INDIAN HOUSING IN THE MARBURG PORT SHEPSTONE SUB-REGION

Submitted in partial fulfilment of the requirements for the degree of Master of Science in Town and Regional Planning in the School of Town and Regional Planning, University of Natal Durban.

by

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PREFACE

Indian housing, or the lack thereof, is a topic which has been increasingly occupying the mind of planners, newspaper reporters, government and local authority officials alike who have an interest in the development of the Indian Community of the Marburg/Port Shepstone Sub-Region.

In 1973, at a meeting of the Natal South Coast Regional Planning Committee the question was raised as to how many residential units were required to accommodate the needs of the growing Indian population of the Sub-region. The writer, who was at the time the responsible planning official for the area was unable to give any direct quantitative answer to this question and thus this study arises out of the need to provide a means for the estimation of existing housing requirements and a projection of future demand resultant from growth in the population.

In this study an attempt has been made to show how existing and future accommodation requirements can be calculated and predicted through the use of two independently constructed statical housing models; and in addition what categories of data are required to be analysed so as to make such projections meaningful.

The study of housing requirements is not an arbitrary process, but is a highly co-ordinated research programme in which the use of social survey data is promoted, in order to give the planner as wide an outlook about the factors affecting the provision of housing in his study area. The statistical interpretation of housing conditions, and the deductions made therefrom can vary tremendously between research studies and thus this thesis aims to show how the selective use of social survey, combined with a controlled projection technique can provide significant forecasts

of the likely demographic, social structures, and housing demand expected to occur in the sub-region at any given point of time in the future.

As is to be expected, no two models or approaches, developed upon independent lines of investigation will necessarily reveal the same results and therefore any comparative analysis of the results of the two research studies undertaken must take account of the various sets of assumptions and data bases used in the respective models.

The value of this research project to the planner therefore lies in its ability to:-

(a) Construct two separate methodological approaches i.e. Exponential Growth Curve and Age Cohort Survival studies for the analysis and projection of existing and future population, family and household composition of the Indian Community of Marburg/ Port Shepstone.

(b) Properly evaluate, interpret and collate survey data in order that future housing construction programmes can be formulated to meet anticipated demand.

A study of this nature and complexity must of necessity be restricted in scope and depth and therefore the analysis has been curtailed to a study of the social and demographic factors which influence housing demand; and has purposefully ignored the importance and influence which economic considerations have on housing requirements.

It is hoped that the research methodology used in this study will make a contribution towards the greater understanding of the particular problems facing Indian housing in Marburg/Port Shepstone,

and in addition that the analytical tools devised will aid future research in the projection of Indian housing amongst other Indian South African Communities.

ACKNOWLEDGEMENTS

The success of a research project, such as has been carried out in this Thesis, has been to a large extent, due to the tremendous co-operation of the local Indian Community of Marburg/Port Shepstone who have ably and so willingly supplied the essential data upon which this study is based, and also to the numerous officials and interviewers who have contributed towards the collation and processing of data.

The local community who have been subjected to a number of surveys in recent years have responded magnificently to the various studies undertaken, and they have in no small measure contributed towards the realization of the aims and objectives set in this study.

A vote of thanks must also go to the numerous interviewers who through their intimate knowledge of the widely scattered rural area of the sub-region, managed to enumerate families and households living in the most unexpected dwellings, who would not have been normally included in any sample or census survey.

I am grateful for the assistance received from both the Marburg and Port Shepstone local authorities who so readily made available their records and staff for the furtherance of this study; and to the Town and Regional Planning Commission and its staff for providing the data and financial resources which enabled me to undertake this research work.

There are naturally too many officials and staff who have assisted in such a mammoth project as this, but those whose special contributions cannot be overlooked and to whom I owe a special debt of gratitude are Messrs. J.B. McCormack, F.G. Price and R. Turner of the Town and Regional Planning Commission; P.W. Johnston and L.D. Baker of the City Engineers Durban, and A.L. Hastings and P. Sinclair of the Marburg

and Port Shepstone local authorities respectively.

To Mr. D. Theron my supervisor I wish to extend a vote of thanks for the time and consideration which you have devoted to this thesis, and to Professor D. Robbins our newly acquired Head of Department, I wish to express my gratitude for the assistance rendered in submitting this Thesis.

A special vote of thanks must be extended to my newly wedded wife who has for a number of years been my support, comforter and assistant throughout this long research period. To her I wish to express my appreciation for all the work and assistance and typing well done.

Finally but not least I offer my thanks to Mrs. E. Serfontein who typed the final draft of this Thesis.

The Marburg-Port Shepstone Sub Region

Plate

CHAPTER ONE

INTRODUCTION

1.1 GENERAL INTRODUCTION

While considerable progress has been made in South Africa towards the provision of low cost housing for Indians in the larger urban centres, little or no attention has been paid to the plight of a relatively small Indian Community living in the area known as the Marburg / Port Shepstone sub-region.

In this age of rising levels of expectations, it has become increasingly necessary for societies to provide healthy and adequate accommodation at economic prices for an ever increasing proportion of the community. However through the lack of planning foresight and involvement by the planners and city fathers alike, combined with the greed of landlords to extort higher and higher rentals as a result of the scarcity of accommodation; little has been done to alleviate the hardship of hundreds of Marburg / Port Sheptsone families who must of necessity seek shelter in sub-standard housing at rentals far beyond their financial capacities.

Planners and architects have for years planned and redeveloped new and existing Indian townships on the basis of normal western class norms and standards, ignoring completely the oriental life styles and customs of the local community. Today this practice has changed as the realization has been reached that each particular community has its own ideals and specific requirements in respect of the provision of housing and community living. Any housing study which is undertaken must therefore reduce cultural bias and provide as detailed a picture about the living patterns, cultural ties and socio-economic living conditions under which the project group is residing.[1]

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1. Mass Housing : Social Research and Design, article by Brent C. Brolin and J. Zusil, taken from the book 'Human Identity in the Urban Environment' pp 327 - 367.

In any research programme, the aims and objectives sought to be achieved by the study must be clearly stated at the outset of the investigation. Thus in this Thesis it is desireable to set the goals for which this study has been undertaken and once these have been clarified a better understanding of the problems of Indian housing will result.

The first and foremost goal is the construction of two statistical models, namely the Exponential Growth Curve Model (i.e. Model I) and the Age Cohort Survival Model (i.e. Model II), which will provide a clear picture of the state of the existing housing conditions and provision in the sub-region, together with a projection of the future housing requirements necessitated by population growth due to natural increase and migration.

In order to prepare such models it is necessary to investigate the general principle upon which any housing survey must be founded. These include:-

1). The delimitation of the boundaries of the project area in terms of accepted limits.

2). The investigation and analysis of past development in order to observe past trends which have helped to change the society's housing requirements. In addition thereto it is necessary to relate such prominant trends as may have been observed to projection techniques, so as to anticipate the future form of development likely to take place in the sub-region.

3). The design and application of a theoretical framework for the projection of housing needs as set out in Models I and II. In studying the methodologies used in both models it is necessary to take cognisance of the importance of the selective use of social survey and what statistical tools and measures are available to the planner for the projection of housing needs.

4). The investigation and correlation of non statistically quantifiable data with that of emperically derived survey results.

In respect of requirement 1, the boundaries of the project area as illustrated in Map 3 and Plate 1, were prescribed by the provisions of the Bureau of Statistics Enumerator Sub-district delimitations. In order to acquire comparable data bases over as wide a period as possible it was necessary to standardise the thesis project area in terms of existing survey areas. By establishing fixed survey parameters, comparative analysis of individual social surveys was made possible, and gradually trends in development patterns, e.g. changing household and family structures, population growth rates etc.. become discernable. Any projection must of necessity make a number of assumptions about future growth and thus in this Thesis it is assumed that the present and past observed trends will be representative of future developments.

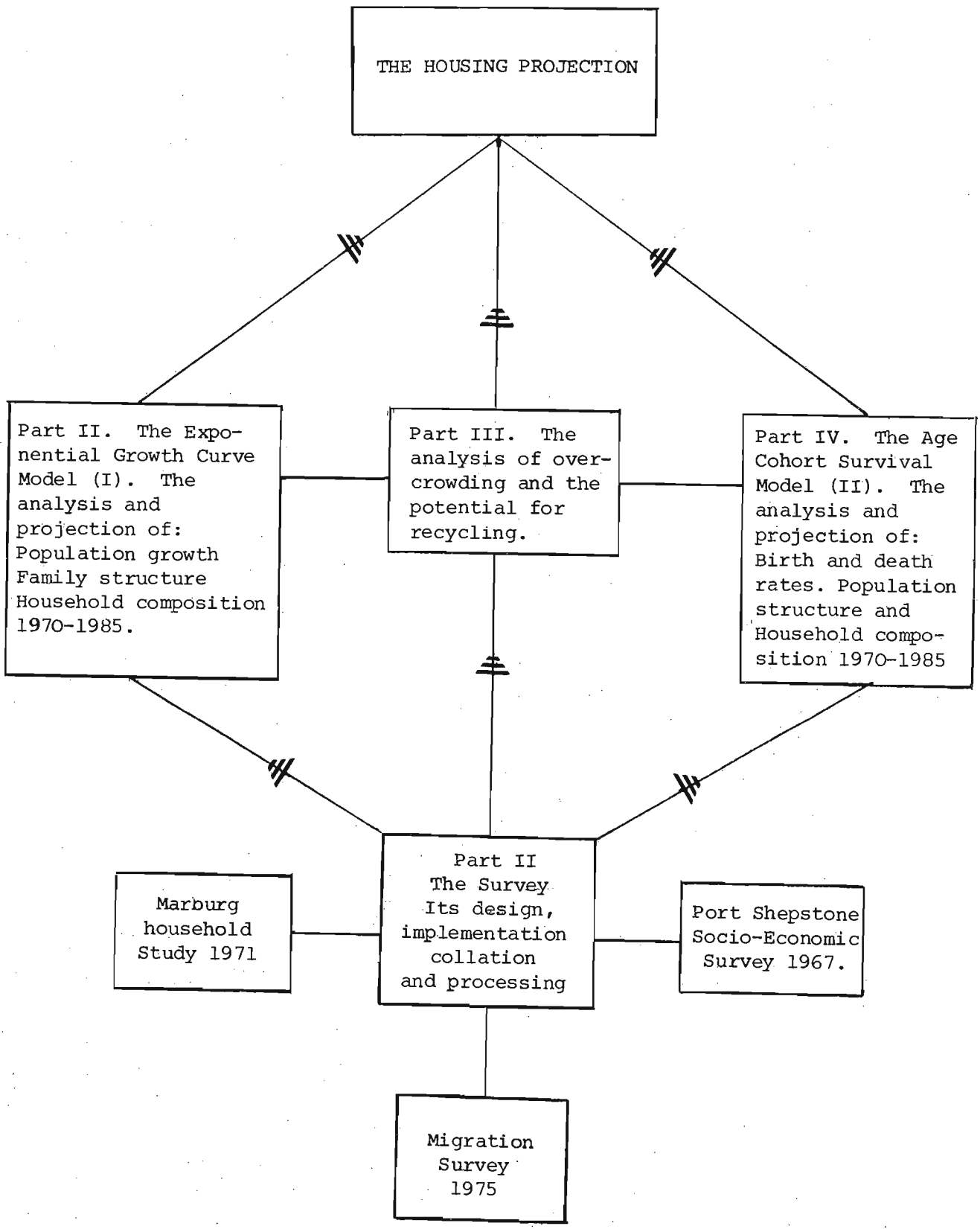
The preparation of any theoretical framework is a crucial aspect in any housing study and it is essential to determine what sources of data are available before designing a research programme. In respect of the Marburg / Port Shepstone sub-region the sole sources of data reflecting past growth prior to 1974 were the Bureau of Statistics Census Reports, and an ad hoc socio-economic survey carried out by the Department of Economics, University of Natal, 1967. Since the data available was limited in scope a number of additional surveys had to be carried out, the results of which were correlated to provide sufficient data bases to satisfy the needs of the respective projection techniques.

Whilst one of the primary objectives of this study has been to determine the quantitative requirements of housing demand, it is also necessary to look at some of the qualitative factors which have affected the existing housing conditions in the study area. In Chapter II, many of the socio-economic, cultural, political and historical influences have been reviewed, and thus any interpretation of statistical data must be seen against the backdrop of such non quantifiable influences as aforementioned.

Having determined the general principles which must guide a housing study it is necessary to see what methodological approaches have been used in this particular study.

This Thesis makes use of two independent research models each of which makes use of its own premises, assumptions and statistical devices for the measurement of the housing problem. In order to assist the reader in understanding the elementary approaches used in this study, Diagram I has been constructed.

Diagram 1



From the illustration embodied in Diagram I it can be seen that no matter which research technique is used in a housing projection, that four separate indepth studies must be undertaken to provide sufficient data upon which the forecast can be made.

