# OLD INSTITUTION MEETS NEW TECHNOLOGY: GIS FOR QUANTIFYING CHURCH ROLES

**GERBRAND MANS (HONS BA)**

**(Student number: 12990205)**

Thesis presented in the partial fulfilment of the requirements for the Masters degree (in GIS for Spatial Analysis and Decision Making) at the University of Stellenbosch

**Supervisor: Prof HL Zietsman**

**Date of submission: December 2003**

**DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL STUDIES**

# DECLARATION

I, the undersigned, hereby declare that the work contained in this thesis is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

# SUMMARY

South Africa today is facing many social and welfare problems. Three of which are very prominent: named HIV/Aids; unemployment; and sexual and/or violent crimes against woman and children. With churches being some of the biggest and most influential non-governmental organizations in the country, government is increasingly acknowledging that churches have a very important role to play in order to help curb social and welfare problems in the community. One inhibiting factor keeps churches from playing the role that government is expecting of them: the roles and expected roles of churches have not been quantified sufficiently.

A geographical information system was chosen to help in this process of quantification. Previous studies related to GIS being used by social and welfare services showed that this software give these service agencies a powerful new way to analyse services in relation to clients and the communities in which they operate. The crux throughout the study is the process by which it is shown how a GIS can be used and is central from the process of data gathering, storing and manipulation of the gathered data, deriving information from it, through to communicating and visualising the obtained results.

**Key words:** geographical information systems; GIS; ArcGIS; Statistica; Microsoft Access; church; NGO; social services; social problems; welfare services; welfare problems; data base; data base management systems; geodatabase; Factor Analysis; quantification

**[Word count: 204]**

## OPSOMMING

In hedendaagse Suid Afrika is daar 'n menigte van sosiale en maatskaplike probleme. Drie van die prominentste van die probleme is MIV/Vigs, werkloosheid en seksuele en/of geweldsmisdade teen vroue en kinders. Kerke is van die grootste en mees invloedryke nie-regeringsorganisasies in Suid Afrika. Die regering besef al meer dat kerke 'n belangrike rol kan speel in die aanspreek van die sosiale en maatskaplike probleme van die land. Daar is egter 'n inhiberende faktor wat kerke daarvan weerhou om dié rol te speel wat die regering van hul verwag; en dit is die feit dat die rol wat kerke speel, en die rol wat die publiek verwag kerke moet speel, nog nie gekwantifiseer is nie.

'n Geografiese inligting stelsel is gekies om te help in die proses van kwantifisering. Vorige studies waar daar gekyk is na die gebruik van GIS deur sosiale en maatskaplike dienste het aangedui dat die sagteware hierdie dienste 'n effektiewe en innoverende wyse gee waardeur hul dienste ontleed en gemonitor kan word. In die studie word gewys hoe 'n GIS gebruik kan word en sentraal is in die prosesse van data insameling, stoor en manipulasie van die ingesamelde data, hoe data omgesit word in inligting en laastens die kommunikasie en visualisering van die resultate wat verkry word.

**Sleutel woorde:** geografiese inligting stelsel; GIS; ArcGIS; Statistica; Microsft Access; kerk; NRO; maatskaplike dienste; sosiale dienste; databasis; databasisbestuurstelsel; geo-databasis; Faktor Analise; kwantifisering

**[Woorde 210]**

# ACKNOWLEDGEMENTS

I am sincerely grateful to Prof Zietsman and Dr Erasmus for their input and guidance.

I also want to thank Phia Basson for her moral support, even though we were literally thousands of kilometres apart; my classmates for their inputs; the community of Paarl, especially Shawn and Marie without whom I think we would never have managed; last but not least my family, Louw, Leonie, Linelle and Karien, for their support and belief in me.

# CONTENTS

Page

# FIGURES

# TABLES

# CHAPTER 1

## QUANTIFYING THE ROLES OF CHURCHES AS SOCIAL SERVICE DELIVERY AGENTS

What is the first image that comes to mind when one ponders a question such as: "What are the major social problems amongst our communities in modern day South Africa?" Is it a picture of unemployed people standing alongside roads and at traffic lights in our cities begging for money or somebody to give them a job? Is it the picture of the little baby you saw on the eight o'clock news born with HIV/Aids and who is now dying as a result of this, or maybe the horrific stories of sexual and violent crimes committed against children, women and even babies? These are all scenes and stories that make one's stomach turn whenever one hears, reads or sees them. Maybe one does not think of such negative events only, but positive thoughts do not make these disappear or become less real. These remain problems that need to be addressed urgently.

Social and welfare problems in our communities related to unemployment, HIV/Aids and sexual and/or violent crimes really need serious attention. One group of organisations that are in a position to help in addressing these problems effectively are churches (Erasmus 2002 *pers.com).*

### 1.1 Churches as social service providers

In South Africa churches are some of the strongest and most influential non-governmental organisations (NGOs) and they address a multitude of problems facing the African continent. Local faith communities (congregations) or faith-based organisations (FBOs) provide a host of human services to their local communities and the nation (Unit for Religious Demographic Research 2002). In 1994, with the implementation of the Reconstruction and Development Programme (RDP), the South African Government called upon numerous organisations and institutions to play their part in the development of communities. The RDP was a programme aimed at the renewal and development of society after the abolishment of apartheid (RDP White Paper 1994). However, government did not explicitly name churches as organisations to play a role in this development and reconstruction of South Africa (Heyns 1997).

Today government increasingly acknowledges that it cannot achieve on its own its goals of a self-reliant society. It is searching for partners who could serve as "delivery agents" (Unit for Religious Demographic Research 2002). The government's interest in churches as NGO's is based on their organisational infrastructure, human resources and their credibility amongst people (Koeglenberg 1994). Churches also elicit the highest degree of trust amongst all NGO's from all people in South Africa. President Mbeki recognised this and has called on churches to play a much-needed role in the transformation of the country and the development of communities.

Churches, however, face a problem to contribute effectively to the creation of self-reliant societies. The role of churches, their expected as well as current roles related to social and welfare services have not yet been quantified. Quantification of the extent of their welfare contributions are necessary for better service delivery and communication (Unit for Religious and Demographic Research 2002). Quantifying the role of religious organisations in communities and incorporating this in a geographic information system (GIS) could significantly improve the social and welfare services that these organisations could deliver. This can be seen in a review of previous literature related to the use of GIS by social services and the way in which it helped to improve their service delivery.

### 1.2 GIS as quantification tool for social services

GIS are computer systems for capturing, storing, and manipulating, analysing, displaying and integrating spatial (geographical or locational) and non-spatial (statistical or attribution) information (Maguire 1995). There are a large number of uses and benefits for human service agencies if they implement GIS in their day-to-day functions. By putting the data of an agency into a spatial data base system, one is able to display this data on a map, providing a whole new way of looking at such data which may reveal information and patterns never discovered before. The following points indicate the kinds of problems human service agencies could solve, or gain better insight into, by the use of GIS:

- identify the clientele of the service being provided (Love & Lindquist 1995; Parker & Campbell 1998);

- reveal the socio-demographic characteristics of the neighbourhoods served by the agency (Dickman, Tsoumpas & Zhou 1997; Hoch, Williams & Rodman 1999; Queralt & Witte 1998 a,b);

- indicate whether the services provided by the agency in a particular community are adequate and whether these people are the appropriate target population (Dickman, Tsoumpas & Zhou 1997; Hoch, Williams & Rodman 1999; Queralt & Witte 1998 a,b; Sherman & Weisburd 1995);

- show demands for additional services in communities being served (Dickman, Tsoumpas & Zhou 1997; Hoch, Williams & Rodman 1999; Queralt & Witte 1998 a,b; Sherman & Weisburd 1995);

- give users an idea about emerging trends in service take up and needs in a particular community (Dickman, Tsoumpas & Zhou 1997; Hoch, Williams & Rodman 1999; Love & Lindquist; Parker & Campbell; Queralt & Witte 1998 a,b; Sherman & Weisburd 1995);

- expose areas in special need of outreach initiatives, such as activities to encourage the development of services in neighbourhoods where the supply appears deficient (Dickman, Tsoumpas & Zhou 1997; Queralt & Witte 1998 a,b; Hoch, Williams & Rodman 1999);

- help to improve fund raising efforts (Fox & Zamudio 1997);

- indicate needs for new branch offices, groups to be targeted and services to be offered (Dickman, Tsoumpas & Zhou 1997; Hoch, Williams & Rodman 1999; Love & Lindquist; Parker & Campbell; Queralt & Witte 1998 a,b; Sherman & Weisburd 1995);

- identify catchment areas for various facilities taking into account maximum distances and travel times appropriate to the life situations of potential clients (Hoch, Williams & Rodman 1999; Love & Lindquist 1995; Morrison et al 1999; Parker & Campbell 1998; Phillips et al 1996);

- estimate travel times of clients to and from various community services (Love & Lindquist 1995; Morrison et al 1999; Parker & Campbell 1998; Phillips et al 1996);

- determine optimal routes to be used by a service: for example, in community policing, what area should be covered to ensure efficient crime prevention? (Sherman & Weisburd 1995);

- establish the geographic accessibility and transportation problems at specific service locations (Hoch, Williams & Rodman 1999; Love & Lindquist 1995; Morrison et al 1999; Parker & Campbell 1998; Phillips et al 1996); and

- help agencies make their services more attractive and useful to clients (Dickman, Tsoumpas & Zhou 1997; Queralt & Witte 1998 a,b).

The use of a GIS in the case of social and human service agencies (such as churches) allow them to produce meaningful, attention-grabbing maps that visually illustrate important administrative, policy and practical issues (Jones 1997). The software also enables administrators and practitioners to gain new insights, for example to find gaps in service delivery, demarcate areas of low service take-up rates and determine the location of areas with new demands for services. GIS software could also help social agencies communicate more effectively to clients the range of services available. In short, GIS software provides a powerful new way to social service agencies to analyse services in relation to clients and the communities in which they operate (Queralt & Witte 1998).

### 1.3 GIS and social services: its place in geography

The part in the discipline of geography concerned with the spatial differentiation and organisation of human activity and its interrelationships with the physical world is called human geography (Johnson et al 2000). The fairness of the distribution of human services is usually dictated by location (Radke and Mu 2001). Location creates service gaps and spatial mismatches between demand and supply of services (Thompson 2000). The accessibility of human services to people (clients) is usually limited by the physical environment, for example the cost of travelling from one place to another (Flowerdew & Gill 1999).

Quantitative geography has been a part of human geography since the 1950s (Johnston 1991), although various human geographers are critically inclined against it. Even when bearing in mind their criticism, quantitative geography has been applied successfully in many instances. Quantitative geography has been getting it done and doing it right for over twenty-five years (Openshaw 1998). Longley & Clarke (1995) are convinced that quantitative geography continues to develop the application and applicability of geographical thinking, and that this way of thinking is central to service planning. Many observers see GIS as the revival of, or newest contribution to, quantitative geography (Longley & Clarke 1995; Openshaw 1998; Taylor & Johnston 1995). As we have seen earlier, the capabilities of GIS are ideal for the analyses of human services as they assist decision makers to deliver an optimum service to their potential clients. In this case human services include churches.

It is clear from the previous discussion that the application of GIS and various GIS techniques in the process of analysing human services are central to geography in the sense that its niche lies within the "hard" (quantitative) side of human geography.

**1.4 Purpose of the study**

This study is being done in conjunction with the Unit for Religious Demographic Research at the Department of Theology, University of Stellenbosch and it is a pilot study for a larger project that should be repeated in other areas in the Western Cape. The study is being done in order to quantify communities' perceptions about what roles they expect churches to play. There is, however, little value in doing a once-off study of the roles and expected roles of churches in an area, because these would change over time. Therefore, similar studies will have to be repeated in future to keep track of the changes. To repeat the study in the same and other areas presupposes that a sound method of gathering the data needs to be established. Such repeated studies would naturally lead to the accumulation of a great deal of data. To store, manipulate and maintain the integrity of the data, it is necessary to develop a database to achieve this. It is also necessary to analyse the data in order to derive useful information from it and communicating these results sensibly to whom it may concern. At the heart of all of the above will be the application of a geographical information system to achieve this.

The aim of this study is consequently to illustrate the process to be followed to quantify the perceived roles of churches in communities by means of a GIS. To indicate how a GIS is used

to quantify the expected roles of churches will involve three different steps or objectives to be realised:

i. To establish a method for gathering geographically orientated data from the study area: a method that can be used again in future

ii. To develop a geodatabase to store, manipulate and keep the integrity of the gathered data. The geodatabase is also important for the addition of future gathered data

iii. To execute geocomputational procedures on the data in order to derive information from it and communicate the information, using outputs from a GIS

**1.5 Research design**

Please refer to Figure 1, page 7, for the steps taken to complete the research application.

A literature study was done to get a good background and insight into the ways GIS was previously used to provide better services to clientele and also to help analyse the services rendered and demand for new services or the allocation of services.

The literature study led to the formulation of the problem to be looked at in the research. In the study GIS was being looked at as a tool in order to quantify the role of churches in our communities. The goal being set by the research problem are addressed by identifying and completing certain steps, called objectives. The first of which was to establish a method of gathering data; then to develop a geodatabase and lastly to execute geocomputational procedures on the gathered data in order to derive information from it.

After the data gathering, storing (in a geodatabase) and data analysis by means of geocomputation, the derived information is synthesised. From the knowledge obtained from doing the research the researcher has a lot of insight into the subject and can therefore recognise and point out gaps in this field that can or must be addressed in future or by future research.

This then concludes the first chapter which introduces the problem being looked at in the research, an overview of related studies in the past and the steps that were taken in order to get answer/s to the problem being identified.

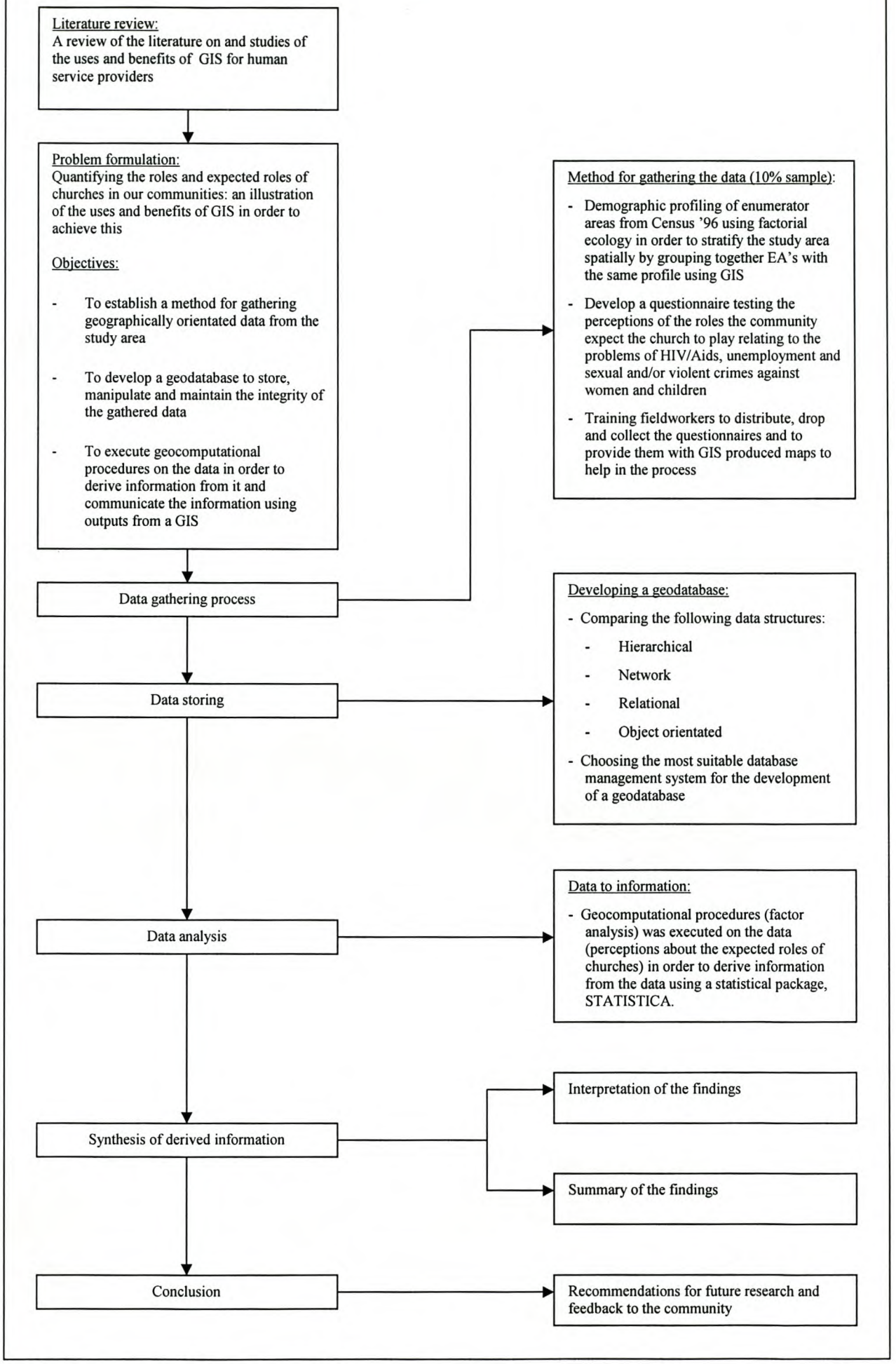



Figure 1: Steps followed to complete the research application

# CHAPTER 2

## DATA GATHERING AND STUDY AREA

The overall aim of the study is to quantify communities' perceptions about what roles they expect churches to play in the broad society. GIS lies at the core of this process and, therefore, the data to be gathered should be geographically orientated in order to incorporate this in a GIS. This chapter of the report will describe the establishment of a method for gathering geographic data.

This is done by first identifying the study area. This is followed by describing how a proportional, spatially stratified, sample for the purpose of a questionnaire survey was done. A demographic profile of the study area is developed to gain better insight into its characteristics as this will be useful for interpreting the results in Chapter 4 of the report. It should be noted at this point that the use of a GIS played a vital role in preparing maps of the study area for data gathering and also in generating the demographic profile. Lastly the development of the questionnaire will be discussed and how it was distributed in order to gather the relevant data.

### 2.1 The study area

The study area incorporated the town of Paarl and adjacent Mbekweni township, as the Church and Community Research Project identified these as ideal places to launch a pilot study (Unit for Religious Demographic Research 2002). Figure 2 indicates the location of the study area in relation to Western Cape Province. Gathering data from this study area involved a sample questionnaire survey, which was completed for 10% of the residents of Paarl and Mbekweni. A sample from the total population thus had to be taken in such a manner that it is representative of the entire population. This is necessary to obtain a true representation of the perceptions of the people about the roles they expect churches to play in society.

