

CHAPTER II

2 THE REVIEW OF RELATED LITERATURE AND INFORMATION AVAILABLE

2.1 General overview of literature available on sustainable building design

There are several books available that discuss the topic of sustainability and the healthy home environment that will form a basis of reference for the analysis. Information will be primarily sourced from literature in English and Dutch available from the Academic Information Service at the University of Pretoria and the researcher's private collection. Other library catalogues and the World Wide Web will supplement the primary sources of data. Key words and phrases for the search are 'sustainable-, green-, eco- and environmentally friendly -architecture and -construction', 'nature conservation' and 'environment'.

A criterion for relevant literature is the accessibility as well as the scientific backing of the content, implying that there needs to be a step from the scientific to the more popular writing style. The results of this study are to be accessible to a broad public and not deemed for professionals alone. A catalogue search using the keywords revealed that available literature is either presented scientifically and excludes non-specialists or has no relevant information for application in South Africa.

The first book referenced on the topic that satisfied the criteria was *The natural house book – Creating a healthy, harmonious and ecologically sound home* by David Pearson (first print 1989). This original Gaia book is written in a popular style which eleven years onwards remains a best seller. In 1998 Pearson published an updated book *The new natural house book – Creating a healthy, harmonious and ecologically sound home* which again has reached best-seller status. It is one of the first works where the *Gaia* principle is presented to the broader public through a 'coffee table' book style. "...the earth and all its life systems as an entity, Gaia (the ancient Greek Earth goddess), which is self sustaining and has the characteristics of a living organism...the house is seen as an micro-ecosystem, interacting with the wider ecosystem of Gaia." (Pearson 1989:21) The book is characterised by an easy reading style, clear illustrations and descriptive photography. It is a manifesto to enduring quality and a definitive work presenting the subject of sustainability that is accessible to a broad public.

The recent increase in available publications displays the growing demand for books that discuss various aspects of sustainability. When selecting books further criteria are recent publication date and the inclusion of recent technical advances and examples. *The Healthy House – Creating a safe, healthy and environmentally friendly home* by Sydney and Loan Baggs (1996) contains holistic practical advice on the prevention of building pollution. The authors combine science and technology with philosophy to present the idea of the earth as an organism that we should choose to live on suitable, considering the needs of both people and the natural environment. *Architecture and the Environment – Bioclimatic Building Design* by David Lloyd Jones (1998) presents recently completed mainstream architectural works that are also environmentally responsible. The discussion chapters preceding the examples concisely discuss a broad range of data relevant to assessing the environmentally responsive designs presented. *Geopathic Stress – How earth energies affect our lives* by Jane Thurnell-Read (1995), is a scientific based research presented not as a report but a readable book. The content is informative and accessible to lay people.

Other literature may be released or become evident as the research progresses and these may form part of the analysis. South Africa has unique problems and available information must be adapted for local use. While lessons can be learnt from international examples of sustainable buildings, the application of available information must always be in terms of the South African context. Appropriateness and accessibility are the keywords to developing user-friendly guidelines.

2.2 Historical overview of international sustainable building design

Interest in sustainability is not merely a passing fashion. History illustrates that societies have from early times realised that in order to sustain life on earth we must respect the natural order of the environment. A respect for nature dates back to ancient times when the sun was revered and knowledge of the earth was passed on from one generation to the next. The earliest pictographic recording of the earth sciences can be found in murals in Mesopotamia and Egypt. Knowledge about survival was associated with the need for shelter, protection, food and clothing. An understanding of nature in the form of environmental design has its origins in the earliest times when man began to build shelters. The shelter was the primary medium of environmental control. The fabric of the shelter was the interface between the external and internal environment, man's second skin. The origin of Environmental Design Theory can be traced back to the "*Ten Books of Architecture*"

by Vitruvius. In Book IV Vitruvius wrote (Hawkes 1996:12): "In the north, houses should be entirely roofed over and sheltered as much as possible, not in the open, though having a warm exposure. But, on the other hand, where the force of the sun is great in the southern countries that suffer from heat, houses must be built more in the open and with northern or north-eastern exposure. Thus we may amend by art what nature, if left to herself, would mar." In other books he discusses issues such as the site of a city, direction of streets, even the correct exposure of different rooms for maximum comfort is discussed

Since the time of Vitruvius there have been many architectural movements, yet as society develops and techniques improve we become more and more engrossed in a consumer society which has lost its respect, understanding and appreciation of nature. Modern society scarcely appreciates the passing of day and night characterised by the movement of the sun and moon. Industrialisation resulted in rapid urbanisation and population shift, which has led to the loss of skills and understanding with regard to human survival on earth.

Luis Barragán clearly described the modern attitude when he wrote:

"Before the machine age, even in the middle of cities, Nature was everybody's trusted companion....Nowadays, the situation is reversed. Man does not meet with Nature, even when he leaves the city to commune with her. Enclosed in his shiny automobile, his spirit stamped with the mark of the world whence the automobile emerged, he is, within nature, a foreign body. A billboard is sufficient to stifle the voice of Nature. Nature becomes a scrap of Nature and man a scrap of Man." (Frampton 1992:319) (See Figure 2.1)

The energy crisis of the seventies is seen by many as the instigator of debates addressing the issues of modern development versus the natural environment. Whether it was a political issue, or the threat of a global shortage of energy, is irrelevant, the renewed awareness that human survival on earth depended on man's attitude has forced many designers to address the issues surrounding the building and its use of energy.

In architecture the movement known as 'Critical Regionalism' can be seen as the move away from Modernism to a more nature specific approach to building design. Critical regionalism respects the local climate, light and topography. It is characterised by the use of local materials, crafts and techniques, effect of local light

and natural topography. It does not exclude modern techniques nor does it become sentimentally vernacular; however, the vernacular is respected as having grown out of the requirements of that locality. The building materials growing in a specific location are usually the most suitable building solutions for that specific climate providing the right type of comfort and protection. Critical regionalism can be identified globally in the work of the Mexican Luis Barragán, Finnish Alvar Aalto, Japanese Tadao Ando and many other international architects.

