Household Environment and Health in Port Elizabeth, South Africa

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EXECUTIVE SUMMARY

(Please refer to Chapters 10 and 11 for a more detailed summary of the results and suggested responses).

The Port Elizabeth Household Environment and Health study was undertaken in Port Elizabeth (PE) as there was an opportunity to link up with the Swedish funded development initiatives which had already been launched in the city. It is part of a four city comparative household environment and health series involving Jakarta, São Paulo and Accra.

Focusing on the environment and health problems at a household level, the study was structured to allow comparisons with the other three cities. As a result, the instruments used are similar to those used in the other city studies. They have, however, been adapted and are set up to highlight the disparities between wealth and health across the city. The study used a random sample of the whole population of the city and is thus able to examine city-wide disparities. In addition to the inter-city comparisons, each study focuses on the specific environment and health issues in a particular city, in this case PE.

The Port Elizabeth Council has been proactive in addressing the range of problems facing it. For example, innovative approaches have been adopted to address low income housing finance shortfalls, overall planning in the area and in setting up a local area budgeting system. A number of these initiatives have financial support from Sida. The Household Environment and Health study forms part of the Sida initiative to help to address the inequalities of the past in South Africa.

The aim of the study was to:

Promote the well-being of communities in PE through research into health, housing and environmental issues, and in so doing to contribute to the understanding of the linkages between health, wealth and environmental conditions.

The objectives of the study were to:

1. Describe a range of interconnected household environmental problems in Port Elizabeth
2. Compare the severity of these problems in different socio economic groups
3. Evaluate their health impacts
4. Assess people’s (and especially women’s) priorities regarding improvements
5. Examine the financial, technological educational and institutional obstacles to improvement
6. Draw out some policy implications

Methods

The National Urbanisation and Health Research Programme of the South African Medical Research Council co-ordinated the study under the auspices of the Stockholm Environment Institute (SEI). A consultative process was followed whereby a local Steering Committee was elected by a community forum to oversee the project. The Institute for Development Planning and Research (IDPR) of the University of Port Elizabeth (UPE) and the PE Municipality played an active role in the fieldwork.
A number of complementary data collection methods was used to establish the environment and health conditions of households across the wealth spectrum. A survey of environment and health conditions was undertaken using a random sample of 1000 households representing the wealth spectrum of the city. A wealth index was used to classify the population into five groups of roughly equal size based on a proxy for wealth determined by ownership of consumer durables. A more detailed survey of a sub sample of 200 households was used to obtain further information on water and fuel use. The initial results of the 1000 household study were presented to the Steering Committee who helped to identify issues for discussion in focus groups. A total of nine focus groups on a range of topics was used to further explore the concerns of those living in lower income groups. Background reports into local government, environmental services, housing and NGOs were commissioned. This report synthesises the findings of the various components of the study.

In addition to this report, the preliminary findings have been presented to a number of fora including the Community Services Committee of the local Council, politicians, civil society leadership, non governmental organisations, local, national and international workshops and conferences.

Results

The results show wide disparities in access to services across the wealth spectrum. While this is typical of cities in developing countries, the data also highlight the relatively poor access to basic services by groups disadvantaged by past government policies. In addition, unequal access to education and therefore opportunities for income generation, in the past, is evident in a high rate of functional illiteracy in the lower wealth groups.

Taking a range of indicators into account, PE is clearly an urban area which is lagging behind the national urban average for access to basic services provided to its residents.

Housing and health

People in the lower wealth quintiles are exposed to risks in their homes related to the building methods and materials. The majority of homes in PE is constructed of brick but more than half of the people in the lower two wealth quintiles live in informal housing. Wood and corrugated iron sheeting are the main building materials for homes in the lowest wealth quintile (76%) and the lower-middle wealth quintile (54%). Problems experienced in the household environment by residents in the lower two wealth quintiles, include damp, thermal inefficiency, overcrowding and the siting of informal housing in poor locations. Other problems are related to poor ventilation rates in informal houses and the risks associated with paraffin (kerosene), the main cooking fuel used by those in the lower two quintiles. While the study showed that 80% of households using paraffin had soot on the walls and ceilings, and the focus groups reported negative health impacts of using paraffin, the adverse health effects of paraffin combustion products require further investigation.

Domestic water

All households have access to municipal supplies of purified water. While most households have access to water in their home or in the yard, 20% of the PE population relies on access to a communal water source. There are gender inequities in the responsibilities for the collection of water in that 80% of the water from communal sources is collected by women. Problems associated with the communal supplies include a lack of access to standpipes, long waiting times and large distances between homes and the standpipes. There was also evidence of deterioration of the water quality between collection point and consumption, highlighting the need for further monitoring and education. The low quantities of water consumed per person per day by users of communal sources are a cause for concern due
to the likely adverse health implications (primarily skin and eye problems) associated with low volume water consumption. In addition, 14% of all households were dissatisfied with the taste and hardness of the water.

**Domestic sanitation**

Those who experience sanitation problems are limited to the lower two wealth quintiles. Those who have access to a sewered (flush) system did not identify any sanitation problems. 15% of the population of PE, which amounts to 24,000 households, are using bucket toilets. These people are predominantly in the lower wealth quintiles. Those who are concerned about their poor access to sanitation services believe that the PE local council is responsible for addressing this problem and people are aspiring to water borne sanitation as the solution. The high overcrowding rates in the middle wealth quintile is reflected in the fact that 20% of Coloured people share a toilet with more than 11 people. Puddles, flies and cockroaches at the toilet were associated with diarrhoea. The bucket system is the subject of much dissatisfaction by its users and water borne sewerage is seen as a priority. The main problems related to the bucket system seemed to be the inadequate emptying service provided by the Port Elizabeth Municipality (PEM). The impressions are that the PEM staff do not care, spill the contents and provide a service which is not regular enough.

**Domestic waste removal**

Littering is a concern of all the people in PE, especially the wealthier groups. Those experiencing and concerned about dumping and burning in their neighbourhoods are largely in the lower wealth quintiles. Burning and dumping problems seem to be related to the lack of waste removal services provided to the lower wealth areas. Backyard shacks and informal “illegal” settlements need to be provided with adequate refuse removal services. The provision of extra refuse bags may be part of the solution. It would appear that the improvement in refuse collection services and the state of general cleanliness in the lower income areas could go a long way to address the dumping and burning problems. The cost effectiveness of providing containers rather than municipal refuse bags should be explored. There is a recognition that collaborative efforts are needed. Agencies which can play a role include the CBOs, neighbourhood groups and the municipality. The current pilot projects, may, if increased in scale be able to help to address the problems identified.

**Urban pests**

The presence of flies, cockroaches, rats etc., is a recognised problem in urban areas as they are carriers of disease. Not surprisingly, the pests are found far more frequently in the lower income areas where there are bucket toilets, refuse accumulates and animals are kept. Flies, mosquitoes, cockroaches fleas and ants were found in a quarter or more of all homes in PE. (Port Elizabeth is not in a malaria or dengue area so mosquitoes are more nuisance than health hazard). The lower-middle and middle wealth quintiles reported a slightly higher frequency of cockroaches than the other groups. Higher levels of diarrhoea were associated with having seen a cockroach in the last 24hrs. In low wealth households, flies were found much more often than in general in PE homes. A quarter (26.7%) of all low wealth households reported “always” having flies around when preparing food and nearly half of all low wealth households (42.2%) reported flies “always” being in the toilet. In the case of flies in the cooking area and in the toilet, the problems experienced by the poor are nearly 3 times that of an average PE household. The most common measures used to address the problems of insects were aerosol insecticides, used in 20% of households on a regular basis. An average of R 12.83 per household is spent monthly in PE on pest control measures The total amount spent in Port Elizabeth privately per month on insecticides is equivalent to the City health budget for a month. In proportion to their income, lower wealth households tend to spend more on insect control measures than the wealthier households.
This is a further indication of the added burden faced by poor people living in areas with environmental hazards.

Rats are often seen in the lower income areas. 60% of the lower two wealth quintile households reported having seen a rat in the previous week with half having seen one in the past 24 hours. In contrast, 70% of those in the highest wealth quintile had never seen a rat. Traps are used by approximately 60% of households but rats are seen to be such a prevalent problem that in half of the low income households no action is taken. Households who reported that dumping of solid waste occurs in their neighbourhoods, experienced a significantly higher number of pests in their neighbourhood.

**Ambient air pollution**

Pollution, burning of waste and other outdoor air problems were a problem across the wealth spectrum but focused in the lower wealth quintiles. Outdoor air pollution was noted as being a problem in over 50% of households. The low wealth quintile households were most concerned, with 85% identifying it as a priority issue to be addressed. In contrast, only 20% of high wealth quintile households experienced a problem with outdoor air quality. The main concerns were dust in the air, the burning of refuse and to a lesser extent, emissions from industrial activities. In nearly 50 % of households, the main problem was associated with dust (across the wealth spectrum) while the burning of refuse was the second most important source identified. 37% in the lowest wealth quintile complained about the burning of waste while in the upper wealth quintile, 22% identified this problem. Emissions from industrial activities were of concern to over 10% of the households. Dust was raised as a particular problem by the focus groups.

**Animals in urban areas**

The desire to keep animals in the urban areas was identified as an issue by the Steering Committee. Many of those in the low wealth group said that they would like to have animals in urban areas, whereas only a few were found to actually keep animals. There is a tension between the desire to keep animals and the negative impact they have in urban areas, if uncontrolled. Those who have animals are seen not to control them and the animals cause a nuisance by scavenging, eating plants and defecating in the public areas. There is also a problem in the disposal of dead animals. Suggestions made by the focus group include the establishment of a controlling board to allocate land for this use and to set up and implement other control mechanisms. A clear stand by Council through a negotiated process will be needed to clarify how animals are to be controlled in urban areas, if allowed at all.
Conclusions

On reflection, it would appear that not only is PE a key urban area in an economically depressed province but that from a household health point of view, the residents of PE are further deprived in contrast to other urban areas in SA in their access to basic services.

The poor level of services to the area could be seen as an opportunity for further focused investment which will be able to address some of the backlogs in an innovative way.

Key aspects which emerge from the data comparing the full range of wealth groups is that the environment and health problems are focused in the lower wealth groups, in particular, the poorest 40% of the households. These problems relate to:

- access to potable water supplies which are convenient;
- a poorly managed and unhealthy bucket system of sanitation;
- inadequate refuse collection services which results in littering, dumping, and burning;
- overcrowded housing which tends to be damp, have poor ventilation and temperature control and
- unemployment.

Each of the above problems have health concerns associated with it. Examples include:

- those using public standpipes are more likely to use less water per person on a daily basis than recommended for good health;
- bucket toilets, refuse, dumping and burning were associated with the presence of rodents, vermin, flies and cockroaches and
- Children’s health is also compromised by living in poor environments with higher levels of ARI and diarrhoea.

Many of these problems will be addressed in time with the housing drive of the PEM. There is however, a need for urgent short term action. In addition, some policy initiatives are suggested.

Short Term Action

The study has shown that there is a need for improvement in the delivery of services by the PEM to ensure that the basic health and environmental safety needs of the poor are met. These involve:

- Rapid release of land with rudimentary services to address the overcrowding problem;
- Improved refuse removal system especially to those in the informally settled areas;
- Street cleaning;
- Improved bucket toilet removal services;
- Short term improved access to water by those reliant on communal water supplies;
Health education drives to minimise the health problems which occur when basic services are inadequate;

- Involvement of community groups with Environmental Health Officers (EHO) to monitor the extent to which Council is providing an improved level of service to the community and to be able to provide feedback to the council service departments so as to help them to improve their service and

- Target the needs of vulnerable groups especially women and children in low income households.

Within the financial and other constraints facing the PEM and other local government structures in South Africa, there would seem to be opportunities to address the challenges. It is suggested that efforts need to be made to:

- Consider how the delivery of services can be fast tracked in such a way as to maximise the limited financial resources available to the PEM.

- Innovative approaches to helping the poorest of the poor to be accommodated in less overcrowded housing with improved levels of services need to be encouraged and explored.

- Deepen the culture of service in the PEM staff so that the services provided are undertaken in such a way as to respect the dignity of the residents in the area.

- Economic activity will be the only impetus to help the Council to address the problems in a sustainable manner. All avenues should be explored to encourage the generation of employment and economic activity.

- Encourage the role of EHOs as front-line PEM staff to help the Council to provide effective and efficient services to meet the needs of its community, and to

- Explore mechanisms to adopt an inter-sectoral approach to service delivery.

The report concludes with comments regarding more generic issues. These include a number of insights from the data regarding the exposure of certain groups to risks, the linkages of the issues at a household level and the need for appropriate responses. The section also highlights the inter-connectedness of the risks and suggests that there is a need for health and built-environment professionals to have a broader perspective of the linkages between health and environment issues in policy, management and implementation.

It is hoped that the initiative will inform policy and practice as well as lead to ongoing research to aid in the process of improving the health and environment of all residents in PE with a focus on the poor.
PREFACE AND ACKNOWLEDGMENTS

This report forms part of the Stockholm Environment Institute’s (SEI) work supported by the Swedish International Development Cooperation Agency (Sida), on household environmental problems in Southern Cities. Studies in Accra, São Paulo and Jakarta were initiated in 1991 and the study of Port Elizabeth, in 1997, soon after the first democratic elections in South Africa.

The present report on Port Elizabeth, like the initial reports of the other cities, explores a range of topics under the broad heading of household environment and health. The topics include, socio-demographics, housing, indoor air quality, water supply, sanitation, external environments and related health problems.

This study required much hard work and commitment from a range of people for which we are very thankful. The Mayor of Port Elizabeth, Mr N Faku and Town Clerk, Mr G Richards and the Council’s Community Services Committee responded positively to the suggestion that Port Elizabeth should be the fourth city in the SEI series of studies. Within the Health Department, the Medical Officer of Health, Dr E du Plessis and Mr A Steyn, Director Environmental Health, provided generous support, encouragement and interest in the initiative. In the Environmental Health Directorate, Mr. G Pozyn, Mr. W Ntlabezo and a team of environmental health officers were involved clarifying issues to be explored in the study and in the collection of data. Other staff of the Port Elizabeth Municipality who were most helpful were those in the water quality testing laboratory of the City Engineers Department, under the guidance of Miss J de Leeuw, who managed the analysis of the samples for the 200 household water quality study.

The Steering Committee made up of representatives of local government and from civic organisations, elected at the launch forum, provided valuable support, comment and guidance regarding issues and the appropriate process to be followed.