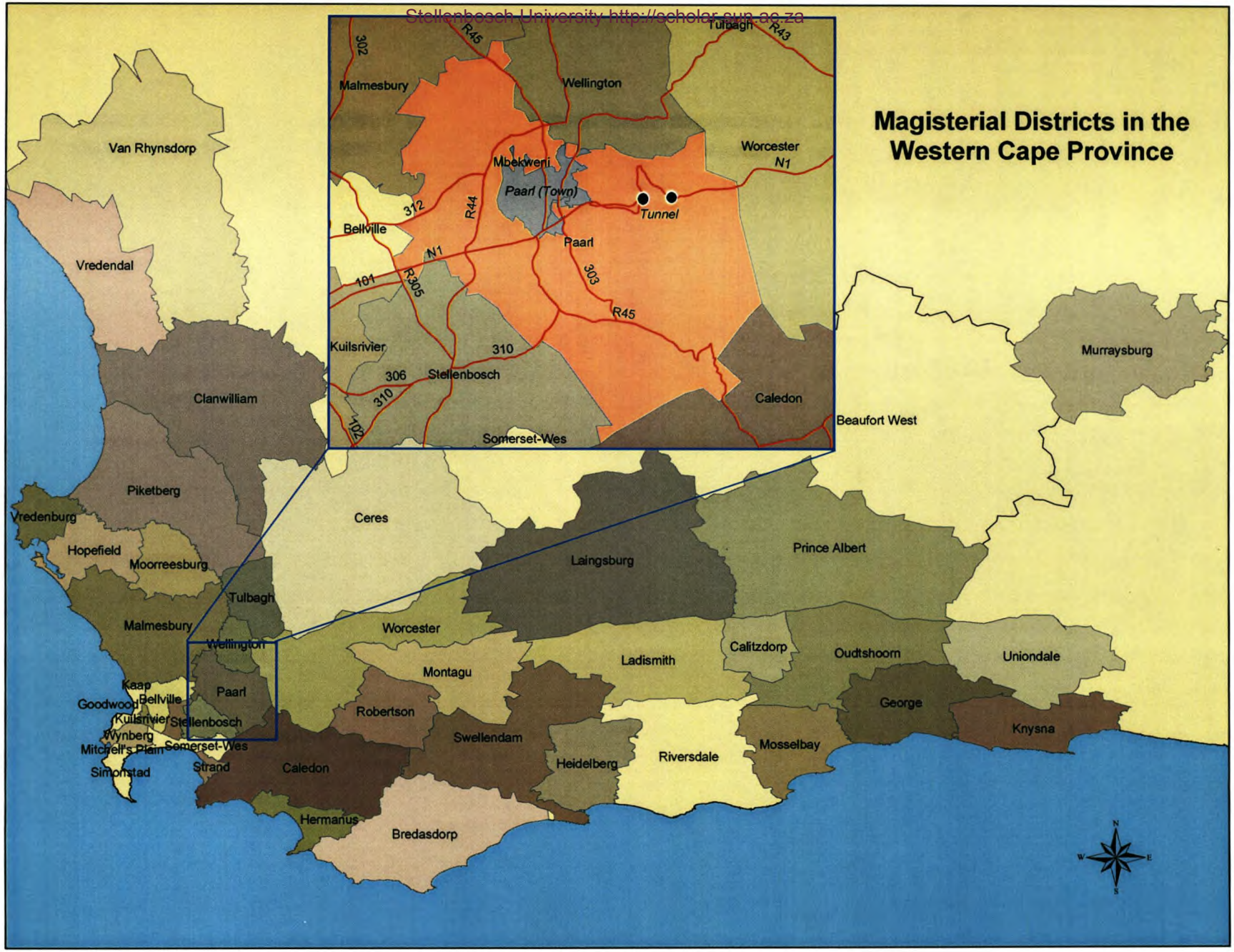



Figure 2: Geographical location of the study areas in relation to the rest of the Western Cape Province

It was decided that a 10% spatially stratified sample needed to be taken from the total number of households in the study area.

### 2.1.1 Spatial stratification of Paarl and Mbekweni

Spatial stratification was done by dividing Paarl and Mbekweni into 30 areas. These 30 areas were created by grouping the 1996 census enumeration areas, with similar overall demographic profiles, using Factor Analysis (Davies 1984; Murdie 1969). Factor Analysis and how it is calculated will be described in detail in Chapter 4 of the report. At this point it is important to bear in mind that Factor Analysis summarises the important relationships between a set of variables by means of a few basic patterns, called factors (Murdie 1969). In other words, in the case of demographic variables, these factors group together different related demographic variables to form a profile for summarizing the characteristics of the enumeration areas (hereafter called EA's).

Factor Analysis was done on demographic variables from the 1996 census data. These variables are listed in Table 1.

Table 1: Demographic variables used in profiling EA's by means of Factor Analysis

| MAIN VARIABLES | SUB-CATEGORIES OF MAIN VARIABLES | | | | | |
|---|---|---|---|---|---|---|
| POPULATION GROUP | African | Coloured | Asian | White | | |
| CHILD BIRTHS PER MOTHER | 0 - 3 | 4 - 7 | 8 - 11 | 12 and more | | |
| GENDER | Male | Female | | | | |
| AGE GROUP | 0 - 13 | 14 - 18 | 19 - 30 | 31 - 60 | 61 - 75 | 75 + |
| MARITAL STATUS | Never Married | Married | Divorced | Cohabit | Widowed | |
| LANGUAGE | Afrikaans | English | African Language | | | |
| DISABILITY | Hearing | Physical | Mental | Multiple | | |
| EDUCATION LEVEL | No schooling | Primary school | Secondary school | Post-school | | |
| INCOME PER MONTH | Low | Middle | High | | | |
| OCCUPATION | White collar | Blue collar | | | | |
| EMPLOYMENT STATUS | Employed | Unemployed | | | | |
| HOUSING | Formal | Informal | Traditional | | | |
| HOUSE OWNERSHIP | House own | House not own | | | | |


Figure 3: Enumerator areas of Paarl and Mbekweni used in the '96 Census

The data from the 1996 census has the advantage of being geographically referenced. Each EA has a unique code. ArcView shapefiles are provided from the census data consisting of polygons, each representing an enumeration area's location geographically. The non-spatial attribute data have the same unique codes as those of the shapefiles in the GIS. On the basis of this common identifier the data files, containing the demographic data, and the geographical locational information respectively can be linked. This then allows the data to be incorporated and shown spatially by means of a GIS. The enumeration areas of Paarl and Mbekweni can be seen in Figure 2. The results from the Factor Analysis used to establish the demographic profile of each EA that had high factor scores were grouped together. There was, however, a prerequisite regarding the number of households in each of these newly formed sample areas, namely that each sample area should contain no fewer than 500 and no more than 1000 households. This was necessary to ensure there would be a sample size large enough for accurately representing the perceptions and opinions of people, when performing a 10% sample. The number of households in each enumeration area was also obtained from the 1996 census data. The thirty areas formed in this way and the number of households in each can be seen in Figure 4.

### 2.1.2 Description of the study area

A full description of the demographic profile of each of these sample areas will be quite laborious and too complex. In summary: Paarl and Mbekweni are divided into three areas by natural boundaries (refer to Figure 4). There is an industrial area down the middle of Paarl and the Breede River also runs through this industrial area. These form the backbone of the study area, with Mbekweni being at the head. To the west of the backbone is a part of Paarl that will be referred to as Paarl West for the purposes of the study. To the east of the backbone is an area, to be referred to as Paarl East. Dividing Paarl according to these naturally formed boundaries, simplifies and makes the discussion of the study area more comprehensible.

Figure 5 shows the different sample-areas with the demographic profile of each. A principal axis Factor Analysis was conducted on the 44 socio-economic and cultural variables for each of these 30 new areas. Three factors were initially extracted with eigenvalues equal to or greater than 0.7. Orthogonal rotation of the factors yielded the factor structure given in Table 2. The factor with the highest score for each sample area was selected as the factor that represents the specific area.

Table 2: Factor scores obtained for each sample area after analysis of the demographic variables

| SAMPLE AREA | FACTOR 1 | FACTOR 2 | FACTOR 3 | HEAVIEST FACTOR |
|---|---|---|---|---|
| A | 2.00582 | -0.67634 | -0.45957 | 1 |
| AA | -0.79988 | -0.64540 | -1.39770 | all neg |
| AB | -0.48945 | -0.56638 | 0.62277 | 3 |
| AC | -0.64023 | -0.94165 | 0.25226 | 3 |
| AD | -0.00460 | 0.08741 | 2.15464 | 3 |
| B | 1.11163 | -1.01726 | -0.65819 | 1 |
| C | 1.74030 | -0.10447 | -0.22773 | 1 |
| D | 1.64715 | -0.60864 | -0.40403 | 1 |
| E | 3.03398 | 0.33732 | -0.00761 | 1 |
| F | 0.40225 | -1.23801 | -0.91049 | 1 |
| G | 0.80063 | 0.70960 | -0.69276 | 1 |
| H | -0.90680 | 0.16755 | -0.46401 | 2 |
| I | -0.94533 | -0.67227 | -0.80162 | all neg |
| INDUSTRIAL | 0.00000 | 0.00000 | 0.00000 | 0 |
| INDUSTRIAL | 0.00000 | 0.00000 | 0.00000 | 0 |
| J | -0.60863 | -0.08300 | 0.54350 | 3 |
| K | -0.06976 | 2.31263 | -0.99726 | 2 |
| L | 0.00000 | 0.00000 | 0.00000 | 0 |
| M | -0.81504 | -1.02684 | -0.06623 | all neg |
| N | -0.80216 | -1.03728 | -0.36283 | all neg |
| O | -0.54081 | 1.23610 | -0.87730 | 2 |
| P | -0.90247 | -0.72349 | -0.75083 | all neg |
| Q | -0.56344 | 0.00611 | -1.33563 | 2 |
| R | -0.34489 | 1.53307 | -0.28070 | 2 |
| S | -0.62805 | -1.28785 | 0.31258 | 3 |
| T | -0.53736 | 1.61963 | 0.14506 | 2 |
| U | -0.39844 | 1.62674 | -0.81065 | 2 |
| V | 0.00853 | 1.70484 | 0.89964 | 2 |
| W | -0.34951 | -0.73125 | 0.95506 | 3 |
| X | -0.17984 | -0.19307 | 1.66095 | 3 |
| Y | -0.35306 | -0.39094 | 1.41581 | 3 |
| Z | 0.12945 | 0.60314 | 2.54286 | 3 |

These factors accounted for 70% of the variance. All of the three extracted factors summarise a combination of variables related to ethnic origin, language, education and economic status (refer to Table 3, page 16). Murdie (1969) basically used the same variables that constituted three factors in his study, with the exception of the variables related to economic status. He classified the factors in his study, "Factorial Ecology of Metropolitan Toronto, 1951-1961", as ethnic status. Because of the variable related to economic status in this study, and the close association with basically the same variables as in Murdie's study, these three factors are classified under the umbrella of "economic and ethnic status". In other words, the three factors each represent the different levels of economic and ethnic status of the people in Paarl and Mbekweni.

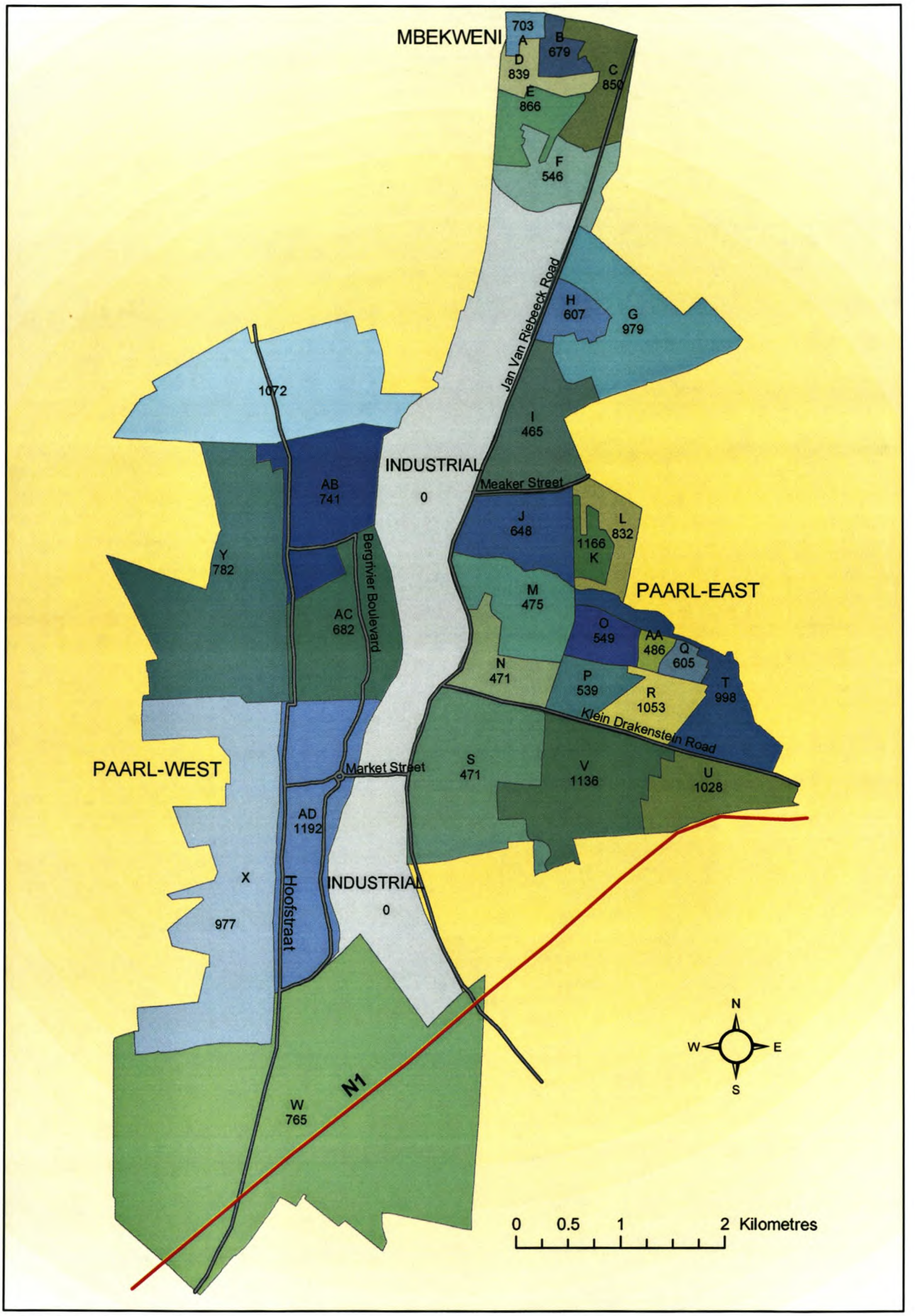



Figure 4: The 30 sample areas established from the EA's using factor analysis

Table 3: Relation of the factors to the demographic variables of the sample areas

| Variables | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|
| EMPLOYED | 0.038380 | 0.89553 | 0.346651 |
| UNEMPLOYED | 0.497624 | 0.62694 | -0.506065 |
| AFRICAN | 0.925955 | -0.18521 | -0.201286 |
| COLOURED & ASIAN | -0.394855 | 0.76084 | -0.356425 |
| WHITE | -0.139873 | -0.16157 | 0.824283 |
| MALE | 0.334894 | 0.66842 | 0.514809 |
| FEMALE | 0.366231 | 0.56448 | 0.039176 |
| AGE 0_7 | 0.312749 | 0.82762 | -0.358647 |
| AGE 8_13 | 0.193306 | 0.87358 | -0.307332 |
| AGE 14_18 | 0.197548 | 0.63708 | -0.001533 |
| AGE 19_30 | 0.482588 | 0.77833 | -0.298060 |
| AGE 31_60 | 0.163750 | 0.94886 | 0.088769 |
| AGE 61_74 | -0.161665 | 0.51768 | 0.432294 |
| AGE_75 & OLDER | -0.003204 | 0.05322 | 0.365415 |
| LNG_AFR | -0.503603 | 0.82030 | -0.014215 |
| LNG_ENG | -0.287180 | -0.22673 | 0.739242 |
| LNG_AFRICAN | 0.914461 | -0.16640 | -0.189359 |
| LNG_OTHER | -0.186734 | 0.18257 | 0.126917 |
| NO_SCHOOLING | 0.485217 | 0.54133 | -0.413889 |
| PRIMARY | 0.280009 | 0.76740 | -0.495288 |
| SECNODARY | 0.090066 | 0.83510 | 0.371626 |
| POST-SCHOOL | -0.210739 | -0.14367 | 0.758439 |
| IN_NON | 0.753189 | 0.36315 | -0.386838 |
| IN_2_4 | 0.805208 | 0.07009 | -0.130314 |
| IN_4_6 | 0.767279 | 0.35976 | -0.264744 |
| IN_6_11 | 0.788930 | 0.28812 | -0.260820 |
| IN_12_18 | 0.657075 | 0.43786 | -0.456003 |
| IN_18_30 | 0.215325 | 0.80464 | -0.247936 |
| IN_30_42 | -0.344148 | 0.79635 | 0.125463 |
| IN_42_54 | -0.299196 | 0.62449 | 0.460773 |
| IN_54_72 | -0.395153 | 0.25900 | 0.785867 |
| IN_72_96 | -0.301905 | 0.13000 | 0.847991 |
| IN 96_132 | -0.246819 | -0.07117 | 0.879953 |
| IN 132_192 | -0.224370 | -0.14741 | 0.826197 |
| IN 192_360 | -0.149120 | -0.13014 | 0.616253 |
| IN_360 & MORE | -0.176925 | -0.02100 | 0.490975 |
| OC_BLUE | 0.343618 | 0.77730 | -0.411024 |
| OC_WHITE | -0.322136 | 0.07593 | 0.905423 |
| HS_FORMAL | -0.221736 | 0.65262 | 0.193983 |
| HS_INFORMAL | 0.658730 | 0.14781 | -0.398511 |
| HS_TRADITIONAL | -0.110424 | -0.14441 | -0.254767 |
| HS_OWN | 0.487781 | 0.70985 | 0.149068 |
| HS_NOT_OWN | 0.001088 | 0.23199 | 0.427031 |

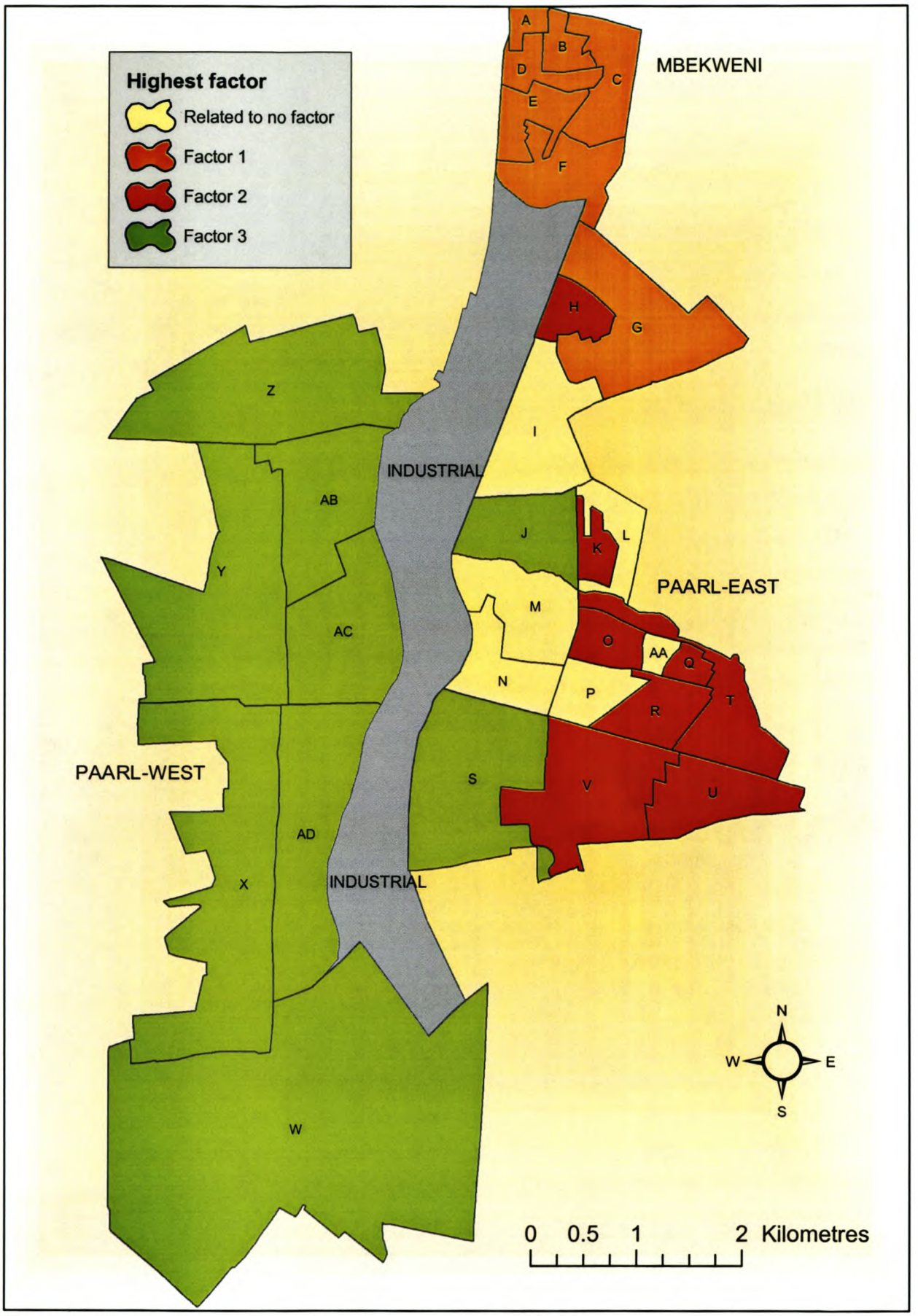



Figure 5: The dominant factor scores of the 30 sample areas

2.1.2.1 Mbekweni

Figure 5, page 17, is a thematic map that shows the sample areas and the major factor associated with the sample-area. The whole of Mbekweni is represented by the first factor. Examination of the factor loadings for the first factor (refer to Table 3, page 16) shows that this component isolates tracts with a large proportion of persons of African descent, Methodist, Presbyterian and AIC religion, speaking an African language with a low income (between R0 and R18 000 per annum).