In recent years the German Institut für Baubiologie & Oekologie (Institute for Building Biology and Ecology) has led Europe in heightening the consciousness of people as to the problems of development and environmental sustainability. Building bio-ecology takes a step further than critical regionalism. The aim is not only to integrate the building with the environment but that it should integrate the whole process of human settlement with nature in a sustainable way. "In future we have to recognise that we are a part of nature and that everything we do to the natural world, we are actually doing to ourselves...Integration is our goal. The question is how to integrate nature with habitat" (Berström *et al* 1992: 2). A holistic approach to human habitation is required. The built environment and the natural environment must be recognised as being part of one ecosystem.

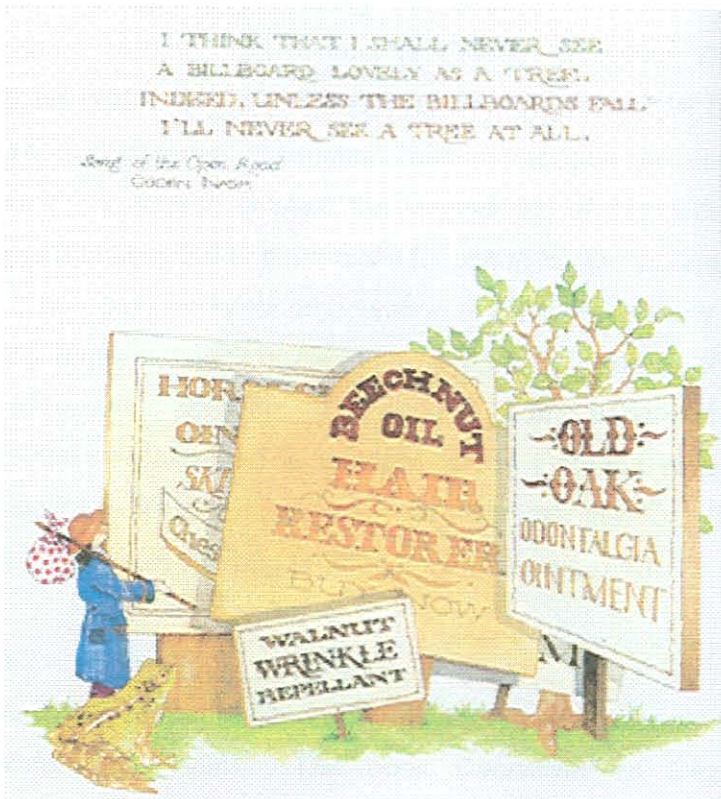


Figure 2.1 - Of trees and billboards. (Denman 1990)

Internationally the idea of permaculture is growing. Permaculture goes beyond the ideas of building biology. Permaculture is not only permanent agriculture but a type of habitation, "a planning and design method with the aim of creating stable self supporting systems, a sustainable economy and culture based on ecological principles, and adequate supply of wholesome food, energy, warmth, beauty and meaningful pursuits. They provide at the same time a vision and a firm ethical base" (Kennedy 1992:46). Ralph Erksine's work at 'Ekerö Mälartown' in Stockholm is an example of an ecological approach.

While lessons can be learnt from international examples of sustainable buildings, the application of available information is not always appropriate to the South African context. South Africa has its own unique problems and available information must be adapted for local use.

2.3 Precedent towards achieving sustainable building design principles for the FOURways house

2.3.1 South African precedent

The Department of Mineral and Energy affairs have released a series of policy and design guidelines promoting the efficient utilisation of energy in buildings in Southern Africa. The '*Primer on Energy Conscious Design*' by D. Holm and R. Viljoen (1996) and the '*Manual for Energy Conscious Design*' by D. Holm (1996), provide accessible information that encourages the use of passive solar design. This study aims to emulate the accessibility of this document with a broader focus on sustainable building practices for use in middle income housing developments.

The non-governmental organisation – Earthlife, in early 2000, launched the *green living and development files* that deal with a diversity of aspects concerning green building and habitation. The content of this document is diverse and where the information presented is relevant to the Gauteng area it will be included in the guidelines. These files are open for perusal on the World Wide Web at <http://www.earthlife.org.za-ghouse-gfiles-aware.JPG>

2.3.2 International precedent

The Dutch concept of 'bio-ecological building' is brought to public attention by Hugo Vanderstadt (1996). The book *Duurzaam en Gezond Bouwen en Wonen* (Sustainable and Healthy Building and Habitation) will be reviewed for information

relevant to the South African situation and the presentation and accessibility of information.

Professor Peter Schmidt of Eindhoven University of Technology is a leading figure in Europe on the subject sustainability. He has written and presented various papers which display his deep understanding of the inter-linking of all aspects, human and scientific, to achieve sustainability. His approach to the problem of sustainability may be described as holistic and at times esoteric. Professor Schmidt's biological sustainability is beyond the limits of this research, but credit must be given for both the success of his initiatives and popularity among colleagues.

The World Wide Web (Internet) sourcebook, '*Sustainable Building Sourcebook*', was developed as part of the Green Building Program by the City of Austin, U.S.A. It is divided into the different aspects of the construction process. Each subject is discussed according to its sustainability with guidelines for relevant use. A critique revealed that many topics are relevant for discussion, but the specific information is not relevant to the South African situation. The sourcebook is available on the World Wide Web at <http://www.greenbuilder.com/sourcebook>

Many countries have been involved in the development of an assessment tool to rate buildings for their sustainability. One of these is the British Centre for Sustainable Construction that has developed the Building Research Establishment Environmental Assessment Method (BREEAM). This method assesses the environmental impact of a building with regard to the global, local and internal environment. The method is highly technical and specific to European conditions and is therefore not appropriate for use in this study. The Green Buildings Tool (GBTool) developed by the Green Buildings Challenge (GBC) is an international initiative supported by 17 countries as an attempt to equalise parameters for assessing the sustainability of a building through a rating system. Various tools including BREEAM have been used to develop the GBTool. The GB Tool has a module for multi-residential units which is interesting in terms of the medium density, residential aspect. This document, however, remains the domain of 'green specialists' requiring many scientific readings and team of assessors and is therefore inappropriate for daily quick reference by all players in the built environment. This assessment tool is not suited to the study aim. The GBTool is available for downloading on the World Wide Web at <http://www.greenbuilding.ca>

2.4 Overview of the growing concern in South Africa with sustainability

The literature available on sustainable building design in South Africa is growing. The South African Green Building Initiative was launched at the University of Pretoria on 5 June 1997. The Initiative currently focuses on commercial buildings, yet many of the concerns are parallel to housing. The Initiative recognises that; “healthy and environmentally sound buildings can reduce illness and absenteeism, boost morale, and increase productivity. Additionally, the use of energy efficient technologies and practices can substantially reduce company operating costs” (Conserva 1997:21). The above motto can easily be applied to the housing sector as well. South Africa must strive to improve the quality of life of all people both at home as well as the workplace.