The first phase involves the construction and implementation of Social Survey and the tabulation of the results obtained therefrom. From this centralised data source, each model draws its respective information requirements.

At the second level of research the respective models employed analyse and project the future accommodation requirements in terms of the respective methodologies used.

The third study employed involves the analysis of the existing housing conditions, and an investigation into the potential for the future recycling of housing. This stage like the initial phase is of equal application to both models and thus the results obtained from this investigation are identical and of equal importance to both models used.

The final process involves the collation and rationalisation of the results of the respective studies carried out at the second and third levels of investigation. It is from the combined analysis of these findings that the final housing projection and an overall view of the existing and future housing requirements is obtained.

Since both models utilise totally different levels of investigation and rely upon differing sets of assumptions, the results obtained in the final analysis cannot be directly compared but must be viewed in the light of the respective methodologies employed.

Within each of the models approaches emphasis has been laid on the need to :-

A. Establish standardised measures for the collation and analysis of data.

B. Determine the importance and influence of migration factors on future housing demand.

C. Establish to what extent natural increase and migration have contributed to population, family and household growth in the sub-region.

D. Discover the relationships existing between family size and household structures, and determine the social groupings most likely to occur in the future, as a result of changing age, sex, marital status, socio-economic, cultural and political factors.

Moving from the more generalised aims and objectives it is now essential to look briefly at the value and goals which each Chapter employed in this study, contributes towards the overall assessment of current and future housing demand.

The Marburg / Port Shepstone household study consists of 5 Chapters which are further divided into a number of sub-sections. Chapter I being the general introduction to the study, presents a summarised layout and an explanation of the general aims and objectives of the study. In Chapter II entitled 'Background' the importance of historical, physical, non physical i.e. cultural, social and political influences on the development of the sub-region between 1860 - 1975 is assessed.

In the third Chapter the writer sets out the methodological approaches to be used in assessing the existing and future housing requirements. Within this Chapter are four major sub-sections, namely:-

(i) Survey Design and Data Collection.
(ii) Data Analysis and projection of housing requirements in terms of the Exponential Growth Curve Approach (i.e. Model I).
(iii) The Analysis of existing housing conditions with special reference to overcrowding and the recycling of housing.
(iv) Data Analysis and projection of housing requirements in terms of the Age Cohort Survival Approach (i.e. Model II).

Attention is paid to the mechanics of the collation, processing and analysis of data; and the terms of reference which are applied by the respective models used in this Thesis.

Chapter IV deals primarily with the analysis and interpretation of the results of the various sub-studies carried out in terms of the particular housing model employed. It utilises the statistical measures described in Chapter III, as a basis for the interpretation and projection of data, and describes the prevailing and past composition of the Community; its social groupings, and housing accommodation. In addition to the analysis of past growth, this Chapter illustrates the projected housing requirements in terms of the formulae set out in Chapter III, and describes the relationships existing between variables influencing housing demand and household formation.

Chapter V which is a final resume of the results of the aforegoing investigations provides an overall assessment of the value of the study and the quantitative requirements of furture and existing housing demand. In addition thereto it surveys the prospects for the future development of the sub-region.

CHAPTER TWO

BACKGROUND

2.1 GENERAL INTRODUCTION

While it is the primary objective of this Thesis to determine housing requirements on the basis of statistically derived data; Chapter II attempts to provide the background information about those factors which are non-statistically quantifiable in character, and which exert an overall influence on housing demand in the area.

In order to determine housing conditions it is necessary to study the spatial relationships existing between members of the Community and establish a record of past and present development patterns and housing trends. To achieve this goal, this Chapter investigates the influence of historical background, migratory trends, population growth, physical and environmental conditions, and legislative controls to see what contribution each has made or is making towards the provision of Indian housing in the sub-region.

2.2 LOCATIONAL SETTING

The Marburg / Port Shepstone Indian area is a relatively small sub-region of some 766 ha's[1] in extent, situated on the southern banks of the Umzimkulu River and lying approximately 150 kilometers south of Durban[2]. (See Map I).

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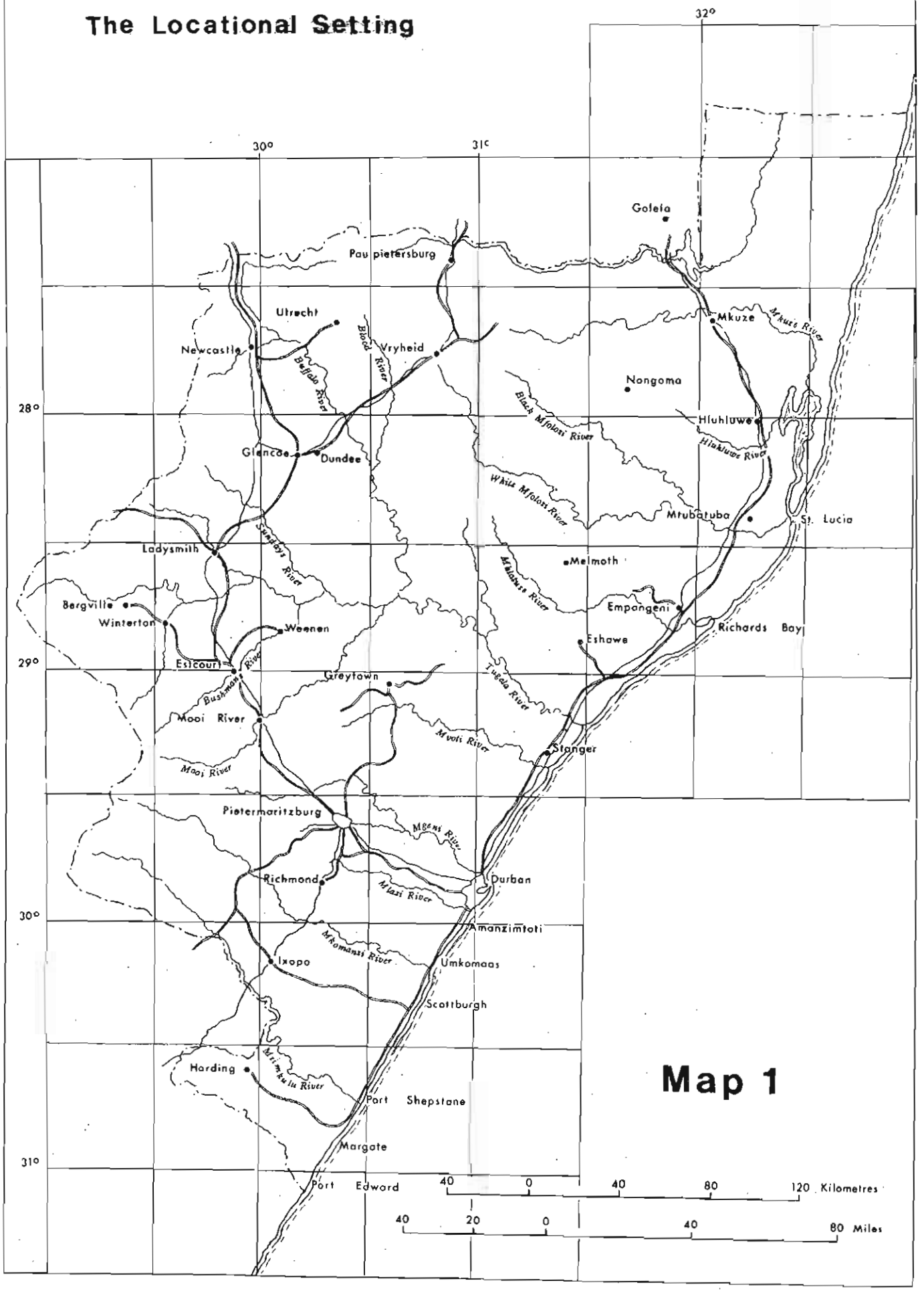
1). The area has been acquired from Marburg Household Study Appendix I contained in the files of the Director Town and Regional Planning (Unpublished data source).

2). Map I provides a sub-regional guide of Port Shepstone's location in relation to that of Durban and its surrounding townships.

The Locational Setting



Map 1

The boundaries of the region as indicated on Map 2 and Plate I, extent 4,5 Kms[1] inland with the western border adjoining the Bantu Location No. 5, and the southern boundary comprising the Izotsha River. In Map 3 the Thesis project area is delineated indicating that not all of the local sub-region has been studied. This is due to the delineation of the Census enumerator sub-district, and Group Area designations which have prescribed the study area.

2.3 HISTORICAL BACKGROUND

In reviewing the historical background of the area it is necessary to pin point the major historical events of the 19th and 20th Centuries which have influenced the development of the sub-region and in particular the Indian Community.

It is reported that as early as the 1550's[3] Portuguese navigators were known to be plying the Natal South Coast, but it was not until 300 years later in 1867[4] that the first serious attempts were made to layout a township, later to be known as Port Shepstone.

Port Shepstone and its hinterland, Marburg, developed as a result of the British Colonial Government's policy to colonise Natal, and in so doing provide a buffer zone between the White settled coastal areas and the Bantu areas to the West and South - of the lower Umzimkulu. The first real settlement was established in 1882[5] with the arrival of 200 Norwegian settlers who were granted small holdings of 100 acres in extent, in the vicinity of the present Marburg Settlement lands.

Development of the sub-region in the initial stages was slow owing to the lack of employment facilities and the inadequacy of communication routes. It was not until the arrival of the sugar and tea estates in the

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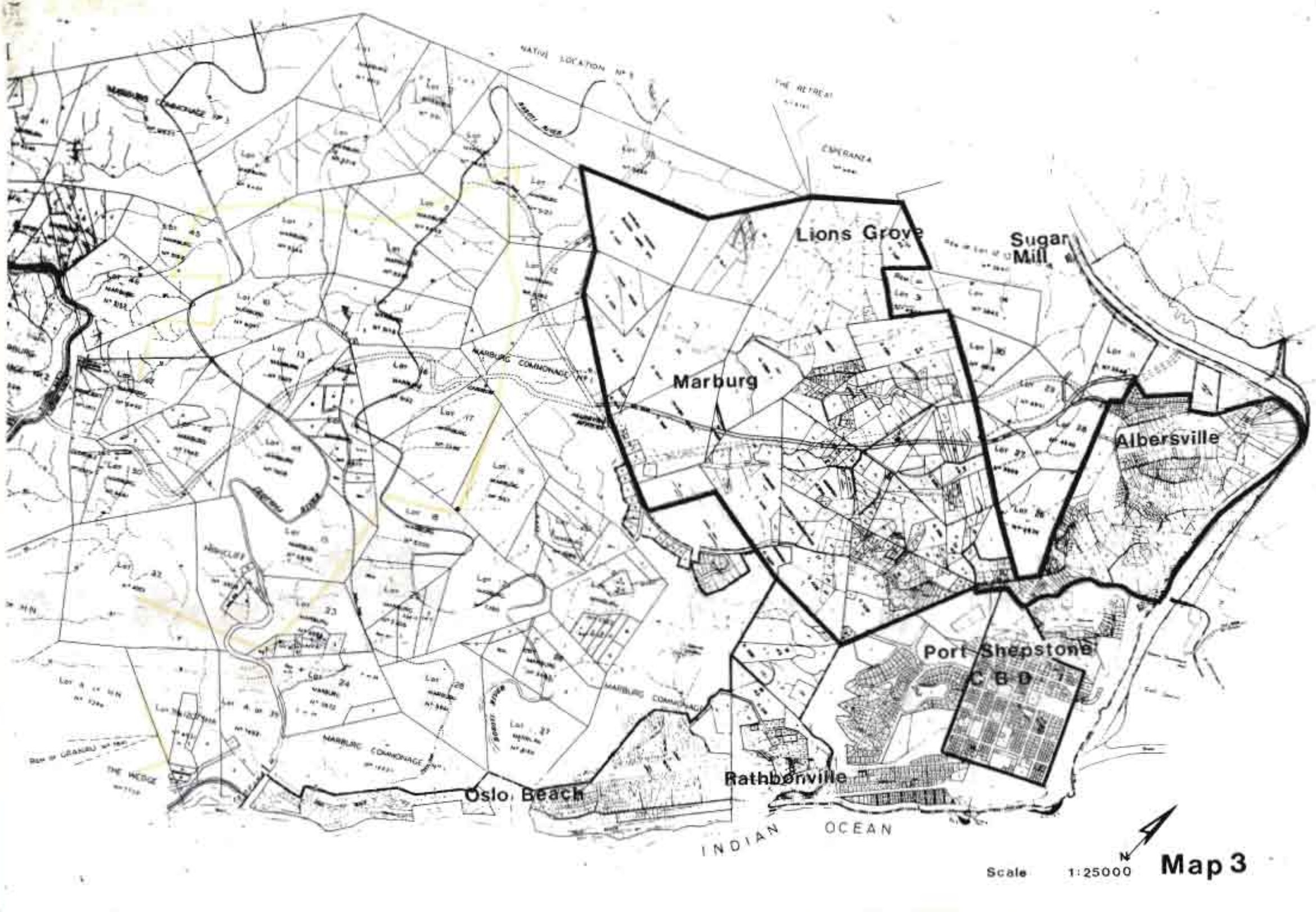
1) Refers to maximum width of the area from coast line to furthest point inland.
2) Map 3 provides a clear illustration of the thesis project area, and for Group Area boundaries see Map No. 7.
3) 'A History of Port Shepstone' W.T. Jackson, M.A. Thesis 1952, Dept. of History, Univ. of Natal (unpublished), p 2.
4) Ibid.
5) Ibid

The Sub-region

Map 2

The Project Sub-Region



Map 3

late 1880's that any real impetus was given to the urbanization of the area.