2.1.2.2 Paarl West

As has been stated earlier, the factors used to profile the Paarl and Mbekweni all represent ethnic; family and economic status of the inhabitants. In Paarl West the same phenomena emerged as in Mbekweni. Again the whole of Paarl West is represented by one factor. Examination of the factor loadings for the third factor (refer to Table 3, page 16) shows that this component isolates tracts with a large proportion of persons that are of European descent; main religions are related to Dutch Reformed denominations and Judaism; there are more people whose mother tongue is English than in the other areas; highest educational level are mainly some post-school education; the income of the inhabitants is between R96 000 and R360 000 per annum; and most of the people have a white collar occupation.

2.1.2.3 Paarl East

Paarl East's sample areas (refer to Figure 5) are not all represented by the same factor, as was the case for Mbekweni and Paarl West. All three the factors are present in this part of Paarl. There are six areas (I; L; M; N; P; AA) in Paarl East that have a low association with all of the factors. The area at the most northern part (G) of Paarl East displays a similar demographic profile as the areas in Mbekweni. In other words the same factor as the one that carried the most weight for each sample area in Mbekweni, is identical for this area in Paarl East.

Two areas (J; S) in Paarl-East have the same profile as the sample areas in Paarl West. The one sample area is situated on the south western point of Paarl East and the other is in the middle of Paarl East, bordering the backbone.

The largest number of areas in Paarl East - eight in total - belong to the third economic and ethnic factor that was identified earlier(refer to Table 3, page 16). Seven of these areas (K; O; Q; R; T; U; V) are clustered together and form the "nose" part of Paarl East around Klein Drakenstein road. The other area is situated to the south of Paarl East. Examination of the factor loadings for the second factor shows that this component isolates tracts with a large proportion of persons that are Coloured; religions are mainly related to Pentecostal/Charismatic, Apostolic and Other Christian denominations; their first language is Afrikaans; most of the people are employed; highest educational level is mainly primary and secondary school level; the age composition of the area constitute two groups, those aged between 0 to 13 and those aged between 31 to 60; the income of the people is between R18 000 and R42 000 per annum; and they are mainly blue collar workers.

## 2.2 Designing and distribution of the questionnaire

Two workshops were held in order to design the questionnaire and decide on the main issues that needed to be addressed by the study. Delegates from different churches and other related social services of Paarl and Mbewkeni were invited to these workshops. During the first round a draft questionnaire was developed and further improved on in the second round of discussions. A final version of the questionnaire was developed after these two workshops (see Addendum A for an example of the questionnaire). Because this study was done in conjunction with the Faculty of Theology, the questionnaire is more extensive than that required by the study. The questionnaire was a self-administered questionnaire and available in Afrikaans, English and isiXhosa. The geodatabase that was developed (discussed in Chapter 3) contained all the data gathered through the use of the questionnaire, but as the main focus in this research was on the perceptions of the people about the expected roles of churches in communities, a subset of questions were analysed.

In each sample area a congregation was selected to take responsibility for that area. The area was then further subdivided into smaller sub-areas each having no fewer than 100, nor exceeding 200, households. This means that between 10 and 20 questionnaires had to be distributed there. Each pastor of the relevant selected congregation was then responsible to organise a fieldworker to drop and collect questionnaires in each of the sub-areas. The fieldworkers received training during a workshop. Each fieldworker received a map of the sub-area and a map at a smaller scale of Paarl for orientation. On the map of the sub-area,

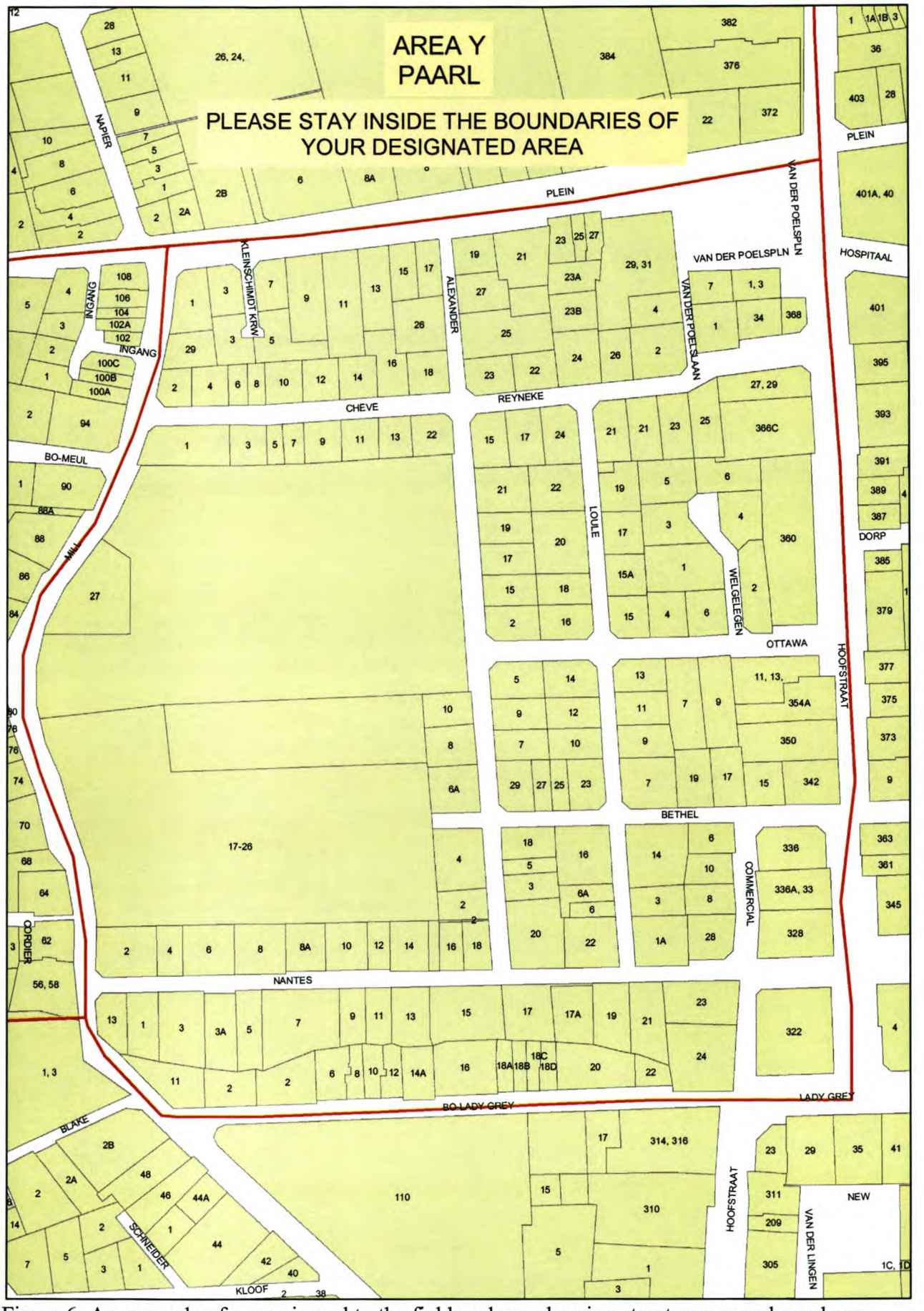



Figure 6: An example of a map issued to the fieldworkers, showing street names and numbers

house numbers and street names were indicated. The location of where the questionnaires were to be dropped was marked on this map in order to assist the fieldworker when collecting the completed questionnaires. Again the use of outputs from the GIS was crucial in assisting the fieldworkers gathering the data. An example of how the sample areas were subdivided and the map each fieldworker received can be seen in Figures 6. Nearly three quarters (72.9%) of the questionnaires were returned, which is a very good return rate for questionnaire surveys (Babbie & Mouton 2001).

# CHAPTER 3

## DEVELOPING A (GEO)DATABASE

After the data had been gathered the researcher was left with a huge stack of completed questionnaires. This data had to be arranged and stored in such a way that it could be easily accessible in the future and also allow the addition of data obtained from follow-up studies. The question thus arose as to how this could be achieved? The answer lies in the construction of a database. As mentioned earlier, the questionnaire was more extensive than that required by this study. The database was, therefore, constructed to accommodate all of the data gathered during the study.

### 3.1 What is a database?

According to Laurini & Thompson (1992) a database is a collection of non-redundant data shareable among different applications (computer programs performing specific functions) representing the need of individual or group users. Within the database, data is organised into larger segments, called files. Files contain records of data, the rows of a file; and the record has data for a particular place, event or entity. A more generalised way of defining a database is by describing it as a collection of organised information relating to a topic like a list of very important clients or a group of friends that owe you money. Databases are in everyday use, such as phone directories, and ordinary dictionaries, etc, and each is a repository for information.

### 3.2 Databases and database management systems

The main reason for the use of a database is to keep track of data. In order to keep track of data in a database, a database management system (DBMS) is needed. A DBMS is a computer based record keeping frame for an integrated and shared storehouse of information. It allows individual data items to be used by different programs, and allows the unification of several distinct sets of data (Laurini & Thompson 1992). Briefly stated, a DBMS is a computer program that is designed to store and manage large amounts of data (Burrough & McDonnell 1998). The user community of DBMS is very broad and include literally millions of firms, accountants, colleges and universities, banks and many more (Clarke 1990). DBMS have come a long way from early stages of development of mainframe computers until today with the popularity of personal computers (PCs).

Although there are different kinds of DBMS, and also taking into account the history of it evolution, DBMS have remained fairly constant over time, regardless of how the attribute data are actually placed into files (or tables). The data definition language is that part of the DBMS that allows the user to set up a new database, to specify how many attributes there will be, what the types and lengths or numerical ranges of each attribute will be, and how much editing the user is allowed to do. This establishes the data dictionary. The data dictionary is a catalogue of all of the attributes with their legal values and ranges. The data dictionary is an important part of the database's metadata (data about the data) and is sometimes critical when the database has to be moved between different computer systems.

The most basic management function of a DBMS is data entry. The DBMS's data-entry system should be able to enforce the ranges and limits entered into the data dictionary by the data definition language. After data entry follows data verification in order to check for errors in the data. Most databases also need to be updated to reflect changes that occurred in the database. After entering and verifying the data, the DBMS could be used to perform its more advanced functions. These are sorting, reordering, sub-setting and searching functions. This involves using a query language. A query language is that part of the DBMS that allows the user to interact with the data to perform these above-mentioned tasks in order to create a new data set. All these functions are common to all DBMSs (Clarke 1990). The DBMS is in itself a computer program located between the user and the physical storage of the data. It provides for the separation of the two, allowing the user to accomplish tasks without being knowledgeable of the physical encodings (Laurini & Thompson 1992).

### 3.3 DBMS and data models

In order to enter data and query a database, a data model is needed. Without a data model, these functions cannot be executed and the data becomes useless. A data model may be defined as a logical construct for the storage and retrieval of information (Clarke 1990).

There are different data models of which the first DBMS developed used the hierarchical structure for organising files (figure 8, page 25). Each file in the hierarchical data model has a "parent" and the "parent" has a relationship with the "child", except for the top most file, which does not have a parent file. All the relationships in a hierarchical database are either one-to-one or one-to-many (Clarke 1990; Burrough 1998; Laurini & Thompson 1992).

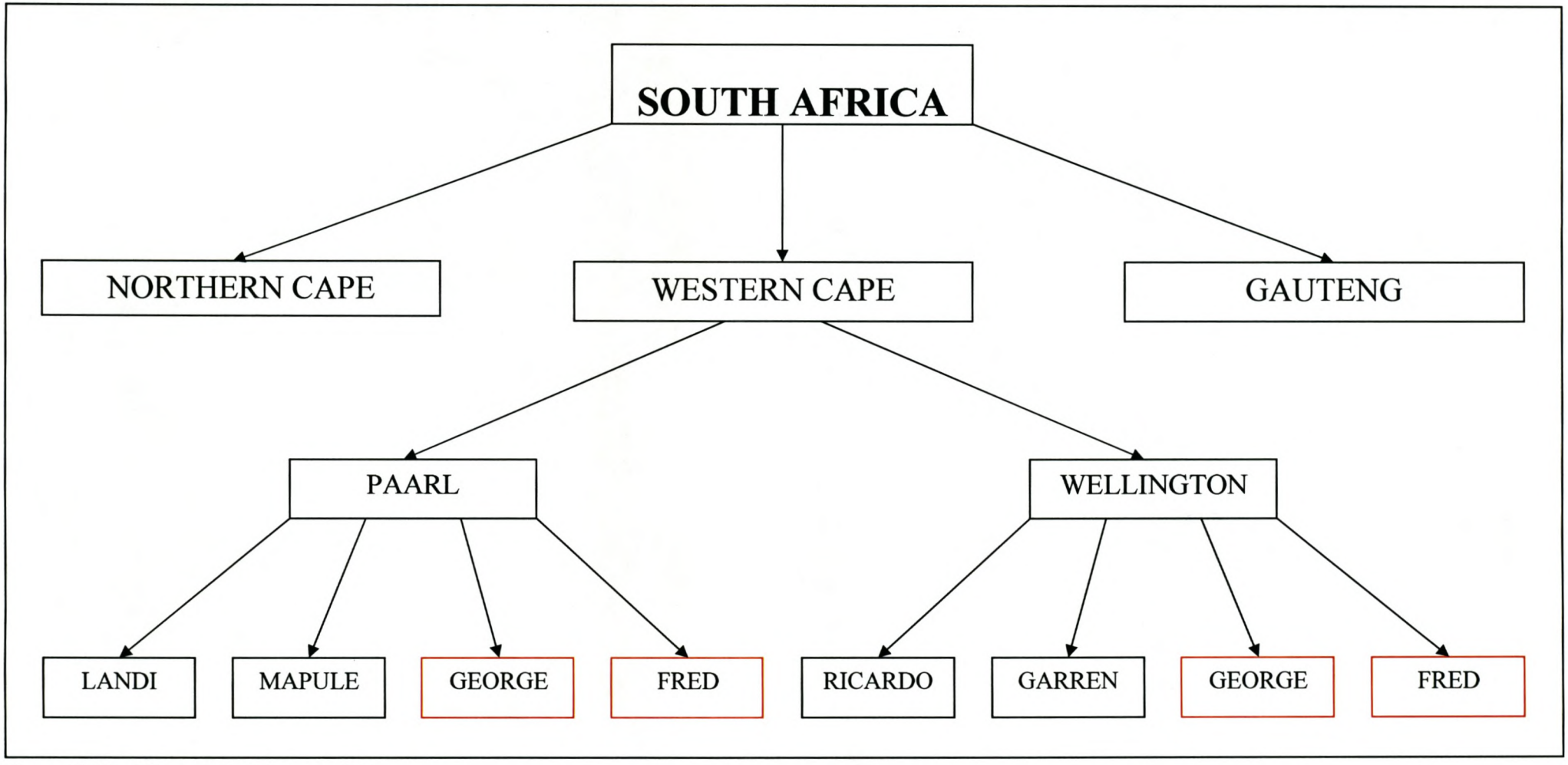



Figure 7: The hierarchical data model

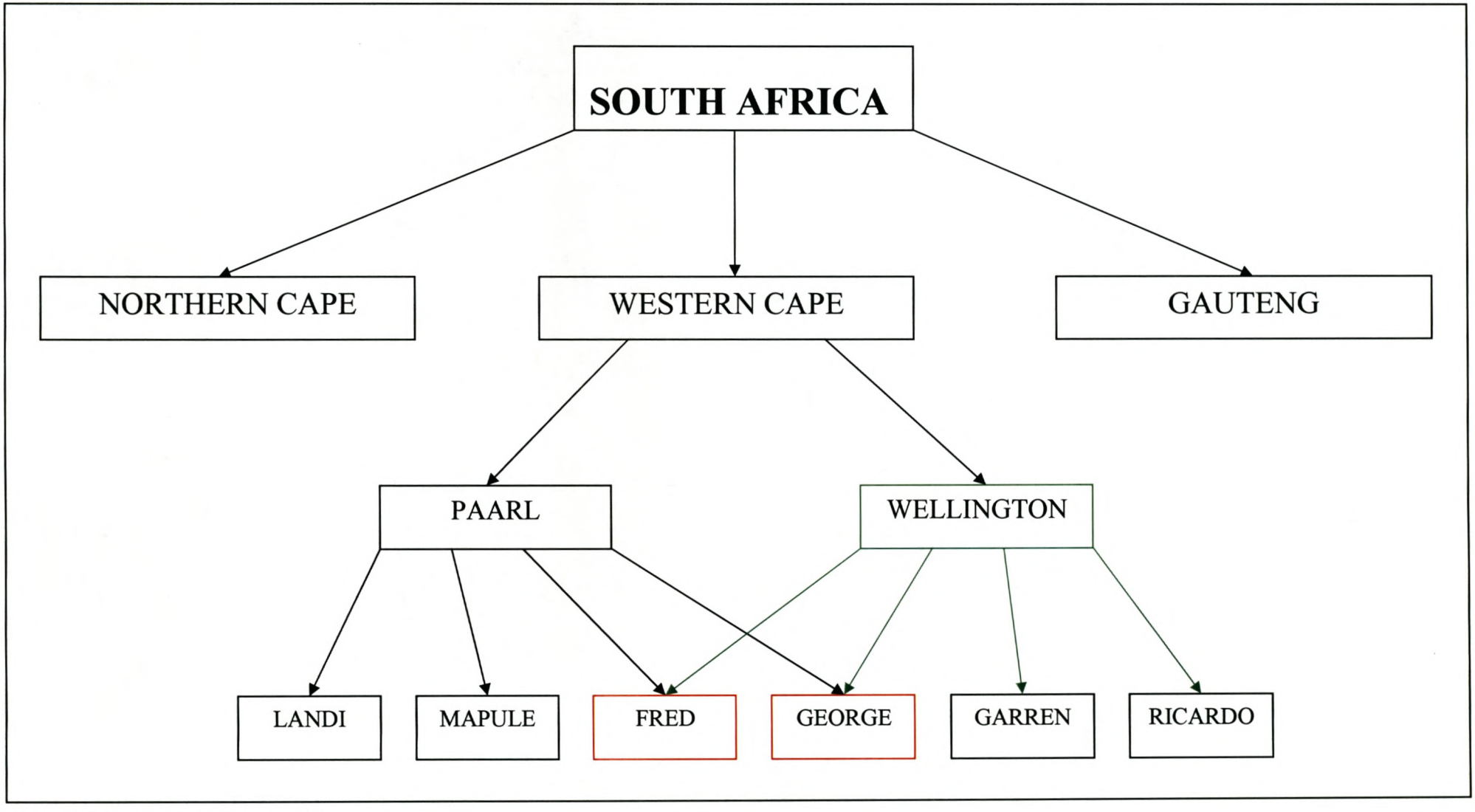



Figure 8: The network data model

In many cases relationships between records overlap. In the hierarchical database there would be redundant data because it only allows a one-to-one or one-to-many relationship from parent to child. In the network database (see Figure 9) one does not need the tree like structure, as in the hierarchical model. It is possible to have connections across branches, which themselves can again be split into branches. In the network system many-to-many relationships are possible (Laurini & Thompson 1992; Demers 2000).