The Green Buildings for Africa (GBFA) launched in 1998 by the CSIR Boutek takes the 1997 initiative into action by assessing projects for their environmentally responsible usage. The GBFA represents South Africa in the Green Buildings Challenge (GBC).

Various non-governmental organisations such as World Wildlife Fund, Earthlife and Green Peace are using their influence to promote conservation and sustainability on the large scale at governmental policy level to ensure every effort is made to preserve the natural environment. While South Africa is using many of the ‘buzz’ words for sustainability these organisations are ensuring that international agreements signed, such as the Kyoto protocol of 1997 (Lace 2000:64), will be upheld.

The government has published a white paper on the “Conservation and Sustainable use of South Africa's Biological Diversity”, however this document only touches on the issues relevant to the building industry. The department of housing has committed to sustainability by including the issue in both the “Housing Act” and the “Housing Bill” and the initiative “African Solutions Towards Sustainable Urban Development”. Which aims to uphold the slogan; “Creating a network of learning for the sustainable development of African cities”. The department of housing has also printed a guideline for “Environmentally Sound Low Cost Housing” which is a specific move to address sustainable buildings within the broader aim of sustainable development. These specific moves by the government indicate their commitment to sustainability as a whole.

The South African Sustainable Building Environment Conference in 1998 and 2000 held in Gauteng brought together diverse local and international professionals who represent the growing concern for sustainability in South Africa. These gatherings are an initiative to stimulate discussion specific to sustainability in South Africa.

The CSIR offers two tools for assessing the sustainability of a building, the GBTool and SBAT. SBAT is essentially a quick check that can be used throughout a project compared to the specialised GBTool, which requires expertise as well as many measurements. The CSIR is currently developing SBAT as a local, widely accessible derivative of the GBTool. It is being developed as a tool that can be used from the outset of a project by the whole project team including the client, architect, developer etc. It does not require specific tools of measurement but rather sets out parameters when adhered to achieve a more sustainable building. Use is made of the three-column definition of sustainability, which include economic and social aspects as well as the obvious environmental issues.



Figure 2.2 - Map of South Africa (Tyson et al. 1950: 49)

Gauteng, 'place of gold' in the Sesotho language occupies the area previously known as the Pretoria-Witwatersrand-Vereeniging triangle (PWV), covering an area of 19 810 square kilometres (see Figure 2.3). The industry and commerce in the

2.5 Literature on middle income housing development in Gauteng

2.5.1 Defining the Gauteng area and identification of developing areas

Literature on Gauteng, South Africa relevant to this study is available in the *Environmental Potential Atlas for South Africa* by Van Riet *et al* (1997). This is one of the only comprehensive works that focuses beyond urban location and land form to include a diversity of interrelated information including demographics, geology, vegetation and so on.

The statistical information is to be gleaned from The South African Bureau of Statistics and the South African Advertising Research Foundation as these sources provide the most recent and accurate information required.

Gauteng is one of South Africa's nine provinces. Located inland on the Great Escarpment it is bounded by the Northern Province in the north, Mpumalanga in the east, Free State in the south and North-West Province in the west (see Figure 2.2). Johannesburg is the provincial capital. Gauteng is located between the 25th and 27th latitude south and the 26th and 28th longitude east.

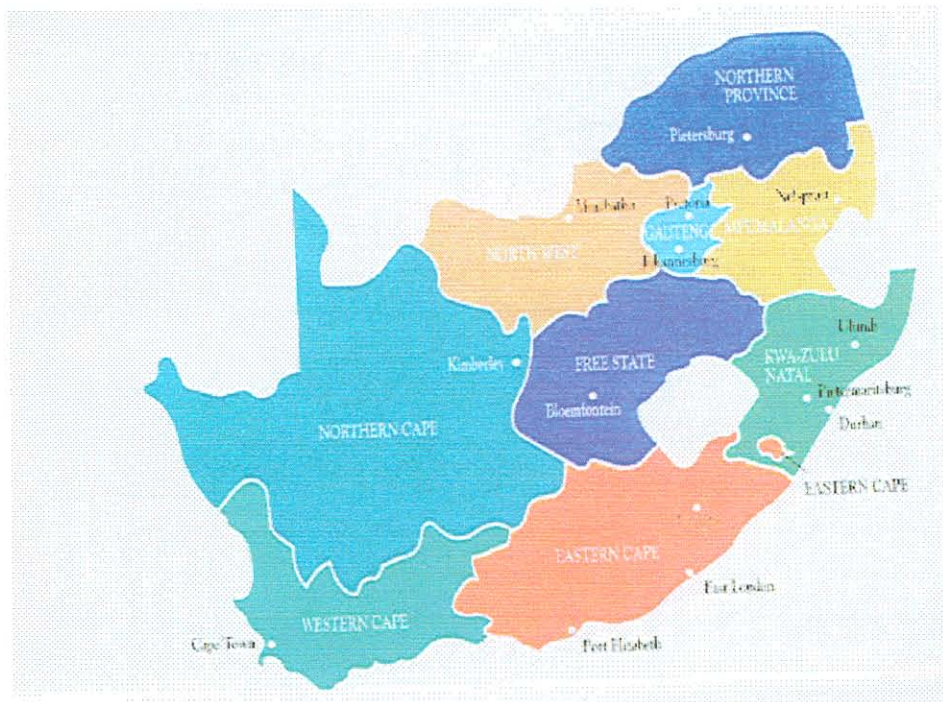


Figure 2.2 - Map of South Africa (Tyson *et al* 1996:49)

Gauteng, 'place of gold' in the Sesotho language occupies the area previously known as the Pretoria-Witwatersrand-Vereeniging triangle (PWV), covering an area of 18 810 square kilometres (see Figure 2.3). The industry and commerce in this

area produce nearly 40% of the GDP with 70% of the country's labour force. Major mining houses, insurance, banking and financial corporation headquarters are located in this province.