A range of other researchers has made contributions either informally or through pieces of commissioned work as background reports. In addition, the ongoing secretarial support of Mrs. Susan Hon of the National Urbanisation and Health Programme of the MRC and Mrs Maureen Phungwayo, of the Centre for Health Policy, University of Witwatersrand, is also much appreciated.

Further information about the multi-city study may be requested from SEI.
1. AN OUTLINE OF THE CHALLENGE

1.1 Introduction

Port Elizabeth (PE) is one of the secondary metropolitan areas in South Africa (Figure 1.1). It is, in many ways, a microcosm of the rest of the country as it has a similar history of inequality and therefore faces similar challenges to both larger and smaller urban areas. As a result of both the stage of development and the inequitable distribution of resources in the past, the environment and health of the residents show dramatic disparities between the rich and poor. For example, there are widely differing levels of access to basic services such as water and sanitation, health services, education and employment opportunities.

There are a number of very encouraging initiatives being undertaken in PE, and throughout South Africa, in order to address the imbalances of the past. These will hopefully narrow the gaps between the rich and the poor. The aim of this study is to highlight some of the problem areas in environment and health. Through the problems identified, it is intended to make suggestions relevant both to PE and on a national level, for appropriate strategies for resource reallocation to ensure basic health and safety for the poor.

The study as a whole follows the format of environment and health research which has been undertaken in three other cities, namely São Paulo, Accra and Jakarta. These studies by the Stockholm Environment Institute (SEI) have focused on the household level of environmental health which is particularly appropriate for a country such as South Africa, owing to the recent commitment to provide equal access to basic services and opportunities for all.

The aim of this chapter is to provide an overview of the context of PE in a socio-economic and institutional framework as a basis for an understanding of the research data. It concludes with a statement of the challenges facing PE as an introduction to the study and its findings.

1.2 The PE community

The economy of PE, in terms of gross domestic product (GDP), is based on secondary industries and tertiary activities. These are in manufacturing (mainly cars and car parts) as well as transport, as the city is an important port for the hinterland of the Eastern and Western Cape. Despite this economic activity, unemployment is high and over 40% of the households have incomes less than the household subsistence level. Estimates of the population of the PE metropolitan area vary considerably due to a lack of reliable sources...
of data. For this study the main sources of population data are the PE Council’s Housing Policy (1996) and more recently, the City of PE’s Annual Health Report (1996/97), which estimates the population as being 1.03 million. The results of the 1996 census, when available, will clarify the situation. The average annual growth rate of the Eastern Cape Province’s population between 1980 and 1997 was 2.6%. In general, the less urbanised provinces are experiencing the most rapid urban growth and the Eastern Cape, with a functionally urban population of only 43%, is no exception. Thus, while there is no precise rate for PE, its urban growth rate, supplemented by immigration from the smaller towns and rural areas, is probably higher than the national average of 3.7%. This rapid urbanisation has exacerbated the problems caused by years of neglect in the previously Black areas of the city. There are enormous backlogs in the provision of services and wide disparities in the basic environment and health services at a household level.

The focus of this report is on the household environmental and health conditions of the population and the constraints which have been identified as factors impeding attempts to address the problems. It is to the household health and environmental conditions which we will now turn. A historical outline of the impact of past apartheid policies on urban development leads into the current situation in the provision of basic services to the residents of PE.

1.3 Household environment and health conditions: the historical context

In South Africa, access to land in urban areas was one of the key strategies used by the apartheid government to limit the urbanisation of Black people. In addition, other strategies were put in place, including the establishment of ‘growth points’ in the homeland areas as incentives to keep Black people rurally based. The provision of land and housing in urban areas was controlled by national and provincial authorities as local governments could not be trusted to implement the draconian national strategies.

Despite these constraints there was a continuous stream of unemployed workseekers to urban areas. The state had control measures in place and attempted to return the workseekers, who were regarded as ‘illegals’, to the rural homelands. Despite pressure for additional serviced land in urban areas, the minimal allocation and servicing of land for low-income (Black) settlement remained part of the state’s apartheid (‘separate development’) and anti-urbanisation strategy.

Severe urban overcrowding and the breakdown in basic services was common in the 1970s and early to mid 1980s. In 1986 the White Paper on Urbanisation recognised the impossibility of the state’s strategy and recommended that the steady flow of urbanising people should be managed rather than allowed to develop into sprawling squatter settlements on the periphery of urban areas.

The Black Local Authorities Act of 1984 had already made suggestions as to how the land could be developed in an orderly manner by “making land available” to developers. Black Local Authorities (BLAs) were responsible for the administration of Black urban areas which were located adjacent to the White, Coloured and Indian-managed areas. While in some cases, services agreements were entered into between the BLAs and the adjacent White Local Authorities, there was a distinct ‘divide and rule’ mentality with decisions being taken in Pretoria regarding the approval of all additional land for settlement/ expansion of Black housing areas. The former ‘group areas’ or racial divisions for land allocation in PE are shown in Figure 1.2.

1 Race is an acknowledged social construct but because of its use in determining access to resources in apartheid South Africa, references will be made to racial classifications in the report.
The steady flow of people from rural areas continued and was supplemented by the natural growth of families in township areas who moved into backyard shacks of formally state-constructed homes and peripherally located settlements.

While the urban development policy initially focused on the prevention of and then on managed urbanisation, a real effort began in the late 1980s to address the problems of the existing informal areas. This began with the legalisation of the settlements (granting land tenure) and the provision of basic services. Both resettlement and in-situ upgrading became the accepted approaches in the early 1990s. Before the first democratic national elections, the local government consultation process had begun in earnest under a ‘One city-one tax base’ adage and some local authorities began to proactively rationalise their service provision by working towards amalgamation. PE was the first urban area in South Africa to adopt this approach.

1.4 Institutional context

On a national scale, the Reconstruction and Development Programme (RDP) was launched by the African National Congress (the eventual majority party) as part of its election manifesto. This provided the framework for a number of policies aimed at addressing imbalances in the past and the RDP rapidly became the overarching development policy document. South Africa’s first democratic government was elected on the basis of a manifesto that promised jobs, housing and access to improved health care and education for all. The White Paper on Reconstruction and Development spells out the government’s objectives in each of these areas and states that it is essential for the government to seek partnerships in order to realise this plan.
This study was launched a year after the first democratic local government elections in South Africa. This is especially significant with respect to the transformation in the government system at all levels and the resultant upheavals this has caused.

The administration of the country was reorganised into nine provincial authorities in terms of the new constitution. PE is the major urban centre of the Eastern Cape which is one of the new provinces. The Eastern Cape was formed from three previous government bodies: the Cape Province and the quasi-independent homelands of the Transkei and the Ciskei. This procedure has involved setting up a rationalised provincial administration and has been an onerous task. Of the nine provinces, the Eastern Cape is one of the poorest from a resource point of view. Each of the nine new provinces is divided up into administrative regions. PE is one of five regions in the Eastern Cape. The PE region is predominantly urban and prior to local government transformation, consisted of a number of local authorities.

Prior to 1994, the White, Coloured and Indian population groups of PE were provided with basic services such as water, sanitation etc. by the Port Elizabeth Municipality (PEM). The Black areas, which made up the bulk of the population, were provided with services by the Ibhayi Council, a Black Local Authority, or the PEM on an ‘agency basis’.2

The rationalisation of service provision into a single city provides a solid base for a way to improve the provision of services to the under-provided. This, however, has not been without its difficulties which have impeded the ambitious attempts by the new council to address the problems of the past.

PE became South Africa’s first Transitional Local Council (TLC) on 6 May 1994 - a mere two weeks after the first national democratic elections. This TLC was the end-product of three years of negotiations by a ‘One City Forum’ comprised of all interested parties. It saw the unification of the erstwhile politically separate but economically linked areas of jurisdiction of the City of PE (erstwhile White group areas), the Northern Areas Management Committee (erstwhile Coloured group areas), the Malabar Management Committee (erstwhile Indian group area) and the Black Local Authorities of Ibhayi, Motherwell, Kwa-Dwesi and Kwa-Magxaki (erstwhile Black group areas). For the first time since apartheid policies divided PE into the above group areas in the 1960s, the inauguration of the PE Transitional Local Council saw one administrative body take responsibility for the entire city.

Like all other large South African local governments, the provision of services by the PEM is allocated to a number of functional departments which deal with issues in a sectoral manner. Decision making, budgeting and execution of tasks are operated in this manner. There are certain cross-cutting functions such as local government finance where priorities between departments are decided upon.

South Africa’s transition to democracy was marked by a proliferation of non-governmental organisations (NGOs) which, in many cases, existed largely as a response to the apartheid regime. They were funded from overseas and had considerable depth and breadth of commitment and played a very significant role in the transformation process. This is especially true where development on the ground was concerned. Since the elections, however, the funding of NGOs linked to the anti-apartheid struggle has largely ceased and many erstwhile activists have been absorbed into government. This has left a vacuum in the NGO sector which is now consequently less of a resource. There are, however, still a few key groups in PE which are able to provide support and advocacy to communities regarding development issues.

The Civil Society Forum (CSF) has been established as an organ of civil society representing the majority of stronger NGOs. The PEM is involved in supporting the role that the CSF can play in facilitating a participatory approach to local governance.

2 ’Agency basis’ refers to the arrangement where a local authority with more capacity would ‘sell’ technical and financial skills to the smaller authorities in the area.
1.5 Health service delivery

Service delivery in PE in the era prior to 1994 was no different from any other South African local authority. It was race-based, inequitable, ineffective and inefficient. Government expenditure on services was along racial lines in terms of an ‘own affairs’ policy for White, Coloured and Indian groups and was subject to the provisions of the Black Local Authorities Act of 1982 for Blacks. Towns and cities were divided into townships with minimal infrastructure for Blacks and well-resourced suburbs for Whites.

Section 20 of the Health Act of 1977 gives local authorities the duties and powers within areas under their jurisdiction to maintain them in a clean and hygienic condition, to prevent unhygienic conditions from occurring, to prevent the pollution of water used by its communities and to render services aimed at preventing communicable diseases, promoting the health of persons and rehabilitating those recovering from illnesses.

Within the PE geographical area the provisions of this section of the Health Act were the responsibility of no less than three authorities, namely, PE City Council for White, Coloured and Indian areas, the Provincial Administration of the Cape of Good Hope, through the Bantu Affairs Administration Board (BAAB) and later the East Cape Administration Board (ECAB) and still later the Ibhayi City Council, for the Black townships of New Brighton, Kwa-Zakhele, Zwide and the informal settlements of Soweto-on-the-sea and Veeplaas. Later on, around 1984/85, the development areas of Kwa-Magxaki and Kwa-Dwesi were added as additional responsibilities of Ibhayi City Council, an arrangement which was rejected by the residents of these areas who preferred to be administered directly by the Provincial Administration of the Cape of Good Hope. Motherwell, a vast expansion of Black townships to the north of PE became the responsibility of the Motherwell Town Council with the Algoa Regional Services Council rendering the health and environmental health services. The actual health and environmental health service delivery within the Ibhayi City Council areas, however, was rendered on an agency basis by the PEM.

Given this multiplicity of authorities and service deliverers within one geographic area it is no wonder that the levels and standards of environmental health services were a source of much discontent and caused community protests which culminated in boycotts of service payments and demands for the resignation of councillors serving these areas. In the wake of these protests and boycotts many Black local authorities collapsed, and there was a breakdown in service delivery and a deterioration of basic infrastructure.

The new PEM has a major challenge to face and has put a number of innovative strategies in place to address the backlogs as quickly as possible.

In South Africa there has been a shift in the health sector from the previous focus on curative services to the Primary Health Care (PHC) approach. Two of the pillars of the PHC approach are the importance of community participation and of multi-sectoral strategies for addressing problems. The revised emphasis of the approach within the ambit of environmental health services is outlined in Box 1.1.
The implications of the above policy change with respect to environmental health services at a local level require that there is:

- political commitment by the local authority, particularly the health department, to community participation in EHS structures;
- retraining and reorientation of EHOs to the developmental nature of their work; and
- a conscious effort to ensure that marginalised groups in society are explicitly targeted by this strategy.

1.6 The housing, water and sanitation challenge

PE has a housing backlog of approximately 41,000 units and the PEM has an extensive programme to build or service sites for houses over the next twenty years. Their strategy is to accommodate the new houses on the northern edge of the city and to meet the needs of the various income groups with differing strategies according to the clients’ income levels. The housing needs and policy are detailed in Chapter 4.

1.7 Financial constraints

A major challenge facing the PE Local Authority is recurrent costs of basic services combined with the continuation of the ‘culture of non-payment’ of the service charges by many communities. This culture of non-payment results in part from a carry-over from the
apartheid past when people had no means of challenging poor service provision other than by protest. Considerable efforts are being made at local and national government levels and through NGOs such as the South African National Civics Organisation (SANCO) to point out that this is not an appropriate response in a democratic society. Other factors, such as the inability to address the services needs of communities in extreme poverty, who simply cannot pay, may undermine the success of the PEM. Debt recovery is impossible without a general culture of civic consciousness and it is also essential to develop appropriate legislation backing up the administration, ensuring the political will to enforce it and adequate administrative machinery.

Poverty presents a particularly complex set of challenges to municipal government. The size of the municipal tax base and therefore the reliability of a regular income is determined by the extent to which the ratepayers are able to pay for the services they receive. PE’s economic activity has historically been very dependent on the motor industry as its core industry but recent economic difficulties in this industry and related secondary industries have meant that retrenchments and unemployment are common. As a consequence, families often have not been able to meet their bills for electricity, rates and basic services.

The challenges outlined above reflect the nature of the problems being faced by local authorities countrywide and are detailed in Box 1.2.

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**Box 1.2 Nationwide local government funding crisis**

The financial viability of local government has had to be reconsidered due to the excessive amounts owed to local authorities by residents who have not paid their service charges. On average, accounts payable to local authorities nationwide are three months in arrears. As many as 92 authorities had insufficient funds to cover one month’s expenses, indicating a seriously distressed condition. Constraints on the payment for services by users have included problems with local authority capacity to render accounts and the inability of users to pay. Some 32% of households were not able to pay regularly or at all, while 68% of households were found to be paying regularly.

*Source: Marchant, D 1997 in Annexure 1.*

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**1.8 Summary**

Poverty, unemployment, lack of hope, violence and crime, and poor households and communities are some of the challenges facing PE. These are elaborated upon below.