Organising data in an easy, accessible and logical way is, however, not as simple as the hierarchical and network model would like it to be. In the hierarchical and network structure, travel within the database is restricted to the paths up and down the pathways that have been established between the files. A complex case would be multiple membership.

The revolution in DBMS that untangles this database obstacle is the use of relational DBMS. The relational model is rather simple. The major difference, from the hierarchical and network model, is that the database could consist of several flat files, and each may contain different attributes associated with a specific record.

One can now have a single record in several databases, none of which requires a hierarchy. Critical to each part of a relational database is a special attribute that serves as a marker rather than a regular attribute. Assigned to every record is a unique identifier, or also known as a primary key. This "key" attribute serves then as a link between the flat files (Clarke 1990; Burrough 1998; Laurini & Thompson 1992). In the example, Figure 10, the names of the students function as the primary key on which relationships could be established between the different databases.

In general, relational databases are popular because they provide simplicity of data organisation for the user – a fixed structure of connections does not have to be known before the database is constructed, which is not the case for the hierarchical and network model. The relational model provides flexibility to the data user as it is able to join tables as needed, it provides for efficiency of storage by proper design of the tables, and it has a non-procedural style for accessing data. In other words the user does not need to go down set paths to reach certain records in the database.

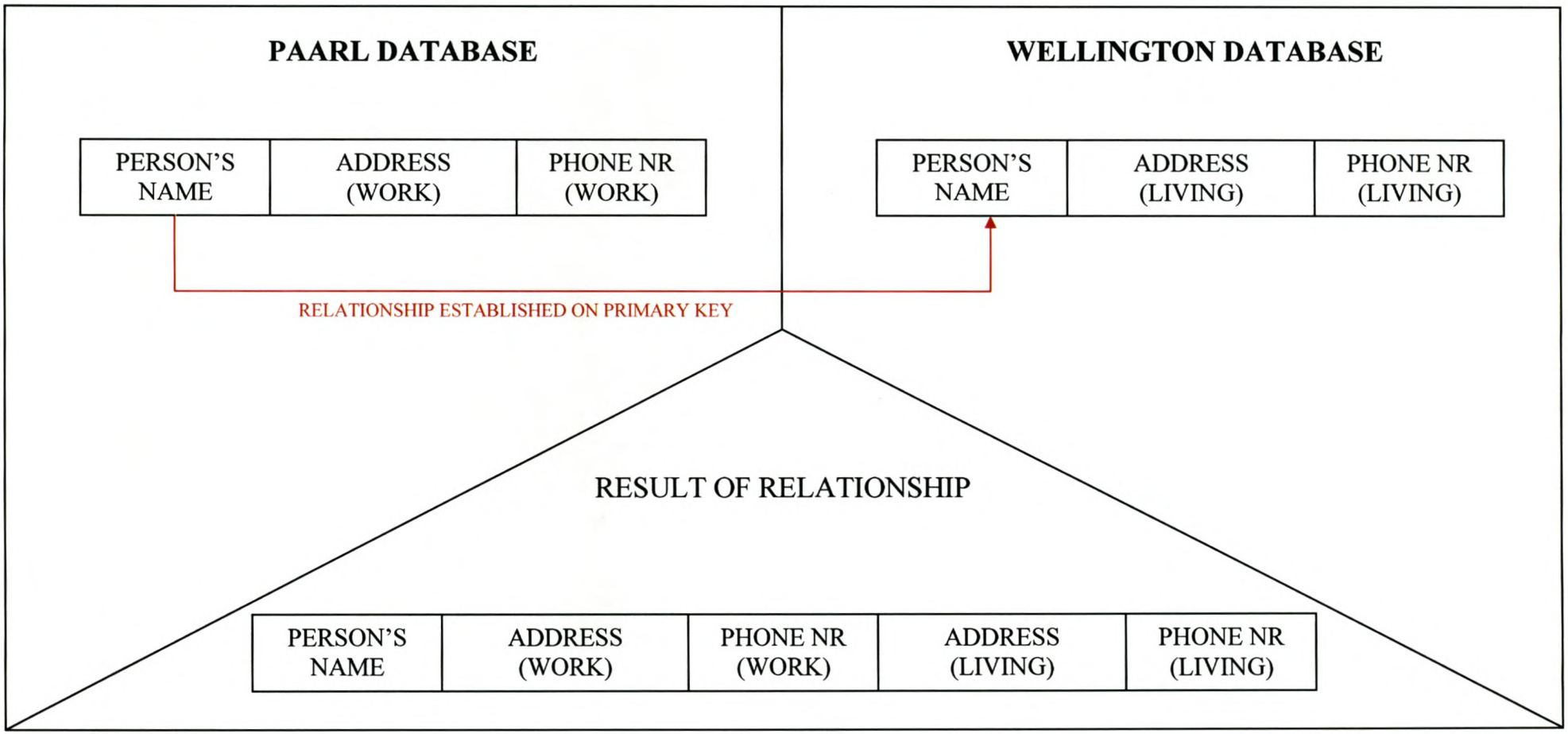



Figure 9: The relational data model

But even in the world of databases there is always room for improvement. The most recent member of the data model family is the object-orientated data structure. Object-orientated concepts originated in programming languages and the application of these ideas to databases was stimulated by the problems of redundancy and sequential search in the relational structure. Object-orientated database models combine the speed of the hierarchical and network approaches with the flexibility of the relational one, by organising the data around the actual entities as opposed to the functions being processed (Burrough & McDonnel 1998). An example of the structure of an object orientated database can be seen in figure 11, page 33.

Data used in an object-orientated database need to be clearly definable as unique entities. Given that, these databases provide very efficient structures for organising hierarchical, interrelated data. Establishing the database is obviously time consuming as the objects may be defined more explicitly and the various links need to be established. That said, relational database structures are still better at performing queries based on the values of an attribute (Burrough & McDonnel 1998).

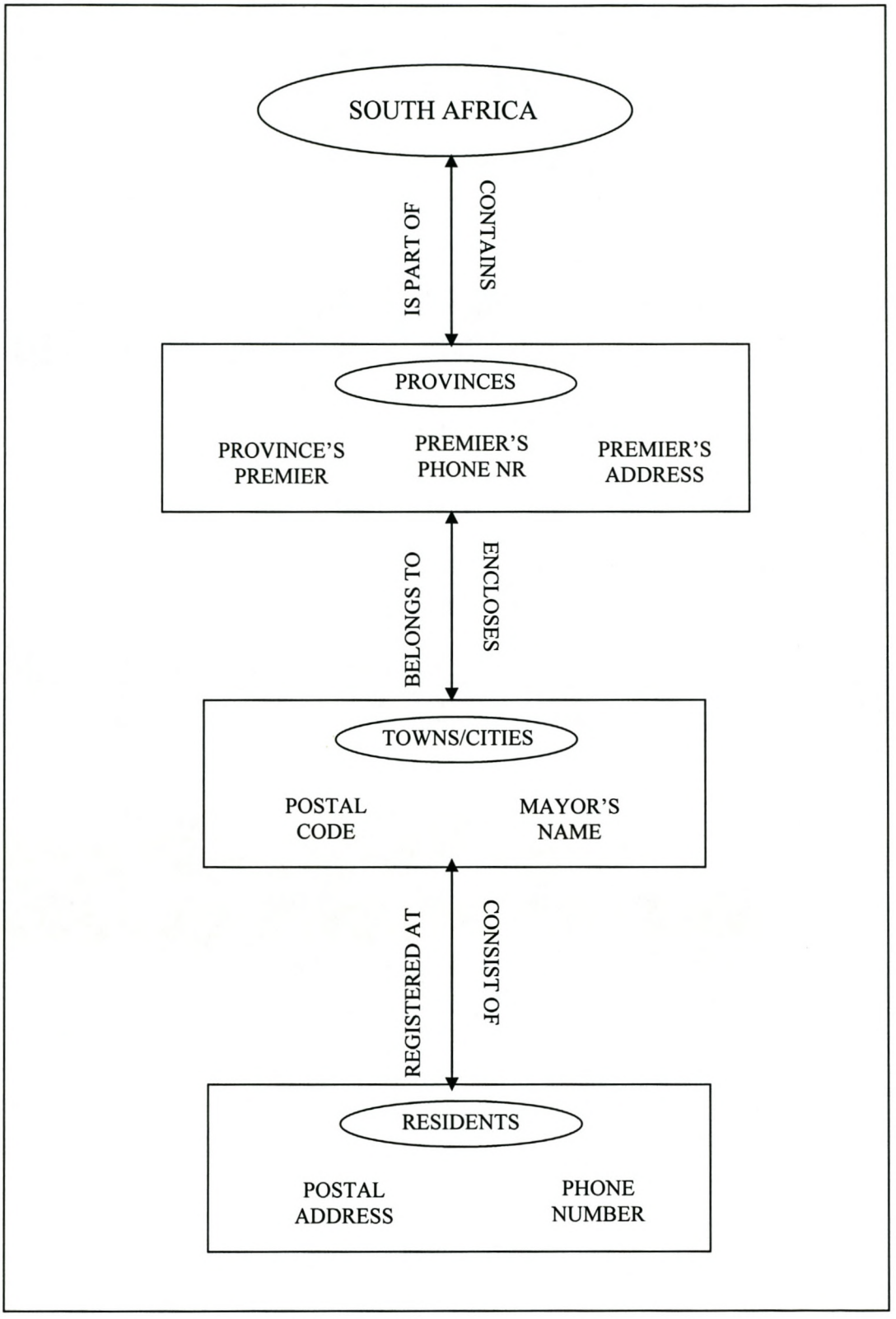



Figure 10: Object orientated data model

### 3.4 Choosing a database

From the discussion regarding the different data models it is clear that the relational data model is the most effective model to use when compared to the object-orientated, network and hierarchical data models. During the data gathering process a great deal of data is compiled from which information needs to be drawn. The process of deriving information from the data will be discussed in the following section. If a data model has been chosen, the question still remains about which DBMS could best be used for the storage and management of the data.

In this study a *geodatabase* is needed, in other words there is a spatial (geographical) dimension to the data in the database. Decision problems that involve geographical data are referred to as geographical or spatial decision problems. A datum may be regarded as geographical if it could be associated with place or location, in other words if the data is geo-referenced (Aronoff 1989). Geographical data is arranged in a geographical matrix (Berry 1964; Wilson 1974). In a data matrix, the rows represent the geographical entities of observation for which data are required. Each entity is described by coordinate data and attribute data (attributes or variables). An attribute is any property that distinguishes a geographical entity. The values of attributes vary over geographical space. Each cell in the matrix contains an observation, which could be in numerical or alphanumerical form. In the case of human services, the analyst could for example use census tracts (entities the coordinates of which are known) and attributes that describe the population in the census areas, such as average income, number of households, etc.

There are two broad categories of geodatabases supported by ArcGIS™: multi-user geodatabases managed, using ArcSDE™ and personal geodatabases. Multi-user geodatabases could be read and edited by multiple users; they require a DBMS, such as Oracle, SQL Server, Informix, or IBM DB2. Multi-user geodatabases could be used with any ArcGIS product (ArcView®, ArcInfo™, or ArcEditor™) but require ArcSDE for editing and schema management. For this study a personal geodatabase is sufficient however. Personal geodatabases support many readers and a single editor. They are stored in a Microsoft Access database. One is able to create and work in personal geodatabases with ArcGIS™ without the need for any other software. Personal geodatabases are usually on the same network as the client application (for example, ArcMap™) (ArcGIS help files). Taking all of the above into account, Microsoft Access is the ideal DBMS for the creation of a personal geodatabase. Each entity in the personal geodatabase (Access database) has a code. Such a code is related to geographical areas from which this data was gathered. After the data had been added into a

project in ArcMap™, via ArcCatalog, it may be joined to the geographical locations by means of the common code. One can access a Microsoft Access database directly in ArcCatalog.

### 3.5 Quick glance at the geodatabase

A screen shot of the structure of the data in the personal geodatabase constructed during this study may be seen in Figure 12. Addendum A will contain a compact disk with the geodatabase and a base map of the study area. The database can be viewed in either Microsoft Access or ArcCatalogue (ArcGIS 8.x).

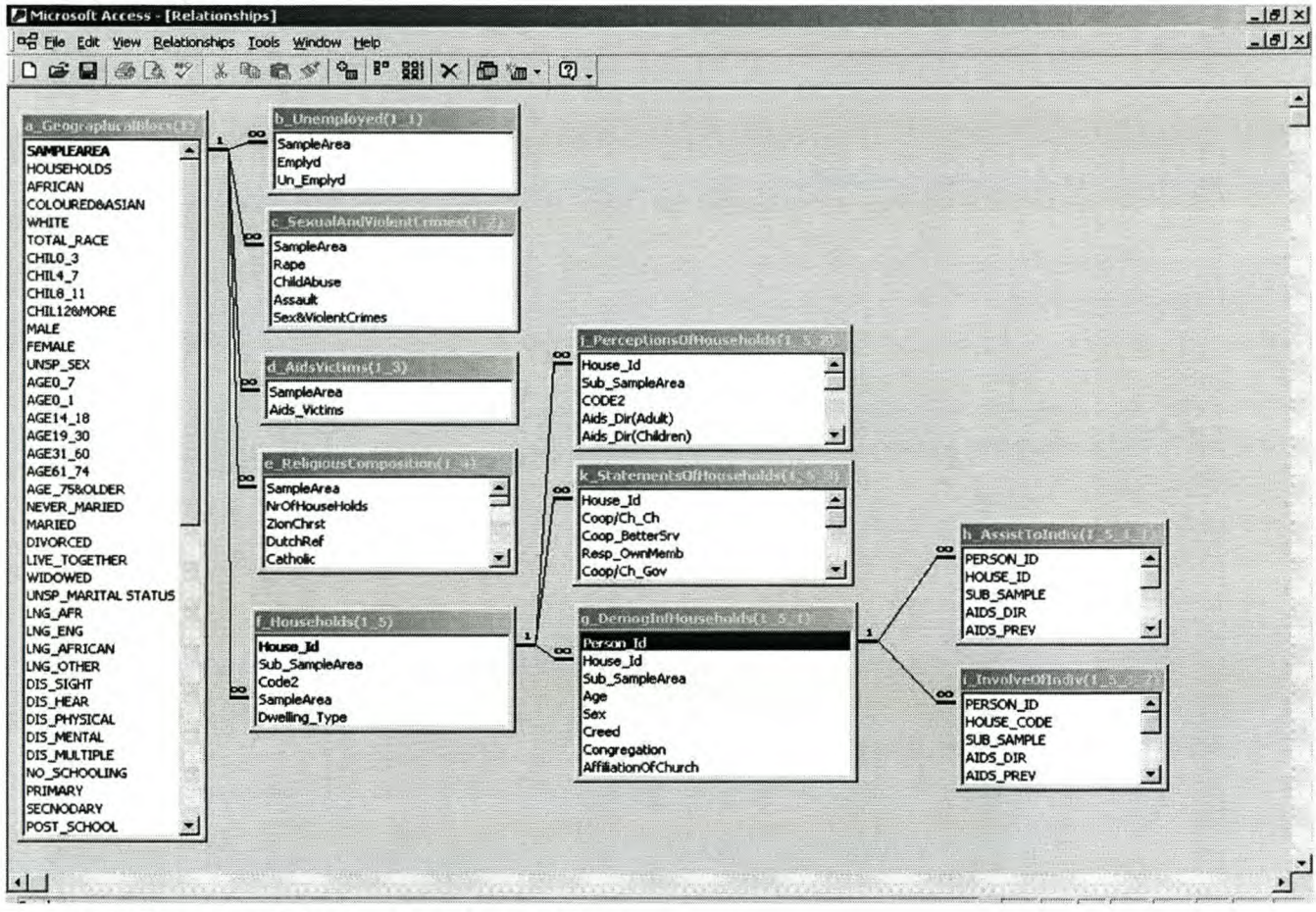


Figure 11: Structure of the developed geodatabase

In Figure 12 the database consists of the different flat files. The first flat file contains the demographic data for each of the sample areas that was derived from the 1996 census. With the use of the primary key (the id code of the sample area), this flat file is connected to the files containing data about the reported cases of sexual and/or violent crimes and HIV/Aids positive cases for one year, the number of unemployed people and also the background information of the participating households for each sample area. The households that participated were given a code; these were then used to link a household to another set of flat files containing data about each particular household. These flat files contains data about the

perceptions of the households concerning the expected roles of churches' involvement in the problems on which the study focused. Certain statements on which respondents had to comment and general background to the household, including information about all individuals older than 16 years of age were indicated. Each individual in the house was given a unique code, which then again served as a link to the next set of flat files containing data about the kind of services in which the individual is involved or receives from the church.

The database contains the relationship of the data from the demographic profile of the sample areas to the level of the individuals in each household and services that they receive and are involved in. The major value of using this database management system emerges when a query is entered. With a single and very simple query one could establish for example how many persons are involved in some kind of preventative action, related to sexual and/or violent crimes against women and children, for each sample area - see Figures 13 and 14 on pages 35 and 36. This is all possible because of the ability of the relational data structure and the links it establishes between the different flat files. It also has the advantage that when data is collected in future - with the prerequisite that the same sample areas are used - the data may be added to this database without much effort, using the identifiers of the sample areas as a primary key.