While the precise date of the arrival of White settlers has been established, that of the coming of the first Indian into the district remains unknown. However, it is recorded that at least 2 Asiatics[1] were living in the Lower Umzimkulu by 1886 barely 4 years after the arrival of the Norwegian settlers.

In the early stages of Port Shepstone's development there was little competition between the White and Indian Settlers for land but as a result of the higher reproductive rates amongst the Indian Community and greater economic advancement of the Whites, this imbalance was gradually upset, which resulted in the Indians being forced to migrate further and further inland. This led to the growth of the urban area of Port Shepstone with the consequent incorporation of a number of outlying sub-regions.

Port Shepstone as a township was proclaimed in 1913[2] when both South Shepstone and the Port area were amalgamated. The township grew slowly until 1948[3] when a large farm known as Albersville was incorporated, thus nearly doubling the size of the original township. Whilst Port Shepstone continued to expand, Marburg, which had formerly been a predominantly rural Indian area, proceeded to grow in importance as a major residential and employment area for the Indian Community. Today this area forms the nucleus of a planned 'Indian New Town' which will if the Planners dreams are achieved alter the total character of the sub-region by the turn of the Century.

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1) W.T. Jackson, Op cit p4.
2) Ibid.
3) Information drawn from unpublished report of the 1st Meeting of the Natal South Coast Regional Planning Committee 1966, p7 as compiled by R.A. Pistorius.

2.4 PHYSICAL DETERMINANTS

While a review of the historical past can provide the planner with valuable insights into the nature of past development, it is essential to determine what influence physical elements have had on the shaping of the spatial matrix of the Indian Community.

Three physical elements appear to have exerted the greatest influence, namely:-

A. The location of the Great Umzimkulu River, and
B. The topographical configuration of Port Shepstone and its hinterland, and
C. The ecological pedology and geomorphology of the sub-region's soils.

Port Shepstone owes it very beginnings to the construction of the port. The siting of the harbour facilities were influenced by:

(a) The location of the deep water channel on the south bank of the Umzimkulu, which meant that the wharfs had to be constructed on the southern bank where the boats could most easily be moored.
(b) The relative flatness of the dune area at the southern bank of the river mouth which assisted the construction of the port and its residential quarters.

Whereas the major portion of the Umzimkulu lies in a deep river line with high embankments on either side, a three kilometer strip stretching from the foreshore westwards towards the existing sugar mill is relatively flat thus facilitating ease of access between the river frontage and the hinterland lying to the south of the river. A combination of both of these factors led to the establishment of the initial township, in the vicinity of the present Port Shepstone central area.

As can be seen from Maps 4 and 5 the areas lying to the west of Port Shepstone are topographically very undulating with a very limited supply of flat land, and are in addition agriculturally poor in quality since they are derived largely from the Williamson and Glenrosa Series[1]. These two factors combined, had a very important bearing on the future development of the region since:-

(i) As a result of poor soils, bad topography, labour problems and a general shortage of markets, the early 'white' settlers soon found agricultural farming to be non economically viable. This led to a migration of the 'white' settlers to the urban area of Port Shepstone or to the agriculturally more desirable North Shepstone. As the 'whites' moved out so the 'free' Indians acquired their lands and because of the latter's greater adaptability, the shortcomings and hardships of a hostile countryside were overcome. By promoting smaller farms and intensively cultivating the few areas of reasonable agricultural potential, the Indian settlers were able to make agriculture more viable.

(ii) Because of the cultural heritage of the early 'coolie' settlers they were better able to adapt their life styles to the terrain and thus one finds that Kutums tend to congregate either on the flatest parts of the hilltops or conversely in the valley lines thus leaving the steeper slopes available for agricultural purposes[2].

(iii) The banks of the Umzimkulu River in the vicinity of present day Albersville were too steep and 'stoney' for agricultural persuits thus urban settlement took place where farming was least productive. With increasing population growth those areas of minimal agricultural potential were taken over for residential development and so Port Shepstone began to grow in both a westerly and southerly direction.

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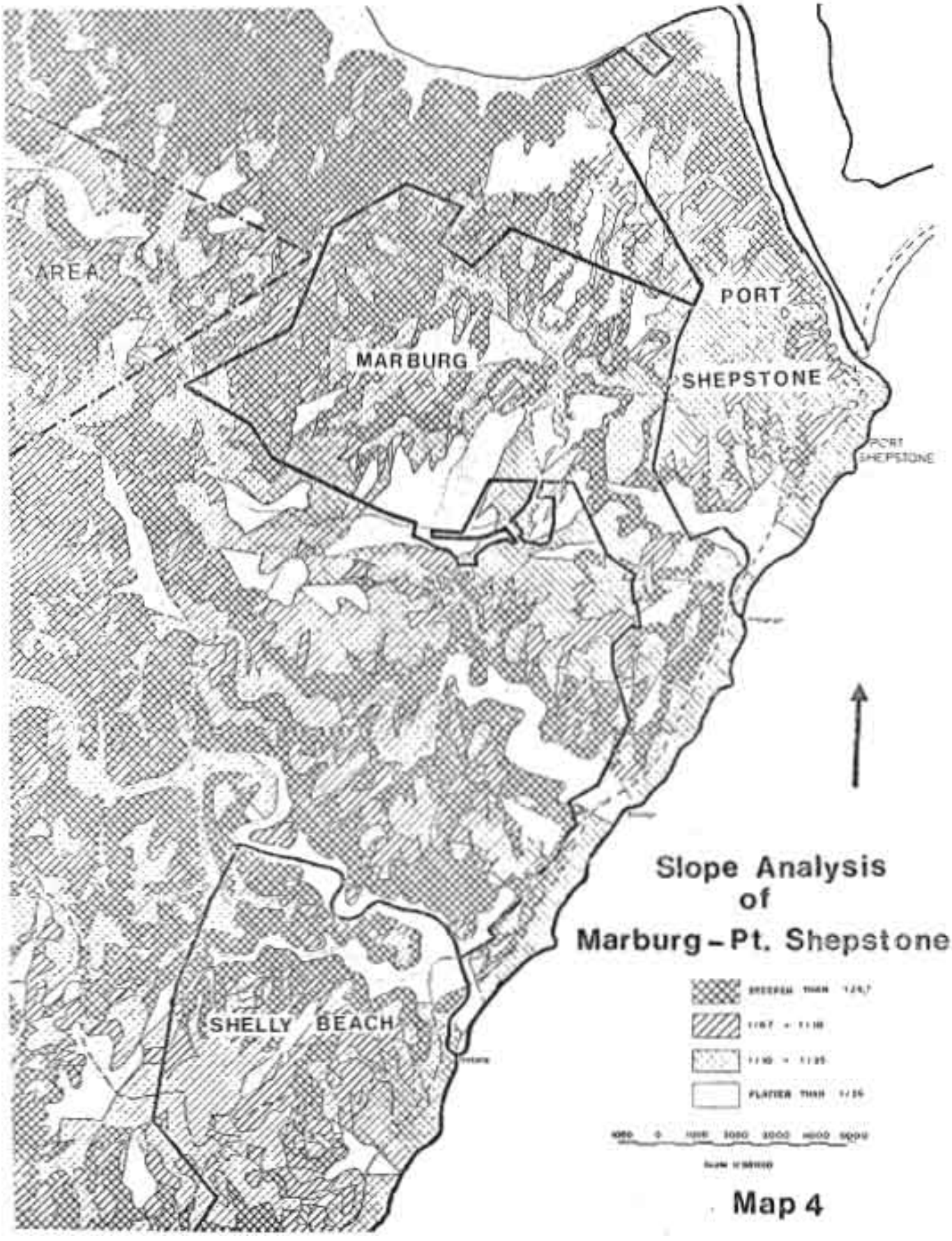
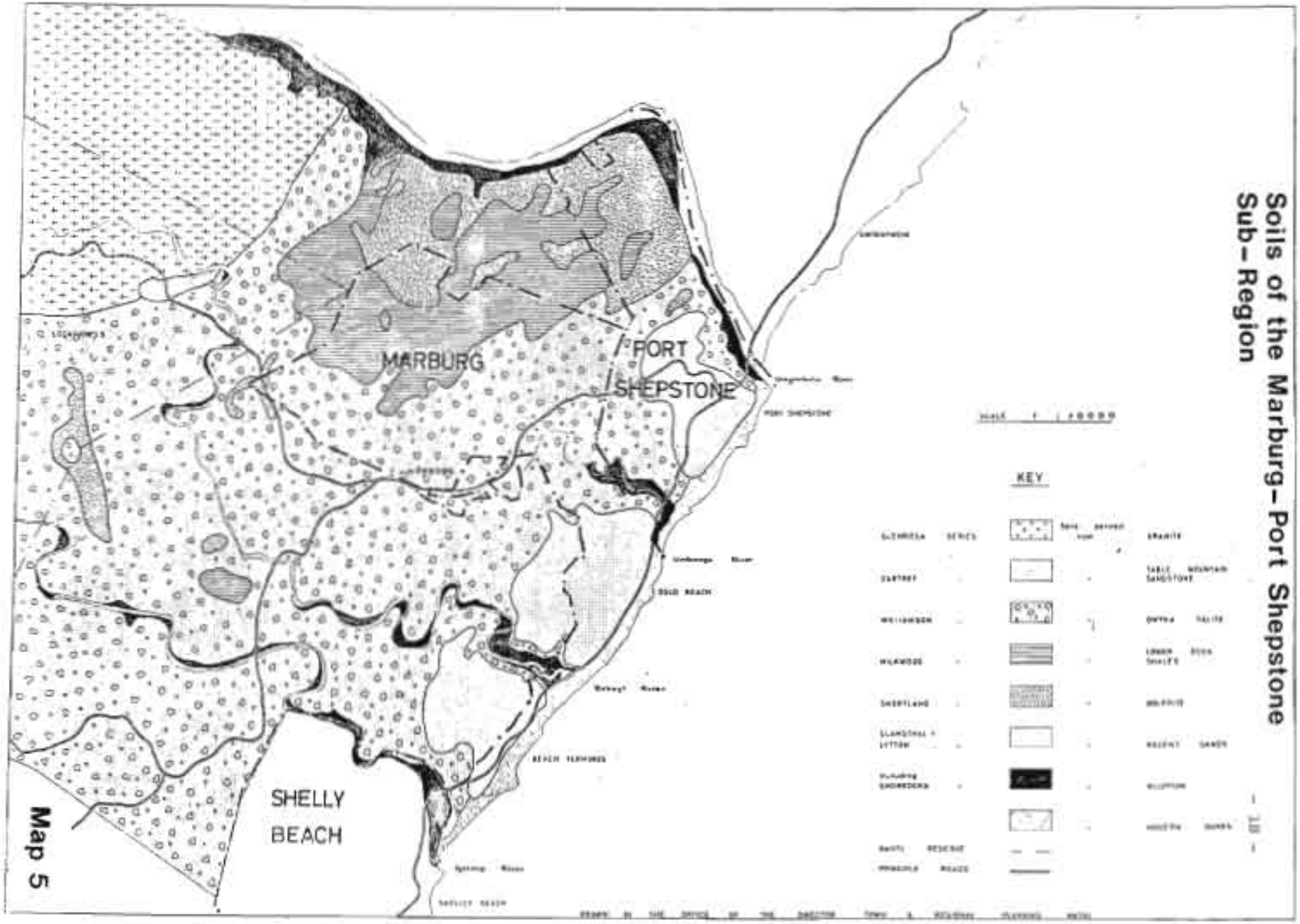
1. In terms of the Loxdon Survey 1971, the agricultural potential is rated as moderate to low. The Williamson & Glenrosa Series soils are largely Shale and Tillities which are hard to work by manual means, and have a generally low nutrient quality.
2. With modern day equipment and fertilisers formally unproductive areas have been increasingly utilised for cane production. In early times market gardening was the major activity but with increasing urbanization this has decreased in favour of sugar cane and banana farming.