Like the other cities in South Africa, there are stark manifestations of the historic inequitable access of the population to basic services necessary for health. Capacity to address the backlogs in a sustainable way needs to be developed while the limited resources need to be used judiciously. The commitment and enthusiasm of the many stakeholders need to be harnessed so that priority problems can be addressed. Local government resources need to be refocused and inter-sectoral initiatives encouraged as a way to address the basic needs of communities holistically at a household level.

Despite the above problems, PE Council and the Civil Society Forum, with its wealth of civic bodies, are making progress and are actively addressing these issues.

Having outlined the local government context, the focus of the report will now move to the environment and health issues which were the subject of the study.
2. METHODOLOGY

2.1 Introduction

As indicated in Chapter 1, the Stockholm Environment Institute (SEI) has already undertaken three collaborative studies of household environment and health in the developing cities of Jakarta, São Paulo and Accra. Port Elizabeth (PE) was chosen for this study as it is reasonably representative of South African cities, is small enough (1.03 million) to allow city-wide interventions to be planned and there was an opportunity to link up with other Swedish-funded development initiatives which had already been launched there. Another reason was that the Port Elizabeth Council has been proactive in addressing the range of problems facing it. For example, innovative approaches have been adopted to address financial shortfalls for low-income housing, overall planning in the area and in setting up a local area budgeting system. A number of these initiatives have financial support from Sida. The Household Environment and Health Study forms part of the Sida initiative which aims to help to address the inequalities of the past in South Africa.

Focusing on the environment and health problems at a household level, the scope of the study was structured to allow comparisons with the other three cities. As a result, the instruments used follow a similar format to those used in the other city studies. They have, however, been adapted to suit the local conditions and are set up to highlight the disparities between wealth and health across the cities and the particular environment and health issues in PE.

2.2 Aims and objectives

The aim of the study was to:
- promote the well-being of communities in Port Elizabeth through research into health, housing and environmental issues, and in so doing to contribute to the understanding of the linkages between them.

The objectives of the study were to:
1. describe a range of interconnected household environmental problems in PE;
2. compare the severity of these problems in different socio-economic groups;
3. evaluate their health impacts;
4. assess people's (and especially women's) priorities regarding improvements;
5. examine the financial, technological, educational and institutional obstacles to improvement; and
6. draw out some policy implications of these findings.

2.3 Research process

The study was launched at a public forum to which all the key agencies had been invited. The meeting was chaired by a member of PEM’s Community Services Committee and agreed, after a presentation of the proposed study and process, to elect representatives from civil society to form a Steering Committee along with representatives of provincial and local government. The Steering Committee met approximately monthly and was involved in guiding the research process. Details of the elected Steering Committee are given in Annexure 2. A number of reportback workshops were held once the preliminary results had been prepared and this process resulted in suggestions about ways in which the research process could be refined.

The National Urbanisation and Health Research Program of the Medical Research Council of South Africa agreed to collaborate with SEI and co-fund the study. The MRC took responsibility for being the project co-ordinator. SEI staff provided support based on the
experience gained in the other three cities, particularly in the early stages of the study. The Institute for Development Planning and Research at the University of Port Elizabeth (IDPR) played a key role in the management of the fieldwork and process co-ordination.

The history of poor education in South Africa has excluded many people from research, so there is a special need to maximise any opportunities for capacity building. As a result, efforts were made to enable those who had not had previous experience in research to gain some training. The focus groups were run using co-facilitators who were trained to run groups themselves by observing experienced facilitators. In addition, efforts were made to involve local community representatives in the research process.

As mentioned above, the selection of PE as the fourth city in the series was made partly because this type of study could support the development initiatives in PE funded by Sida. This type of study is particularly useful in that it profiled health and wealth across the whole population of the city and thus both highlighted the disparities and helped to identify intervention priorities.

It was agreed from the outset that the boundary of the study area would be the PE official municipal boundary. Discussions in progress at the time regarding the incorporation of the functional areas of Uitenhage into the PE Metropolitan area were unresolved, and so it was decided not to include Uitenhage in the study.

2.4 Research design

The fieldwork involved the use of the following tools:
1. a survey of 1,000 randomly selected households representative of the total population of Port Elizabeth;
2. a sub-sample of 201 households for detailed information on fuel usage and water quality;
3. focus group discussions on a range of environmental health issues;
4. a survey of children in their environments with a focus on the development of a health promotion programme; and
5. commissioned background studies and key informant interviews.

The interrelationship of research components is shown in Figure 2.1.
The complexity of the range of qualitative and quantitative data collected has resulted in the compilation of this report as a synthesis document. Readers are encouraged to refer to the supporting reports for further details which may be of interest to them. For each of the above components, the methodology will be briefly outlined here. Details of the methodology can be found in Background Report number 1 (see Annexure 1).

### 2.4.1 1 000 household survey

The 1 000 household broad spectrum survey forms the core of the study. A multi-stage random sampling procedure was followed, beginning at the level of census enumerator areas. A randomly selected series of enumerator areas for the 1996 census was drawn and ten households were sampled from each of these (see Figure 2.2). The selected households represent the spectrum of wealth and health across the city. Figure 2.3 indicates the selected enumerator areas. Further details can be found in Background Report 1 (see Annexure 1).
### Figure 2.2 Sampling process based on census enumerator areas

1996 Census  
(Port Elizabeth)

1427 Enumerator Areas (EA's)  
(AV. 100 - 200 HHolds/EA)

Random Selection of 100 EA's

Random Selection of 10 Addresses per EA

1 000 Household survey  
Nov/Dec 1996

Water Quality & Fuel Survey  
Focus Groups

### Fig. 2.3 Map of sampled enumerator areas in Port Elizabeth

Source: Adapted from A.D. Walker. UPE 1998
The survey instrument was based on the questionnaires used in the other cities with adaptations to the local context. The sample selected resulted in 580 households from the historically Black areas, and the balance proportionately from the Coloured, Indian and White areas. The issues covered in the questionnaire included the demographic profile of the household; access to and use of basic services such as sanitation, water and energy; wealth (measured by commodity ownership); land tenure and housing-related questions; as well as health indicators.

The 1 000 household survey was undertaken by local community members who had been trained by an experienced researcher. The coding, data entry and analysis was undertaken by the Institute for Development Planning and Research at UPE with the support of other specialists on the campus. The data was coded and entered into a Statistical Package for the Social Sciences (SPSS) data base. The data set is referred to as the ‘1 000 household survey’ for ease of reference, although the actual number of households was 1 026.

2.4.2 Household water and fuel survey

A sub-sample of 201 of the 1 000 households was asked for more details of water and fuel usage. The sample was stratified equally between households having running water inside their homes, those with yard taps and those making use of communal stand pipes. A questionnaire was used and Environmental Health Officers (EHOs) made observations in and around the home environment. Further information on this part of the study is contained in Annexure 1.

Where the results of the sub-study are used in the report, reference is made to the ‘fuel and water survey’. The deliberate stratification of the sub-sample restricts the generalisability of the data and therefore these results cannot be assumed to be a reflection of the population of the whole of PE.

The questionnaire design, data coding, entry and analysis was undertaken by experienced local researchers who had also been involved in the 1 000 household survey.

The water study was undertaken so as to ascertain the differences in access to water supplies and in particular the possible deterioration in water quality associated with local practices such as water collection and storage methods, for those households which did not have running water in their homes. Water samples were collected from unflamed taps, storage containers, if used, and a drinking vessel. These samples were analysed for microbiological quality at the municipal laboratory using standard methods. Further data analysis was undertaken by the MRC with assistance from the Council for Scientific and Industrial Research (CSIR).

2.4.3 Focus groups

A series of focus groups was held once the results of the 1 000 household survey had been collated. Since the more serious environmental problems were concentrated in the poorer areas, participants were selected to reflect this situation. The issues discussed in the focus groups were selected using the results of the survey plus the experience of the research and steering committees. A series of nine focus groups was held.

2.4.4 Children’s environment and health

Another initiative was launched in order to explore how children could be involved in both identifying environmental health issues and incorporated into environmental education efforts. A series of reports was commissioned from experts in education and communication (see Annexure 1), as was a video which depicts the environmental health issues facing children living in the poorer communities in Port Elizabeth.
2.4.5 Background commissioned reports

In addition to the above field-based research activities, there were a number of desk studies commissioned. These reports provide further detail regarding:

1. the context from an environmental health service provision perspective;
2. local government dynamics and the capacity of civil society to address issues;
3. details regarding the housing challenge facing the city and what strategies have been put in place to address the backlogs; and
4. a scoping study of the health impacts of using paraffin as a cooking fuel in the home.

Executive summaries of these reports can be found in Annexure 1.

2.4.6 Ongoing process

The above mentioned data provides a breadth and depth of information about household conditions in Port Elizabeth. It draws together both qualitative and quantitative methodologies which provide data which complement one another. The real challenge and strength of this approach is to synthesise the insights from the various sources and to be able to draw out the policy and implementation implications. The aim of this report is to synthesise the results and to generate additional knowledge from the technical reports which provide the detailed data from each of the surveys referred to above. The research is intended to lead to additional studies and to be able to inform the development of PE.

2.4.7 Analysis

2.4.7.1 Wealth-based quintiles

In the past, many South African studies used legally defined race groups as a proxy for social class. While it is helpful to use race as a classification category to be able to monitor the extent to which access to resources and opportunities are being equalised, it can be misleading with regard to the disparities in wealth in the population. As a result, and based on the other three city studies, a wealth-based set of criteria have been prepared and the analysis has been undertaken based primarily on wealth and not race.

Since it is very difficult to ascertain income, especially in areas with a large proportion of people employed in the informal sector, proxies for income are frequently used. In this study, five wealth categories (quintiles) were devised based on a points system derived from the value (reduced to a monthly repayment where necessary) of the consumer durables owned by the household (see Table 2.1). Using the classification shown in Table 2.2 the population of PE fell into five approximately equal groups. Those in the lowest quintile had very few possessions, e.g. they might own an iron and a radio or a radio and a car battery but could not have had all three as this would have given them sufficient points to enter the next category. The wealthiest owned a wide range of consumer durable goods such as refrigerators, televisions, video machines and cars.
Table 2.1 Weighting system for consumer durables as a proxy for wealth

<table>
<thead>
<tr>
<th>Consumer durable (wealth indicator)</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron</td>
<td>1</td>
</tr>
<tr>
<td>Radio</td>
<td>2</td>
</tr>
<tr>
<td>Black &amp; white TV</td>
<td>4</td>
</tr>
<tr>
<td>Microwave oven</td>
<td>8</td>
</tr>
<tr>
<td>Telephone</td>
<td>8</td>
</tr>
<tr>
<td>Colour TV</td>
<td>15</td>
</tr>
<tr>
<td>Video machine</td>
<td>15</td>
</tr>
<tr>
<td>Refrigerator</td>
<td>15</td>
</tr>
<tr>
<td>Car</td>
<td>60</td>
</tr>
<tr>
<td>If no electricity and car battery owned</td>
<td>2</td>
</tr>
<tr>
<td>If electricity: monthly cost/10 to a max. of 10 (Rand)</td>
<td>0-10</td>
</tr>
</tbody>
</table>

Table 2.2 Distribution of the sample according to 'wealth quintiles’

<table>
<thead>
<tr>
<th>Wealth quintile</th>
<th>Weighting score</th>
<th>Percentage of sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>&lt;5</td>
<td>18.2</td>
</tr>
<tr>
<td>Lower-middle</td>
<td>5-21</td>
<td>20.6</td>
</tr>
<tr>
<td>Middle</td>
<td>22-47</td>
<td>20.2</td>
</tr>
<tr>
<td>Upper middle</td>
<td>48-123</td>
<td>22.8</td>
</tr>
<tr>
<td>High</td>
<td>&gt;123</td>
<td>18.8</td>
</tr>
</tbody>
</table>

Based on the socio-economic profile of the PE population given in the PEM Housing Report (1996), the quintiles can be allocated to the estimated household income. It must be stressed that while this is a rough estimation, it is sufficiently accurate for most purposes.

When used in the report, the 1 000 household results are usually stratified by wealth quintile. The fuel and water survey results are usually broken down by access to water, as this was the manner in which the samples were defined.

2.4.7.2 Integration of the quantitative and qualitative data sets

Those who were responsible for managing and recording the focus groups were not involved in the initial surveys nor in the quantitative data analysis. The focus groups and child-based video material, (see Annexure 1) however, reinforced over and again the same issues which were identified in the quantitative surveys. This high consistency provides face validity for the findings.
3. SOCIO-DEMOGRAPHIC PROFILE

3.1 Introduction

This section will review the socio-demographic characteristics of the population, describing the household composition, wealth and racial disparities, migration characteristics and educational levels of the population.

3.2 Economic disparities

Economic power is typically the main determinant of access to goods and services. It is, however, difficult to measure. As discussed in the previous chapter, incomes are hard to accurately estimate with survey instruments, and so the ownership of consumer durables was used as a proxy for wealth and economic well-being in this study. In this report, wealth quintiles have been used as the basis for presenting the statistics. Typical commodities owned by households in the different wealth quintiles are shown in Table 3.1, as are the approximate income levels which are derived from the proportions of the population they represent.

<table>
<thead>
<tr>
<th>Wealth indicators</th>
<th>Low</th>
<th>Lower-middle</th>
<th>Middle</th>
<th>Upper-middle</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicative consumer durables</td>
<td>Iron and radio</td>
<td>Iron, radio, black and white TV, car battery</td>
<td>Refrigerator, colour TV</td>
<td>Refrigerator, colour TV, video machine (40%), microwave (30%) car (51%)</td>
<td>Refrigerator, colour TV, video machine, microwave, car.</td>
</tr>
<tr>
<td>Approximate household monthly income based on PE municipal housing statistics$^2$</td>
<td>&lt;R800 per month (42%)</td>
<td>R800 – R1 500 per month (15%)</td>
<td>R1 500 – R3 500 per month (21%)</td>
<td>&gt;R3 500 per month (22%)</td>
<td></td>
</tr>
</tbody>
</table>

1 The commodities indicated are typical of each quintile, but each household was classified into a wealth quintile based on the total value of the commodities owned.
The distribution of households by possessions and income indicates the dramatic differences that exist in access to opportunities of all kinds. However, with South Africa’s long history of using race as a legal construct for the distribution of resources, race is closely associated with economic power and may also determine a person’s politically based opportunities. Most of the analysis of this report is presented using wealth quintiles, but in some cases the racial dimensions are also explored and presented. This is considered important in order to provide a better basis for pursuing and monitoring efforts to reduce racially grounded disparities.