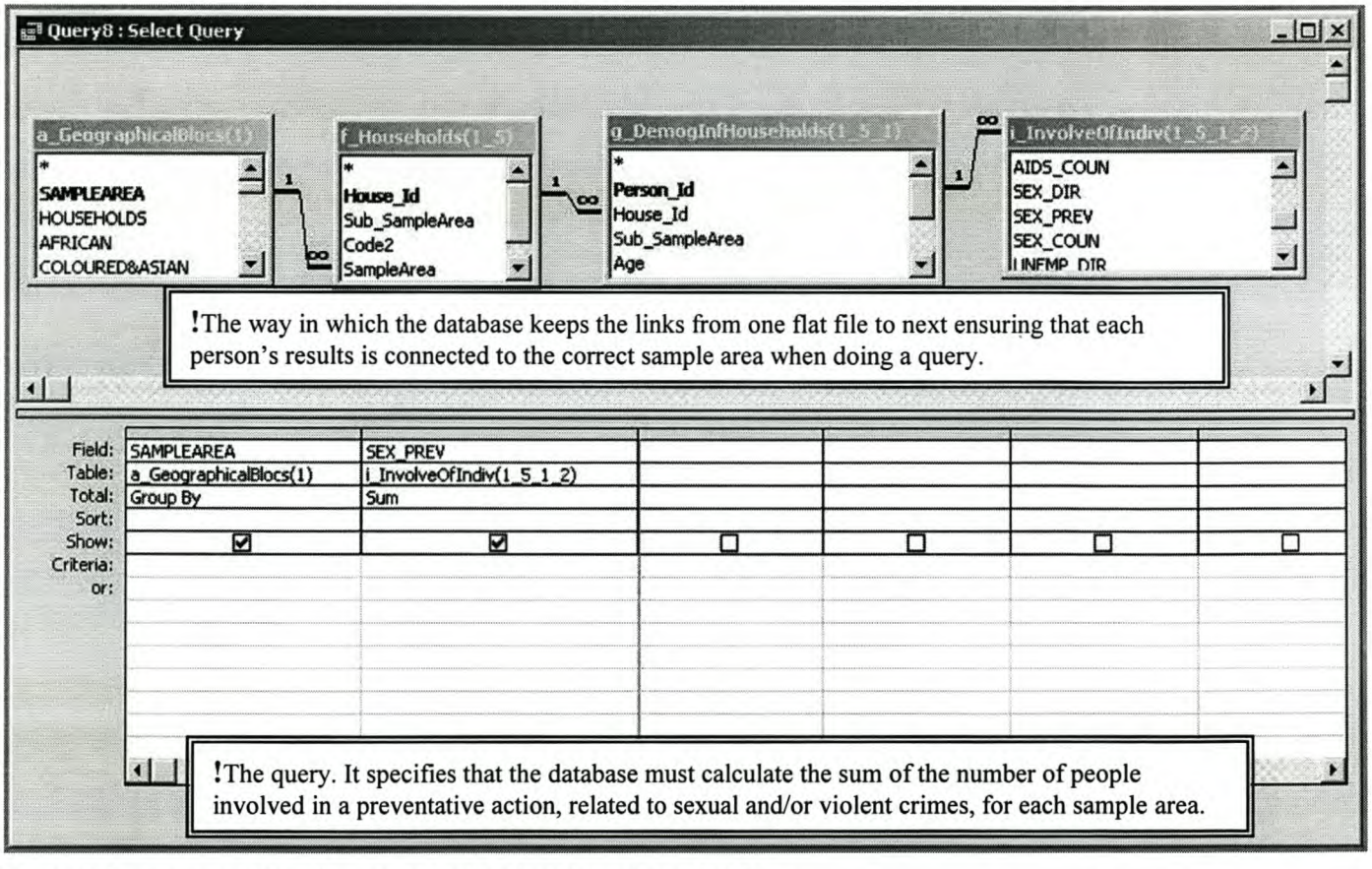
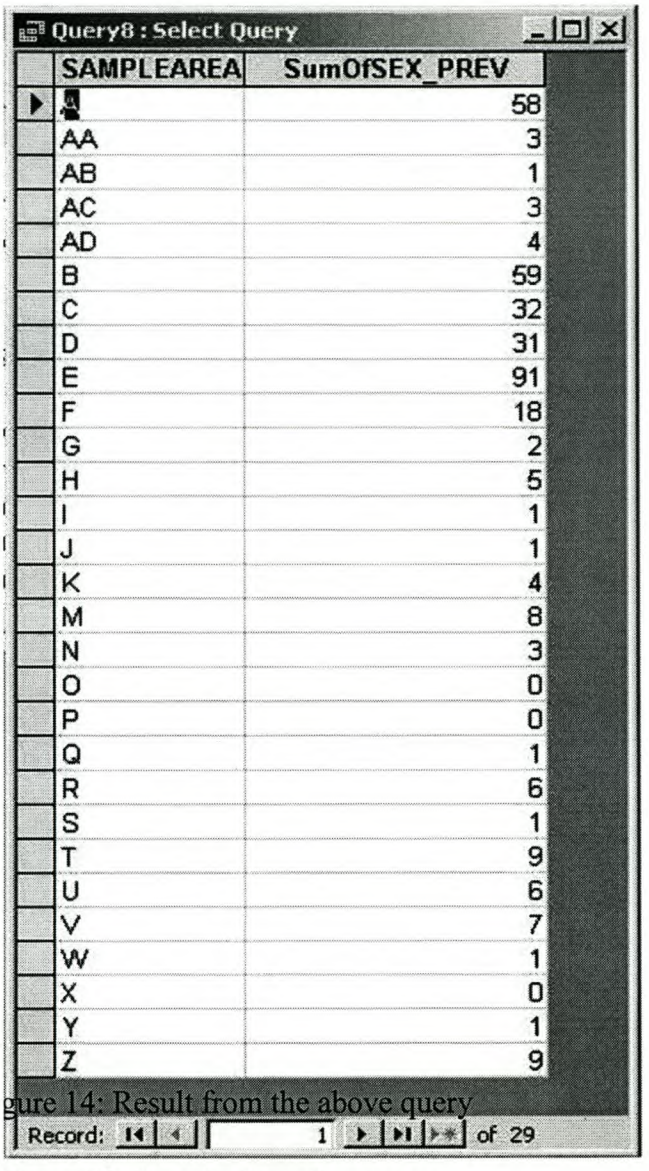



Figure 12: An example of a query in the developed geodatabase




gure 14: Result from the above query

Figure 13: Results from the query

The data gathered during the study are stored in a personal geodatabase. The database makes it possible to manipulate the data easily and effectively. This data must then be presented in such a way that it is accessible and understandable to a large variety of people to whom this data is of potential value.

# CHAPTER 4

## DATA TO INFORMATION: A GEOCOMPUTATIONAL PROCESS

"Data are of little value; to be useful it must be transformed into information" (Malczewski 1999).

Data can be transformed into information by analysing it in various ways in order to provide answers to particular questions. GIS is a tool which may be used for a wide range of scientific and general ends. In itself GIS, however, provides little guidance as to how geographically related problems could be analysed and/or be solved. Geocomputation is a method for the extraction and accessing of useful information form large and frequently complex datasets.

The provisional working definition for geocomputation, according to Couclelis (1998), is: "the diverse application of computational methods and techniques to portray spatial properties, to explain geographical phenomena, and to solve geographical problems." The data gathered in this study is bound to entities with specific geographical locations. One of the purposes of the study is to observe the spatial variation of certain phenomena derived from this geographically orientated data by means of computational procedures. This means that the use of geocomputation in this study is necessary to explain the geographical phenomena through different methods of statistical analysis of the data.

There are a number of points of view and arguments about the relationship between GIS and geocomputation and this constitutes a discussion of considerable length on its own. Longley et al (1999), however, feel that the environment for geocomputation is provided by geographical information systems. According to them geocomputation leads to the creative and experimental use of GIS. By this is meant that many researchers in the field of GIS do not use proprietary GIS technology, but choose instead to write their own programs or couple GIS with other specialised software in order to put particular methods into practice (Longley et al 1999). In this study the latter method was used. The software package Statsitica was used for the geocomputation process in order to derive information from the geographically orientated data. The results of this analysis were imported into the GIS in order to portray and help to explain observed spatial variation in the phenomena. In other words the GIS was coupled,

through a process of loose coupling, with a specialised statistical package (Statistica). This process is easy, because software is becoming more and more interoperable. A proof of this interoperability between Statistica and ArcMap™ is the fact that the different graphs, plots, diagrams and tables produced in Statistica and inserted in ArcMap™ could be dynamically linked to the original data files in Statistica. This means that any changes made to the data by using Statistica are immediately portrayed in the graphs, plots, diagrams and tables added to any GIS project. Figure 14 illustrates how this is done on the graphical user interface of ArcGIS.

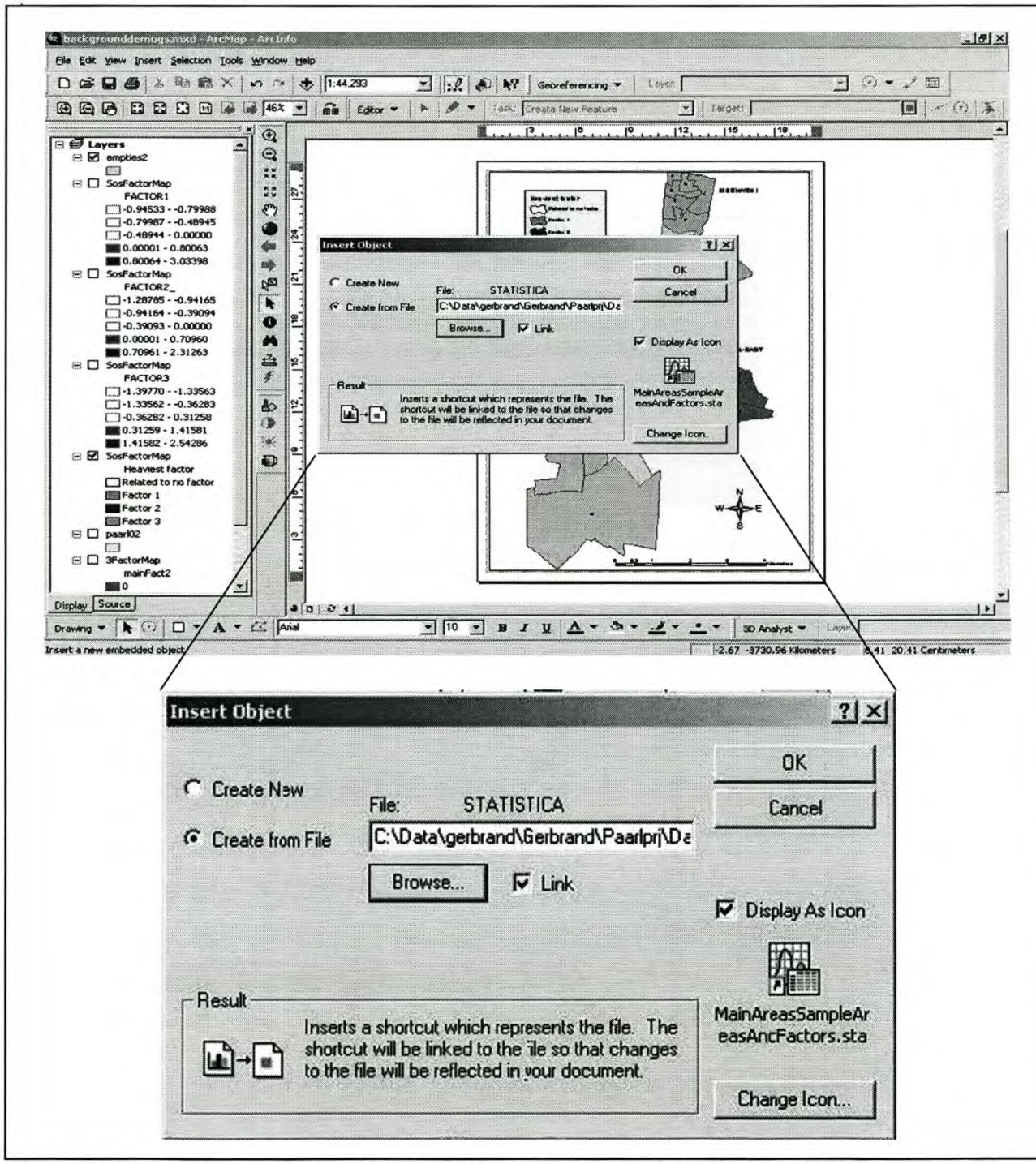



Figure 14: The way in which ArcGIS allows the user to dynamically link it to Statistica.

A discussion on the statistical analysis done on the gathered data by means of a statistical procedure, called Factor Analysis using Statistica, will now follow. The same statistical procedure (Factor Analysis) was used previously to establish the demographic profile of the study area as was discussed in Chapter 2 of the report. The demographic profile of the study area will serve as a background for the interpretation of the results from the analysis of the data.

### 4.1 Factor Analysis of perceptions

Factor Analysis deals with the simultaneous variation in many variables, a situation that causes many problems for human geographers as they frequently deal with large data sets. This poses a problem when having to make sense from the masses of data (Cattell 1952). Factor Analysis summarises the important relationships between the variables in the form of a few basic patterns, called factors (Murdie 1969). In other words, it provides a way of identifying patterns of relationships in data and separating general patterns of variation from specific local patterns. Factor Analysis is thus a method to synthesise data to produce generalisations (information). The technique was developed initially by psychologists early in the 20$^{th}$ century as a method of analysing the results from intelligence tests (Davies 1984; Murdie 1969).

At first little interest was shown in the technique, but by combining this with matrix algebra and the wider availability of electronic computers, its popularity has increased dramatically. This was because much larger datasets could be handled in a shorter period of time. At the same time the use of this analysis technique spread to other disciplines of which geography was one. Examples of research by geographers incorporating Factor Analysis includes economic regionalisation (Murdie 1969), climate regionalisation (Murdie 1969), the classification of cities (Murdie 1969), the regionalisation of urban areas and the analysis of commodity flow patterns (Murdie 1969). Factor Analysis is also widely used as a method of deriving information from data when doing analysis using a GIS. Hargrove & Luxmoore (1997) used it to develop a spatial clustering technique for the identification of customisable eco-regions, Hoon Chang (2001) developed a comprehensive vulnerability assessment model for local communities using GIS and Factor Analysis, Srinivasan, Ferreira & Shen (1999) used it for the quantification of neighbourhood characteristics and Davis (1999) used it for establishing the factorial ecology of cities.

In this study there were 13 variables in the questionnaire testing the perceptions of the communities in Paarl and Mbekweni about how the residents felt in relation to the involvement of the church in providing certain social and welfare services to the community. In Addendum B, section D, page 7 of the questionnaire, the different questions in the questionnaires can be seen. There are three main social/welfare issues on which the study concentrates, namely sexual and/or violent crimes against women and children, unemployment and HIV/Aids. Churches have three main categories or approaches at providing social/welfare related services to people. The first of these are through providing some kind of direct service to people. In other words, if someone should be unemployed and, therefore, has no income, the church will then provide in the need of this person through, for instance, a financial grant. Thereby the person receives direct assistance from the church. The second way is by means of counselling. Counselling could be defined as a service where a person is assigned the job of helping another by giving him/her assistance and guidance on a emotional level over an extended period of time in relation to the problem that the person is experiencing. An example would be the help a woman receives to overcome the trauma after a sexual crime was committed against her. The final kind of service is one that involves the prevention of certain situations or conditions. Consequently a preventative action is taken by the churches. Churches may implement a preventative plan of action against problems by, for instance, making people aware of the way in which HIV is contracted and informing about the dangers of the pandemic (Erasmus *pers.com*). The different questions in the questionnaire were constructed in such a way that it tested whether or not the communities of Paarl and Mbekweni perceived it as necessary for the church to either provide direct assistance, counselling or preventative action in relation to problems pertaining to sexual and/or violent crimes, unemployment and HIV/Aids. The perceptions of the people were measured on a five point Likert-scale.

There are too many variables in the survey on which to report individually in a comprehensible manner. Consequently a Principal Axis Factor Analysis was conducted on 13 selected variables. Three factors were initially extracted with eigenvalues equal to or greater than 0.7. Orthogonal rotation of the factors yielded the factor structure given in (Table 4). These factors accounted for 64.2% of the variance. A combination of the variables that score high on an extracted factor, form a class that should be classified and the specific factor represents this combination of the variables. The factor loadings measure the association of the original variables with each factor and may vary between +1.0 to –1.0, the extremes of perfect correlation. High positive scores indicates a strong positive correlation between the

variable and the extracted factor. Zero shows no correlation and a negative score measures a negative correlation between the variable and that factor. Three factors were extracted, relating to the perceived necessity of the involvement of churches in social and welfare problems in communities.

Table 4: Strength of the relationship between the variables and the extracted factors

| Perceptions | Factor1 | Factor2 | Factor3 |
|---|---|---|---|
| Aids_Dir(Adult) | 0.243571 | 0.285988 | 0.733295 |
| Aids_Dir(Children) | 0.345785 | 0.252845 | 0.732348 |
| Aids_Prev1 | 0.304614 | 0.244421 | 0.673337 |
| Aids_Coun1 | 0.339819 | 0.271991 | 0.673711 |
| Sex_Dir(Adult) | 0.768836 | 0.256621 | 0.428096 |
| SexDir(Children) | 0.796612 | 0.223480 | 0.392493 |
| Sex_Prev1 | 0.385568 | 0.461737 | 0.428099 |
| Sex_Coun1 | 0.459373 | 0.481035 | 0.405704 |
| Unemp_Dir1 | 0.197581 | 0.838553 | 0.177809 |
| Unemp_Prev1 | 0.098038 | 0.643584 | 0.322161 |
| Unemp_Coun1 | 0.256841 | 0.757734 | 0.239953 |
| Unemp_Dir(opt) | 0.283677 | 0.350731 | 0.407933 |
| Unemp_Coun(opt) | 0.389159 | 0.311738 | 0.500927 |
| Expl.Var | 2.319081 | 2.751558 | 3.276823 |
| Prp.Totl | 0.178391 | 0.211658 | 0.252063 |

The first factor appears to be related to the opinion that the church should provide some kind of direct assistance to women and children affected by sexual and/or violent crimes. The questions in the questionnaire that constitute the variables shown in Table 4, are defined in section D, page 7, question 13 and 14 of the questionnaire (Addendum B). Both these questions are related to a need for direct assistance to women or children affected and influenced by sexual and or violent crimes. The second factor is related to direct assistance and counselling to unemployed people. The factor loadings of the perceptions of the community, about the church's involvement in some kind of preventative action related to unemployment (see the variable "Unemp_Prev1"), is also relatively high in relation to other factor loadings for the variables related to unemployment. Refer to section D, page 8, questions 22, 23 and 24 of the questionnaire (Addendum B) for the questions that constitute these variables. Against this background the whole of the factor can be interpreted as a wish that the church becomes involved in helping to curb unemployment in the communities. The final factor relates to the need for direct assistance to adults and children infected or affected by HIV/Aids. In support the factor also has moderately high loadings on two other variables ("Aids_Prev1" & "Aids_Coun1"). See section D, page 7, questions 8, 9, 10 and 11 of the

questionnaire (Addendum B) for an explanation of the questions that constitute these variables. These are the variables related to the perceived necessity of the involvement in some kind of preventative action to restrain the rate of infection and spread of HIV/Aids and also in providing counselling to people infected or affected by HIV/Aids. By including these variables factor III is interpreted as a factor related to a need for the church to be involved in limiting the effects and infections of HIV/Aids. The three factors, related to the perceived necessity of the involvement of churches in social and welfare problems in communities, are, therefore: (A) Direct assistance to women and children influenced by sexual and/or violent crimes; (B) Help in curbing unemployment; (C) Limiting effects and infections of HIV/Aids.

After extracting the different factors from the data, a factor score for each entity that participated in the survey are calculated and added as an extra field or attributes to that entity. These factor scores that are now part of the attributes of the entities, show the relationship between the entity and the factors that have been extracted. The different entities in this study are the relevant households. The factor scores, which are standardised measures of the households, range from high negative to high positive. The signs show the direction of the association between those factors and the variables. High positive scores indicate that people feel very strongly about the role of the church to provide these services that form the extracted factors. Naturally high negative scores show the inverse of the above. A zero factor loading indicates no association between that variable and the corresponding factor.

The factor loadings for each household are known, but the study area (Paarl and Mbekweni) has been divided into sample areas. To generalise the results from the survey, based on households to the sample areas, the average factor scores for the sample areas were calculated by adding the factor scores of all the houses situated in a certain sample area and dividing it by the number of households. The results of calculating the mean for each sample area from the factor scores of the households may be seen in Table 5. These mean factor scores on factor I, II and III were then imported into ArcMap™ and used to indicate the spatial variation in the perception of the people according to the different sample areas in the study. Again the division of Paarl into three areas - Mbekweni, Paarl East and Paarl West - is used to structure the discussion of the results. The difference in spatial variation of the perceptions of the people for each of these three areas, will be discussed for factor I, II and III in the sections that follow.