AREA
MARBURG
PORT
SHEPSTONE
PORT
SHEPSTONE
SHELLY BEACH
Slope Analysis
of
Marburg - Pt. Shepstone
Map 4


Soils of the Marburg-Port Shepstone
Sub-Region
MARBURG
PORT
SHEPSTONE
SHELLY
BEACH
Map 5
KEY

(iv) Continual flooding of the alluvial plains adjacent to the Umzimkulu River occurred annually forcing those Indian farmers who had established themselves on the alluvial plains adjacent to the Umzimkulu to seek shelter 'higher up' on the banks; thus even to this day the low lying riverside areas remain largely undeveloped and are left primarily for sugar cane farming.

(v) Owing to the undulating character of the countryside and more particularly in the Lions Grove and Albersville Townships, a large proportion of the sub-region is rendered unsuitable for conventional housing development. As a result thereof lots tend to be large with development restricted to small portions of the property. Residential development both in Marburg and Port Shepstone has tended as a result to take place either on the hilltops or along the flatter parts of the valley lines which results in the sub-region having a more rural character than the population densities would suggest. Because of the relative scarcity of flat land Indian families tend to group their dwellings together and thus such groupings serve social functions in addition to normal town planning and structural requirements.

(vi) Those areas which are of lesser agricultural value have been progressively developed for urban purposes which has resulted in scattered development taking place throughout the sub-region. Since most roads followed contours it is to be expected that development has been promoted in conjunction with and in close proximity to the existing communications network. This has led to a number of settlements being constructed at points far removed from the existing urban concentrations.

(vii) Both the roads and river courses have played a major part in demarcating the project area and the northward and southward migration of the Indian Community has been halted by the effects of these two important physical factors.

2.5 LAND OWNERSHIP AND MIGRATION PATTERNS

In order to more fully understand the development of the sub-region, and the Indian Communities contribution towards it, it is essential to investigate:-

A. The conditions under which the initial Indians arrived and settled in the region.
B. The form and type of occupation which has been evolved by the Indians themselves over a period of 80 years.
C. The type of land acquisition and time scale whereby the Indian established himself as a major component in the sub-regions development.
D. Non physical factors i.e. political influences, town planning controls etc. and their influence on overall development.

As has been established earlier in this chapter there were 2 classes of Indian settlers i.e. 'Indentured and Passenger' of whom, by far the greater proportion were 'indentured coolies', imported largely as labourers for the vast sugar and tea estates. The indenture contracts required that an Indian immigrant 'coolie' worker bind himself to a 'white' employer for a period varying between 3 - 5 years[1] during which he would receive free housing, food rations and health services for his labour. Accommodation was provided in the main in stone or iron barracks[2], or in simple huts. The conditions of contract stipulated that after the successful completion of 2 periods of indenture the worker and his family would be entitled to either a free passage home to India or a piece of Crown Land equal in value to the return fare. However, since a large proportion of the Indian immigrants arrived during the latter 1890's and early 1900's they were unable to qualify for the land grants since the repeal of the Indian Immigration Act in 1891[3] withdrew this land

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1. The Indian Elites in Natal South Africa, article by H. Kuper for the Social Science Conference, Durban 1956 p129.
2. Data drawn from consultation with Councillor B. Johnson a former mayor of Port Shepstone.
3. The Indian South Africa, Dept. of Information Publication February 1975, p7.

privilege. This meant that those 'indentured coolie' who obtained their freedom and wished to remain in the area, had to either acquire their land from:-

(a) sympathetic former employers,or

(b) white speculators,or

(c) those Norwegian settlers who decided to quit their farms in the Marburg settlement lands.

In the initial years those 'free' Indians who had accumulated sufficient savings from their meagre wages[1] acquired land along the Umzimkulu River, but successive floods soon forced those landowners to migrate either to the Marburg region or to the developing Marburg agricultural areas of the 'Band' or 'Langalabella'[2].

Since these early pioneers had to acquire their land in an open market, and had to pay inflated prices (average price £4 per acre)[3] for the land, out of their meagre savings, it is not surprising that the farms, small holdings or plots acquired were restricted in size. Up to the period 1915 the Norwegian settlers properties were the primary source of land for the Indian Community. With the splitting up of Albers Estate in 1915 into the township now known as Albersville, the free Indian settlers obtained their first real opportunity to acquire property in freehold title. A.G. Choonoo[4] in discussing the consequences of Indentured Indian Immigration suggests that a large proportion of land acquired by Indians was obtained from 'white' speculators rather than direct from the early pioneer settlers. Evidence of this practice exists in the Port Shepstone area, a prime example of which was the splitting up

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(1) The average wage which a long serving trained male'coolie' could expect was about £4 per month excluding rations and accommodation and rudimentary health services, while a newly indentured male or female labourer was paid approximately 10/- per month. I. Thomson 'Indian Immigration into Natal' p26.

(2) See Map 2 for locational guide.

(3) Data obtained from personal records of V.R. Appalraju a prominent landowner in the Marburg / Port Shepstone sub-region.

(4) A.G. Choonoo 'Indentured Indian Immigration into Natal 1860-1911'. M.A. Thesis, Dept. of Geography, University of Natal.

of Albers Estate by a certain Mr. McKenzie who promptly sub-divided the deceased's estate and transferred properties to Indian buyers in open title.

Other areas, which had been formally 'white' enclaves soon followed, especially in Marburg where the Norwegian settlers and their descendants, tired of trying to eek out an existance on agriculturally unproductive smallholdings, gladly sold out to prospective Indian buyers. Since the land grants to the Norwegian settlers contained no restrictive clauses, transfer of properties to Indian purchasers were more easily fascilitated, and thus the hinterland of Port Shepstone became progressively 'Indianised'.

Amongst the earliest of the free Indians to acquire properties in the sub-region were P. Moodley and P. Pillay (both in Albersville 1922), V. Appalraju (Louisianna, Albersville, White House Farm) and A. Goomal (Umbango) whose descendants today rank amongst the larger of the land owners and who through their attitudes towards development have markedly affected the overall growth pattern and direction of urbanization in the sub-region.

It is also most important to look at the phases of development which have overtaken the region and thus in Map 6 an illustrated analysis of the patterns of migration and land acquisitions as they have occurred in the project area, has been made.

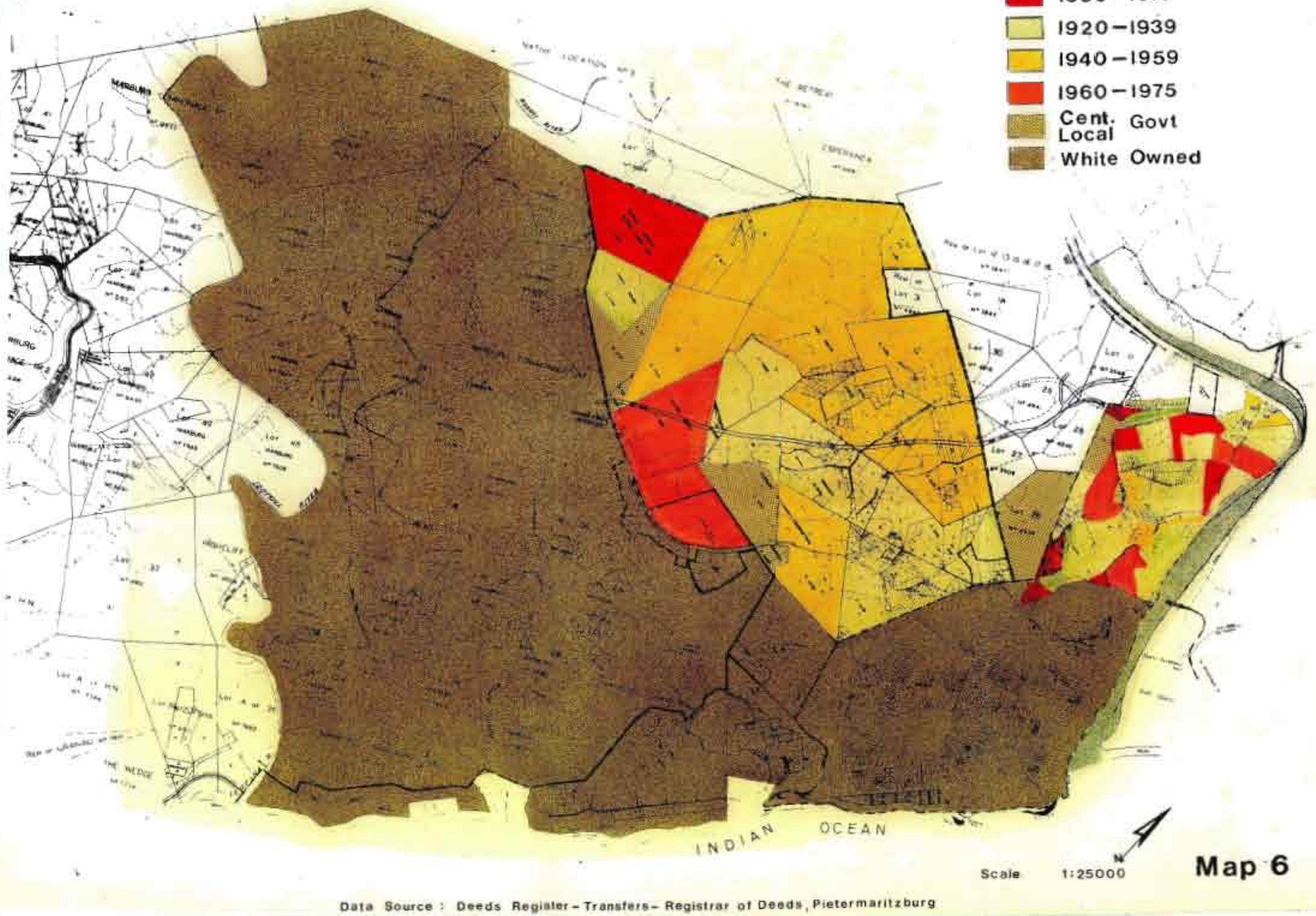
From the results obtained therein it can be concluded that:-

(i) 60 percent of the properties in Albersville were acquired prior to 1940.

(ii) The foremost period for the sub-division and acquisition of land was between 1940 and 1949.

(iii) The incidence of acquisition of land by Crown Grant is very limited which indicates that most of the land has been acquired by the Indian Community from purchasers of 'white' owned property.

Land Ownership and Migration



Map 6

Data Source : Deeds Register – Transfers – Registrar of Deeds, Pietermaritzburg

2.6 NON PHYSICAL PARAMETERS

Thus far discussion has taken place about the influence which physical factors have had on direction and speed of growth and it is now necessary to investigate what influence non-physical factors have had on the sub-regions development. These parameters can be broadly grouped into 3 categories, namely:-

A. Politicial considerations
B. Economic influences
C. Planning Controls

Right from the outset, the Indian settlers whether descendant from 'Indentured or Passenger' stock, enjoyed little or no civil liberties. Their rights were guarded by a 'Protector of Indian Affairs' and by their employers. Rights over the tenure, occupation and acquisition of land remained unrestricted until 1943 when the 'Trading and Occupation of Land Restriction Act'(i.e. Pegging Act) [1] was passed, which provided controls over the sale and purchase of land between Indians and Whites. An analysis of Map 6, however, reveals that the provisions of this act could only have had a minimal effect, since a large number of property transfers took place between Whites and Indians, subsequent to the enactment of this legislation.

The Pegging Act was but a mere forerunner to more formal control which was introduced in 1965, with the proclamation of 'Group Areas' in the sub-region (see Map 7).