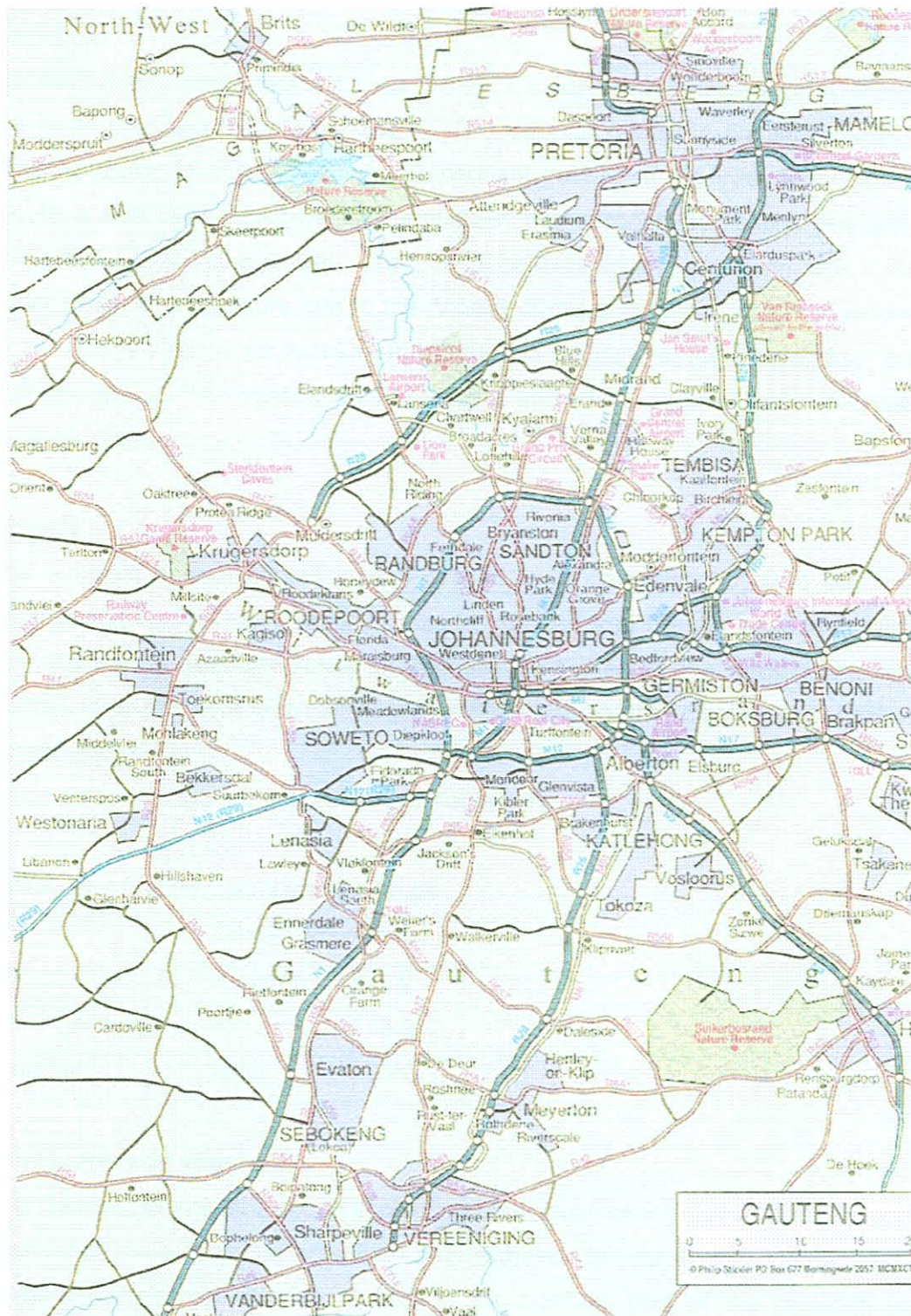


Figure 2.3 - Map of Gauteng (Smith 1998:8)

Gauteng is the most densely populated province with 7,4 million people in 1996 (Tyson *et al* 1996:46). The large number of urbanised people has resulted in a housing crisis with many being housed in squatter developments.

Location

Gauteng drains into three catchment areas, Limpopo in the north west, Olifants in the north east and Vaal to the south. The summer rainfall in Gauteng made it a suitable region for maize farming. Dependence greatly on the Vaal Dam for water in Gauteng due to the high-density population has a runoff per capita per annum being below 500 cubic metres. Gauteng is considered an area with high surface water production pressure due to the density of the population. Water is essential to life and is needed for survival and growth in agriculture, industry and for basic human survival. The importance of economic and effective use of water in Gauteng must be stressed.

Climate

The average annual rainfall is 650-800mm, with characteristic short but heavy thunderstorms. The wet season occurs in summer and the dry season in winter. The average of sunshine hours is amongst the highest in the world. The winter months are characterised by a great difference in the diurnal and nocturnal temperatures.

The average temperature is 20°C (see Table 2.1)

Table 2.1 – Gauteng temperature range

	Temperature range	
	January	July
Johannesburg	26°C.	16.5°C.
Pretoria	28°C.	20°C.

Landscape and vegetation

The Gauteng biome as a broad ecological association of vegetation types is mostly grassland (rocky Highveld grassland and Highveld grassland) with a small section of savannah (sweet/mixed bushveld) in the northern part of the province (see Figure 2.4). The vegetation types named are the originals before farming and urbanisation changed the grasslands to maize and wheat farming and urban development with its concrete, asphalt and exotic plants.