<table>
<thead>
<tr>
<th>Percent of the population in PE</th>
<th>Medical Officer of Health’s Report 1996/97</th>
<th>1 000 household survey(^3)</th>
<th>Provisional results 1996 National Census</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>66</td>
<td>59</td>
<td>56</td>
</tr>
<tr>
<td>Coloured</td>
<td>19</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td>White</td>
<td>15</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Indian</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Unspecified</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
</tbody>
</table>

The systematic exclusion of Blacks from access to all types of resources such as education, land and employment has resulted in large disparities in wealth between Black and White. From the data collected, the PE racial groups have the wealth breakdown shown (Figure 3.1 and Table 3.2). Black people, who represent the majority of the population, occur in all wealth groups, but are concentrated in the less well-off groups. A higher percentage of Coloured people is found in the middle and upper-middle quintiles. Whites and Asians are predominantly in the wealthiest group.\(^4\)

Source: 1 000 household survey

\(^3\)The above data highlights the historic problem of the accuracy of population statistics in South Africa. The 1 000 household survey undertaken for this study reflects racial distribution of the sample at a mid-point between the Medical Officer of Health and Census results.

\(^4\)The number of ‘Indian’ respondents is too small to be considered separately. In this report the terms ‘Indian’ and ‘Asian’ are used interchangeably.
From Table 3.3, it is also possible to describe the racial composition of the different wealth groups. Ninety-three percent of the households in the low wealth quintile are Black and the remainder is Coloured. The proportions are similar in the lower-middle wealth group. In contrast, the highest wealth group is 62% White, with Indians, Coloured people and Blacks each constituting 10-15%. All Indian households were in the highest two wealth quintiles. These outcomes are obvious consequences of previous apartheid policies. There are, however, a number of Black households which have managed to obtain wealth despite apartheid disadvantages. Figure 3.2 shows the distribution of wealth in the sampled enumerator areas of the city and, whilst the historical black ‘group areas’ are still closely associated with low wealth, there is evidence of the full range of wealth in certain predominantly Black areas.

Figure 3.2 Distribution of wealth in sampled enumerator areas

Source: Adapted from A.D. Walker, UPE 1998
3.3 Household composition

In the 1000 household survey, the average household size was 4.3 persons. The distribution of households of different sizes is depicted in Figure 3.3 and Table 3.4.

Table 3.4 Distribution of household sizes by wealth (%)

<table>
<thead>
<tr>
<th>People per household</th>
<th>Low</th>
<th>Lower-middle</th>
<th>Middle</th>
<th>Upper-middle</th>
<th>High</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>41.4</td>
<td>21.3</td>
<td>14.9</td>
<td>19.5</td>
<td>27.6</td>
<td>24.4</td>
</tr>
<tr>
<td>3-4</td>
<td>36.0</td>
<td>37.4</td>
<td>30.3</td>
<td>35.0</td>
<td>45.3</td>
<td>36.7</td>
</tr>
<tr>
<td>5-6</td>
<td>14.5</td>
<td>24.2</td>
<td>26.4</td>
<td>28.3</td>
<td>21.4</td>
<td>23.3</td>
</tr>
<tr>
<td>&gt;6</td>
<td>8.1</td>
<td>17.1</td>
<td>28.4</td>
<td>17.3</td>
<td>5.7</td>
<td>15.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td><strong>Total in sample</strong></td>
<td><strong>187</strong></td>
<td><strong>211</strong></td>
<td><strong>207</strong></td>
<td><strong>228</strong></td>
<td><strong>193</strong></td>
<td><strong>1 026</strong></td>
</tr>
</tbody>
</table>

Source: 1 000 household survey

Small households were more common in the poorest and the wealthiest quintiles. The relationship between wealth and household size in part reflects household life-cycles. The tendency for many of the poorest households to be small reflects a preponderance of single workers and newly established households with fewer consumer durables, and fewer children. On the other hand, the high share of smaller households in the wealthiest quintile includes long established households whose children are leaving home, as well as smaller nuclear (often White) households. The largest households were found among the Coloured population (average 5.4 persons), and the smallest among the White population (average 3.1). Some 75% of the households had children living at home. The 30% with three or more children in the household were mostly found in the middle wealth quintile.

3.3.1 Population structure

As depicted in the population pyramids (Figure 3.4), the age group 15-24 years is the largest in all wealth groups. This reflects a population structure typical of a developing country. When disaggregated, the data show distinct differences by wealth group. There is

5 However, the Medical Officer of Health’s Annual Report (1996/97) gave an estimated population of 1,031 million, in 160 000 households or an average household size of 6.4. The disparities between different estimates are an indication of the lack of reliable data on population and may also be a result of relative under-sampling of the higher density, predominantly Black areas, in this study.
a higher proportion of older people in the higher wealth categories and a larger proportion of youths in the lower wealth categories. In the lowest wealth group, however, both the elderly and children are under-represented. As indicated in Table 3.7, the highest wealth group has a more nuclear family structure while extended families are more common in the middle groups. The data also indicates that having relatives forming part of the household is common among the Black and Coloured households (almost 50%) but less frequent among Indians and Whites (about 15%).

Table 3.5 Distribution of children in households by wealth (%)

<table>
<thead>
<tr>
<th>Children in household</th>
<th>Wealth</th>
<th>Low</th>
<th>Lower-middle</th>
<th>Middle</th>
<th>Upper-middle</th>
<th>High</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>39.6</td>
<td>22.3</td>
<td>15.9</td>
<td>20.7</td>
<td>30.1</td>
<td>25.2</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>23.0</td>
<td>24.2</td>
<td>21.2</td>
<td>18.1</td>
<td>20.7</td>
<td>21.2</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>20.9</td>
<td>23.7</td>
<td>19.7</td>
<td>25.6</td>
<td>30.6</td>
<td>24.1</td>
</tr>
<tr>
<td>&gt;3</td>
<td></td>
<td>16.6</td>
<td>29.9</td>
<td>43.3</td>
<td>35.7</td>
<td>18.7</td>
<td>29.3</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: 1 000 household survey

Table 3.6 Distribution of children <6 years in households by wealth (%)

<table>
<thead>
<tr>
<th>Relatives in the household</th>
<th>Wealth</th>
<th>Low</th>
<th>Lower-middle</th>
<th>Middle</th>
<th>Upper-middle</th>
<th>High</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td></td>
<td>69.9</td>
<td>61.9</td>
<td>56.5</td>
<td>62.5</td>
<td>71.4</td>
<td>64.2</td>
</tr>
<tr>
<td>One small child</td>
<td></td>
<td>26.3</td>
<td>26.7</td>
<td>32.4</td>
<td>26.8</td>
<td>24.0</td>
<td>27.3</td>
</tr>
<tr>
<td>Two small children</td>
<td></td>
<td>3.8</td>
<td>8.6</td>
<td>7.2</td>
<td>9.4</td>
<td>3.6</td>
<td>6.7</td>
</tr>
<tr>
<td>Three or more small children</td>
<td></td>
<td>0.0</td>
<td>2.9</td>
<td>3.9</td>
<td>1.3</td>
<td>1.0</td>
<td>1.9</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: 1 000 household survey

Table 3.7 Distribution of relatives living in the household by wealth (%)

<table>
<thead>
<tr>
<th>Relatives in the household</th>
<th>Wealth</th>
<th>Low</th>
<th>Lower-middle</th>
<th>Middle</th>
<th>Upper-middle</th>
<th>High</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td></td>
<td>67.4</td>
<td>57.3</td>
<td>51.4</td>
<td>57.7</td>
<td>79.8</td>
<td>62.3</td>
</tr>
<tr>
<td>One relative</td>
<td></td>
<td>19.3</td>
<td>18.0</td>
<td>19.7</td>
<td>19.4</td>
<td>13.0</td>
<td>17.9</td>
</tr>
<tr>
<td>Two relatives</td>
<td></td>
<td>7.5</td>
<td>8.1</td>
<td>13.0</td>
<td>11.5</td>
<td>3.6</td>
<td>24.1</td>
</tr>
<tr>
<td>Three or more relatives</td>
<td></td>
<td>5.9</td>
<td>16.6</td>
<td>15.9</td>
<td>11.5</td>
<td>3.6</td>
<td>29.3</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: 1 000 household survey
Figure 3.4 Population pyramids by wealth

Source: 1 000 household survey
Table 3.8 Distribution of household head by wealth (%)

<table>
<thead>
<tr>
<th>Household head</th>
<th>Wealth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Couple</td>
<td>41.9</td>
</tr>
<tr>
<td>Female</td>
<td>36.6</td>
</tr>
<tr>
<td>Male</td>
<td>21.5</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: 1 000 household survey

Some 56% of the households had both a male and a female head of household, i.e. were headed by a couple (Table 3.8). Some 34% of the households were headed by females and 11% by males only. A third of the male-headed households were single person households, and half had no children of their own in the household. Over half of the male-headed households had no adult women living there. Of the female-headed households, however, only 8% were single person households. Close to half had no adult man in the household, but only 22% were without children. Female-headed households were actually as likely to have children as those headed by couples (having both a male and a female household head). Three quarters of the single-headed households were found among the Black population.

The age sex profile of the upper income group (48.4% male) is similar to the national average for South Africa. The lower income groups (44-45% male) reflected the Eastern Cape’s particular population structure, which is characterised by absent males.

The mean dependency ratio among the surveyed households was 1:2.6. The ratio was highest among the middle wealth groups (3.2) and low in both the lowest (1:2.1) and the highest wealth quintiles (1:2.2). This again reflects the life-cycle factors related to ageing, childbearing and wealth accumulation mentioned above.

Some 40% of the households had at least one unemployed person. The number of unemployed per household varied by wealth (see Table 3.9).

Table 3.9 Distribution of potentially economically active age group by employment status (%)

<table>
<thead>
<tr>
<th>During the day</th>
<th>Wealth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>At home</td>
<td>15.8</td>
</tr>
<tr>
<td>Looking for work</td>
<td>20.1</td>
</tr>
<tr>
<td>Not looking for work</td>
<td>10.1</td>
</tr>
<tr>
<td>At home, working</td>
<td>4.1</td>
</tr>
<tr>
<td>Working away from home</td>
<td>27.1</td>
</tr>
<tr>
<td>Full-time education</td>
<td>16.4</td>
</tr>
<tr>
<td>Disabled/pensioner</td>
<td>6.4</td>
</tr>
<tr>
<td>Total in sample</td>
<td>487</td>
</tr>
</tbody>
</table>

6 The household headship is ‘reported’ headship, where the respondents were free to nominate male or female heads of household or both.
7 The Eastern Cape Province has a high percentage of males who are migrants working on the mines, over 1 000 km from home.
9 Ratio of potentially economically active population (aged 15-64) to total number of dependents.
The problem of unemployment also featured strongly in all the focus groups. It emerged as the major concern of low-income groups. Some opinions and suggestions on the matter, which were voiced in focus groups, are shown below.

### Box 3.1 What people said about unemployment....

“The creation of employment opportunities is a key to all empowerment processes, and could also curb the mushrooming of additional shacks.”

“Unemployment robs people of an opportunity for self-realisation, results in dependency, and affects family members by leading to family disintegration and financial problems.”

“Priorities are provision of housing, provision of training and creation of employment opportunities.”

### 3.4 Migration

Nearly half of the residents interviewed were born in PE. Of people who had moved to PE, those in the upper wealth quintiles tended to have come to PE from other towns or cities, while those in the lower wealth quintiles had come mostly from farms or (smaller) towns. The respondents\(^\text{10}\) in the lowest wealth group were more likely to have moved to PE in the previous five years than any of the other groups but 45% of those in the lower two wealth groups had lived in PE for more than 20 years. The majority of those who had moved into PE in the previous 5 years were living in informal areas with precarious infrastructure.

Those in the mid wealth quintile were the most settled on their properties with 75% having lived in the same place for over 5 years. In the upper wealth quintiles, 60% had lived at the present home for more than 5 years. In contrast, those in the lower two groups were much more recently settled. In the poorest group, 70% of households had lived at the current site for less than 5 years, the majority having moved from other sites in PE. Table 3.10 depicts the close relationship between length of stay and wealth.

<table>
<thead>
<tr>
<th>Length of stay in years</th>
<th>Wealth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>&lt;5 years</td>
<td>7.51</td>
</tr>
<tr>
<td>5-10 years</td>
<td>12.21</td>
</tr>
<tr>
<td>Total in sample</td>
<td>186</td>
</tr>
</tbody>
</table>

Source: 1 000 household survey

### 3.5 Education

There are marked differences in educational levels between the wealth groups. Some 21% of all households had at least one member with higher education (tertiary diploma or a university degree) and 37% of these people were in the highest wealth quintile and only 4%...
in the lowest wealth quintile (see Table 3.11). Households with well-educated members are found across the racial groups, with the Indians being significantly more likely to have at least one highly educated member (44% of the households). For the other racial groups the proportion was 19% (Blacks), 23% (Coloured people) and 24% (Whites).

Table 3.11 Higher education by wealth (%)

<table>
<thead>
<tr>
<th>With higher education</th>
<th>Wealth</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Lower-middle</td>
<td>Middle</td>
<td>Upper-middle</td>
<td>High</td>
<td>Total</td>
</tr>
<tr>
<td>No</td>
<td>96.3</td>
<td>92.9</td>
<td>76.9</td>
<td>66.1</td>
<td>63.2</td>
<td>78.8</td>
</tr>
<tr>
<td>Yes</td>
<td>3.7</td>
<td>7.1</td>
<td>23.1</td>
<td>33.9</td>
<td>36.8</td>
<td>21.2</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: 1 000 household survey

It is interesting to note that the correlation between wealth and higher education is much stronger for Black people. Some 52% of the (110) Black households in the upper two wealth quintiles had a member with a diploma or a degree. For the other groups the percentages were lower: Indians, 44% (all Indian respondents fell into these wealth groups); Coloured, 33%, and Whites, only 25%. This suggests that education is a particularly important means for Blacks to achieve success, but that it still does not compensate for other disadvantages.

Functional illiteracy of all potentially economically active household members (defined as less than ‘Standard 4’ education)11 (in the potentially economically active group) ranges from 29% in the lowest wealth group to 0.6% in the wealthiest group (see Table 3.12).