In conjunction with the Group Area designation in October 1965, the surrounding areas of Murchison, Izotsha, Langalabelia and The Band became

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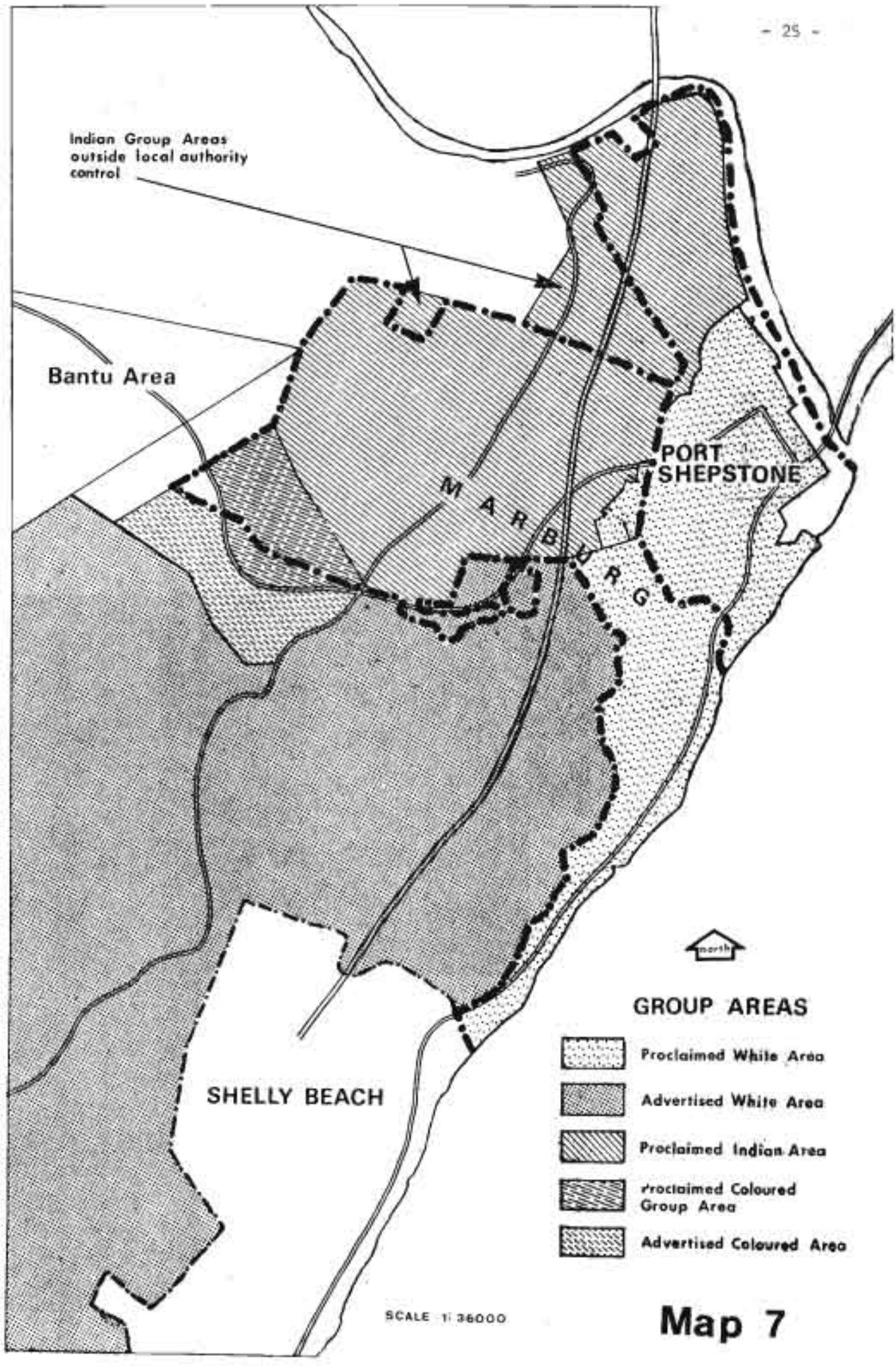
1. The Durban Housing Survey, University of Natal, 1952, p6.


Indian Group Areas outside local authority control
Bantu Area
MARBURG
PORT SHEPSTONE
SHELLY BEACH
north
GROUP AREAS
Proclaimed White Area
Advertised White Area
Proclaimed Indian Area
Proclaimed Coloured Group Area
Advertised Coloured Area
SCALE 1: 36000

Map 7

Controlled Areas[1] which effectively restricts the spread of urban development in the rural regions, thus forcing emigration to the Urban Areas. The effects of the 2 aforementioned factors can be best summarised as follows:-

(i) Because of the uncertainty existing over the future of the Group Area designations, housing development during the early 1960's slowed down, which as will be seen later in this study, might well have had an important influence on the shortage of accommodation in the sub-region.

(ii) The proclamation of Group Areas has had only a minimal effect on the relocation of Indian and White families, since most of the White families had moved out of the predominantly Indian Areas (i.e. Albersville) in the early 1950's, and only a handful of Indian traders remained in the White area bordering Reynolds and Wooley Streets (i.e. in the Port Shepstone C.B.D. area).

(iii) With the declaration of the project sub-regions neighbouring rural areas as 'Controlled Areas' this has forced the younger families seeking accommodation to move to proclaimed Indian areas where their rights to the occupancy and ownership of land and buildings are entrenched. The legislative controls might well be having an effect on the high rates of in-migration currently being experienced in the sub-region, and more particularly in the Marburg area which is thus far, largely undeveloped.

(iv) With the coming of 'Group Areas' etc., changes in the urban fabric and employment patterns have resulted. Owing to the need to provide more land for housing to accommodate the vast increase in population, agriculture has reduced in importance, which in turn has led to a new distribution of families and households across the entire sub-region.

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1. A 'controlled area' is a region where legislation is applied to restrict new development and the sale of property to members of specified race groups as designated by the Minister of Community Development.

(v) Due to the shortage of land available to the Indian Community, imposed by the Group Area restrictions, considerable sub-division of land has taken place in the Indian owned and occupied land, which has had the effect of reducing the sizes of properties and stimulated the conventional westernized nuclear family style of living pattern.

The present residential distribution of Indians in the sub-region has, in addition to the legislative controls, been prescribed in part by the political and economic dominance of the White race group[1]. Through the combination of Group Areas legislation and the higher economic purchasing powers of the Europeans, non-white groups have been forced to move either into the alluvial flats lying adjacent to the Umzimkulu or to the inland areas lying behind the Oslo Beach ridge. The combined effect of the restrictions placed on Indian residential development has lead to the growth of a block of homogeneous Indian areas where varying standards of periurban development prevail.

The importance of economic factors and their influence on the housing situation cannot be overlooked but since this Thesis is primarily concerned with the influence of social factors only a brief glimpse of economic considerations can be obtained.

For the Indian with restricted means of utilizing his capital, the house becomes the major economic and emotional investment, and is an integral part of a much wider community. Although today the economic position of the local Indian community has improved considerably since its earliest beginning, this has only been achieved through shrewd entreupeneurship and a maximization of the limited economic resources available. The economic advancement of the Indians has to a large extent been based on agriculture and trade and in latter years by greater industrialization and the growth of a thriving holiday resort industry. Although the growth in employment facilities has raised the lot of the

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1. Indian people in Natal, Institute of Race Relations Report by H. Kuper pXlV.

average Indian worker, a substantial proportion of the community still fall within the economic and sub-economic wage earning group, which means that while there is a demand for housing few if any of the potential home seekers, can acquire accommodation of their own accord at economically attractive rates.

As a result of the combination of high land values[1], a scarcity of land, and the complete lack of any official assisted housing scheme, this has forced a system of tenancy to persist in the sub-region. In the Port Shepstone Study 1967, 42 percent[2] of the total households were found to be tenants-at-will and since only an average 7[3] dwelling units a year are being built in the Port Shepstone Indian area it can be expected that the rate of tenats will have increased dramatically. Due to the economic position of most Indian households and the shortage of accommodation, many Indian families are forced to rent sub-standard housing and thus one finds as a general condition that double-storey dwelling houses tend to be converted into maisonettes and that all available outbuildings and garages are converted to provide low cost accommodation to a greater proportion of the population than normally would be possible.

It was not until 1952 in respect of Port Shepstone and May 1972 for the Marburg area that Town Planning Controls were first introduced into the sub-region. In the absence of formal regulations all development was guided in the initial years by the Title Deed restrictions and building bye-laws but since neither controls were strictly enforced this had little influence on the general design and construction of accommodation in the sub-region.

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1. The average value of undeveloped land is R4 000 per 1 000 m^2 in the Marburg Township. Data source from 1974/1975 Marburg Valuation Roll.
2. Socio-Economic Survey of the Port Shepstone District, p62. Dept. of Economics, University of Natal, July 1968.
3. Data obtained from the Borough of Port Shepstone building returns for period 1969, 1975. The maximum number of houses built in any one year was 13, the minimum 2.

Resultant from the relative lack of planning control until a very late stage in the Marburg / Port Shepstone's development, the sub-region affords the researcher an ideal area in which to investigate the characteristics of Indian Urban development, which has resulted in the absence of 'White' western imposed standards and controls. One finds thus a free form of development in which the Indian Community has been able to express itself in its development programme and yet on further investigation it will be seen how such uncontrolled development has contributed towards the housing and planning problems currently being experienced in the sub-region.

2.7 THE TRADITIONAL INDIAN FAMILY AND ITS CUSTOMS

No discussion on Indian housing would be complete without a thorough knowledge of the Indians way of life, his customs, mores and folkways.

Port Shepstone's earliest immigrant arrived in the area during the late 1880's from Madras, Bombay and Calcutta[1]. They brought with them a variety of customs and traditions since each group came from a different historical background. By far the greater majority were Hindu indentured coolies who were uneducated and rural peasants who clung to the traditions of a strict caste system. The 'Passenger Indians' were predominantly Muslims and were better educated and more westernised than their Hindu counterparts.

In the earliest times when the sugar companies provided the accommodation there was little formal caste structure since all the indentured labourers were forced to cohabitate within close proximity of one another. In addition marriage amongst Indians was not recognised and so the family unit was merely a defacto grouping of men and women.

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1. Natal Regional Survey, M. Palmer

Gradually, as the Indian society established itself and more women joined their menfolk the rudimentary social groupings of clans re-established themselves. As more and more indentured Indians acquired their freedom they joined other members of their clans, pooled their economic resources and established Kutums (joint households) which is the basic unit in traditional Indian society.

The Kutum[1] is the focal point in the Hindu society and comprises a restricted kinship group who trace descent through a male head and in which the classification principle defines the relationship existing between members. Within any given Kutum there may be 50 to 100 persons and it is not surprising that the early Indian settlers found it difficult to adapt their life styles to a western orientated social system in which marriage was not recognised and inter caste social interaction enforced.

As the indentured 'Coolies' gained their freedom they settled themselves on small holdings in and around the Port Shepstone township, and this soon led to a peri urban form of development. This meant that the heritage of the traditional life style had to adapt to new patterns of urban living within a common economic structure. With the urbanization of the community inter caste, inter religious and inter cultural mixing took place, and over the years this has lead to the erosion of the traditional Indian way of life in favour of a unique South African Indian life style which combines both oriental and western living standards.

Sufficient evidence exists to indicate that the overall Indian family pattern is tending to develop towards the nuclear family but it is the purpose of this study to see to what extent change has taken place in this area which is presently undergoing the process of urbanization. With the legislative and economic controls of today it is no longer practical to expect the traditional Indian family way of life to exist for not enough land is available for Kutums to group together and

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1. F. Meer 'Portrait of Indian South Africans'.

competition has grown considerably as the result of population growth pressures and the limit on the amount of land allowed under Group Areas legislation. While it is not suggested that the Indian's traditional way of life has collapsed completely, for it is certainly very much alive, it has adapted itself so that it can take cognisance of modern economic, social, cultural, and political trends.

Status plays a very important part in the Indian social system for it fixes the relationship between people within the household. It is therefore essential that in this research we look at the social structure of households within the total project area. While traditionally women play a very minor role in the caste system, today with changing work opportunities and industrialization more and more women are fulfilling new functions thus causing large scale changes to the structure of the household.

It is an Indian tradition that a woman on marriage should move to her husband's house; but today this practice is diminishing as a result of the greater independence of the female youth and the stresses which often develop between mother and daughter-in-law. Owing to deteriorating family relationships between the old and the young[1] - jealousy, financial disputes and overcrowding - the extended family is declining in popularity and it is now a common goal of the average Indian family to try and set up a nuclear household as soon as finances allow. Under the traditional Indian system a single male has no status in the society at large, and hence the need for marriage and home ownership is stressed. Marriage therefore means higher social status, better economic advantage and all important better rights of inheritance. B.A. Naidoo[2] states that the multifunctional pattern of the Indian household has changed and altered and exists on only a very limited scale. The influences of the changing society and the stress of urbanization has removed first one and then another

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1. G.G. Maasdorp and P.N. Pillay, 'The East Rand Indian Community' p30.
2. B.A. Naidoo, 'The Challenge to Urban Family Life Today' 1969, pI.

of its functions until today we find that the traditional Indian joint family is a mere shadow of its former self. He goes on further to state that the changing pattern of economic activity within the Indian family has developed under industrialised conditions and that this has had a marked effect on the degree of cohesion within the Indian family. The indications are clear that the demands of youth and modern social trends will increasingly modify the pattern of the Kutum cohesion. The life of the Indian of today who is possibly the fourth and fifth generation must therefore be very different from that of his forebearers.

2.8 THE HOUSING PROBLEM, OVERCROWDING AND POPULATION GROWTH

The problems of providing adequate housing for Indian Communities in Natal is not a new problem, but an ongoing malady caused in the main by high population growth and limited economic resources amongst the Indian communities. From the evidence of the Wragg Commission (1887) [1] it can be seen that there were severe conditions of overcrowding on all the early sugar estates and it is thus not surprising that Marburg / Port Shepstone has never fully recovered from this poor start.

