or unsatisfactory stated that not enough information was displayed at these meetings and that outcomes of public

meetings were poor, since they were not satisfied with the impact assessments being carried out and were not thoroughly informed about potential impacts that projects may have on the community. There was also a high level of consensus that meetings and interventions thus far were a waste of time since very little is being done in the community to address the problems they experience in relation to air pollution. This implies that respondents are generally confused about the effectiveness of these public meetings and attempts to address problems thus far, which suggests that the meetings were not thoroughly planned with regard to allaying people's concerns and fears, nor did they make decisions that were clear. Public participation is required in most environmental impact assessments; but the involvement of communities is often regarded as being procedural and thus including the public effectively in environmental decision making is often overlooked (Shepherd and Bowler 1997). This certainly appears to be the case in the SDB.

Previous research indicates that residents are established in the area and will resist any attempts to move out (Scott and Ridsdale 1997). However, this research shows that a significant proportion of the residents (78%) would move out of the SDB if they were adequately compensated and homes were found close to their places of work – thus moving them away from the environmental problems and conflicts.

The following suggestions were put forward by respondents to help address the perceptions and concerns raised in relation to negative impacts that create conflicts between residents and industries:

- It is abundantly clear that there is a definite need for greater and stronger degrees of communication between industries in the area and the community. Therefore, residents assert that more attention needs to be directed towards making the community understand the benefits and adverse impacts of the development and upgrades of industries. It is also of significant importance that the community is involved in decision-making processes with regard to proposed upgrading and expansion projects and that their views and opinions are taken into account.

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- In creating stronger community awareness of activities, developments and upgrades of industries, residents suggested that it is imperative to strengthen awareness campaigns by disseminating information via flyers/pamphlets, newsletters, brochures, poster boards and media broadcast advertisements rather than relying on public meetings. In terms of the latter, it was also regarded as important that the public is well informed of these meetings. It is also possible to inform individuals and households adequately about conflicting industrial activities through electing road representatives who would carry the information directly to the community members.
- Members of the community are also unaware of the government's interaction with local councils and suggest that the representatives of these bodies identify themselves and work with the community in resolving issues and concerns. The government should therefore be an integral part of all decision-making processes associated with industries and residents, and thereby cascade relevant information to members of the community.
- Residents indicated that the vast majority of the community is poor and is affected by health problems that may be a direct result of the pollution associated with industries. Therefore, they suggested that industries address these health issues as a matter of urgency by working closely with health care practitioners to address health related concerns and gradually allay the people's fears. The health and safety of the community should be a priority.
- To avoid conflict between residents and industries about employment opportunities, residents assert that industries deliver on the buy-in promises made of creating more employment opportunities for the local community. Community members should be given first preference in any employment opportunity available in industries in the area, instead of individuals from other regions or provinces.
- It was also suggested that industries place more emphasis on community projects that focus on the care, conservation and protection of the surrounding environment. Projects should also include the provision of paper to schools that are financially incapable of purchasing reams of paper for printing, drawing, etc., as well as assistance with the upgrading of facilities in the community, as the entire community will benefit from this effort.

## **Conclusion**

It is not surprising that environmental conflicts in the SDB are prevalent. Most industries are not interested in the perceptions of the community and often their pleas, issues and concerns go unheard or unanswered. A large number of respondents indicated that they did not attend public meetings, as they were not thoroughly informed about these meetings. An important study finding was that a significant proportion of the respondents would like to move out of the study area if the opportunity arose. This trend in responses was due to numerous reasons, but it was evident that members of the community are trying to escape the hassles of living in close proximity to several industries, since respondents' eagerness to move is clearly related to the negative environmental impacts that are associated with industries in the SDB.

There is need for research to examine the key aspects further. In particular, unemployment in the area requires research to unpack why in such a major industrial zone high levels persist. Furthermore, although beyond the scope of this article, the legal framework needs to be investigated. One respondent stated that although there are laws that limit pollution and other industrial activities in the area, the industries prefer to pay the penalties rather than adhere to these regulations. This suggests that currently the legal framework is inadequate.

It is important to foster more effective communication between industry and the community. It is also of importance that the community is involved in decision-making processes and that their views and opinions are taken into account. Strengthening communication could be vital to bridging the gap between industry and the local community. Mix and Shriver (2007) assert that the results from research conducted in communities in conflict can feed into public and social policies that better address community and industry perceptions and concerns.

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