Table 3.12 Functional illiteracy of potentially economically active household members (%)

<table>
<thead>
<tr>
<th>Illiteracy</th>
<th>Wealth</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Lower-middle</td>
<td>Middle</td>
<td>Upper-middle</td>
<td>High</td>
<td>Total</td>
</tr>
<tr>
<td>Potentially economically active and functionally illiterate12</td>
<td>29</td>
<td>17</td>
<td>14</td>
<td>5</td>
<td>0.6</td>
<td>100</td>
</tr>
<tr>
<td>Total number</td>
<td>739</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: 1 000 household survey

3.6 Summary

The study highlights the wide socio-economic disparities in PE which result, inter alia, from a range of factors, including the inequitable access to education in the past and migration from deprived rural areas to the city. The disparities are deepening due to the increasing levels of unemployment, concentrated in the poorer groups. The analysis has used a commodity ownership index to divide the sample into wealth quintiles but these reflect the racial disparities due to the apartheid policies of the past. Wealth and race categories are used in the report to help in targeting suggested interventions to address the environment and health issues at a household level.

11 ‘Functionally illiterate’ refers to those with a Std 4 education or less. This level of literacy should be achieved by a child of age 12. According to the education policy, children are supposed to start school at the age of 7 - however, there are many pupils who are substantially older than the norm for their class due to the lack of access to schools and political upheavals in the schools in the past.
4. HOUSING

4.1 Introduction

One of South Africa’s major challenges is the provision of safe and affordable housing. An estimated 3 million people, of South Africa’s approximately 40 million people, live in what is officially regarded as inadequate housing. Those in inadequate housing1 are almost all Black, a result of a long history of institutionalised racism. In PE, the ‘backlog’ of housing2 is estimated at over 40 000 housing sites and top structures and about 26 000 top structures on already serviced sites. If the projected natural population growth to the year 2010 is to be accommodated (estimated to result in a need for a further 66 000 units), then an average of 7 600 units need to be produced per year. The majority of these housing units are required by low-income groups, for whom the Council has to play an active role as developer or as provider of land. On the demand side, expectations far exceed what is currently provided. In the past, most low-income homes were, however, erected outside the ‘formal’ system of housing provision. Problems here relate to poor building materials and methods of construction falling far short of most householders’ needs.

South Africa’s housing policies have generally been geared towards addressing the very urgent supply side of housing needs. However, limited attention has been given to addressing the fundamental social and spatial divisions, which characterise the country’s cities3.

This chapter will first review national and local policies and plans in relation to housing. Thereafter, the findings from the survey and group discussions in relation to home ownership and house structures are discussed.

4.2 National, provincial and local policy and strategies

A central component of the national housing policy in South Africa is a subsidy scheme, designed to enable families below a certain income (currently R3 500 per month) to obtain a serviced site4 as well as contribute towards the house structure (see Box 4.1 below). Those in need of new housing are typically living in overcrowded housing, backyard shacks and shacks5 in unserviced areas, or as families in hostels intended for single sex use.

2 Housing backlog refers to the difference between the estimated demand for house structures and the available supply.
4 Service levels vary but generally include piped water to, or near, the plot and sanitation. The latter varies from ventilated improved pit latrines (VIP of various designs) through septic tanks, with or without flushing systems, to full water-borne sanitation.
5 ‘Shack’ is the generally used word to refer to a single-storey informal structure made of materials such as wattle and daub, corrugated iron sheeting, cardboard and plastic.
A number of problems have emerged in the process of the massive housing delivery effort
countrywide. These include problems of funding, delivery process and building standards.

The annual provincial budgets for housing subsidies are too small for the current demand
and as a result delivery is being delayed. Furthermore, the banking sector has not been
willing to make home-loans available to low-income or unemployed borrowers. Special
initiatives are under-way to reduce the risks faced by developers and to set up guarantees
for small borrowers’ loans (see Box 4.2 on the PE Low Income Housing Programme
(PELIP)).

6 This amount was amended in 1998 to account for inflation.
The housing subsidy system charges developers with the responsibility for setting up partnerships with local governments and community groups. This has been fraught with difficulty owing to mistrust, incompatible objectives and other problems. There are great disparities between the expectations of the end users of completed house structures and what is possible within the scope of the subsidy scheme. While many end-users aspire to a four-roomed house made of bricks or blocks with full services on site, the subsidy amount only covers the minimum levels of service with a small residual for the top structure, or alternatively, full services (with no residual for the house).8

Provincial Housing Boards have made further stipulations of minimum standards for basic services and the size of the top structures. Each subsidised housing opportunity is required to fulfill at least the minimum requirements of having a communal standpipe within 200 metres of the house, and a ventilated improved pit latrine (VIP). The residual amount left over from the subsidy after provision of basic services is made available to the owner/developer as a contribution towards a small starter home.

However, the standards are at times not achievable within prevailing financial allocations and geo-physical conditions. Furthermore, it appears that the design standards are not based on health criteria, nor on the residents’ priorities. Up until the end of 1997, there was a lack of guidelines in the provision of housing. An amendment to the Housing Amendment Act of 1993 in late 1997 has provided a vehicle for guidelines to be developed, but this is yet to be accomplished.10

Like the national housing policy, PE Municipality’s Local Housing Strategy (1996)11 also targets households with incomes below R3 500 per month but this is equivalent to 78% of the city’s population (see Figure 4.1 below).

8 Background reports by Bleibaum 1998 and 1997 provide detail on these issues.
9 For example, the specifications for communal standpipes do not make any suggestions regarding the need for adequate soak aways in the vicinity of the taps.
10 However the Housing Amendment Act was repealed by the Housing Act promulgated in December 1997. In terms of this Act, the Minister must determine national policy, including national norms and standards, in respect of housing development. The Act states that national norms and standards refer to permanent residential structures and may also refer to other aspects of the housing product. To date no such norms and standards have been published.
11 Towards Housing the People of PE by 2010, PE Municipality, 1996.
The City Council is committed to obtaining as many housing subsidies as possible from the Provincial Housing Board, and then to facilitating additional top-up finance. To accommodate the varying strategies for households of different income ranges, the proposed strategy targets each of the income groups shown in Box 4.3 as follows:

**Box 4.3 PE City Council housing strategy**

Households with incomes up to R800 per month: encourage owner builder construction through agencies such as the Homeless People’s Federation, and encourage community driven savings plans for additional funds.

Households with incomes of R800 to R1 500 per month: facilitate access to small loans of up to R10 000 through the Sida/PELIP programme (referred to in Box 4.2) and possibly other funding mechanisms.

Households with incomes of R1 500 to R3 500 per month: promote housing developments with micro-loans and conventional mortgage loans for the employed sector of the community, with employer assistance where possible.

Table 4.1 highlights the fact that the bulk of the Municipality’s innovative approaches are targeted to those with incomes between R801 and R3 500, whereas households with incomes below R 800 per month are mostly left to use their own resources apart from the national subsidy scheme.

---

**Figure 4.1 Income distribution of the population of PE**

![Pie chart showing income distribution](chart.png)

*Source: Towards Housing the People of PE by 2010, 1996, Annexure 1, p i, Table 1 Income Distribution PE Households for 1995.*

12 Data adjusted by the PE Municipality for the report from the 1991 census results.
Table 4.1 Summary of the PE municipal housing strategy to meet the housing need by income group

<table>
<thead>
<tr>
<th>Income group (monthly household income)</th>
<th>Serviced sites and houses (required)</th>
<th>Percentage</th>
<th>Accepted PE municipality strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to R800</td>
<td>70 239</td>
<td>66</td>
<td>Owner builder, community saving clubs</td>
</tr>
<tr>
<td>R801 to R1 500</td>
<td>17 469</td>
<td>16</td>
<td>Sida small loans, rent to buy etc.</td>
</tr>
<tr>
<td>R1 501 to R2 500</td>
<td>7 255</td>
<td>7</td>
<td>Micro loans, conventional loans and employer-assisted housing</td>
</tr>
<tr>
<td>R2 501 to R3 500</td>
<td>3 306</td>
<td>3</td>
<td>Micro loans, conventional loans and employer-assisted housing</td>
</tr>
<tr>
<td>Over R3 500</td>
<td>8 364</td>
<td>8</td>
<td>None needed</td>
</tr>
<tr>
<td>Total</td>
<td>106 633</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>


Apart from the municipal initiatives outlined above, there are a number of innovative approaches to address problems of overcrowding and poor access to services in low-income areas. Private groups, such as the Delta Foundation, are actively involved in finding more cost-effective solutions, specifically in the area of housing design, to work within the financial allocations of the national subsidy scheme (see Box 4.4).

In housing projects funded by the Provincial Housing Board, the PE Council has defined a minimum level of service in addition to those established nationally and those of the Provincial Housing Board. Each site is to be provided with flush toilets connected to a waterborne sewerage system, an on-site water supply with a consumption meter, gravel surfaced roads with surface stormwater drainage and public street lighting. Certain low-income residential areas have also been provided with domestic electricity reticulation in the form of aerial bundle conductors.
Box 4.4 An innovative approach for increasing living space sponsored by the Delta Foundation

In 1995, the Delta Foundation (sponsored by Delta, a very big motor car manufacturer in PE) financed an investigation into the factors which have prevented the rapid delivery of houses at the lowest end of the housing market. The study concentrated on housing for those earning less than R800 per month and eligible for the Provincial Housing Board subsidy of R15 000.

The study concluded that the subsidy amount could be more effectively used and the recipients housed in accommodation more closely aligned to their expectations if a number of trade-offs were effected. The study was followed by a project testing these ideas using 21 families in an experimental project at Missionvale. Following a lengthy negotiation phase, a variety of demonstration houses, with floor areas ranging from 12m² to 68m², were constructed (see Figure 4.2). The building specifications and the construction methods used subsequently formed the basis for a tender to which a number of contractors, NGOs and self-help support groups responded. The main impact of the initiative has been that the owners were able to achieve significantly larger floor areas in the dwellings where alternative ‘collective’ approaches were adopted. This alternative approach includes some of the following solutions, all of which contribute to lower construction costs and allow larger homes to be constructed:

- communal or shared services (as opposed to individual services for each family unit);
- smaller plot sizes, with narrower street frontages and higher densities;
- common ‘party’ walls in duplex and fourplex units;
- concentration of plumbing through the grouping of bathroom facilities in duplex and fourplex units; and
- Self-help methods of construction (labour substitution).

The self-help approach to housing delivery needs careful analysis, however, since there are hidden costs, sometimes creating a false impression at a level of housing which is extremely price-sensitive. Nonetheless, self-help has social benefits such as the use of local skills and providing training opportunities.

Useful insights were gained through the project, both in the planning and implementation stages. These include:

Plot size and density. ‘Recipients’ are generally willing to trade large plots with small houses for larger houses on small plots. What needs to be examined further is the possibility of reducing front and side spaces in order to consolidate more efficiently usable space on one side of the house, preferably at the rear. This will lead to higher densities and more usable space even at a reduced overall size.

Organisational structure at community level. Few members of the community had experience of home ownership. Thus, further information regarding the rights and obligations of the homeowner vis-à-vis the local authority, neighbours and him/herself is required. There is also a need for community organisational structures, possibly at street (precinct) level, consisting of a group of families (say 20 or 30) to co-operate with the municipality in ensuring that service maintenance aspects at street level (i.e. blocked drains, burst pipes, refuse collection, tree maintenance, municipal lighting, etc.) are effected. This could help the municipality to fully assume its maintenance responsibilities and provide a channel for communications between communities and the local authorities.

Source: Interviews with Delta Foundation Project Managers, Metroplan, PE
Figure 4.2 Photo collage of the Delta project

Shared walls and water/sewer connections allows increased proportion of subsidy to be used for the house.

Typical RDP house - 20m²

Shared plumbing between four Delta, demonstration houses allows increased floor areas - 68m².
4.3 Location of land for settlement

Land has been identified for the low-income housing projects. The project sites are to be located in the northern areas of PE, to the north and west of Bethelsdorp, north of Kwa Dwesi and Kwa Magxaki, and north and east of Motherwell. This allocation would be expected to further entrench the spatio-racial distribution of the population. Thus, an even larger share of the Black population can in the future be expected to be living far away from the city centre with poor transport and poor access to employment and commercial services. A vigorous initiative is needed to ensure that suitable vacant land within the city is developed before further land is allocated for settlement on the periphery. Further details can be found in Annexure 1.13

4.4 Suitability of land for settlement and access to basic services

When people locate and construct their own homes independently of official plans, the houses tend to be well located with respect to employment opportunities. However, other factors may make these areas unsuitable for housing development. One example is the sprawling settlement in the Chetty River floodplain, which persists, in spite of repeated flooding of the area,14 as well as ongoing attempts to relocate the residents to a different site. The risks faced by households located in dangerous locations can include the loss of lives, homes, possessions and trauma. Still, the Chetty River area is continually invaded by people in search of a place to settle. Other examples of poorly located housing include settlements adjacent to refuse dumps, where again, health risks are traded for income earning opportunities (which of course bring indirect health benefits).

Spontaneous settlements occur in already overcrowded former ‘townships’ on land designated for public facilities such as schools and open space. This is often a problem for planners and residents. In addition, informal housing is often densely packed as a consequence of the shortage of accessible land. There is a range of problems which result from this condition, including lack of space for expansion of houses, inadequate access to refuse removal, water, sanitation and disposal of sullage, and the risk of fire.

Of particular concern is the lack of access to emergency services. Ambulances and fire services are often unable to enter informal areas and as a result, the residents are less protected against damage to property and life. There are a number of factors which make informal housing areas particularly susceptible to fires. These include the burning of waste (as there are rarely any refuse removal services), the use of paraffin and candles (as electricity is often lacking), the use of inflammable construction and insulation materials such as wood, cardboard and plastic sheeting (alternatives are expensive), and the close proximity of the houses to each other (exacerbating the risks of the fire spreading).

Community and local government partnerships are needed to make sure that land is allocated speedily for settlement in areas that are well located with regard to employment opportunities. Also, people living on dangerous sites must be fully informed about the risks they are facing, as well as the problems they cause when living on land destined for other uses. While some problems regarding squatting may prove difficult to resolve, there is well-located vacant land within PE where the settling of communities could be negotiated.

4.5 Need for space, privacy and protection

The main housing problems, described below, are tied to human comfort and the issue of overcrowding. Key concerns are the lack of space, privacy and protection from the elements. Focus groups expressed dissatisfaction (Box 4.5) despite the energetic programme underway since 1994 to address the housing and services backlogs. The main

13 See background report by Bleibaum, 1997.
14 Overall, 7% of the households in the 1 000 household survey indicated ‘flooding’ as their primary environmental concern.
concerns were related to the small size of buildings provided through the subsidy scheme, compared to the much larger structures anticipated. The underlying major constraint in addressing the current housing problems is poverty.15

Box 4.5 What people said about housing

“Housing is a basic right.”