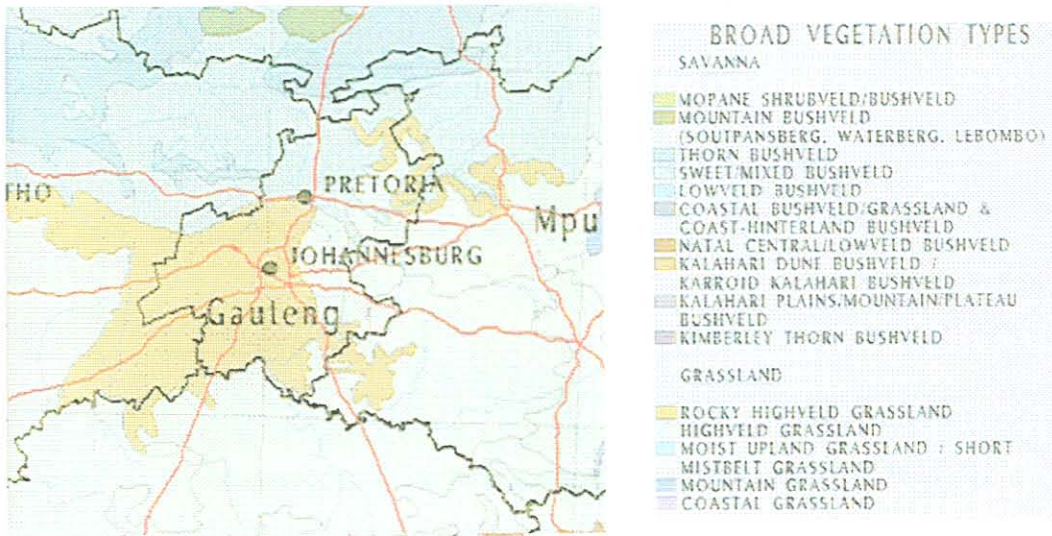


Figure 2.4 - Broad Vegetation types of Gauteng (adapted from van Riet *et al* 1997: 12)

Landscape scenery is an important aspect of the human appreciation of the environment. The greater part of Gauteng is low lying with relief from higher lying ridges such as those around Pretoria, Bedfordview and the beginning of the Magaliesberg etc. Gauteng is considered to have an average natural resource for human appreciation, the metropolitan areas however cannot produce sufficient biomass for the high population. The land is not able to generate biomass to sustain life both in the natural and agricultural environment.

Geology

The geology of an area influences the soil, vegetation and landforms. The Witwatersrand quartzite led to the gold rush and consequent urbanisation of Johannesburg and its surrounds. The mining activity has had an impact on the environment. The issues are to minimise the impact of mining on the environment. Generally Gauteng has a low susceptibility to erosion. If one is the greatest susceptibility on a scale of one to twenty, the areas in Gauteng have a rating between twelve and eighteen. Even though Gauteng has a high population density the geology of the area ensures that there is only a low susceptibility to erosion (see Figure 2.5).

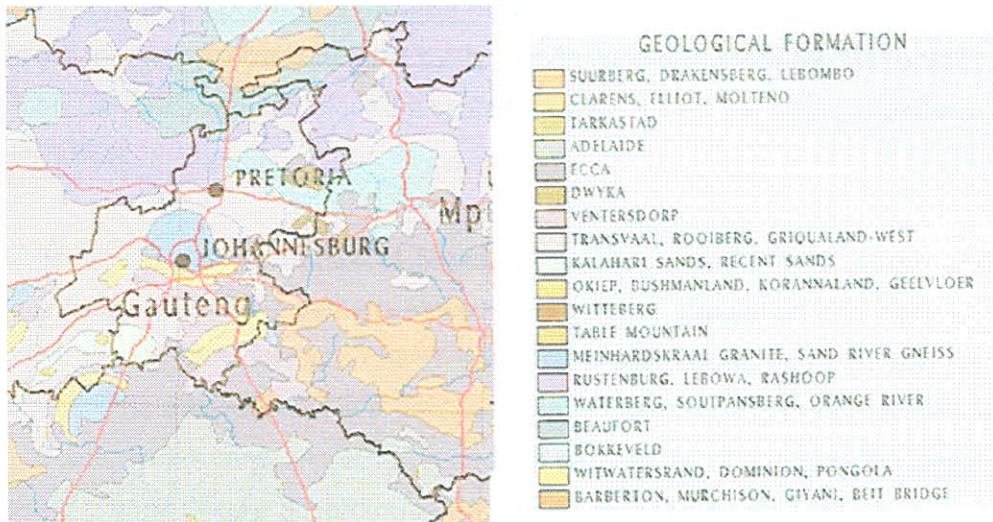


Figure 2.5 - Broad geology of Gauteng (adapted from van Riet *et al* 1997: 6)

Gauteng is in need of an environmental reconstruction programme in order to achieve an environmentally sustainable future. This programme must incorporate the need for economic development. Permanent environmental damage has already occurred due to uncontrolled urban sprawl and extensive mining. In order to sustain the environment for future generations an effort must be made to bring the situation under control and repair where possible. There are municipalities such as Midrand and Centurion that have applied control measures but the province as a unit should work as a team if these measures are to be effective.

2.5.2 The definition of middle income house

The **middle income group** is defined by the South African Advertising Research Foundation (SAARF) who developed a system in 1989 called the Living Standard Measure (LSM).

“The SAARF LSM (Living Standards Measure) has become the most widely used marketing research tool in Southern Africa. It divides the population into eight LSM groups, 8 (highest) to 1 (lowest). LSM-7 and LSM-8 are divided into Low and High respectively. The SAARF LSM is a unique means of segmenting the South African market. It cuts across race and other outmoded techniques of categorising people, and instead groups people according to their living standards using criteria such as degree of urbanisation and ownership of cars and major appliances.”
(<http://www.saarf.co.za>, January 2001)

The system therefore measures living standards better than single variables only, that is population, sex or age. The All Media and Products Survey reports for 2000A establishes that the population is categorised into eight LSM groups. Category 7 defines the group on which this research focuses; it is the most heterogeneous LSM of all and is composed of 11,4% of the adult population. This group is highly urbanised with nearly three out of five living in metropolises (59%) with strong representation in Gauteng (33%) and the Western Cape (22%). There is almost an equal distribution in gender: 49,6% male and 50,4% female. 6% have been to school...over half have gone at least as far as matric. Average income climbs sharply to R6 539 per month. Marriage is more common than in the lower LSMs with ‘young couples’ and ‘new parents’ just significantly above the country average. 28% of this group, unlike lower LSMs, can afford domestic help. This group includes the highest proportion of Coloured and Indian population than in any other LSM. (SAARF LSM, November 2000:48)

Middle income house

A middle income house is a house that is affordable for the middle income group.