Table 5: Mean Factor scores for the different Sample Areas

| SampleArea | FACTOR 1 | FACTOR 2 | FACTOR 3 |
|---|---|---|---|
| A | 0.05248999116 | 0.26479368857 | 0.43933334730 |
| AA | -0.06375569456 | 0.31273985623 | 0.02788364195 |
| AB | 0.35974079742 | -0.17439897565 | -0.32720420600 |
| AC | 0.18587075277 | -0.02594514433 | -0.28995256467 |
| AD | 0.31031155827 | 0.00697601312 | -0.34580496452 |
| B | -0.14150534982 | 0.03503587238 | 0.14774476440 |
| C | 0.05655578294 | -0.06893660974 | 0.24628195294 |
| D | -0.12481351777 | 0.42710621062 | 0.49198993949 |
| E | 0.04628203743 | -0.08062784832 | -0.07711661805 |
| F | -0.35586533536 | -0.38733198945 | 0.54413432777 |
| G | -0.59100486839 | -0.01625408211 | -0.14116585943 |
| H | 0.13295258115 | -0.13312978718 | -0.02576164325 |
| I | -0.12259301688 | -0.16889849513 | 0.10628872141 |
| J | 0.15438459640 | 0.91501258284 | 0.49286251649 |
| K | 0.03269882575 | 0.10125986604 | 0.27065240007 |
| M | -0.23120557870 | -0.21705028711 | 0.12933914243 |
| N | 0.16134062306 | 0.30916326476 | -0.07057884539 |
| O | -0.16070969344 | 0.21943749138 | -0.02967370752 |
| P | -0.05928610318 | 0.29141099773 | 0.04661550756 |
| Q | 0.17256016056 | -0.89948038111 | 0.03140784535 |
| R | -0.33278508033 | -0.16769942104 | -0.36196155948 |
| S | -0.14917062952 | -0.27943639197 | 0.03043236668 |
| T | -0.15441499688 | 0.04816504926 | 0.01527882179 |
| U | 0.00093553130 | 0.24231441672 | -0.01888505062 |
| V | -0.11841530722 | -0.24263526178 | 0.01284008684 |
| W | 0.15877571911 | -0.14704540279 | -0.33952086644 |
| Y | -0.00312018731 | -0.07951458585 | -0.28910358561 |
| Z | 0.28164239916 | -0.17926792953 | -0.16087576115 |

4.1.1 Factor I

The *first factor* is related to the perceptions of the people about whether or not the church should provide some kind of *direct assistance to woman and children influenced or affected by sexual and/or violent crimes.* The factor scores for each sample area for factor I are shown in Figure 16. To symbolise the different sample areas the factor scores were divided into six class intervals ranging from high negative to high positive. This was done by using the symbology capabilities of the GIS and specifying the intervals for each of the six classes. High positive scores indicate that the people feel very strongly about the church being involved in providing this kind of assistance. A discussion on the differences in the loadings for factor I, according to the different areas into which the sample areas were grouped (Mbekweni; Paarl East; Paarl West), will follow.

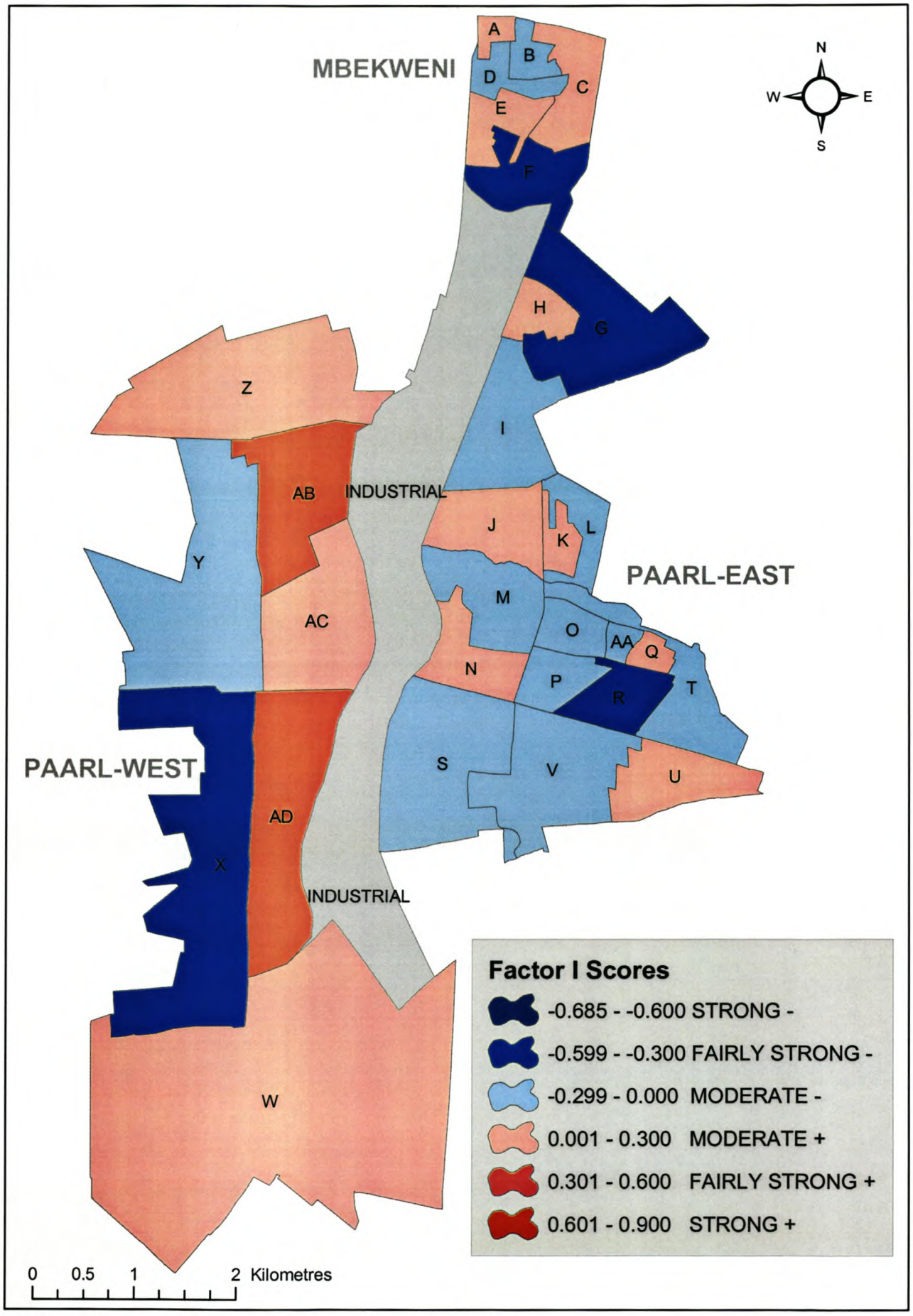



Figure 15: Scores of Factor I for each of the sample areas

Mbekweni

When Figure 15 is analysed spatial variation in the perceptions are clear. The darker the red shading, the stronger the people in the particular sample area perceive it as necessary that the church should indeed provide this kind of assistance. The darker blue means that the lowest number of people perceive it as necessary that the church should provide this kind of assistance. Mbekweni consists of six sample-areas. There are two areas (E; C), situated in the middle and to the east of the area and one (A) at the southwestern corner of Mbekweni, that feel moderately that the church should provide this kind of assistance. The positive scores are divided into "moderate", "fairly strong" and "strong". Half of the sample-areas (50%) in Mbekweni feel to a moderate degree that the church should provide some kind of direct assistance to women and children affected by sexual and/or violent crimes. The other 50% of the respondents do not feel that it is the role of the church to provide this kind of assistance.

Paarl East

In Paarl East there is no clear pattern in relation to the six sample-areas (H; J; K; N; Q; U) that feel moderately about whether churches should be providing direct assistance to women and children affected by sexual and /or violent crimes. These areas are randomly scattered as can be seen in Figure 15. The majority of sample-areas, 11 of 17 (68%), in Paarl East indicate that it is not necessary for churches to provide this kind of direct assistance.

Paarl West

Five of the seven, that is 71%, of the sample-areas (Z; AB; AC; AD; W) from the most northern part of Paarl West, all along the industrial area, to the most southern area perceive it as necessary that churches should provide direct assistance to women and children affected by sexual and/or violent crimes. Two areas within this group of five (AB and AD) feel moderately about churches providing this kind of direct assistance. The other three areas, Z, AC and W, feel fairly strongly about churches providing direct assistance to the women and children in need. It is only the two areas furthermost west (X; Y), along the eastern side of Paarlberg, that do not perceive it as necessary for churches to provide direct assistance in this regard.

4.1.2 Factor II

Figure 16 shows the spatial variation according to the second factor, which is related *to the extent to which people see it as necessary that the church should provide some kind of assistance to help curb unemployment.* Again, the factor scores are divided into six class intervals ranging from high negative to high positive. High positive scores indicate that the people feel very strongly about the church being involved in providing this kind of assistance. The range for each interval is similar to the first factor's scores. This helps in facilitating the process to compare the degree to which the people feel about the perceived necessity of the church to provide this kind of assistance in relation to other kinds of assistances being analysed in the study. The same class intervals were also used to avoid confusion.

Mbekweni

Figure 16 shows the spatial variation in factor 2 as it pertains to Mbekweni. Of the six areas in Mbekweni, three (50%) perceive it as necessary that the church needs to provide some kind of assistance in order to help curb unemployment. These three areas (A; B; D) are situated in the southwestern corner of Mbekweni. Two of the areas (A; B) feel to a moderate degree that the church should be involved and the sample-area to the south of these two (D) feel fairly strong that the church needs to provide assistance of some kind to help limit unemployment. The other half of the sample areas perceive it as not being necessary for the church to be involved in such a kind of assistance to the community.

Paarl East

Figure 16 shows the difference in factor scores for the second factor, related to the church's role in providing a service to curb unemployment. Nine of the 17 areas (53%) support this idea. Eight of the 10 areas are situated just south of Klein Drakenstein Road in the part of Paarl East that forms the "nose" around the road. Only one area is situated to the north of Klein Drakenstein Road and is also the most eastern situated area in Paarl East. These areas are basically grouped together, with only area M falling out of the pattern.

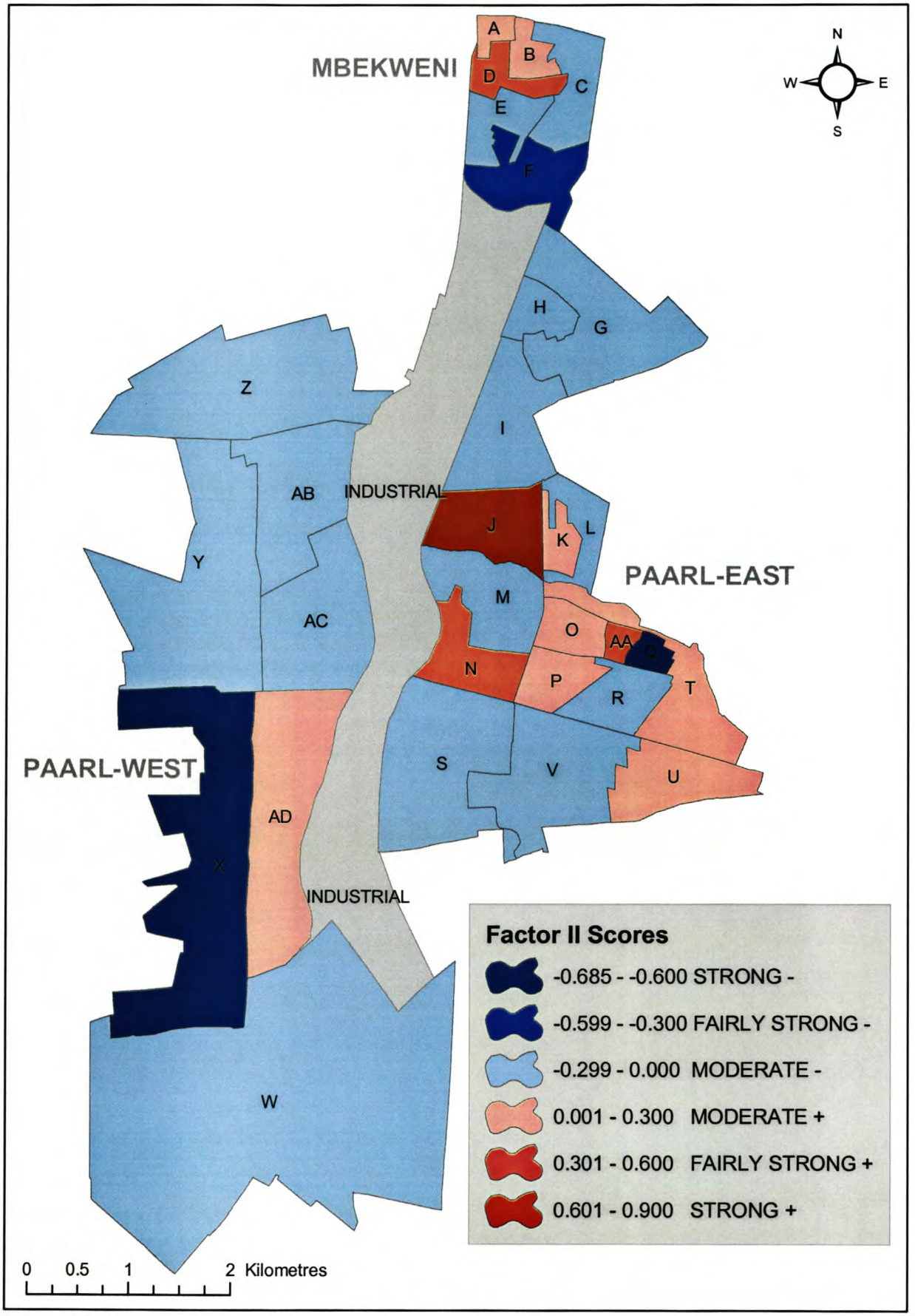



Figure 16: Scores of Factor II for each of the sample areas

Paarl West

Figure 16 shows the variation in the factor scores of the inhabitants in Paarl West about whether or not they regard it as important that the church provide some kind of assistance in order to limit unemployment. In Paarl West there is only one area (AD) where the people are moderately in favour of churches being involved in this kind of assistance to the community. The perception of the area adjacent to AD is very negative towards churches being involved in providing some kind of assistance to help limit unemployment. Paarl West is mostly against churches being involved in this kind of assistance.

### 4.1.3 Factor III

Figure 17 shows the spatial variation according to the third factor, which is *related to the extent to which people see it as necessary that the church needs to provide some kind of assistance to people infected or affected by HIV/Aids*. Again, the factor scores are divided into six class intervals ranging from high negative to high positive. High positive scores indicate that the people feel very strongly about the church being involved in providing this kind of service. The range for each interval is again kept similar to that used for displaying the first and the second factor's scores.

Mbekweni

Figure 17 shows the spatial variation in scores on factor three for Mbekweni. Five of the six areas (83%) in Mbekweni perceive it as necessary that churches should provide some kind of assistance to people infected or affected by HIV/Aids. Three of the areas feel fairly strongly. Two of the areas (A; D) are situated at the northwestern side, and the other one (F) in the southeastern corner of Mbekweni. The other two areas (B;C) feel moderately strong about the provision of this kind of assistance. Sample area C is situated on the eastern side of Mbekweni and D is one of the northernmost sample areas in Mbekweni.

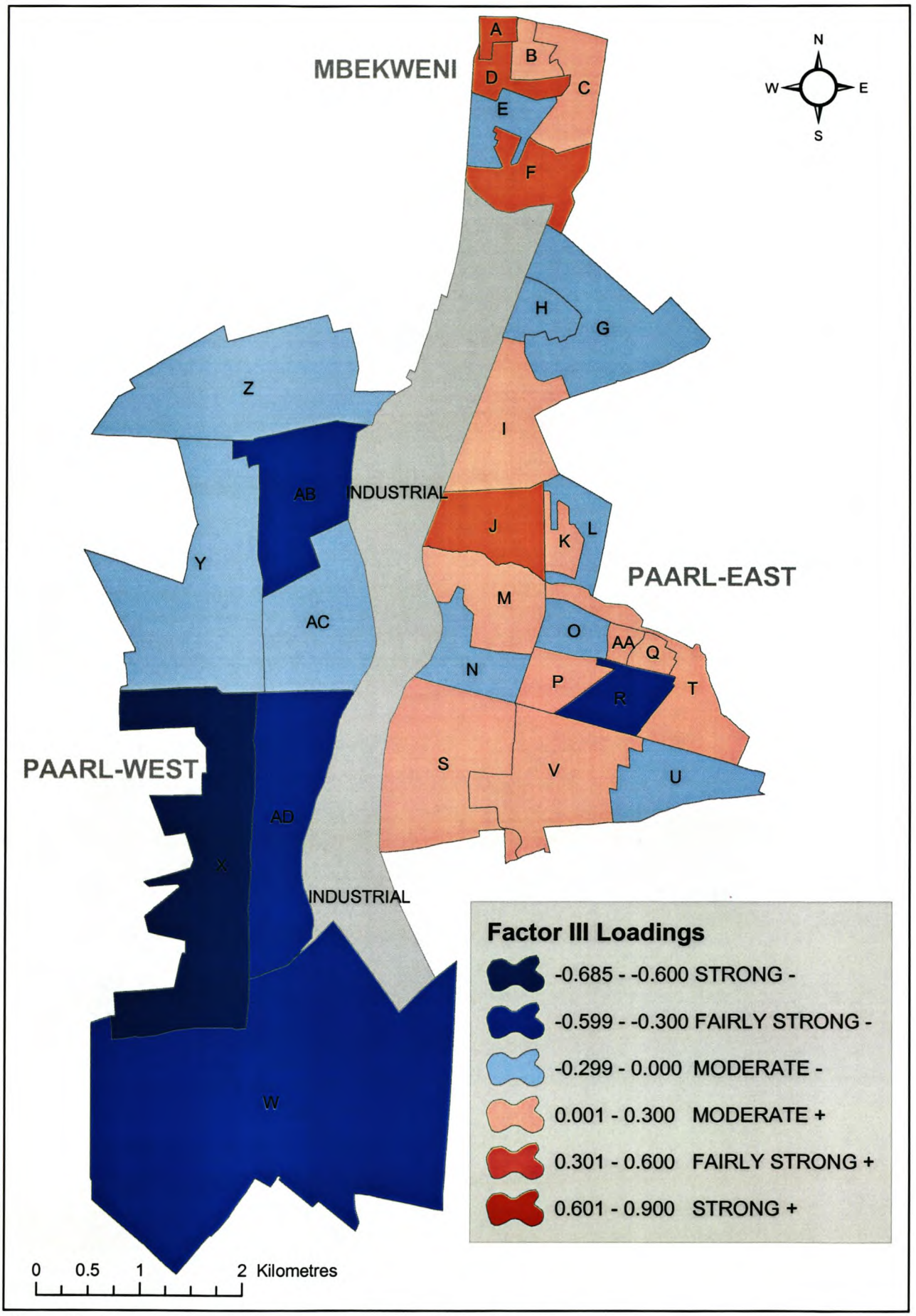



Figure 17: Scores of Factor III for each of the sample areas

Paarl East

Figure 17 shows the difference in factor scores for the third factor in Paarl East. Ten of the 17 (58%) areas perceive it as necessary that churches should provide assistance to people infected or affected by HIV/Aids. Eight of these 10 areas are situated just north of Klein Drakenstein Road in the part of Paarl East that forms a kind of "nose" around the road. The other two areas are situated to the south of Klein Drakenstein Road. The sample areas that feel positive about churches being involved in this kind of assistance are clustered together in the centre of Paarl East.

Paarl West

The spatial variation in the scores for factor three in Paarl West are shown by Figure 18. From this it is clear that none of the areas perceives it as necessary for the church to provide some kind of assistance or service to people affected or infected by HIV/Aids. The degree to which the people perceive it as unnecessary, is the only factor that varies from one sample-area to the next. The sample area (W) to the south feels fairly strongly that churches do not need to provide this kind of assistance. Area AD, just to the north of W, and area AB, express the same feelings as W. Area X, east of W, feels strongly about churches not becoming involved in this venture, while the remainder of the areas (Y; Z; AC) feel to a moderate degree that the church does not need to be involved.