“The small size of shacks results in overcrowding and this in turn leads to juvenile delinquency.”

“Shacks provide no privacy to individuals, young or old. Parents with anti-social behaviour have a profound impact on the socialisation of their children.”

“Backyard shacks are especially a problem due to a lack of service provision.”

“The general lack of facilities, be it schools, clinics, police stations, parks etc., is a major housing problem.”

4.6 Tenure

In the 1 000 household survey, respondents were asked about the ownership status of their homes and the land on which they were constructed. Overall, 70% said they owned their houses, and 59% also owned the land. As shown in Table 4.2, house and land ownership approached 90% in the highest wealth quintile, while it ranged between 33% for land and 57% for houses in the lowest wealth quintile. Lack of legal title to the house/land is inversely related to wealth.

Table 4.2 Land and house ownership by quintile (%)

<table>
<thead>
<tr>
<th>Ownership</th>
<th>Wealth</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Lower-middle</td>
<td>Middle</td>
<td>Upper-middle</td>
<td>High</td>
<td>Total</td>
</tr>
<tr>
<td>House</td>
<td>57</td>
<td>60</td>
<td>91</td>
<td>73</td>
<td>88</td>
<td>70</td>
</tr>
<tr>
<td>Land</td>
<td>33</td>
<td>40</td>
<td>65</td>
<td>69</td>
<td>89</td>
<td>59</td>
</tr>
</tbody>
</table>

Of the house owners, 84% also owned the land on which the house was built, 2% rented it, while 14% had no title to the land. In the highest wealth quintile land and house ownership were closely correlated, whereas in the lowest wealth quintile, 43% of the house-owners had no title to the land. This raises concern about poorer households having invested in permanent structures on land to which they have no legal right. While insecure land tenure is more predominant among the Black population, this precarious situation is more closely linked to wealth than to race.

Focus group discussions on housing also illustrate the importance of housing from a human rights as well as an emotional perspective. A dwelling should provide security, comfort and a safe place to raise children. Few people seemed to believe that housing should be acquired in accordance with economic capacity, at least when those capacities are low.

15 Virtually all the focus groups indicated that unemployment was a major constraint to development.
4.7 Housing structures in PE

The majority of households in PE live in individual houses (75%). The remainder occupy semi-detached houses (15%), flats (7%) or hostels (3%) (see Table 4.3). The houses comprise a variety of very different structures, ranging from flimsy shacks to luxurious homes, as indicated by the differences in house and plot size, as well as building materials used (see Figure 4.3).

Table 4.3 Type of dwelling

<table>
<thead>
<tr>
<th>Dwelling</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single house</td>
<td>768</td>
<td>75.4</td>
</tr>
<tr>
<td>Semi-detached house</td>
<td>149</td>
<td>14.6</td>
</tr>
<tr>
<td>Flat</td>
<td>72</td>
<td>7.1</td>
</tr>
<tr>
<td>Hostel</td>
<td>30</td>
<td>2.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1 019</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: 1 000 household survey

4.8 Size of dwellings

The median number of rooms per dwelling was 4 (see Table 4.4). The dwelling size is, not surprisingly, strongly correlated to wealth. The median number of rooms (including kitchens but excluding bathrooms) was, for the lowest wealth quintile, 2, lower-middle, 3, middle, 4, upper-middle, 5, and for the highest wealth group, 6 rooms. For houses with up to four rooms, there is also a correlation between the number of rooms and the number of people living in the household: the larger the household, the larger the dwelling. However, this relationship does not hold for the largest dwellings.

Table 4.4 Number of rooms

<table>
<thead>
<tr>
<th>Number of rooms</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>75</td>
<td>7.4</td>
</tr>
<tr>
<td>2</td>
<td>121</td>
<td>11.9</td>
</tr>
<tr>
<td>3</td>
<td>129</td>
<td>12.7</td>
</tr>
<tr>
<td>4</td>
<td>345</td>
<td>33.9</td>
</tr>
<tr>
<td>5</td>
<td>123</td>
<td>12.1</td>
</tr>
<tr>
<td>6</td>
<td>224</td>
<td>22.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1 017</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: 1 000 household survey

---

16 Hostels were built as temporary urban accommodation for single-sex migrants working in urban areas on contract from rural areas. This was one of the means used by the apartheid government to keep families in rural areas. Most hostels are now occupied by families.
Figure 4.3 House types by wealth

Low wealth quintile housing

Lower-middle wealth quintile housing

Middle wealth quintile housing

Upper-middle wealth quintile housing

High wealth quintile housing
The floor area of homes varied, with one third of all homes being less than 50m², just over a third between 50m² and 100m², and somewhat less than a third greater than 100m². In the lowest wealth quintile, 36% of households were living in structures of less than 20m² and 82% living in structures less than 50m² (see Table 4.5).

<table>
<thead>
<tr>
<th>Mean house size (m²)</th>
<th>Wealth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>&lt;20</td>
<td>36.5</td>
</tr>
<tr>
<td>20 – 49</td>
<td>45.7</td>
</tr>
<tr>
<td>50 – 99</td>
<td>16</td>
</tr>
<tr>
<td>&gt;100</td>
<td>17.7</td>
</tr>
<tr>
<td>Number</td>
<td>175</td>
</tr>
<tr>
<td>Mean (m²)</td>
<td>35.4</td>
</tr>
<tr>
<td>sd</td>
<td>29.8</td>
</tr>
</tbody>
</table>

Source: 1000 household survey

The ‘RDP’ housing subsidy houses often have floor areas of less than 18m². This was raised as a problem in the focus groups, where people voiced dissatisfaction with new houses provided through the housing subsidy scheme having floor areas of less than 45m². Many RDP houses have been extended with informal structures to meet the accommodation needs of the households. To stretch the subsidy amount to accommodate larger houses, major changes in the approach to delivery would be required. One attempt in this regard is presented in Box 4.4 above.

The plot size of the residential stands also varied by wealth. The estimated plot sizes from the survey in PE are shown in Table 4.6.

Table 4.6 Estimated size of plot according to wealth

<table>
<thead>
<tr>
<th>Plot size (m²)</th>
<th>Wealth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>&lt;50</td>
<td>11.4</td>
</tr>
<tr>
<td>50-99</td>
<td>22.8</td>
</tr>
<tr>
<td>100-199</td>
<td>33.5</td>
</tr>
<tr>
<td>200-499</td>
<td>31.7</td>
</tr>
<tr>
<td>&gt;500</td>
<td>0.6</td>
</tr>
<tr>
<td>Less than 300</td>
<td>87.7</td>
</tr>
</tbody>
</table>

Source: 1000 household survey

When considering wealth and plot size, over 60% of those in the lowest two quintiles (the poorest 40%) were living on plots smaller than 200m². The expressed concern from the focus groups was that plot size should not be less than 300m². The proportion of houses in PE with a plot size of less than 300m² is 39.9%. This raises a real dilemma for the planners dealing with subsidy schemes, as there is a trade-off between the servicing costs of larger plots and the residual for the top structure. The desire of the focus group respondents for a four-bedroomed 45m² home on a plot of greater than 300m² may not be possible without substantial inputs of resources by the residents themselves.

---

17 A typical South African four-roomed house has a floor area of 85m².
18 The Minister of Housing has stated that all subsidised houses should be in excess of 30m². Business Day 23.12.98.
4.9 Building materials

The different building materials used in PE clearly display the vast contrasts in living standards. Examples of different building structures are shown in the photo-collage in Figure 4.2 above. According to the 1 000 household survey, the most common building material in PE is brick. Bricks were used for walls in 71% of the cases, but most often found in the dwellings of the wealthier households. Alternative wall materials, predominantly used in low-income homes, were corrugated metal sheeting (15%) and wood (13%). The smallest houses, one-roomed shacks, most often had thin sheeting wooden walls (see Table 4.7).

The most commonly used material for roofs was asbestos sheets (39% of the households), corrugated iron or zinc (29%) and roof tiles (23%). The latter predominated among the wealthier households, whereas corrugated metal sheeting was the most commonly used material among the lowest wealth households (68%). Some 10% of the poorest homes had plastic, wood or hardboard roofs (see Table 4.8).

Another matter of concern is the flooring of many houses. While most houses had cement floors, and several had carpeted or wooden floors, over 18% of all households had mud floors. In the much poorer city of Accra, Ghana, where a similar study was undertaken in 1991/92, only 3 of the 1 000 households surveyed had mud floors.

<table>
<thead>
<tr>
<th>Table 4.7 Main construction materials – walls (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wall materials</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Low</td>
</tr>
<tr>
<td>Lower-middle</td>
</tr>
<tr>
<td>Middle</td>
</tr>
<tr>
<td>Upper-middle</td>
</tr>
<tr>
<td>High</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>Bricks/blocks/cement</td>
</tr>
<tr>
<td>Corrugated iron/zinc</td>
</tr>
<tr>
<td>Wood</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Total in sample</td>
</tr>
</tbody>
</table>

Source: 1 000 household survey

<table>
<thead>
<tr>
<th>Table 4.8 Main construction materials – roofs (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Roof materials</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Low</td>
</tr>
<tr>
<td>Lower-middle</td>
</tr>
<tr>
<td>Middle</td>
</tr>
<tr>
<td>Upper-middle</td>
</tr>
<tr>
<td>High</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>Asbestos</td>
</tr>
<tr>
<td>Corrugated Iron/zinc</td>
</tr>
<tr>
<td>Roof Tiles</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Total in sample</td>
</tr>
</tbody>
</table>

Source: 1 000 household survey

19 In the much poorer city of Accra, Ghana, where a similar study was undertaken in 1991/92, only 3 of the 1 000 households surveyed had mud floors.
### Table 4.9 Main construction materials – floors (%)

<table>
<thead>
<tr>
<th>Floor materials</th>
<th>Low</th>
<th>Lower-middle</th>
<th>Middle</th>
<th>Upper-middle</th>
<th>High</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cement</td>
<td>35.0</td>
<td>38.1</td>
<td>39.0</td>
<td>42.5</td>
<td>37.3</td>
<td>38.5</td>
</tr>
<tr>
<td>Carpet</td>
<td>6.6</td>
<td>11.9</td>
<td>22.4</td>
<td>24.3</td>
<td>30.6</td>
<td>19.4</td>
</tr>
<tr>
<td>Mud</td>
<td>41.5</td>
<td>23.8</td>
<td>9.8</td>
<td>14.2</td>
<td>4.1</td>
<td>18.3</td>
</tr>
<tr>
<td>Wood</td>
<td>9.3</td>
<td>13.8</td>
<td>14.6</td>
<td>13.7</td>
<td>27.5</td>
<td>15.7</td>
</tr>
<tr>
<td>Other</td>
<td>7.7</td>
<td>12.4</td>
<td>14.1</td>
<td>5.3</td>
<td>0.5</td>
<td>8.1</td>
</tr>
<tr>
<td><strong>Total in sample</strong></td>
<td><strong>183</strong></td>
<td><strong>210</strong></td>
<td><strong>205</strong></td>
<td><strong>226</strong></td>
<td><strong>193</strong></td>
<td><strong>1 017</strong></td>
</tr>
</tbody>
</table>

*Source: 1 000 household survey*

The range of buildings offers varying degrees of protection from the wet winter climate of PE. While 46% of the households, overall, reported problems with dampness in the home, this figure was 85% among those with shacks made out of corrugated metal sheeting or wood, and 71% of all households with mud floors.

Some 60% of the dwellings had ceilings, ranging from 93% in the highest wealth group to 17% in the lowest. Virtually all houses with roof tiles (the wealthier households) also had ceilings, whereas homes with metal roofs (the poorest households) rarely had a separate ceiling. However, to compensate for the poor thermal efficiency of walls made out of metal or thin wooden sheeting, 60% of low wealth households insulated their walls with materials such as paper and cardboard. While providing some relief from temperature extremes, these insulation materials can exacerbate problems with dampness, as well as present a fire hazard. (For further discussion on the impact of building materials on health see section 5.2 below.)

### 4.10 Summary

1. National Housing Policy provides for housing subsidies to be made available to those who meet certain income criteria. An ambitious programme is underway by Port Elizabeth Municipality to meet the shortfall in housing by 2020.
2. There is a mismatch between the type of house aspired to and what can be delivered within the subsidy constraints. The size of house and plot being delivered is considered to be too small by the focus group participants. Additional innovation is needed to try to increase the floor area of the structure and to make micro loans more accessible.
3. Some 70% of houses in Port Elizabeth are constructed of brick. The balance is made of thin wooden sheeting and corrugated iron.
4. A number of problems were identified in houses occupied by the lower wealth groups. These included damp, poor ventilation and poor thermal efficiency.
5. Despite the ambitious endeavours of Port Elizabeth Municipality in addressing the backlogs in the provision of housing, it would appear that there will be a long wait before the majority of those in need will get access to the form of housing proposed by Port Elizabeth Municipality. This underpins the need for both short and longer term strategies.
6. For the majority, who have a household income of less than R800 per month, the chances of being able to build a 45m² brick house, (the aspired to standard) are low. It is therefore proposed that mechanisms be put in place to help those who are in this position to maximise the opportunities to improve their living environments through housing savings clubs, housing advice and housing co-operatives. Innovation in building technologies and mechanisms for stretching the subsidy as far as possible should be given specific attention. (An example by Delta Foundation is provided in Box 4.4.)

20 Whilst ‘carpet’ is not usually regarded as floor construction material it is used directly on the ground in some informal settlements. The response to this question therefore probably overlaps with ‘mud’ among the poor and ‘cement’ or ‘wood’ in the wealthier households.
4.11 Suggested responses

1. The rapid release of serviced land is necessary as a first step for addressing the overcrowding problem.
2. Innovative methods should be devised and encouraged to maximise the floor area of the subsidy-funded structures.
3. Pilot projects and educational initiatives through the housing support process and civic organisations are necessary to maximise the health benefit of the subsidy. Thermal efficiency, ventilation and the use of materials which protect the occupants from the elements, especially damp, should be addressed.
4. In the short term, educational materials should be developed and used to improve the understanding by end-users of the environmental aspects of informal structures and the health benefits of potential improvements.
5. All new housing-related environmental guidelines or standards should take full account of the overall environmental and health consequences of their implementation.
5. INDOOR ENVIRONMENTS

5.1 Introduction

Whilst the physical construction of a house is a major determinant of the living environment, the manner of use of the dwelling also influences health. Thus issues such as overcrowding and indoor air quality are of importance. Since the modification of risk factors associated with human behaviour, rather than with physical structures, require different approaches, they are dealt with in a separate chapter which gives greater emphasis to the qualitative data relating to people’s perceptions of the living environment.