A general rule that financial institutions apply when granting home-loans is that the monthly instalment of a bond may not exceed 30% of the gross monthly income.

The joint income of married couples is taken into consideration where applicable.

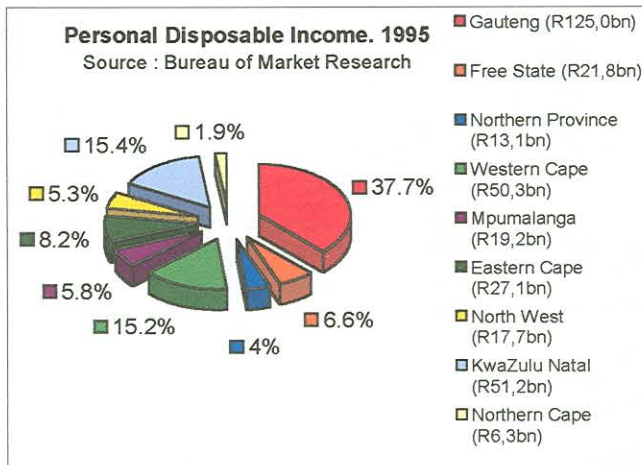


Figure 2.6 – Personal disposable income per province (Tyson *et al* 1996:52)

“Absa Bank calculates the maximum home loan that you can afford based on your monthly home loan repayment, not exceeding a maximum of 30% of your single or joint gross monthly income. This is done so as to reserve cash for the remaining household commitments. The restriction of up to 30% is necessary to ensure your other monthly expenses are met adequately from your remaining household income, and to avoid financial difficulties in the future.” (<http://www.absa.co.za>, 25 January 2000). Taking a bond repayment over 30 years at prime rate (14-15 %) with a household income of R6 500 we can establish that a bond of approximately R 170 000 will be granted to a family with a middle income. A middle income house is therefore a home valued at approximately R170 000.

LSM 7 is associated with specific consumer behaviour, which has an impact on the requirements that will be set when selecting a home. Table 2.2 illustrates the demographics and residential character of this group.

“The only dwelling types of significance in this group are houses (79%) and flats (15%). Cluster/townhouse accommodation stands at 3%, making the total for conventional urban type homes 97%. However, only 68% own the property they live in. Over a quarter (29%) have mortgage bonds. All have electricity, nearly all have in-home water (99%) – usually both hot and cold (93%) – and everyone has a flush toilet. All but 2% have a kitchen sink in their home, while one in ten has a pool.” (SAARF LSM November 2000:48-50).