Housing on the sugar estates consisted of barracks, grass huts or lines of corrugated iron shanties of which the latter were by far the most popular. There were little sanitation facilities and workers were crowded into the available accommodation irrespective of their marital status.

It is not surprising therefore that when the Indian 'Coolie' workers gained their freedom and constructed their meagre dwellings with their limited economic resources that they tended to promote the conditions of overcrowding to which they had become accustomed. Today, conditions have changed and household densities have declined, as the extended family declines and the influence of health and building byelaws are felt.

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1. P. Davis and Sons, Wragg Commission Report, 1887, p60.

However, despite the general improvement in living conditions a large number of residential units (i.e. 17 percent of total dwellings[1]) can be described as shanties or shacks which constitute undesirable living accommodation. It is primarily in these dwelling units that the more severe conditions of overcrowding occur.

Population growth as will be seen later in this chapter has been remarkably rapid and the Indian Community has grown more swiftly than any of the other racial groups which make up the sub-region's population.

While it is generally accepted that traditionally Indian families are large in size, it is necessary in this study to see what trends are operating amongst the Indian society for the promotion or decrease in the Indian population growth rate.

Population growth is directly related to the availability of a marriageable female population and thus the continuing increase in population growth can be ascribed to the greater availability of child bearing females.

During the early years of the sub-region's development, the importation of marriageable females was discouraged with a result that social disorder became prevalent amongst the indentured 'Coolie' workers. Once these workers regained their freedom they reformed their Kutums and the family unit once again became the predominant social force with a concomitant rise in the growth of the Indian population. This rise has today tended to level off as a result of urbanization, westernization, industrialization and economic considerations and while aggregate growth far outstrips any of the other racial groupings, it can be expected that there will be a levelling off of growth at current levels until such time as in-migration is stifled as a result of a shortage of land or accommodation.

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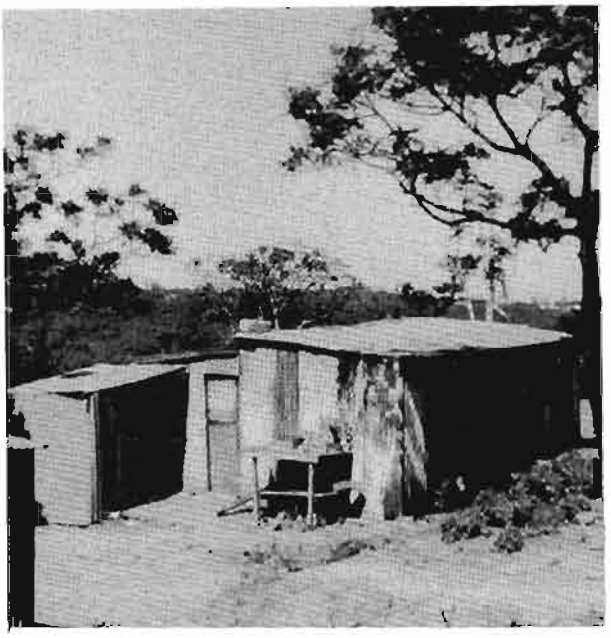
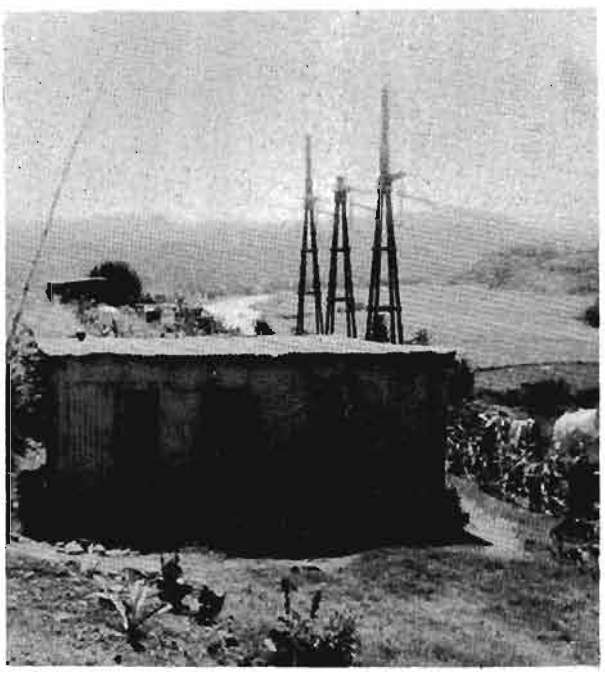
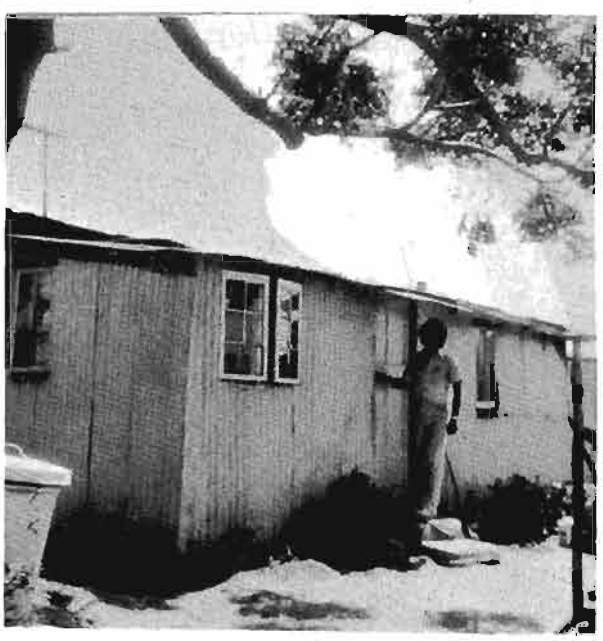
1. Percentage figure obtained from findings of Table XX.



The earliest dwellings consisted of aggregations of wood and iron structures grouped hapharzardly together.



The dwelling unit consisted of a rectangular shell with a single entrance, minimal window space and no internal partitioning.



No matter how palatial or mean and Indian's home is, it serves as both his shelter and shrine.

Plate 2

CHAPTER THREE

METHODOLOGY

3.1 GENERAL INTRODUCTION

Chapter III, which deals with the methodological approach to the study of future housing requirements, investigates the means by which the planner can determine what social and allied demographic factors are likely to affect the future provision of housing in the sub-region.

In pursuance thereof, this Chapter has been divided into four parts, namely:-

Part I The Study of the Social Survey - its design and execution.
Part II The projection of housing requirements in terms of the Exponential Growth Curve approach.
Part III An analysis of existing housing conditions with particular reference to 'overcrowding' and 'recycling'.
Part IV The projection of future accommodation requirements in terms of the Age Cohort Survival Model.

Although there are four parts to this study there are in effect only two methodological approaches to the assessment of future housing needs. Both models to an extent overlap, and call on common data bases, and thus it will be seen that Parts I and III are of vital importance to both Model I and II alike.

3.1.1 The General Principles that underly a Housing Study

Although there are basic differences in the approaches used by the respective models, a number of theoretical constraints predetermine the research design. The most basic requirements for any housing study prescribe that:-

A. There must be a sound demographic basis for the projection of population and housing needs.

B. The data based upon which the research is centred must be appropriate and sound both in theory and practice.

C. A set of analytical procedures which are well structured and completely pertinent to the research model must be devised and applied to the research project.

D. The methodological approach to be adopted must be flexible enough to reflect influences on local change and yet be sufficiently detailed enough to permit the planner to make specialised design decisions, e.g. in respect of projecting future household requirements for dwellings in 5 year periods.

It will be seen from the foregoing criteria that the basis for planning theory in respect of estimating housing provision relies on the accurate analysis and projection of population data using controlled research techniques.

3.1.2. A Summary of the objectives sought to be achieved by the Study.

It would seem therefore pertinent to review the objectives sought to be achieved by this Thesis at this stage. These objectives can be summarised as follows:-

> 'The Marburg / Port Sheptsone housing study is an attempt to establish the reliability, validity and relationship existing between two independant models or demograhic population and housing forecasting, using the services of socio-economic survey (Census returns and other research) material as a data source.'

In achieving the aforementioned objectives the research models referred to above make use of the following variables:

A. The analysis of socio-economic and slums survey results by statistical means.

B. Comparative population growth curve projections.

C. The analysis of continually changing migration, sex, marital status, age, birth and death factors, and their relationship to changing household and family structure patterns.

A note of warning however must be sounded at this point in that degree of reliability of a socio-economic and demographic research project depends largely on the extent and size of the universe[1] under investigation and on the sampling methods employed, to make the forecasts.

Since the Port Shepstone / Marburg sub-region presently contains an estimated population of approximately 5 000[2] Asiatics and with a projected doubling of the population by the year 1985 to 11 000[3] souls, such universe will in all probability remain small and thus subject research findings to a measure of error.

3.1.3. The methods whereby the objectives are attained.

This research project is based to a large extent on the findings of :-

A. The socio-economic survey of the Port Shepstone District undertaken by the Department of Economics, University of Natal, in order to obtain research data about employment and housing conditions.

B. The Marburg Household Study 1971, carried out by the writer for the Director, Town and Regional Planning Commission, Pietermaritzburg. This particular study which forms a major data base for the models used in this thesis was undertaken to acquire valuable data about the socio-economic position of the local community for both regional and town planning purposes.

C. The 1960/1970 Bureau of Statistics, Pretoria Census returns. Such data basis provide acceptable control points from which population

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1. The term 'Universe' refers to the total population as indicated in the data source.
2. Census Return for Asiatics, Port Shepstone / Marburg 1970 (See Table VI)
3. For Population Estimate see Tables VIII and XXIX.

C. projections can be made.

D. The Migration Survey 1975, which was carried out by the writer to determine the extent of inward migration which is currently being experienced in the sub-region.

3.1.4. The controls required to determine the research design.

Owing to the wide scope for research in this topic it has been necessary to restrict[1] this thesis research purely to an investigation of the socio-demographic aspects as they affect future housing provision. While the data obtained from the investigations of 3.1.3. A - D, provides an overall view of the existing socio-economic position of the sub-region, it is necessary to extract only that information e.g. family and household statistics etc, which will assist in the projection of future requirements.

In order to make meaningful demographic suppositions and forecasts[2] it is necessary to adopt a fixed research design in which:-

(i) The research hypothesis is clearly and unequivically stated.

(ii) A precise definition of the terms of reference to be used in the study are made.

(iii) The level of abstraction and indepth investigation is established early in the research process.

(iv) All traces of bias are removed.

(v) There is a clear and logical structuring of concepts, recording and interpretation of data.

(vi) Value judgements[3] are reduced to a minimum.

Provided that all the abovementioned criteria are met, it is possible to :-

A. Determine definite trends which are assisting in the reshaping of the community.

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1. As this thesis has only been carried out on a part time research basis its indepth level of study has been severely restricted by both time and financial considerations.
2. W. Goodman & E. Freund p 54 (Principles and Practice of Urban Planning) defines a projection as being 'a technique used to reach conclusions referring to a point in time lying in the future', whereas a forecast is an unconditional assertion about a future population.
3. Goode and Hatte, 'Methods in Social Research' pp 9, 63.

B. Establish correlations existing between research factors e.g. living room size with household or family size - at any given point in time.

C. Evaluate data by statistical means with higher degrees of validity and reliability.

From the aforegoing requirements it is obvious that no data can be collected in isolation and that any survey material which might be collected must be correlated with other observations bearing similar rigorous research controls[1].

Although there are many measures available to the planner for the collation of data e.g. Census, Survey Polls, etc.....; it is necessary to introduce some degree of standardization in the design stage of the questionnaire or schedule, and in the data collection process. Towards this end it is essential that:-

(a) Cross cultural biases should be removed from the research programme.

(b) The research design take cognisance of the socio-economic background and cultural and political asperations, mores and folkways applicable to the study area; and that the questionaire or schedule used in the study should be compiled in such a way so as to accommodate the conceptual and educational level of the respondents under investigation.

(c) The mutual co-operation between the respondent and researcher should be maintained at all times.

No study of housing can rely solely on the results of studies of past and present socio-economic research since they merely represent growth from the past and represent conditions only at one given point in time.

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1. E.g. When examining average room sizes by area it is necessary for the definition in respect of the Marburg / Port Shepstone household study to apply. Direct correlation is possible. If the definitions vary the degree of correlation widens or becomes nulified.

This is not to say that study of past research is meaningless but emphasises the need for the continual monitoring and updating of research data, if predictions (i.e. forecasts or projections) are to be made with any degree of accuracy.

In respect of this Thesis it has been deemed desirable to obtain as many comparable data sources over as wide a time period as possible, in order to provide as comprehensive a record reflecting past growth. Similarly one particular set of results e.g. Marburg Household Survey 1971, cannot reveal trends on its own unless it is related to other ancillary data sources, e.g. birth, death and migration rates, etc.