5.2 Crowding and comfort

Crowding emerged as one of the major reasons for dissatisfaction with housing conditions. Focus group participants highlighted the social implication of this (see Box 4.5 above).

An overcrowding index (adapted from Batson, 1943) based on the number of people per habitable room and which regards children under 10 as half an adult, was used to calculate levels of overcrowding. According to this index, half the houses in Port Elizabeth (PE) were not crowded, 32% were overcrowded and 18% grossly overcrowded (see Table 5.1).

Table 5.1 Overcrowding (modified Batson Scale) according to wealth (%)

<table>
<thead>
<tr>
<th>Crowding</th>
<th>Wealth</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Lower-middle</td>
<td>Middle</td>
<td>Upper-middle</td>
<td>High</td>
</tr>
<tr>
<td>Uncrowded</td>
<td>51.6</td>
<td>34.1</td>
<td>30.7</td>
<td>49.6</td>
<td>85.3</td>
</tr>
<tr>
<td>Over-crowded</td>
<td>34.1</td>
<td>40.3</td>
<td>35.1</td>
<td>35.8</td>
<td>13.2</td>
</tr>
<tr>
<td>Grossly over-crowded</td>
<td>14.3</td>
<td>25.6</td>
<td>34.1</td>
<td>14.6</td>
<td>1.6</td>
</tr>
<tr>
<td>Total in sample</td>
<td>182</td>
<td>211</td>
<td>205</td>
<td>226</td>
<td>190</td>
</tr>
</tbody>
</table>

Source: 1 000 household survey

1 Based on an average occupancy standard and sex-separation, those aged ten or over are classified as an ‘adult’ and those under ten are classified as ‘half an adult’. The three categories presented by Batson were slightly modified for this study. The three categories used here are: uncrowded, overcrowded, and grossly overcrowded. See the Interim Report of the Social Survey in Cape Town, by Batson E in the official report of the Social Survey Conference in Cape Town 1943, Hortors, Cape Town for further information.
Those living in shacks in the lowest wealth quintile tend to be living in less crowded conditions. It appears that there is a trade-off between other forms of wealth and space with many of the lower wealth households living in less crowded conditions than those in the middle wealth quintiles. Some households may purposefully do without some material goods, in order to afford a larger home with more space and privacy. However, this effect could also be a result of household ‘life-cycle effects’ (see Chapter 3 for further details).

The highest levels of overcrowding occur in the middle wealth quintile. This raises questions in relation to the health linkages to crowding and the cultural values embedded in the measurement tool. Further research is suggested to investigate people’s perceptions of crowding and its health impacts.

An alternative indicator of crowding is the prevalence of sharing of beds. In 29% of all households there were regularly more than two people sleeping in one bed. This situation is most common in the middle and middle to lower wealth groups, where it was reported in nearly 40% of the households. This corroborates the findings on overcrowding in general.

Another indicator, the average number of people sleeping in each room, was 2.27. The mean by wealth groups is shown in Figure 5.1, where the highest number was found in the second lowest quintile. The main conclusion, however, should be that crowding is an issue of concern in the lowest three quintiles.

The comparison of crowding for different wealth quintiles using a range of indicators of crowding is shown in Table 5.2. There would appear to be a need for a more in-depth analysis of the crowding data to develop appropriate tools for assessing the health risks of crowding. This view is endorsed by Clauson-Kaas et al that a ‘range of indicators of crowding could improve the measuring of this potential health risk’ (1996, p349;1997,p1)2,3.

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**Figure 5.1 Mean number of people sleeping per room by wealth**

![Bar chart showing mean number of people sleeping per room by wealth quintile.](chart.png)

The mean number of people sleeping per room by wealth quintile is as follows:
- Low: 2.50
- Lower-middle: 2.66
- Middle: 2.55
- Upper-middle: 1.77
- High: 1.47

Overall mean: 2.27

---

Table 5.2 Crowding by wealth according to a range of indicators (%)

<table>
<thead>
<tr>
<th>Measures of crowding</th>
<th>Low</th>
<th>Lower-middle</th>
<th>Middle</th>
<th>Upper-middle</th>
<th>High</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overcrowded</td>
<td>34.1</td>
<td>40.3</td>
<td>35.1</td>
<td>35.8</td>
<td>13.2</td>
<td>32.1</td>
</tr>
<tr>
<td>Grossly over crowded</td>
<td>14.3</td>
<td>25.6</td>
<td>34.1</td>
<td>14.6</td>
<td>1.6</td>
<td>18.3</td>
</tr>
<tr>
<td>&gt; Two per bed</td>
<td>32.4</td>
<td>39.7</td>
<td>37.9</td>
<td>24.1</td>
<td>8.9</td>
<td>28.7</td>
</tr>
<tr>
<td>Average number of people per room</td>
<td>2.50</td>
<td>2.66</td>
<td>2.55</td>
<td>1.77</td>
<td>1.47</td>
<td>2.27</td>
</tr>
<tr>
<td>People concerned about overcrowding</td>
<td>27.3</td>
<td>18.2</td>
<td>9.3</td>
<td>5.3</td>
<td>0.6</td>
<td>12.0</td>
</tr>
</tbody>
</table>

Source: 1 000 household survey

When asked about the priority local environmental issue to be addressed, residents in the lower three quintiles highlighted ‘overcrowding’ as a concern. Those in the lowest wealth quintile, where 31% indicated overcrowding, and in the lower middle wealth quintile (20%) expressed the gravest concern. Overall, 12% of households in Port Elizabeth had overcrowding as their top priority.

Over half of the households concerned about overcrowding saw its rectification as a responsibility of the Port Elizabeth Municipality. Others indicated central government and neighbourhood groups as the most suitable agency for addressing the problem. Although crowding was not a major quantifiable problem in the low wealth quintile, the major concern expressed by those in this group about crowding, is likely to reflect the hardship that they experience as a result of crowding. It is possible that those complaining about crowding had moved to poorly serviced sites as a consequence of overcrowded homes that they previously occupied as part of an extended family. This might indicate that living in poorly located and inadequately serviced sites is one of the trade-offs made by people facing a number of difficult choices.

The possible psychosocial implications of crowding range from discomfort and stress to domestic violence and rape. Other health consequences include increased rates of transmission of infectious disease. While it is generally accepted that overcrowding has numerous adverse psychosocial and health implications, more detailed studies are necessary to fully understand specific issues and health risks, in the local context.

5.3 Bio-climatic issues - protection from the elements

PE has a cool wet winter but temperature extremes are moderated by its location on a coastline washed by warm currents. The average minimum monthly temperature is 6.3°C (July) and the maximum 26°C (February). Throughout the year, there are strong winds, and occasional gusts causing extensive airborne dust, which can be quite unpleasant.

Overall, 46% of the homes were reported to be damp (see Table 5.3). This ranges from 75% in the lowest wealth quintile to 16% in the highest. The dampness of homes of poor households is due to poor building materials and construction methods - see Section 4.8 on building materials.

As exemplified in Box 5.1 below, low-income residents are very concerned about the quality of their homes.
Table 5.3 Households experiencing problems with dampness (%)

<table>
<thead>
<tr>
<th>Problems with damp?</th>
<th>Wealth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Yes</td>
<td>74.7</td>
</tr>
<tr>
<td>No</td>
<td>25.3</td>
</tr>
<tr>
<td>Total in sample</td>
<td></td>
</tr>
</tbody>
</table>

Source: 1 000 household survey

Ventilation of the home makes a significant difference in terms of problems with damp. Some 80% of the homes without ventilation (in the kitchen) reported problems with dampness, whereas only 35% of those with ventilation (in the kitchen) did so. Also, the lack of ceilings, associated with generally poorly built houses, was associated with a higher prevalence of damp problems. Of the 40% of the houses with no ceiling, 72% reported problems with damp. The combustion of paraffin can also contribute to damp conditions through condensation. Some 81% of households using paraffin as their primary cooking fuel had problems with dampness, compared to 31% among electricity users. Dampness is also associated with respiratory problems. In 63% of the damp households (with children), at least one child experienced a dry cough in the previous two weeks, compared to 47% in households without damp conditions (see Chapter 9 on health).4

The data from the survey show clearly that while damp is found in many homes, it is concentrated in the lower wealth quintiles and especially in houses made with corrugated iron and wood. From a community perspective, there is an awareness of the linkages between the damp housing conditions and health, which is supported by international research (see Box 5.1 below). Of concern are the proven links between damp and children’s and carer’s health, causing other symptoms and longer term health problems.

4 There is a strong association between those who have soot in their homes and damp. This is not surprising as there was also a close association between those using paraffin as their primary cooking fuel and damp (p<0.000).
### Box 5.2 Damp housing and health

The international literature shows that there is a close link between damp and mould in homes and health conditions. In a comprehensive study in the UK, it was found that:

- defective housing was strongly associated with ill health among children;
- respiratory problems and other symptoms suggestive of infections and stress were more common in children in damp dwellings;
- those living in damp houses had more emotional distress; and
- the early exposure to an adverse living environment is likely to increase vulnerability to illness in later life - particularly to chronic respiratory diseases.

Poor housing conditions in childhood, for example, are associated with higher rates of admission to hospital and higher morbidity and mortality in adult life.

Mould was shown to have a greater effect on wheeze than damp.

The increasing severity of dampness was significantly associated with a greater prevalence of a range of symptoms. These included children with bodily aches, pains, wheezing, vomiting, sore throat, irritability, tiredness, headaches, fever, high temperature and runny nose.

In conclusion, the studies by Martin and Strachan, having limited as far as possible alternative explanations, found that damp and mouldy dwellings have direct and deleterious effects on the physical and psychological well-being of adults and children.

A household survey undertaken in Jakarta found indoor air pollution from cooking, crowding, humidity and poor ventilation to be important factors for predicting respiratory illness, particularly among female householders.

A study in Taiwan looking at damp housing conditions and respiratory symptoms in primary schoolchildren found that “the prevalence of respiratory symptoms was consistently higher in homes with indications of dampness than in non-damp homes.” The study concluded that, “dampness constitutes a significant public health problem in subtropical areas.”

The above studies reflect the links between respiratory infections and damp in climates which tend to be warmer and more humid than that of PE. However, the presence of damp in 46% of the homes and the occurrence of respiratory infection in over 10% of children in the study should be the subject of further investigation.

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6 Ibid.
7 Ibid.
8 Ibid.
11 Platt SD et al.
The majority of those living in shacks (over 50%) had installed insulation in the form of paper, cardboard or wood to try and reduce temperature fluctuations and condensation in their shacks. Ceilings were found in 60% of all homes. While 93% of those in the highest wealth quintile had ceilings, less than 20% of those in the low wealth quintile did. The quote in Box 5.3 above indicates the problem of those living in shacks being exposed to temperature extremes. Temperature variations in poorly insulated and poorly ventilated shacks can be extreme, with potentially hazardous high temperatures for infants being reached on sunny days with no wind.

In conclusion, damp has been shown to have adverse health impacts in the short and longer term. Damp would appear to be a problem especially associated with wood and iron structures with mud flooring. Efforts should be made to address the damp problems through education and building advice so that those living in wood and corrugated iron houses can take steps to protect themselves from this condition.

It is proposed that an initiative be launched to help those living in shacks to be able to maximise the energy efficiency of their homes and to reduce levels of dampness. Research has already been done about how to help those living in shacks to live more comfortably and several interventions have been piloted. Building advice and support could fall under the umbrella of the Port Elizabeth Municipality City Engineer’s Department Building Support and Information Centres, as proposed in the Port Elizabeth Municipality Housing Strategy (1996).

Dampness and poor thermal efficiency could also be reasons for reviewing the possibility of increasing the proportion of the housing scheme subsidy allocated to the house structure itself. It is important that houses constructed with subsidies be designed to maximise thermal efficiency. This is currently being considered as part of the national housing guidelines. Guidelines should be prepared to help those living in poor quality housing to more cost-effectively minimise the health risks associated with their homes. An illustration of the typical problems associated with informal housing is shown in Figure 5.2.

Box 5.3 What people said about human comfort and thermal inefficiency

“Solar heat in summer results in shacks becoming terribly hot during the day. In winter they are very cold at night.”

15 Environmentally sound low cost housing, draft guidelines for implementation, prepared by the Department of Housing, March 1998, unpublished.
5.4 Indoor risks and air quality

There are numerous risks inside homes. These can be broadly classified into risks related to the structure and risks related to the activities which take place in the home.

Other than the obvious issue of overcrowding (dealt with above), there are other risks related to the indoor environment. In informal areas, these include the danger of fire due to the flammable nature of the structures and the poor access to firefighting equipment, problems of exposed wires due to the informal electrification of shacks, as well as eye problems because of poor lighting.

The health risks related to activities in the home are exacerbated in low-income households by the use of paraffin as the main fuel for cooking and heating. Storage of paraffin, which is both inflammable and poisonous, presents a further health risk. Paraffin poisoning is an often-underestimated hazard. Paraffin is frequently sold and stored in unmarked or inappropriately marked containers such as those initially used for drinks, and may be mistaken for a beverage, especially by young children. Home-based economic activities such as the preparation of foodstuffs, metal work and spray painting can also be intrusive and have their own specific adverse health impacts.

This study focused on indoor air quality issues and although the issues cited above contribute to hazardous household environments, they are not covered in detail here.
Indoor air quality is a result of the interplay of a number of factors. These include external conditions, building materials and their insulation capacity, number of people living in a home, fuels for cooking and lighting, indoor space, especially where the cooking occurs, and ventilation. Over 47% of South African households use electricity for cooking\textsuperscript{16} and do not have indoor air pollution problems related to fuel combustion. Some 58% of households have access to electricity but many only use electricity for lighting. Those without access to electricity are concentrated within the poorer sectors of the Black community in South Africa. Cooking is mainly undertaken using paraffin, liquefied petroleum gas (LPG), and wood or coal stoves. Major problems with smoke inhalation are more prevalent in winter when braziers\textsuperscript{17} are used for indoor heating. Inhabitants of small, overcrowded and poorly ventilated houses suffer most severely. Deaths from carbon monoxide poisoning, resulting from inefficient combustion of coal in poorly designed or maintained stoves and braziers, are not uncommon during very cold winter nights.\textsuperscript{18} This is because inhabitants not only close doors and windows when it is very cold but they also fill in all other openings to exclude any cold air from entering the house. Carbon monoxide-related morbidity, with people experiencing headaches, sore eyes and drowsiness, is also a problem.