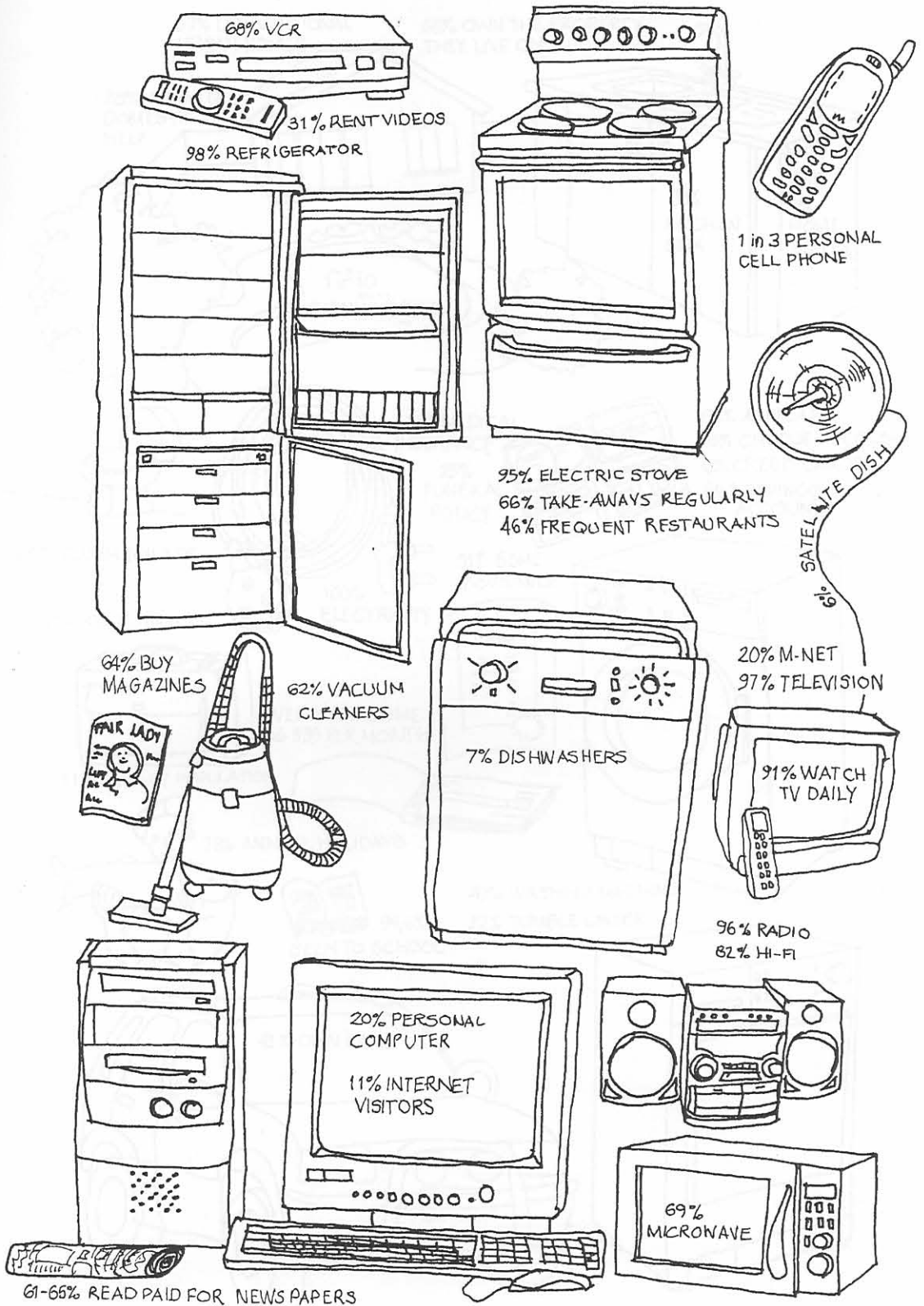


Figure 2.7a – Illustrating LSM 7 demographics and residential characteristics (adapted from SAARF LSM 2000: 50)

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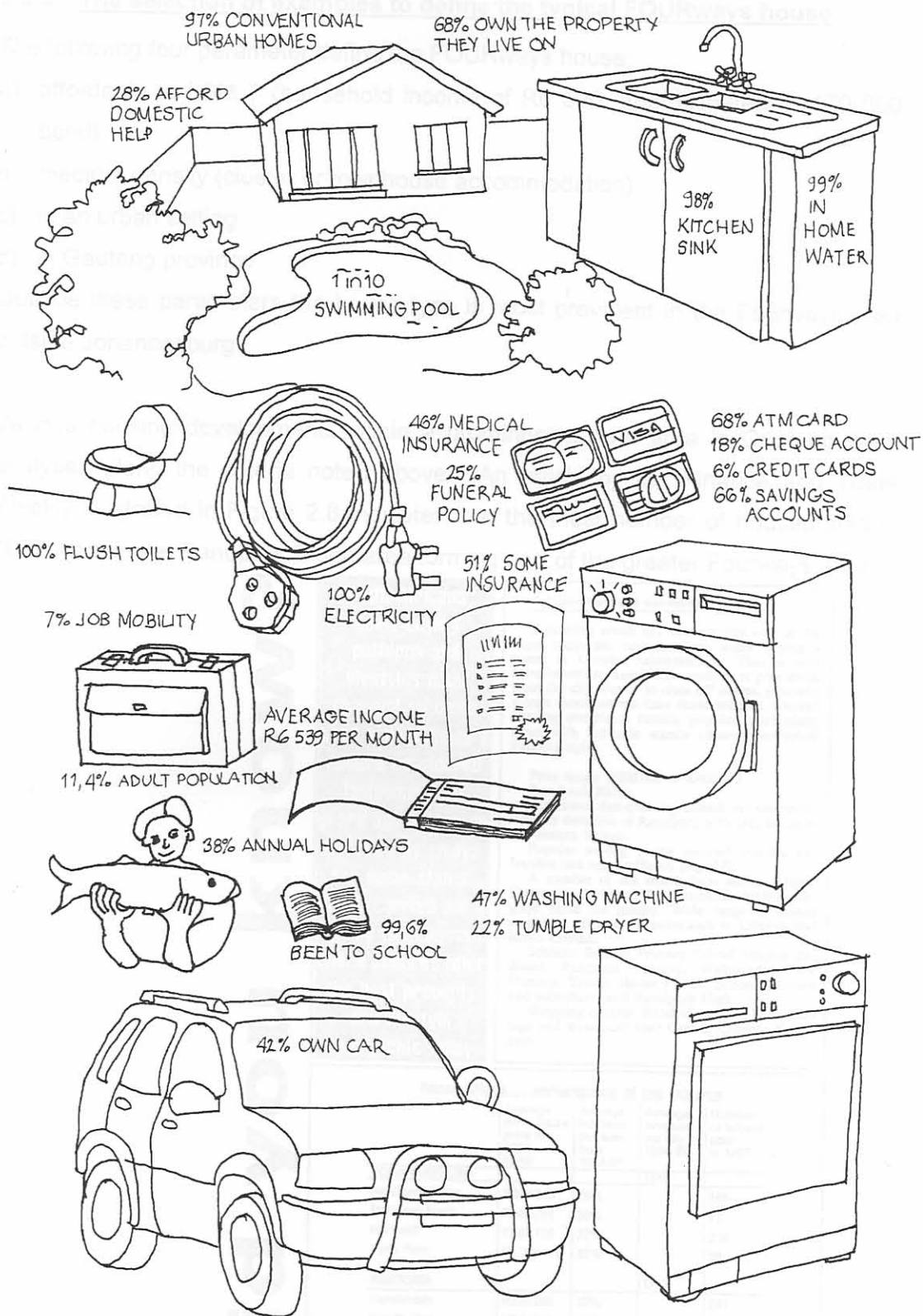


Figure 2.7b – Illustrating LSM 7 demographics and residential characteristics (adapted from SAARF LSM 2000: 50)

2.5.3 The selection of examples to define the typical FOURways house

The following four parameters define the FOURways house:

- affordable to LSM 7 (household income of R6 500, approximately R 170 000 bond)
- medium density (cluster or townhouse accommodation)
- in an urban setting
- in Gauteng province

Outside these parameters the house type is most prevalent in the Fourways area outside Johannesburg

Various housing developments within a prominent growth area in Gauteng were analysed along the criteria noted above. An article by the Finance and Trade Weekly illustrated in Figure 2.8 indicates that the most number of houses sold in 1997 were in the Randpark Ridge area forming part of the greater Fourways area.

Did you know?

South Africans' home buying patterns and lifestyles have changed so much over recent times a suburb considered fashionable 10 years ago, no longer necessarily enjoys the same status. F&TW carried out a survey to determine which suburbs offer the best property and lifestyle investments today.

Johannesburg and surrounds

Escalating crime has made safety one of the most important considerations when buying a home in Greater Johannesburg. That is why suburbs with manned access control, or permission from the city council to close off streets, generally attract more interest than those without. Secured housing complexes remain popular, particularly those with full title stands allowing individual building styles.