3.1.5. The Principles to be used in projecting housing requirements

Once the research data has been successfully gathered, verified and classified, the planner must determine which particular projection technique is most suited to the study. Like the survey, there are a number of underlying principles which predetermine the methodology to be used in the projection of housing requirements. These include amongst others:-

A. That each group within the Universe must be projected independently e.g. taking cognisance of special growth characteristics e.g. birth rates, migration rates, etc....
B. That such projective techniques as are chosen must allow for planned change and control over all potential forces likely to promote change.
C. That the projection must make allowance for migration possibilities in its forecasts and be able to supply the planner with observable, empirically approved research data.

Provided that the three aforementioned requirements have been complied with, the planner is able to provide a dynamic set of projections

which provide estimates of the future form of development within specified limits (e.g. any population growth projection is dependent on the growth rates of migration and natural increase. Thus if variations occur or are likely to occur over a planning period, it is necessary to qualify a projection by indicating the units within which migration or natural increase rates are likely to vary.)

CHAPTER THREE

METHODOLOGY

PART I

THE STUDY OF THE SOCIAL SURVEY

3.2 GENERAL FRAMEWORK

In approaching this subject, concerning the importance of good survey design, it might well be opportune to look at the following cliche.[1]

> *'No survey can be better than its questionnaire or schedule and no matter how efficient the sample design or sophisticated the analysis, ambiguous or biased questions will produce non comparable answers, biased returns and non valid responses.'*
>
> *C.A. MOSER*

While the theoretical requirements of a socio-economic research programme have been described in the preceding sub-chapter, it is now the writer's intention to investigate the finer details of three independent research programmes which have been executed in order to provide a reliable data base upon which future projections can be made.

Each research study follows its own specifically designed methodological approach, details of which are briefly described in this Chapter. Although the three surveys undertaken were carried out independently and at different time periods, they have a communual application for each of the housing models to be dealt with later in this Thesis.

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1. C.A. Moser 'Survey Methods in Social Investigation'.

When viewing each study the research programme must of necessity be viewed in relationship to the relevant schedules, contained in the appendicies of this volume.

3.2.1. The Marburg / Port Shepstone Household Survey (1971)[1]

(i) The Objective

The overall objective of this study carried out in November, 1971 was to acquire detailed information about household and family size structures; the state of the existing housing and service provision; sex, age and marital status breakdown of the population and the economic factors for each and every household in the sub-region.[2]

For the purpose of this Thesis the primary objective of the analysis of this survey was to establish :-

(a) The physical structure of the households
(b) The classification of the population into groups in terms of predetermined criteria, e.g. age, sex, marital status as set out in Appendix A and B.
(c) The extent and nature and availablity of accommodation to the Indian Community as at 1971.
(d) The extent of migration and its effects on household composition.
(e) The economic circumstances of households in the Indian sector of the Marburg / Port Shepstone community.

It will be seen from the foregoing that the goal of this study is to provide specific data about the prevailing demographic, social structure and housing situation occuring in the project area.

Having set the goals for the study it is necessary to investigate the methods by which such goals can be achieved. This is pursued in the

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1. The Marburg / Port Sheptsone Household Survey, 1971, will hereafter be referred to as 'The Marburg Household Study or Survey, 1971'.
2. The sub-region referred to is the thesis project area.

following sub-heading.

(ii) The Methodology

Since only a limited quantity of reliable socio-economic data existed in 1971, concerning the socio-economic wellbeing of the lower South Coast Indian Communities it was decided to undertake a comprehensive household survey of all Indian inhabited homes situated within the Marburg / Port Shepstone sub-region. The study was specifically designed and undertaken to record detailed information concerning both households and personal characteristics of the Indian inhabitants of the project area.

The fieldwork which formed a major portion of the study was undertaken by 14 Indian School teachers acting as interviewers; and was conducted over the period October / November, 1971. The entire sub-region was divided into 24 sub-zones with each interviewer responsible for the survey of one or more areas.

The survey required that each and every household (as defined in Appendix A) should be visited by an interviewer and that the personal and household data gleaned should be recorded by the interviewer on the structured interview schedule (see Appendix B) provided for the household.

On completion of the survey the schedules were to be checked and forwarded to the supervisor for final vetting.

In order to provide an additional check on the reliability of the returns further checkbacks were carried out by the writer to determine whether there were any ommissions in the data records.

(iii) The Schedule

In designing the Marburg / Port Shepstone schedule (See Appendix B) cognisance was taken of the need to:-

(a) Provide a data base which would be wide enough to provide, if not all, most of the information required for the examination of existing housing conditions and the population structure of existing households and the community.

(b) Provide a highly structed interview[1] which would eliminate interview bias and response error, while at the same time promoting a standardized response[2] suitable for easier costing and data processing. Through the ommission of evaluative or attitude response questions, emperical data is obtained which then rationalised into 'personal'[3] or 'household' categories provides immediate information about the population, family, and household structure or service provision on each and every household in the sub-region.

(c) A schedule which would be readily understood by a predominantly rurally orientated Hindu Community.

Since the target population of the study area were known to be a rural community undergoing a period of readjustment to urbanization, the level of research and the design of such research framework took cognisance of the relatively unsophisticated, uneducated conceptual attitudes of the local community. Towards this end the definitions contained in Appendix A have been devised and are based on the socio-cultural trends expected to be reflected in the survey. E.g. the definitions of Kinship groups, family, etc... are based on the expected social interaction pattern normally associated with South African Indian household living patterns, and not on Western life styles. It is thus possible to clearly evaluate the household structure of homes in the sub-region in terms of defined criteria which avoid bias and make the establishment of relationships between defined categories - e.g. family type x living rooms - possible.

---

1. A 'structured interview' is one in which a survey is carried out by a trained interviewer using a standardized pre-prepared schedule. Sellitz, Jahoda, Deutch and Cooke. Research Methods in Social Research.
2. Goode and Hatte Op Cit P184.
3. Personal data refers to individual responses of individuals e.g. age marital status, etc.

(d) Standardise the data collation process through the elimination of evaluative or attitude response questions. Through pre-coding the Marburg Survey limits response error and facilitates the easier coding and tabulation of results.

(e) Rationalise the survey format so as to provide information about personal and grouped[1] data separately.

For the purpose of this housing survey only those categories which have a direct relationship with the provision of data concerning occupancy, economic household structure statistics, sex and age ratios have been included in the interviewer's manual contained in Annexure A.

In the manual the working definitions are illustrated and this will be of importance when the analysis of data takes place in Chapter IV of this Thesis.

By restricting the number of quantative response questions to 3 categories the degree of interviewer or respondent response error is diminished thus subscribing to the requirements as aforementioned.

(iv) Data Processing - Coding

As a result of the decision to carry out a comprehensive survey of the sub-region, it became necessary to devise a mechanised data collection and coding system, which would assist the rapid tabulation of results in the best possible format. Since the schedule design incorporates a prescribed reply format, it was a simple matter of transferring the survey material onto the computer coding forms as illustrated in Appendix C and D[2] for processing by an I.C.L. 1900 computer.

The primary benefit of the mechanised data processing technique lies in its ability to verify[3] and cross check data returns as speedily as possible

---

1. Grouped Data refers to household categories e.g. type of dwelling, number of living rooms, etc.
2. The Coding Manual comprises Appendix C and D and was designed by L.D. Baker, Chief Land Surveyor, Durban Corporation, as amended by the N.P.A. computer bureau to meet I.C.L. 1900 computer requirements.
3. 'Verification' refers to the checking of 2 data inputs against one another and is normally used when checking computer inputs.

while at the same time maintaining rigorous control over the whole data analysis programme.

3.2.2. A Socio-economic survey of the Port Shepstone District 1967.

(i) The Objective

This study was designed and executed by the Department of Economics, University of Natal, Durban, in order to acquire reliable detailed information about :-

(a) The personal attributes of a sample section of the community, i.e. the age, sex, marital status of each individual.

(b) Family and household structures and living patterns. This includes amongst other things the study of family and household sizes, types of dwellings, service provision in the house, etc... and of which reflect the current housing situation in the sub-region.

For the purposes of this Thesis, this particular study was analysed to provide an initial data base from which the results of the Marburg Household Study 1971 could be compared[1].

(ii) The Method

Unlike the approach used in the Marburg Household Survey this study makes use of random sampling procedure in which questionaires were distributed to all Indian Scholars attending the Port Shepstone Indian High School and in particular those attending Stds. 6, 8, and 10. After briefing the children on the contents of the questionaires the scholars were expected to take the questionaire home and complete the forms with the assistance of their parents. The completed questionaires were thereafter returned to the school and check backs were undertaken by the Department of Economics staff to determine the authenticity of the returns.

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1. To establish any projection, the data sources must have comparable reference points, using similar pre-determined concepts.

For the purpose of the study a 22 percent[1] sample of the estimated number of households in the sub-region was deemed acceptable bearing in mind the economic and time constraints set on the study.

It is inevitable that a small sample size, which is reduced[2] even further by the exclusion of the rural component will have a larger margin of variance than that of the 1971 Survey and therefore all data results must of necessity be subjected to statistical analysis to determine the upper and lower limits of the research findings.

(iii) The Questionnaire

The questionnaire (see Appendix E) was constructed in 2 parts :-

(a) The first section was designed to obtain information concerning the scholar, his family, and the family dwelling.

(b) The second part was designed to investigate the economic situation in respect of the educational and employment aspects[3] of the study.

Since the survey was to be carried out by relatively unsophisticated research techniques the format of the questionaire had of necessity to be simple in design. To facilitate easier handling of the completion of the questionaires the study was broken into 6 Schedules only 3 of which have particular relevance to this housing study. These are:-

Schedule 1 : Questions concerning the scholars personal details together with information on his parents.

Schedule 2 : Questions concerning other members of the household of which the scholar is a family member.

Schedule 6 : Questions concerning the type of accommodation enjoyed by the household.

---

1. A Port Shepstone Socio-Economic Survey, OP CIT P42.
2. The survey emunerator area covers a far larger area than this thesis project sub-region. From Table XI we find that the sample covers 111 households which represent a sample of between 18-20 percent of the estimated number of households in the project area.
3. Since the study does not extend to the analysis of the influence of employment patterns on the housing situation, part (ii) of the questionaire is ignored for the purposes of this research project.

Like the Marburg Household Schedule this project made use of the standardised response techniques in the design of the questionnaire. This reduced the extent of bias and made for easier comparative analysis of the data available.

(iv) Data Processing

This survey, because of its restricted size, did not require the more sophisticated data processing methods as were employed in the Marburg 1971 Study. The basis of data recording was simply that of hand tabulation taken direct from data records. Such method is subject to uncontrolled errors of recording, which cannot readily be verified and therefore all results must be statistically analysed to determine their degree of validity and reliability.

3.2.3 The Migration Survey, 1975.

(i) The Objective

Since migration plays an important part in the analysis of any housing model, and there was no reliable observed data concerning patterns or rates of migration occurring in the Marburg / Port Shepstone sub-region, it was decided to undertake a random sample survey of known migrant households, in order to establish the characteristics of migrant families and their households. The particular characteristics which were to be studied were governed by the requirements of the projection Models 1 and 2, and entailed the study of:-

A. Household / family size
B. Age / Sex / Marital status structure
C. Reasons for migration
D. The extent of the migration i.e. time - distance

(ii) The Methodology

From Table VIII it can be seen that the number of annual migrants accruing to the Indian Community of the Marburg / Port Shepstone area constitute only 2 percent of the total population, therefore a random sample to determine the characteristics of 'migration' was not possible. However, since the Marburg / Port Shepstone 1971 Study constitutes a 'universe'

survey the data returns of households and families with recorded residence of under 1 year in a dwelling unit offers a unique opportunity for establishing a reliable data base.

This migration survey has therefore been designed as a check back on the 1971 survey with the expressed intent of acquiring greater detail from a controlled[1] population source concerning migration statistics.

The survey uses for its 'universe' the total number of households with periods of residence of under 1 year as at 1971. From this universe is derived a random sample survey which constitutes approximately 30 percent of all migrant households and is fully representative of households situated both in Marburg and Port Shepstone.

The fieldwork was carried out by the writer in July 1975 and involved the execution of a stuctured interview with the head of the household of each unit falling within the sample specifications. Where population shifts had occurred and new tennants were installed, the present occupants of the dwellings were interviewed[2], and included in the project analysis.

(iii) The Schedule

The Migration Schedule which comprises Appendix F of this study, was designed to provide the maximum amount of detail about personal and household characteristics of immigrants into the area.

In designing this schedule, it was intended to :-

---

1. The controlled population source referred to are the migrants established in terms of the residence criteria as at 1971.
2. The inclusion of such sample returns is uncontrolled and may or may not be biased. However for the purpose of this Thesis the data is included in the analysis in order to act as a correction factor in the absence of 2 comparable data sources.

(a) Established the age, sex and marital status of the migrants.