5.5 Fuel use in Port Elizabeth

In PE there are two main sources of domestic energy, namely electricity and paraffin. Some 72% of households have access to electricity but, as indicated above, this is sometimes only used for lighting. There has been a major electrification drive countrywide but due to affordability constraints, both in terms of immediate cost of electricity and the cost of appliances\textsuperscript{19}, there is a limit to the capacity of the poor to be able to use electricity for anything other than lighting. The fuels used for cooking in Port Elizabeth are shown in Table 5.4.

<table>
<thead>
<tr>
<th>Fuel used for cooking</th>
<th>Wealth</th>
<th>Low</th>
<th>Lower-middle</th>
<th>Middle</th>
<th>Upper-middle</th>
<th>High</th>
<th>Total</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td></td>
<td>19.3</td>
<td>36.0</td>
<td>83.6</td>
<td>94.3</td>
<td>99.5</td>
<td>67.4</td>
<td>1,028</td>
</tr>
<tr>
<td>Paraffin</td>
<td></td>
<td>77.0</td>
<td>59.7</td>
<td>12.1</td>
<td>3.9</td>
<td>0.0</td>
<td>29.6</td>
<td></td>
</tr>
<tr>
<td>LP gas</td>
<td></td>
<td>3.7</td>
<td>4.3</td>
<td>4.8</td>
<td>2.2</td>
<td>0.5</td>
<td>3.1</td>
<td></td>
</tr>
<tr>
<td>Total in sample</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,028</td>
</tr>
</tbody>
</table>

Source: 1000 household survey

In contrast to most urban poor in South Africa and in Accra, see Figure 5.3, poor Port Elizabeth households are not reliant on coal owing to the distance of Port Elizabeth from the sources of coal (in the north east of the country) and its consequent high price. In addition, biomass fuels are not readily available, so Port Elizabeth is one of the major consumers of paraffin.

Two focus groups discussed the air pollution problems in the city. The discussion raised concerns by paraffin users about the safety of the fuel and the impact it was having on health (see Box 5.4). Paraffin stoves, both pressurised and wick stoves, were regarded as major contributors to indoor air pollution. The fuel used was also said to be unclean and impure. The consequences of this problem were reported as pains in the chest and eyes, headaches and problems with the skin. Particularly noted was a bad effect on children and on pregnant women.

\textsuperscript{16} Census in Brief 1996, Statistics South Africa.
\textsuperscript{17} Braziers are metal drums which have holes punched in the sides of them and are fuelled by wood and coal. These are used for space - heating purposes indoors.
\textsuperscript{19} Simmonds G and Clark A. 1998 Energy strategies for the urban poor. Energy and Development Research Centre, UCT.
While the direct health impacts of paraffin usage\textsuperscript{20} have not been investigated under local conditions, users were clearly concerned. Two relevant studies have been recently undertaken in South Africa. One, a part of this study, was a scoping study on the health impacts of paraffin usage, and the other was a brief study by the United States Department of Energy based on fieldwork in Kimberley, South Africa. The results of the scoping study are shown in Box 5.5.

\textsuperscript{20} Numerous studies have been undertaken internationally. As South African paraffin is of a different grade to that used overseas, there is a need for local health impact studies to be undertaken.
The possibility of there being cause for concern regarding the use of paraffin burning stoves has further support from a recent study which was undertaken in Kimberley (see Box 5.6). The US Department of Energy has suggested that further studies be undertaken as very high levels of CO were found in homes, which used paraffin wick stoves in Kimberley.

Box 5.5 Scoping study on the health impacts of paraffin usage in the home

As there was little known about emission rates from paraffin burning appliances, a scoping exercise was undertaken to ascertain what emissions should be measured and what the impact on the health of communities using this fuel might be. The scoping study was undertaken by the Council for Scientific and Industrial Research at the request of the Medical Research Council and was funded by the Paraffin Safety Association of Southern Africa.

The results of the study were:

1. The literature study indicated that the indoor air quality due to paraffin use can be expected to be better than that associated with biomass fuel use. For certain compounds of concern the exposure due to paraffin can be between 5 and 10 times less depending on the type of appliance, condition, and mode of operation. (As with any combustion appliance, the exposure is the highest for low rates of removal of the compounds from the household by ventilation.)

2. Compounds of concern include: CO, NO\textsubscript{x}, HCHO and PAHs (including benzo-a-pyrene), benzene and 1,3 – butadiene. Substances of concern due to their uncertain toxicity include styrene and the xylenes. Substances not of concern due to the low expected exposures include SO\textsubscript{2} and particulates. A range of non-methane hydrocarbons has been identified and excluded from the compounds of concern on the basis of their low toxicities.

3. Additional data is required before specific estimates of exposure can be made. This includes the substances formed in the appliances used in Port Elizabeth, burning South African paraffin. (It is believed that local paraffin will burn cleaner than published examples, but no local data is available.) Other information which will be required includes the ventilation rates of the exposure areas in the household and the types of stoves used.

Source: Study undertaken as a background report by the CSIR for this research project. For further information, see Appendix 1.
Box 5.6 Peer\textsuperscript{21} Africa indoor air quality project: Kimberley, South Africa

A project is underway to construct energy-efficient housing in Kimberley. The pilot stage involves the construction of the first energy-efficient houses in South Africa, which use both passive solar and advanced construction techniques. Part of the design involves the insulation and use of less natural ventilation within the structure than shacks. As a result, it is important that the levels of CO and other indoor pollutants are low so as to ensure that windows can be kept closed to maximise energy efficiency. In addition to the fuel efficiency, the houses are larger than those in the surrounding area built with the same subsidy.

The first 200 pilot structures are completed and are part of a 1 000 house construction project.

A study of the condition and efficiency of the stoves used by the households before they moved into the newly constructed houses was undertaken. 36 houses were sampled. Over 85\% of these households were using poorly designed paraffin stoves and space heaters, which were found to emit extremely high CO levels (600-1000ppm). These levels were higher than the most hazardous coal-burning braziers. The problems with the stoves were substantiated by reports by the residents of chronic headaches and burning eyes. From observation, it appeared that the CO levels increased dramatically with the change in the flame caused by a pot being placed on the wick stove and the resultant suppressed air/fuel mixing during combustion.

Over and above the suggestion that when moving into the new houses, use of the wick-type paraffin stoves should be discontinued, it is suggested that:

- Training is given regarding the dangers of paraffin and how it can be used safely.
- Stoves are tested for their fuel efficiency and health hazards.
- Suggestions are made regarding improved household ventilation.


Having established that there are concerns about the use of paraffin stoves, it is appropriate to give an indication of the profile and use patterns of those cooking with paraffin. Virtually all routine cooking is done indoors in PE. Eighty percent of the households had a separate kitchen while in the lower quintiles 57\% had a separate kitchen and 41\% cooked in a multipurpose room. In the lowest wealth quintile (40\% of the users of paraffin), more than half the households cooked in a multi-purpose room (see Table 5.5).

\textsuperscript{21} Peer is an abbreviation for ‘Pollution, Environment, Community Development and Energy Resources’, a consultancy.
The mean time spent cooking with paraffin (from the fuel and water survey) was 254 minutes per day. Those cooking with electricity spent an average of 162 minutes per day. In the case of paraffin users, the main meal took an average of two hours to cook. Those cooking with paraffin took 1.5 times longer cooking than the households with electricity ($p<0.000$). There would appear to be a relationship between cooking time and exposure risk, with those spending longest cooking (paraffin users) also using the fuel associated with the most hazards (see Table 5.6).

Table 5.5 Place where meals are usually cooked according to wealth (%)

<table>
<thead>
<tr>
<th>Cooking place</th>
<th>Wealth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>In separate kitchen</td>
<td>45.5</td>
</tr>
<tr>
<td>In multi-use room</td>
<td>54.5</td>
</tr>
<tr>
<td>Outdoors</td>
<td>0.0</td>
</tr>
<tr>
<td>Total in sample</td>
<td></td>
</tr>
</tbody>
</table>

Source: 1 000 household survey

While the questionnaire asked about the time spent cooking, what is not known is how long the paraffin stoves are further used on a daily basis to heat water. As the majority of those reliant on paraffin for cooking would be unlikely to have a separate bathroom it is most likely that water for washing is heated in the place where the food is cooked. The location of the cooking and water heating activities in the home is likely to contribute, in part, to other health risks. For example, the high levels of soot reported in homes using paraffin, as well as the presence of damp, could be a result of the additional fuel used and condensation resulting from the water heated for washing. (See below for further discussion of these issues.)

Table 5.6 Cooking time in minutes by fuel type and wealth

<table>
<thead>
<tr>
<th>Time (mins)</th>
<th>Low</th>
<th>Lower-middle</th>
<th>Middle</th>
<th>Upper-middle</th>
<th>High</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity total</td>
<td>225</td>
<td>206</td>
<td>178</td>
<td>155</td>
<td>108</td>
<td></td>
</tr>
<tr>
<td>Electricity main meal</td>
<td>118</td>
<td>117</td>
<td>109</td>
<td>99</td>
<td>83</td>
<td></td>
</tr>
<tr>
<td>Paraffin total</td>
<td>239</td>
<td>266</td>
<td>258</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Paraffin main meal</td>
<td>124</td>
<td>136</td>
<td>132</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Total in sample</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 020</td>
</tr>
</tbody>
</table>

Source: 1 000 household survey

5.6 Ventilation

In 76% of the households the ventilation was seen to be ‘adequate’ in the room used for cooking, according to the Environmental Health Officer’s observations. The ventilation in the lowest wealth quintiles was considered inadequate in more than half the households (55%) and as high as 76% in households relying on communal water supplies (see Table 5.7).
Table 5.7 Adequacy of ventilation in cooking area according to wealth (%)

<table>
<thead>
<tr>
<th>Adequate ventilation?</th>
<th>Wealth</th>
<th>Low</th>
<th>Lower-middle</th>
<th>Middle</th>
<th>Upper-middle</th>
<th>High</th>
<th>Total</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td></td>
<td>45.1</td>
<td>57.3</td>
<td>83.5</td>
<td>89.8</td>
<td>98.4</td>
<td>75.5</td>
<td>766</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>54.9</td>
<td>42.7</td>
<td>16.5</td>
<td>10.2</td>
<td>1.6</td>
<td>24.5</td>
<td>249</td>
</tr>
<tr>
<td>Total in sample</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 015</td>
<td></td>
</tr>
</tbody>
</table>

Source: 1 000 household study

Other factors which will need to be explored in more detail include the space per person inside the home, impacts of smoking, the desire for reduced indoor ventilation and more heating due to internal conditions such as damp and variable weather conditions outside.

5.7 Smoking

The health risks associated with smoking, both for the smoker and passive smokers, are well documented\(^22\). Some 40.8% of homes had no smokers living in them. The percentage of ‘smoker-free’ homes was inversely related to wealth. In 54% of the highest wealth households there were no smokers but in the lowest quintile there were only 30% of households which were free of cigarette smoke. Over 30% of all respondents (primary caregivers) smoked but in the low wealth quintile the percentage increased to 42.5% (see Table 5.8). This is of concern as young children are therefore exposed to passive smoking risks. Children with caretakers who smoked were 1.3 times more likely to have had symptoms of acute respiratory infections (ARI) in the previous two weeks \((p=0.023)\). In 22% of the households there were two or more smokers in the home. This peaked in the upper-middle wealth quintile where there were two or more smokers in 26% of households.

Table 5.8 Smoking prevalence by wealth (%)

<table>
<thead>
<tr>
<th>Did the person interviewed smoke?</th>
<th>Wealth</th>
<th>Low</th>
<th>Lower-middle</th>
<th>Middle</th>
<th>Upper-middle</th>
<th>High</th>
<th>Total</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td></td>
<td>42.5</td>
<td>28.8</td>
<td>32.7</td>
<td>30.0</td>
<td>23.3</td>
<td>31.3</td>
<td>319</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>57.5</td>
<td>71.2</td>
<td>67.3</td>
<td>70.0</td>
<td>76.7</td>
<td>68.7</td>
<td>700</td>
</tr>
<tr>
<td>Total in sample</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 019</td>
<td></td>
</tr>
</tbody>
</table>

Source: 1 000 household study

5.8 Summary

1. Half of the houses in Port Elizabeth were overcrowded according to the modified ‘Batson index’ applied in this study. Overcrowding was noted as being the primary issue to be addressed by those with wealth less than the mean. Overcrowding is likely to have both psycho-social and health implications.

2. Children who had experienced damp conditions at home were more likely to have had symptoms of acute respiratory infections (ARI) than those without damp in their homes. The local residents and international literature confirms that dampness is associated with poor respiratory health. Further, the international literature points out that the occurrence of frequent respiratory infections in childhood leaves the person more susceptible to ill health as an adult.

\(^{22}\) White C., Smoking in public should be restricted. British Medical Journal Vol. 316 March 1998
3. The majority of poor households in Port Elizabeth use paraffin as their main cooking fuel. Paraffin was seen to contribute to ill health in the form of respiratory infections, skin and eye problems. Soot in the home was associated with the use of paraffin for cooking.

4. The health impacts of paraffin usage are not yet fully understood and further research is necessary.

5. Children living in homes with poor rates of ventilation and occupied by one or more smokers, especially if the smoker is their primary caregiver, are likely to be at increased risk of respiratory illness.

5.9 Suggested responses

1. In the short term, education to maximise the health benefit of incremental improvements to informal structures should be developed and implemented. Access to micro loans and other enabling factors could facilitate the incremental improvements in problems in existing houses’ ventilation, thermal efficiency, damp, etc.

2. The caregivers of children presenting at clinics with acute respiratory infection symptoms should be given information on the links between the home environment and health. They could be offered an opportunity to meet with a building advisor who might also run workshops (effectively health promotion sessions) at clinics and community centres.

3. Educational materials which have been developed to promote safer paraffin use in the home23 should be widely disseminated to minimise the health impacts of unsafe paraffin usage. As further information becomes available regarding indoor air pollution caused by paraffin combustion, this should be added to the current materials, which tend to focus on poisoning and fire risks.

23 ‘Keep paraffin stoves, lamps and matches away from children’, Paraffin Safety Association of Southern Africa, PO Box 6094, Roggebaai 8012, South Africa.