**4.2 Interpreting information: demographics vs perceptions**

The demographic and socio-economic characteristics of the population is considered in this chapter in an attempt to gain further insight into the relationships with the observed variations of perceptions concerning the need for churches to get involved in providing particular social services to communities.

The information used for this comparative analysis was documented in the second chapter of the report where a demographic profile of the study area was given. A Factor Analysis was executed on demographic data obtained from the 1996 census. The results from the Factor Analysis were then used to profile each sample area. A generalised approach was used in order to construct this profile. This was done by taking only the factor that had the highest weight for a specific sample-area. The three factors were related to economic and ethnic status.

The Factor Analysis on the perception data from the study produced three factors. These factors were related to: (A) Direct assistance to women and children influenced by sexual and/or violent crimes; (B) Helping to curb unemployment; (C) Limiting the effects and infections of HIV/Aids.

### 4.2.1 Mbekweni

According to their demographic profile, all the sample areas in Mbekweni fall into the same category. An examination of the factor loadings for the first factor indicates that this component represents tracts of land with a large proportion of persons:

- of African descent;
- mainly Methodist, Presbyterian and AIC religions;
- speak an African home language;
- have an income that varies between R0 and R18 000 per annum.

The factor scores for *factor I (sexual and/or violent crimes)* from the analysis on the perceptions indicate that 50% of the sample-areas (areas A; C; E) in Mbekweni feel to a moderate degree that the church should provide some kind of direct assistance to women and children affected by sexual and/or violent crimes. *Factor II (unemployment)* again indicate that 50% of the Mbekweni sample areas (A; B; D) perceive it as necessary that the church need to provide some kind of assistance in order to help curb unemployment. In the case of, *factor III (HIV/Aids)*, five (A; B; C; D; F) of the six areas feel that churches should be involved in providing this kind of assistance. The factor on which the most areas in Mbewkweni obtained a positive factor loading, was Factor III, showing that 83% of the people in Mbekweni see it as necessary for churches to provide some kind of assistance to people affected or infected by HIV/Aids.

### 4.2.2 Paarl West

Like Mbekweni, all the sample areas in Paarl West fall into the same category when one looks at the demographic profile. Examination of the factor loadings for the second factor shows that this component isolates tracts with a large proportion of persons:

- that are of European descent;
- religions are mainly related to Dutch Reformed denominations and Judaism;
- highest educational level are mainly some post-school education;

- the income of the people is between R96 000 and R360 000 per annum;
- and most of the people follow a white collar occupation.

The factor scores for *factor I* indicate that 71% of the sample-areas (Z; AB; AC; AD; W) perceive it as necessary that churches should provide direct assistance to women and children affected by sexual and/or violent crimes. On *factor II* there is only one area that perceives it as necessary for the church to provide some kind of assistance to help limit unemployment. None of the areas perceives it as necessary (no positive score on *factor III*) for the church to provide some kind of assistance to people affected or infected by HIV/Aids. Factor I is, therefore, the factor on which the most sample areas register positive scores, which tends to indicate that the people of Paarl West feel the strongest about churches providing some kind of assistance to women and children affected by sexual and or violent crimes.

### 4.2.3 Paarl East

Paarl East is different from Mbewkeni and Paarl West in that the sample-areas are not all represented by the same demographic profile. Paarl West's sample-areas are represented by all three different factors. Six areas have a neutral association with the factors, one area bordering Mbekweni to the south has the same demographic profile as the sample-areas of Mbekweni and two areas has a similar demographic profile to the sample-areas of Paarl West. Most of the sample-areas - eight of them - are represented by the third demographic factor. Examination of the factor loadings for the third factor indicates that this component isolates tracts of land with a large proportion of persons who:

- are Coloured;
- their main religions are related to Pentecostal/Charismatic, Apostolic and other Christian denominations;
- their first language of choice is Afrikaans;
- most of the people are employed;
- their highest educational level is mainly primary and secondary school level;
- the age composition of the area constitute two groups, those aged between 0 to 13 and those aged between 31 to 60;
- the income of the people varies between R18 000 and R42 000 per annum;
- and mainly blue collar workers constitute the working population.

The factor scores for *factor I* shows that 68% of the sample area feel that it is not necessary for churches to be involved in assistance given to women and children affected by sexual and or violent crimes. For *factor II* the analysis indicates that nine of the 17 areas (53%) perceive it as necessary that churches should provide some kind of assistance in order to help curb unemployment. Ten of the 17 (58%) areas perceive it as necessary that churches should provide some kind of assistance to people infected or affected by HIV/Aids, this perception being related to *factor III*. In Paarl East most people feel strongly about churches providing some kind of assistance related to two major problems, being unemployment and people infected or affected by HIV/Aids.

From the above it is clear that the different ethnic and socio-economic groups which naturally make up the different geographical areas perceive different social problems as being priority for church involvement. Why there is a definite divide between ethnic and socio-economic status in relation to priority of the problem to be addressed can only be speculated on at this stage and will need further research in order to provide a clear answer. However, it provides a clear picture to the churches in these different areas about what issues the people feel they must address.

# CHAPTER 5

## SYNTHESIS AND INFERENCES

In the introduction of this study some of the main social and welfare problems currently facing our communities in South Africa were identified: namely HIV/Aids; unemployment, and sexual and/or violent crimes. The South African government has come to the realization that it cannot address these problems efficiently without the help of churches. Churches are after all some of the largest and most influential non-governmental organisations in the country.

One inhibiting factor keeping churches from playing the role that government is now increasingly expecting of them is the fact that the roles of churches in society have not been quantified sufficiently. A geographical information system was chosen to help in the process of quantification because, from previous studies related to GIS being used in studies of social and welfare services, it was shown that the relevant software provides service agencies with a powerful new way of analysing services in relation to clients and the communities in which they operate. The major focus of this study has been to demonstrate how a GIS can be used to support data gathering, store and manipulate the gathered data, derive information from it as well as communicating and visualising the results obtained. A short synthesis will follow of the different procedures in which the GIS was used.

### 5.1 Gather, store and manipulate data

In the data gathering process a GIS was first used in order to stratify the study area spatially. The spatial location of enumerator areas (EA's) from the 1996 census data was used in this process. Factor Analysis was conducted on selected demographic variables of the communities in these EA's. EA's with the same demographic profiles were grouped together to form the sample areas to be used in the data gathering process. Sample areas were sub-divided into smaller manageable blocks for the fieldworkers. GIS was used to produce maps (of these smaller blocks in each bigger sample area) with street names, the street number's of houses and the number of questionnaires to be handed out in the area. This helped the fieldworkers in their process of dropping and collecting the questionnaires.

After the data had been gathered it was important to use a data base management system in order to store, manipulate and ensure the integrity of the data. The development of the geodatabase (database coupled with a GIS containing geographically orientated data) was also crucial because more data will be gathered in future in the same, and other, areas, because the quantification of the role of churches cannot be a once off endeavour. A well designed database is essential for adding future datasets.

The data base management system used to construct the geodatabase is Microsoft Access, because ArcGIS 8.1 stores its personal geodatabases in a Microsoft Access database. Microsoft Access uses a relational data model. When comparing the relational data model to other data models - such as the hierarchical; network and object orientated ones - it seems that it is currently the preferred data model for many applications. This is because in the hierarchical and network structure, travel within the database is restricted to the paths up and down the pathways that have been established between the files. Compared to the object orientated model, it is time-consuming establishing the database as the objects need to be defined more explicitly and the various links need to be established. That said, relational database structures are still better at performing queries based on the values of an attribute, and consequently it was decided to use the Microsoft Access database as it is based on the relational database structure and supported by the ArcGIS software.

## 5.2 From data to information

In Chapter 4 of the report the use of geocomputaion as a method of deriving information from the data gathered during the study was introduced. Statsitica, a specialised statistical package, was used to execute statistical procedures (Factor Analysis) on the data. It was illustrated how the geocomputational capabilities of a GIS could be extended through coupling this statistical software package to a GIS. This process also showed how easy this process operates, because of the interoperability of the two software packages, Statistica and ArcMap™.

In Statistica a statistical procedure was executed on the data related to perceptions of the people in the survey. The perceptions were tested on 13 different variables measuring whether people wished churches to either counsel, provide direct assistance or start some kind of preventative action in relation to the major problems in our communities. This generated too much data on which to report in detail, therefore, the data was generalized by a Factor Analysis. Factor Analysis summarises the important relationships between the variables in the

form of a few basic patterns, called factors. It is, therefore, a method to synthesise data to produce generalisations (information).

After executing Factor Analysis three factors were identified explaining the variables. The factors that emerged from the data are related to church involvement in: (A) Direct assistance to women and children influenced by sexual and/or violent crimes; (B) Helping to curb unemployment; (C) Limiting effects and infections of HIV/Aids. The different factor scores for each of these three factors were added as extra attributes to the attribute table of the sample areas in the GIS and used to create thematic maps to show the spatial variation in the perceptions of the people in Paarl and Mbekweni. The three areas (Mbekweni, Paarl West and Paarl East) were used as a basis for the discussion. To obtain some insight into the factors causing the spatial variation in perceptions amongst Mbekweni, Paarl West and Paarl East, these were compared to the demographic profiles of these three areas established earlier.

All sample areas in Mbekweni have the same demographic profile. The demographic profile is related to economic and ethnic variables. A large proportion of people in Mbekweni are of African descent and they have a low economic status. The Mbewkeni residents feel the strongest about churches being involved in some kind of assistance to people infected or affected by HIV/Aids.

Paarl West is like Mbewkeni in that all the sample areas in Paarl West all have the same demographic profile. The largest proportion of the people in Paarl West are of European descent and have a very high educational and economic status. The people in Paarl West feel the strongest that churches should be involved in providing assistance to women and children affected by sexual and or violent crimes.

The situation in Paarl East differs from that of Mbewkeni and Paarl West in that the sample areas are not all represented by the same demographic profile. There are three different factors that represent the demographic profile of these areas. A majority of the areas are, however, represented by a single factor. A large proportion of the people in Paarl East are Coloured, the people have a fairly high educational level and they a favourable economic status. The people of Paarl East feel the strongest that churches should provide assistance to people infected or affected by HIV/Aids, with 10 out of the 17 (58%) sample areas sharing this view. A close second to this perception is that churches should provide some kind of assistance to help limit

unemployment. Nine of the 17 sample areas shared this view. Thus in Paarl East the most of the people feel strongly about churches providing some kind of assistance related to two major problems, namely unemployment and people infected or affected by HIV/Aids.

### 5.3 Future research opportunities

This research has made it possible to gain some insight into the use of GIS for quantifying the roles of churches in our communities. It may pave the way for similar future research. The procedures for capturing, handling and deriving information from spatial data could be used repeatedly to monitor future changes. The use of GIS also has the added advantage of being able to communicate results in a highly effective and satisfactory manner, by displaying results on maps.

There are yet other advantages of using GIS for the study of social and welfare related services. Analysing the accessibility to service centres will be of great value and to the advantage of churches. To determine the accessibility of service centres, effective spatial decision-making will be needed. For effective spatial decision- making a well-developed database of current locations of human services provided by churches will be required. The determination of optimal locations for future service centres could also be done by using GIS. Again, a well-developed database of the current locations of services is needed as well as an indication of future changes expected. Previous studies determined the optimal placing of service centres, such as shopping malls and industrial parks. These studies could guide analytic investigations into the role of churches in society.

Hopefully this study has contributed to a better understanding of the roles and expected roles of churches in South African communities. Having their roles quantified and in a manageable way, as well as providing the ability to view the data in an "easy-to-understand" manner, is very important. The data management capabilities of a GIS, and also its abilities to display the data spatially, is useful. Its capacity to model complex social processes and to examine their spatial outcomes, considerably facilitates churches in their decisions regarding the role they need to play in South Africa today.

## 6 REFERENCES

Aronoff, S 1989. *Geographical information systems: a management perspective*. Ontario: Canada: WDL Publications.

Babbie, ER & Mouton, J 2001. *The practice of social research.* Oxford University Press, Oxford.

Berry, BJL 1964. Approaches to regional analysis: a synthesis. *Annals of the Association of American Geographers* 54 1:2-11.

Burrough, P & McDonnel, RA 1998. *Principles Geographical Information Systems.* Second Edition . Oxford University Press, Oxford.

Catell, RB 1952. *Factor Analysis*. New York: Harper.

Clarke, KC 1990. *Analytical and Computer Cartography.* Prentice Hall, New York.

Clouclelis, H 1998. People manipulate objects: beyond the raster vector debate in GIS. In Frank, AU, Campari, I & Formentini, U. *Theories and methods of spatio- temporal reasoning in geographic space.* Springer Verlag. Berlin.

Croner, CM & Thomas, TB 1998. The Association of American Geographers 95th annual meeting. Working models of state and local public health GIS. Honolulu, Hawaii.

Davies, WKD 1984. *Factorial ecology*. Guilford, England: Gower Publishing Company Ltd.

Davis, D 1999. The association of American geographers 95th annual meeting. A factorial ecology of crime: geographic homicide perspective. [Online]. Available: http:www.esri.com/campus/library/bibliography/ [15.5.2002].

Demers, MN 2000. *Fundamentals of geographical information systems*. Wiley, New York.

Dickman, A, Tsoumpas, P, & Zhou, S 1997. Seventeenth annual ESRI user conference. GIS supports social service planning in South Florida. San Diego, California.

Erasmus, JC 2000. Lecturer at the Faculty of Theology and Project manager of the URDR. Doctors degree in Practical Theology. Information given to G.G. Mans during a personal communication in 2002.

Flowerdew, R & Gill, M 1999. The Association of American Geographers 95th annual meeting. Measures of population distribution to reflect service delivery costs. Honolulu, Hawaii.

Fox, G & Zamudio, G 1997. GIS for GOD: Geographical organization of data for the Notre Dame Church membership. [Online]. Available: http:www.esri.com/library/userconf/proc97/to150/pap123/p123.htm [15.5.2002].

Hargrove, W & Luxmoore, RJ 1997. A spatial clustering technique for the identification of customizable eco-regions. [Online]. Available: http//www.esri.com/campus/library/bibliography/ [15.5.2002].

Heyns, LM 1997. Praktiese teologie en die heropbou en ontwikkelings program. *Praktiese Teologie in Suid Afrika* 12, 1:31-38.

Hoch, C, Williams, C, & Rodman, D 1999. URISA 99 Annual Conference Proceedings. Food access Chicago: Finding and filling the food gaps for households in Cook County's low-income neighborhoods. Chicago, Illinois.

Hoon Chang 2001. *Development of a comprehensive vulnerability assessment model for local communities using GIS*. Doctoral dissertation. Cornell University.

Howitt, D and Cramer, D 1997.A Guide to Computing Statistics with SPSS for WINDOWS.

Johnson, RJ, Gregory, D, Pratt, G, & Watts, M (ed.) 2000. *The dictionary of human geography*. Oxford UK: Blackwell Publishers Ltd.

Johnston, RJ 1991. Geography and geographers: Anglo American human geography since 1945. London: Edward Arnold.

Jones, C 1997. *Geographical information system and computer cartography*. Addison-Wesley Longman.

Koeglenberg, R 1994. Third national church conference and fair: the reconstruction and development programme: the role of the church, civil society and NGO's. *South African Outlook* 124 10:113-115.

Laurini, R & Thompson, D 1992. *Fundamentals of Spatial Information Systems.* Academic Press.

Longley, PA, Brooks, R, McDonnell, R & MacMillan, B 1999. *Geocomputation: A Primer*. Wiley, Chichester.

Longley, P & Clarke, C 1995 (ed). *GIS for business and service planning*. United Kingdom: Bell and Bain, Glasgow.

Love, D & Lindquist, P 1995. The geographical accessibility of hospitals to the aged: A geographical information systems analysis within Illinois. *Health Services Research* 29:629-651.

Maguire, DJ 1995. An overview and definition of GIS. In D.J. Maguire, M.F. Goodchild, & D.W. Rhind (Eds.), *Geographical information systems: Principles and applications*. New York: John Wiley & Sons.

Malczweski, J 1999. *GIS and multi-criteria decision analysis*. Canada: John Wiley & Sons, Inc.

Martin, D 1991. *Geographical information systems and their socioeconomic applications*. London: Routledge.

Morrison, D, Alexander, D, Fisk, J & Maguire, J 1999. Improving delivery of health and community services to welfare recipients, Columbia, South Carolina, 1997. *Journal of Public Health Management and Practice* 5, 2: 49-50.

Murdie, RA 1969. *Factorial ecology of metropolitan Toronto, 951 - 1961*. Research paper 116. Chicago: Department of Geography, University of Chicago.

Openshaw, S 1998. Towards a more computationally minded scientific human geography. *Environment and Planning A* 30:317-332.

Page, P 1993. Thirteenth annual ESRI user conference. Join item: GIS and social services. Palm Springs, California

Parker, EB & Campbell, JL 1998. Measuring access to primary medical care: some examples of the use of geographical information systems. *Health & Place* 4, 2:183-193.

Philliber, SG, Schwab, MR & Sloss, GS 1980. *Social research: Guides to a decision-making process*. USA. F.E. Peacock Publishers, Inc.

Phillips, R, Kinman, E, Schnitzer, P, Lindbloom, E & Ewigman, B 1996. Using geographic information systems to understand health care access. *Archives of Family Medicine* 9: 971-978.

Queralt, M & Witte, AD 1998a. A map for you? Geographic information systems in the social services. *Social Work* 43, 5:455-467.

Queralt, M & Witte, AD 1998b. Influences on neighborhood supply of child care in Massachusetts. *Social Service Review* 72: 17-46.

Radke, J & Mu, L 2001. Twenty-first annual ESRI user conference. Spatial decompositions and modelling to level access to social problems. San Diego, CA.

RDP White Paper 1994. Discussion document. Government of national unity.

Rich, TF 1996. The Chicago police department's information collection for automated mapping (ICAM) program. Washington, DC: US Department of Justice.

Sherman, LW & Weisburd, D 1995. General deterrent effects of police patrol in crime "hot spots": A randomized controlled trial. *Justice Quarterly* 12: 625-648.

Srinivasan, S, Ferreira, J & Shen, Q 1999. Quantifying neighborhood characteristics that influence trip linking. [Online]. Available: http:www.esri.com/campus/library/bibliography/ [15.5.2002].

Sweetser, FL 1965. Factorial ecology: Helsinki 1960. *Demography* 2: 372-386.

Taylor, PJ & Johnston RJ 1995. Geographic information systems and geography. In Pickles, J. *Ground truth*. London: The Guilford Press.

Thomson, JA 2000. Twentieth annual ESRI user conference. Applying GIS for social services: A case study of Monterey county's childcare and housing priorities. San Diego, California.

Unit for religious and demographic research 2002. Church and community research project.

Wilson, AG 1974. *Urban and regional models in geography and planning*. London: Pion.

Worrall, L 1991. *Spatial analysis and spatial policy using geographic information systems*. London: Belhaven Press.

Worboys, MF 1995. *GIS – a Computing perspective.* Taylor & Francis, London.

# ADDENDUM A: QUESTIONNAIRE

The questions that tested perceptions of the community can be seen in section D, page 7 of the questionnaire.

UNIVERSITEIT·STELLENBOSCH·UNIVERSITY
jou kennisvennoot · your knowledge partner

# CHURCH AND COMMUNITY RESEARCH PROJECT

QUESTIONNAIRE TO HOUSEHOLDS OF PAARL.