Price range: R200 000 to R400 000

Randpark Ridge

Attractive, fast-growing suburb on the north-westerly outskirts of Randburg with easy access to the western bypass.

Popular among young married couples and families (see age profile on page 12).

A number of the streets have access control. Houses are fairly new (low maintenance) and offer good value for money. Wide range of cluster complexes. Several nurseries such as Lifestyle and Keith Kirsten.

Schools: Boskop Primary School (double medium), Randpark Primary, Weltevreden Park Primary, Trinity House Private School (primary and secondary) and Randpark High.

Shopping centres: Randridge Mall, Rock Cottage and Randpark Spar Centre. Close to North-gate.

House prices... performance of top suburbs

Suburb	Average purchase price in 1997 (000)	Average increase per area from 1994-97	Average increase per city 1994-97	Number of houses sold in 1997
JOHANNESBURG				
Randpark Ridge	R276 836	25%	15%	358
Parktown North	R492 701	33%		77
Northcliff	R457 100	27%		210
Hyde Park	R1 258 410	37%		36
PRETORIA				
Garsfontein	R266 286	27%	17%	241
Faerie Glen	R329 096	12%		207
Lynnwood	R430 587	31%		217
Waterkloof	R629 122	31%		340

F&T Weekly, 27 March 1998

Figure 2.8 – Marketing information adapted by developers from “SA’s best suburbs to live in” in *F & T Weekly*, March 27 1998, vol.50, no.12, p12-16.

A site visit to the area indicated that the strip flanking the highway ten kilometres to the north bounded by William Nicol Drive on the east and DF Malan Drive on the west (see Figure 5.1) indicates intense medium density development that is sold out before construction has commenced.

The case study has been selected from the Randpark Ridge, Weltevreden Park, Radiokop, North Riding area which is one the growth points in Gauteng. The area called North Riding is part of the extending urban sprawl originating from the central Johannesburg and Randburg area (see Figure 2.9). It is situated north-west of Johannesburg centre and forms part of the greater Randburg area. (see Figure 5.3)

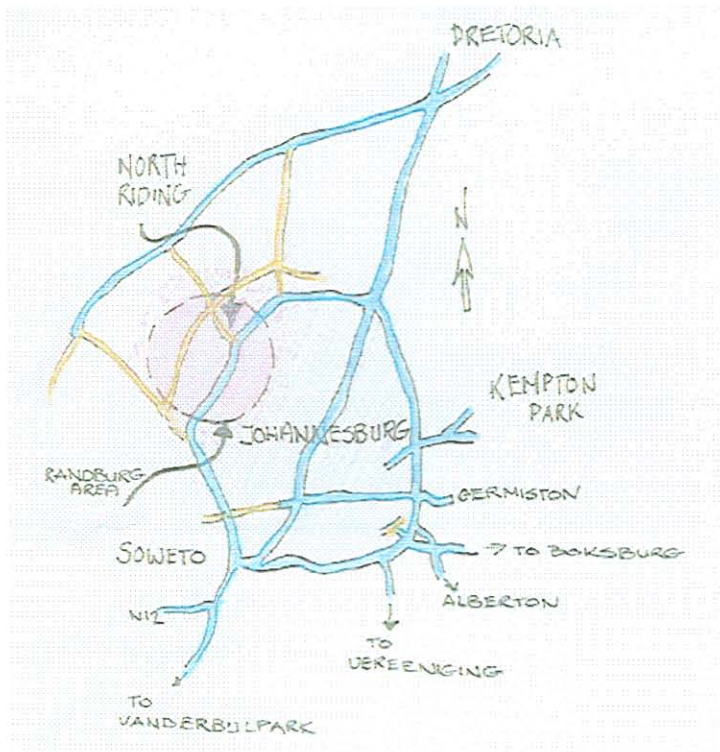


Figure 2.9 - The Randburg area relative to the area Greater Johannesburg

One housing development, with two variations, was selected for analysis. The development Ravenna in North Riding, which is partially complete and inhabited was selected for the case study. (see Figure 2.10) The developers were approached and permission was gained to access drawings and the site.

There are still several undeveloped stands on the site, which will be developed as home-buyers select and purchase off plan. Two new houses will be built as from January 1999 to stimulate further sales at Ravenna enabling an in-depth an of the construction process.

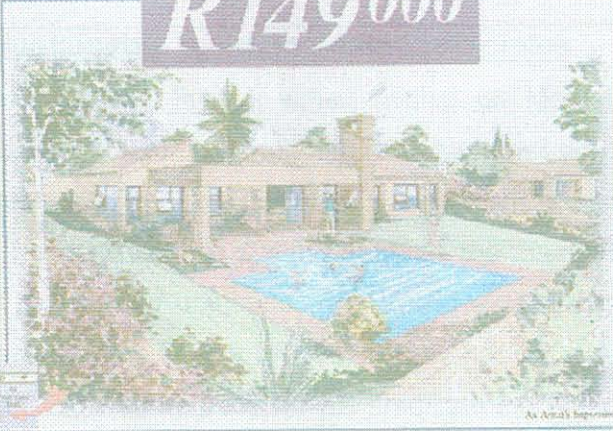
46 Saturday Star PROPERTY GUIDE November 14 1998

Shows Time

A UNIQUE, CLUSTER HOME IN NORTHRIDING (Blandford Road)

FROM **R149 000**

2+3 BEDROOM FREEHOLD CLUSTERS ON LARGE INDIVIDUAL STANDS



Value offers a special financial plan to suit your pocket right now!

- Close to Northgate and Supermarket
- Established, developed, paved roads, all services etc.
- Fully effective security in place!

BUY WITH COMPLETE CONFIDENCE!

HOMES
ESTABLISHED INTO
Building fine homes
for over 25 years.

NO ONE IN THE NORTH GIVES YOU MORE VALUE FOR YOUR MONEY THAN WE DO!

Call: **011-252-2222**
011-252-5151 (Office) **011-252-5151**

On Show Sunday 11am - 5pm

Follow the water mainline from the main pipe to the Blandford Drive to site in Northriding Road.

Figure 2.10 - The advertisements of the case study (The Saturday Star – Property Guide 14 November 1998: 86)