This research project is a joint venture between the Unit for Religious Demographic Research (Faculty of Theology) at the University of Stellenbosch and various churches in Paarl. The **purpose** is to investigate what congregations of all denominations are doing to provide service and care for their communities with regard to the most severe problems of HIV/AIDS, unemployment, sexual and/or violent crime and substance abuse.

- Your answers will be kept confidential and anonymous.
- Make a cross (X) in the block next to the answer that you choose. PLEASE MAKE ONLY ONE CROSS AND DO NOT EXCEED THE BLOCK.
- **Thank you for taking part in this survey. If you have any questions do not hesitate to contact us.**

# KERK EN GEMEENSKAP NAVORSINGSPROJEK

VRAELYS AAN HUISHOUDINGS IN PAARL

Hierdie navorsingsprojek is 'n gesamentlike onderneming tussen die Eenheid vir Godsdiens-Demografiese Navorsing (Fakulteit Teologie) aan die Universiteit Stellenbosch en verskeie kerke in die Paarl. Die **doel** is om vas te stel wat gemeentes van alle denominasies doen om dienste te lewer aan hulle gemeenskappe t.o.v. MIV/Vigs, werkloosheid, seksuele en/of geweldsmisdade en middel-afhanklikheid.

- U antwoorde sal as vertroulik en anoniem hanteer word.
- Trek 'n kruisie (X) in die blokkie by die antwoord wat u kies. TREK SLEGS EEN KRUISIE EN MOET ASB NIE DIE BLOKKIE OORSKRY NIE.
- **Dankie vir u deelname aan die opname. In u enige navrae het, moenie huiwer om met ons in verbinding te tree nie.**

Dr Johannes Erasmus 808-3260/egdn@sun.ac.za

Mnr Gerbrand Mans 0832567067/12990205@maties.sun.ac.za

FAKULTEIT TEOLOGIE
FACULTY of THEOLOGY
sol iustitiae illustra nos

**Questionnaire / *Vraelys*** ☐☐☐ ☐☐☐☐

## A. BIOGRAPHIC INFORMATION / *BIOGRAFIESE INLIGTING*

1. Type of dwelling of the household (check one) / *Tipe woning van die huishouding (merk een):*

☐ House on separate stand
*Huis op aparte erf*

☐ House / flat / room in backyard
*Huis / woonstel / kamer in agterplaas*

☐ Flat in block of flats
*Woonstel in woonstelblok*

☐ Informal dwelling / shack in backyard
*Informele woning / shack in agterplaas*

☐ Townhouse
*Meenthuis*

☐ Informal dwelling / shack elsewhere
*Informele woning / shack elders*

☐ Unit in retirement village
*Eenheid in aftree oord*

Other / *Ander*

2. Please provide the information for each occupant 16 years and older in a separate row (See example
*Voorsien asseblief die inligting van elke inwoner 16 jaar en ouer in 'n aparte ry (Sien voorbeeld).*

**Person / *Persoon***

| **Gender** *Geslag* | **Age** *Ouderdom* | **Religion, denomination or creed** *Godsdiens, denominasie, of geloof* | **Name of congregatio** *Naam van gemeente* |
|---|---|---|---|
| Person X / *Persoon X* | | **For example / Voorbeeld** | |
| M☐ ☒F / V | 35 years *jaar* | NG Kerk | Strooidak |
| Person 1 / *Persoon 1* | | | |
| M☐ ☐F / V | ☐☐ years *jaar* | | |
| Person 2 / *Persoon 2* | | | |
| M☐ ☐F / V | ☐☐ years *jaar* | | |

2. Please provide the information for each occupant 16 years and older in a separate row.
*Voorsien asseblief die inligting van elke inwoner 16 jaar en ouer in 'n aparte ry.*

Continue / *Vervolg*

**Person / Persoon**

| **Gender** *Geslag* | **Age** *Ouderdom* | **Religion, denomination or creed** *Godsdiens, denominasie, of geloof* | **Name of congregation** *Naam van gemeente* |
|---|---|---|---|

Person 3 / *Persoon 3*

M ☐ ☐ F / V ☐☐ years *jaar* _____ _____

Person 4 / *Persoon 4*

M ☐ ☐ F / V ☐☐ years *jaar* _____ _____

Person 5 / *Persoon 5*

M ☐ ☐ F / V ☐☐ years *jaar* _____ _____

Person 6 / *Persoon 6*

M ☐ ☐ F / V ☐☐ years *jaar* _____ _____

Person 7 / *Persoon 7*

M ☐ ☐ F / V ☐☐ years *jaar* _____ _____

Person 8 / *Persoon 8*

M ☐ ☐ F / V ☐☐ years *jaar* _____ _____

See reverse side / *Kyk op keersy*

## B. INVOLVEMENT WITH CHURCH / RELIGIOUS GROUP / ORGANISATION
## *BETROKKENHEID BY KERK / GELOOFSGROEP / ORGANISASIE*

Are you or any other person in your household involved with any activities of a church or community organisation? Please provide the information for each occupant 16 years and older in a separate column.

*Is u of enige persoon in die huishouding by enige aktiwiteit van 'n kerk of gemeenskapsorganisasie betrokke? Voorsien asseblief die inligting van elke inwoner 16 jaar en ouer in 'n aparte kolom.*

| | Person / *Persoon* 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1. Helping the needy (e.g. food, clothes, shelter, finance)<br>*Hulp aan behoeftiges (bv. kos, klere, onderdak, finansies)* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 2. Counselling for poor and needy people<br>*Berading aan arm en behoeftige persone* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 3. Home based and hospice care for persons infected by HIV/AIDS and TB<br>*Tuis- en hospiesversorging van persone met MIV/Vigs en TB* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 4. Serving the needs of AIDS orphans<br>*Voorsien in die behoeftes van VIGS-wesies* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 5. HIV/AIDS information and awareness<br>*MIV/Vigs-inligting en bewusmaking* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 6. Counselling for persons infected or affected by HIV/AIDS and TB<br>*Berading vir persone geinfekteer of geaffekteer deur MIV/Vigs en TB* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 7. Serving the needs of the aged and senior citizens<br>*Voorsien in die behoeftes van bejaarde- en seniorburgers* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 8. Attending to adult victims of sexual and/or violent crimes<br>*Voorsien in die behoeftes van volwasse slagoffers van seksuele en/of geweldsmisdade* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 9. Attending to children that are victims of sexual and/or violent crimes<br>*Voorsien in die behoeftes van kinderslagoffers van seksuele- en/of geweldsmisdade* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 10. Activities that provide information and training regarding the prevention of sexual and/or violent crimes<br>*Aksies wat inligting en opleiding t.o.v. die voorkoming van seksuele- en/of geweldsmisdade verskaf* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 11. Counselling for victims of sexual and/or violent crimes<br>*Berading vir slagoffers van seksuele- en/of geweldsmisdade* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 12. Attending to the victims of substance abuse<br>*Voorsien in die behoeftes van slagoffers van middelafhanklikheid* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 13. Activities that provide information and training regarding the prevention of substance abuse<br>*Aksies wat inligting en opleiding verskaf t.o.v. voorkoming van middelafhanklikheid verskaf* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

See reverse side / *Kyk op keersy*

| | Person / *Persoon* 1 2 3 4 5 6 7 8 |
|---|---|
| 14. Counselling for victims of substance abuse<br>*Berading aan slagoffers van middelafhanklikheid* | ☐☐☐☐☐☐☐☐ |
| 15. Counselling for convicted offenders<br>*Berading aan voorheen veroordeeldes* | ☐☐☐☐☐☐☐☐ |
| 16. Skills training and empowerment programmes for adults (e.g. literacy classes, ABET, business skills, etc.)<br>*Vaardigheidsopleiding en bemagtigingsprogramme vir volwassenes (bv. geletterdheid, ABET, besigheidsvaardighede, ens.)* | ☐☐☐☐☐☐☐☐ |
| 17. Job creation projects<br>*Werkskeppingsprojekte* | ☐☐☐☐☐☐☐☐ |
| 18. Attending to the needs of unemployed and retrenched people<br>*Voorsien in die behoeftes van werklose en afgedankte persone* | ☐☐☐☐☐☐☐☐ |
| 19. Counselling for unemployed and retrenched people<br>*Berading vir werklose en afgedankte persone* | ☐☐☐☐☐☐☐☐ |
| 20. Promoting peace and reconciliation<br>*Bevorder vrede en versoening* | ☐☐☐☐☐☐☐☐ |
| 21. Lobbying in support of matters of public concern<br>*Betrokke by drukgroep vir sake van gemeenskapsbelang* | ☐☐☐☐☐☐☐☐ |
| 22. Representing community organisations or church at any level<br>*Verteenwoordig gemeenskapsorganisasie of kerk op enige vlak* | ☐☐☐☐☐☐☐☐ |
| 23. Other (specify)<br>*Ander (spesifiseer)* | |

If involved with any of the above-mentioned services rendered by a church or organization, please provide the name of the church(es) and/or organisation(s). Write the number of the service, as it is numbered above, and the name of the church or organization in the space provided below.

*Indien u betrokke is by enige van bogenoemde dienste wat deur 'n kerk of organisasie gelewer word, voorsien asseblief die naam van die kerk en/of organisasie. Skryf die nommer van die diens, soos hierbo genommer, en daarna die naam van die kerk/organisasie in die ruimte hieronder.*

| | **Number of service**<br>***Nommer van diens*** | **Name**<br>***Naam*** |
|---|---|---|
| **Church**<br>***Kerk*** | ☐☐ | |
| **Organization**<br>***Organisasie*** | ☐☐ | |

See reverse side / *Kyk op keersy*

# C. ASSISTANCE RECEIVED FROM CHURCH / RELIGIOUS GROUP / ORGANISATION

## *BYSTAND ONTVANG VAN KERK / GELOOFSGROEP / ORGANISASIE*

Have you or any person in your household received assistance in the last 2 years from a church/ religious group/organisation? Please provide the information for each occupant 16 years and older in a separate column.

*Het u of enige persoon in die huishouding in die vorige twee jaar bystand van 'n kerk/geloofsgroep/ organisasie ontvang? Voorsien asseblief die inligting van elke inwoner 16 jaar en ouer in 'n aparte kolom.*

| | Person / *Persoon* 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1. Immediate relief regarding food, clothes, shelter, finance<br>*Onmiddellike verligting t.o.v. kos, klere, onderdak, finansies* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 2. Counselling for poor and needy people<br>*Berading aan arm en behoeftige persone* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 3. Home based and hospice care for persons infected by HIV/AIDS and TB<br>*Tuis- en hospiesversorging van persone met MIV/Vigs en TB* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 4. Needs of AIDS orphans<br>*Behoeftes van VIGS-wesies* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 5. HIV/AIDS information and awareness<br>*MIV/Vigs-inligting en bewusmaking* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 6. Counselling for persons infected or affected by HIV/AIDS and TB<br>*Berading aan persone geinfekteer of geaffekteer deur MIV/Vigs en TB* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 7. Needs of the aged or senior citizens<br>*Behoeftes van bejaarde- en seniorburgers* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 8. Adult victims of sexual and/or violent crimes<br>*Volwasse slagoffers van seksuele en/of geweldsmisdade* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 9. Children that are victims of sexual and/or violent crimes<br>*Kinderslagoffers van seksuele- en/of geweldsmisdade* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 10. Information and training regarding the prevention of sexual and/or violent crimes<br>*Inligting en opleiding t.o.v. die voorkoming van seksuele- en/of geweldsmisdade* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 11. Counselling for victims of sexual and/or violent crimes<br>*Berading aan slagoffers van seksuele en/of geweldsmisdade* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 12. Victims of substance abuse<br>*Slagoffers van middelafhanklikheid* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 13. Information and training regarding the prevention of substance abuse<br>*Inligting en opleiding t.o.v. voorkoming van middelafhanklikheid* | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

See reverse side / *Kyk op keersy*

| | Person / *Persoon* 1 2 3 4 5 6 7 8 |
|---|---|
| 14. Counselling for victims of substance abuse<br>*Berading aan slagoffers van middelafhanklikheid* | ☐☐☐☐☐☐☐☐ |
| 15. Counselling for convicted offenders<br>*Berading aan voorheen veroordeeldes* | ☐☐☐☐☐☐☐☐ |
| 16. Skills training and empowerment programmes for adults (e.g. literacy classes, ABET, business skills, etc.)<br>*Vaardigheidsopleiding en bemagtigingsprogramme vir volwassenes (bv. geletterdheid, ABET, besigheidsvaardighede, ens.)* | ☐☐☐☐☐☐☐☐ |
| 17. Job creation<br>*Werkskepping* | ☐☐☐☐☐☐☐☐ |
| 18. Needs of unemployed and retrenched people<br>*Behoeftes van werklose en afgedankte persone* | ☐☐☐☐☐☐☐☐ |
| 19. Counselling for unemployed and retrenched people<br>*Berading vir werklose en afgedankte persone* | ☐☐☐☐☐☐☐☐ |
| 20. Promoting peace and reconciliation<br>*Bevorder vrede en versoening* | ☐☐☐☐☐☐☐☐ |

21. Other (specify)
*Ander (spesifiseer)*

If you received any of the above-mentioned services rendered by a church or organization, please provide the name of the church(es) and /or organisation(s). Write the number of the service, as it is numbered above, and then the name of the church or organization in the space provided below.

*Indien u bystand ontvang het van enige van bogenoemde dienste wat deur 'n kerk of organisasie gelewer word, voorsien asseblief die naam van die kerk en/of organisasie. Skryf die nommer van die diens, soos hierbo genommer, en daarna die naam van die kerk / organisasie in die ruimte hieronder.*

| | **Number of service**<br>***Nommer van diens*** | **Name**<br>***Naam*** |
|---|---|---|
| **Church**<br>***Kerk*** | ☐☐ | |
| **Organization**<br>***Organisasie*** | ☐☐ | |

See reverse side / *Kyk op keersy*

# D. PERCEPTIONS OF THE INVOLVEMENT OF CHURCHES / RELIGIOUS ORGANISATIONS IN THE COMMUNITY

## *PERSEPSIES VAN DIE BETROKKENHEID VAN KERKE / GELOOFS ORGANISASIES IN DIE GEMEENSKAP*

Should the church or religious organisations be involved in the following?
*Behoort die kerk en geloofsorganisasies betrokke te wees by die volgende?*

| | Certainly not *Beslis nie* | No *Nee* | Unsure *Onseker* | Yes *Ja* | Certainly *Beslis* |
|---|---|---|---|---|---|
| 1. Needs of disabled persons *Behoeftes van gestremdes* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 2. Needs of homeless (street) children *Behoeftes van daklose (straat) kinders* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 3. Needs of homeless adults or families *Behoeftes van daklose volwassenes of gesinne* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 4. Countering racism *Teenwerk van rassisme* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 5. Assisting with crime prevention *Bystand met misdaadvoorkoming* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 6. Immediate relief regarding food, clothes, shelter, finance *Onmiddellike verligting t.o.v. kos, klere, onderdak, finansies* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 7. Counselling for poor and needy people *Berading aan arm en behoeftige persone* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 8. Home-based and hospice care for persons infected by HIV/AIDS and TB *Tuis- en hospiesversorging van persone geinfekteer met MIV/Vigs en TB* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 9. Needs of AIDS orphans *Behoeftes van VIGS-wesies* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 10. HIV/AIDS information and awareness *MIV/Vigs-inligting en bewustheid* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 11. Counselling for persons infected or affected by HIV/AIDS and TB *Berading vir persone geinfekteer of geaffekteer deur MIV/Vigs en TB* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 12. Needs of the aged or senior citizens *Behoeftes van bejaarde- en seniorburgers* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 13. Adult victims of sexual and/or violent crimes *Volwasse slagoffers van seksuele- en/of geweldsmisdade* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 14. Children that are victims of sexual and/or violent crimes *Kinderslagoffers van seksuele- en/of geweldsmisdade* | ☐ | ☐ | ☐ | ☐ | ☐ |

| | Certainly not *Beslis nie* | No *Nee* | Unsure *Onseker* | Yes *Ja* | Certainly *Beslis* |
|---|---|---|---|---|---|
| 15. Information and training regarding the prevention of sexual and/or violent crimes *Inligting en opleiding t.o.v die voorkoming van seksuele- en/of geweldsmisdade* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 16. Counselling for victims of sexual and/or violent crimes *Berading aan slagoffers van seksuele- en/of geweldsmisdade* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 17. Victims of substance abuse *Slagoffers van middelafhanklikheid* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 18. Information and training regarding the prevention of substance abuse *Inligting en opleiding t.o.v. voorkoming van middelafhanklikheid* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 19. Counselling for victims of substance abuse *Berading aan slagoffers van middelafhanklikheid* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 20. Counselling of convicted offenders *Berading aan voorheen veroordeeldes* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 21. Skills training and empowerment programmes for adults (e.g literacy classes, ABET, business skills, etc.) *Vaardigheidsopleiding en bemagtigingsprogramme vir volwassenes (bv. geletterdheid, ABET, besigheidsvaardighede, ens)* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 22. Job creation *Werkskepping* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 23. Needs of unemployed and retrenched people *Behoeftes van werklose en afgedankte persone* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 24. Counselling for unemployed and retrenched people *Berading aan werklose en afgedankte persone* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 25. Promoting peace and reconciliation *Bevorder vrede en versoening* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 26. Lobbying in support of matters of public concern *Betrokke by drukgroep vir sake van gemeenskapsbelang* | ☐ | ☐ | ☐ | ☐ | ☐ |

27. Other (specify)
*Ander (spesifiseer)*

See reverse side / *Kyk op keersy*

# E. STATEMENTS / *STELLINGS*

| | Disagree stronlgy *Verskil sterk* | Disagree *Verskil* | Unsure *Onseker* | Agree *Stem saam* | Agree strongly *Stem beslis saam* |
|---|---|---|---|---|---|
| 1. There should be more co-operation between Christian churches *Daar behoort beter samewerking tussen Christelike kerke te wees* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 2. The church should co-operate with governmental and/or other NGOs to address problems in the community *Die kerk moet met die regerings en ander nie-regerings-organisasies (NRO's) saamwerk om probleme in die gemeenskap aan te spreek* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 3. The moral views of the church are outdated *Die morele sienings van die kerk is verouderd* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 4. The church does not care about the poor *Die kerk gee nie om vir arm mense nie* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 5. Men are intimidated by women in leadership positions in the church *Mans voel bedreig deur vroue in leierskapsposisies in die kerk* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 6. Churches should be racially integrated *Kerke behoort te integreer t.o.v. ras* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 7 The church makes a difference in my community *Die kerk maak 'n verskil in my gemeenskap* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 8. Each congregation is responsible for its own members only *Elke gemeente moet net vir haar eie lidmate verantwoordelikheid neem.* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 9. If churches co-operate the needs of the community can be addressed more effectively *Indien gemeentes saamwerk sal die behoeftes van die gemeenskap meer effektief aangespreek word* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 10. AIDS does not yet have an impact on my community *VIGS het nog nie 'n impak in my gemeenskap nie* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 11. The church should provide a friendly and loving environment for persons infected and affected by HIV/AIDS *Die kerk moet 'n vriendelike en liefdevolle omgewing wees vir persone wat deur MIV/VIGS geinfekteer of geaffekteeer is* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 12. People with AIDS deserve it *Mense met VIGS verdien dit* | ☐ | ☐ | ☐ | ☐ | ☐ |
| 13. The church should be involved in sex education *Die kerk moet betrokke wees by seks-opvoeding* | ☐ | ☐ | ☐ | ☐ | ☐ |

## ADDENDUM B: GEODATABASE AND BASE MAP

The geodatabase can be viewed either in Microsoft Access or ArcCatalog (ArcGIS 8.X). Each record in the geodatabase has a unique code which bounds it to a specific geographical location. The tables from the geodatabase can be joined to the attribute table of the basemap, based on these unique codes, and used to create thematic maps using the information from the newly joined tables.