(b) Discover the length of residence which the immigrants had spent in the dwelling unit and the sub-region.

(c) Ascertain the primary motives for migration and the extent to which migration was taking place.

(d) Determine what the family and household charactertics of the migrants were, and their relationship to the data obtained in (a) above.

(iv) Data Processing

Since the Migration Survey was very limited in size it was not necessary to use mechanical means of data processing. Thus simple hand tabulation sufficed, and any errors made were remedied by visual inspection.

CHAPTER THREE

METHODOLOGY

PART II

MODEL I EXPONENTIAL GROWTH CURVE APPROACH

3.3 GENERAL INTRODUCTION

Probably the most widely used projection method employed by planners in estimating future populations is the 'Exponential Growth Curve Analysis'. Its relative simplicity, speed of use, and comparative accuracy in projecting growth curves amongst large universes, has endeared this particular approach to the planning profession.

For the purpose of this Thesis, Model I will attempt to show how a detailed study of past and present trends in population, family and household growth can be successfully employed in predicting future growth patterns through the use of specialised statistical measures.

The model which is highly structured clearly establishes a framework in which:-

A. Several data bases between the period 1960 - 1975 are constructed and analysed so as to provide a framework upon which comparative analysis can take place.

B. Each stage in the research process is clearly demarcated and structured so as to conform to the general methodological requirements set out in 3.1.

C. Assumptions are strictly limited, and where necessary are supported by statistically approved back-up information.

D. The research findings of social survey are integrated into a dynamic working model which can portray the development of a community throughout a 15 year planning period.

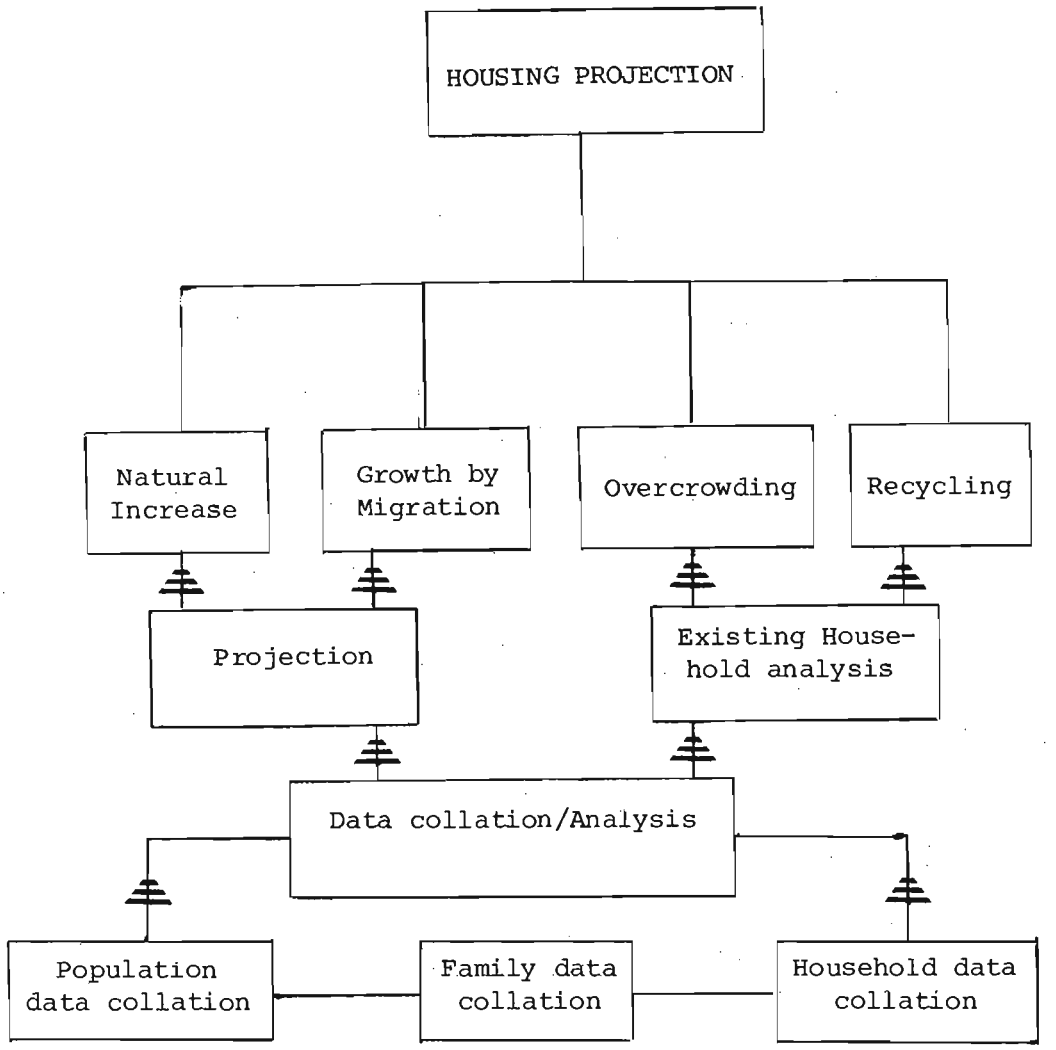
Despite the rigorous application of a highly structured data collection process, and a statistically controlled projection technique, errors in interpretation can occur. These can largely be attributed to:-

(a) The limited size of the population and household universes in the sub-region.
(b) The relative short term observations, which have been made as a result of a lack of detailed data and incomplete growth.
(c) The use of a number of differently derived data bases each of which contains an element of bias.
(d) The use of mean data results which are drawn from limited data records containing short term variations and fluctuations within the data records.

Notwithstanding the reservations expressed above, it is considered that the 'Exponential Growth Curve' projection technique offers a means for establishing future requirements within prescribed limits; and that such an approach is of equal application whether it be utilised in an Economic or Social assessment of future housing requirements.

In order to appreciate the complexities of the model's construction, Diagram 2 has been designed to provide a graphical illustration of the various stages and processes involved, in the projection model.

Diagram 2



Start

From Diagram 2 it can be seen that the Exponential Growth Curve Model derives its basic information from three separate sources which after analysis and synthesis provides the basic data upon which the examination of existing housing conditions and the projection of future requirements is founded.

In respect of the examination of the existing housing situation the model investigates the extent of gross overcrowding and the effects of

recycling after which the net immediate housing requirements are ascertained.

The projection aspect is always dealt with in two parts and separate investigations of growth in the demand for accommodation through Natural Increase and Migration are undertaken.

The final housing projection is acquired by combining the results of all four sub-studies which reflect future demand resultant from population growth and existing inadequate housing conditions.

3.3.1 Stage I The Study of Past Trends

(i) The examination of Past Population Growth

When establishing a population projection model it is necessary to briefly review past historical trends so that indications of:-

(a) The nature and extent of overall growth tendencies, and
(b) Cyclical growth patterns, and
(c) The direction of growth can be established.

Table 1 sets out the Population Census Returns for the period 1910 - 1970, and from these records it can be established to what extent changes have taken place in the growth of the Indian community over a considerable period of time. It should be noted however that all Census Returns are subject to error[1], and the earliest returns are considered to be suspect, since the methodological approaches used were far less rigorous and sophisticated than present day methods.

(ii) The Evaluation of the Compatability of 1960 -1970 Census Returns

The next step in the research programme is to continually evaluate the compatability of the data sources being utilised in the establishment of the projection. In this Thesis the cenus returns of 1960 and 1970 for both Marburg and Port Shepstone urban areas[2], together with the 1967 and 1971[3] survey data, have been subjected to critical analysis.

---

1. The errors referred to consist of underenumeration and seasonal shifts in population structure and composition.
2. The project area only governs the urban areas as defined in terms of the Bureau of Statistics. Use of rural figures has occasionally been used for comparative purposes to establish the universe size of the 1960 census.
3. Port Shepstone Socio-economic Survey. Op cit.
   Marburg Household Study. Op cit.

Maps number 8 and 9, indicate the enumerator sub-districts as designated by the Bureau of Statistics for 1960 and 1970 respectively. It will immediately be seen that a considerable difference in size exists between the two survey areas, and thus the equation of the two survey areas is a prima-facie requirement, in order that the control points for the projection can be established.

To achieve this goal it is necessary to investigate the structural breakdown of the 1960 and 1970 census returns. Tables II and III set out the population returns for the areas which are indicated on Map numbers 8 and 9. Since the enumerator sub-districts vary between census it is necessary to remove the rural component from the 1960 census returns so as to bring the two data sources into alignment.

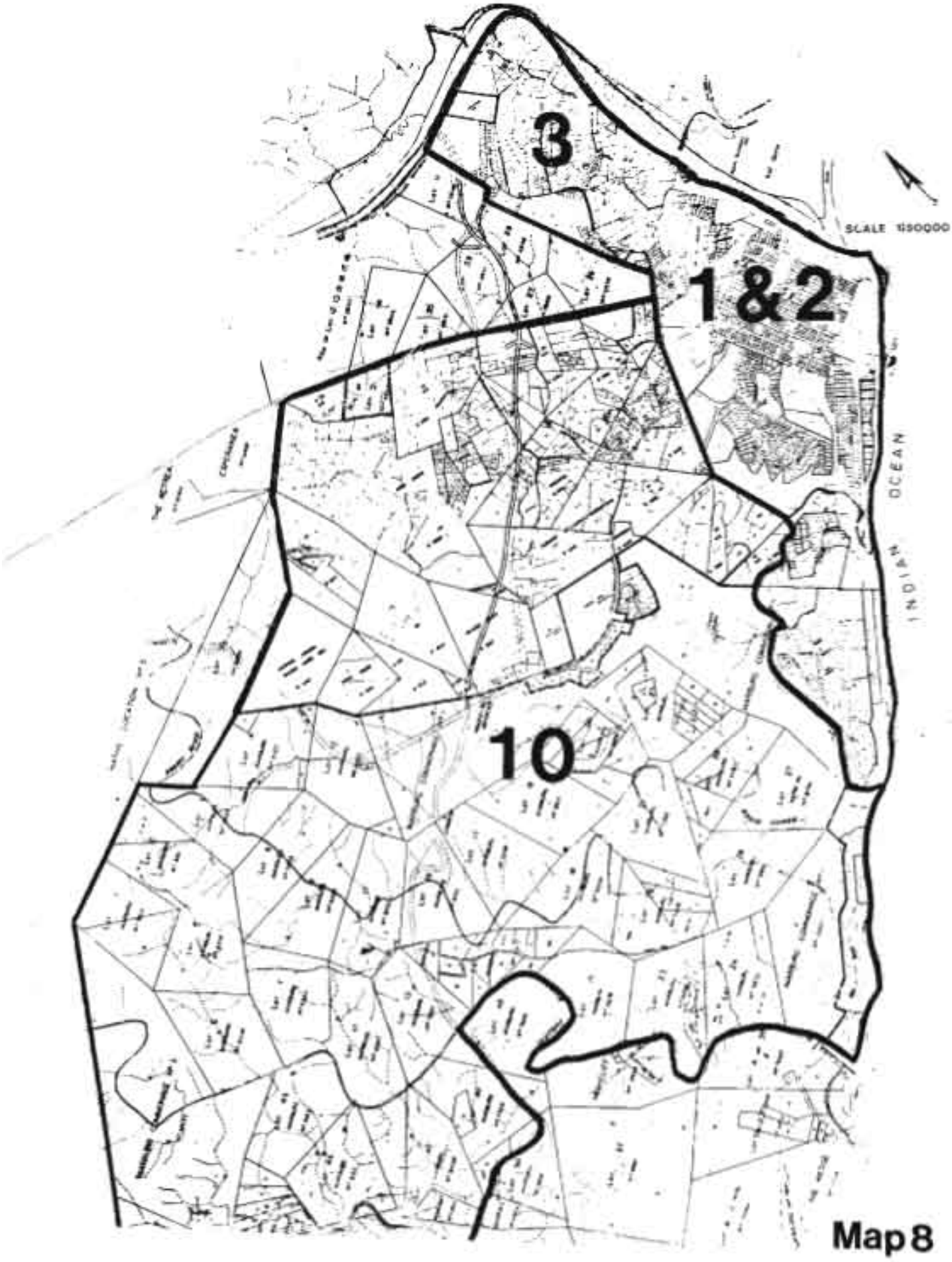
Before adjusting the 1960 census data it is necessary to establish the mean annual growth rate[1] for the total sub-region[2] including that portion of the Port Shepstone rural area lying to the south of the project area as indicated on Map number 2 between census. It will be seen that the 1960, 1970 E.S.D. boundaries are not completely congrous; but since only a limited number of properties[3] are at variance and the potential population differences constitute approximately 1 percent[4] of the total population it is assumed that the two regions are synonomous for analytical purposes.

In order to establish the growth rate for the sub-region as defined for the Marburg / Port Shepstone urban and rural areas the following

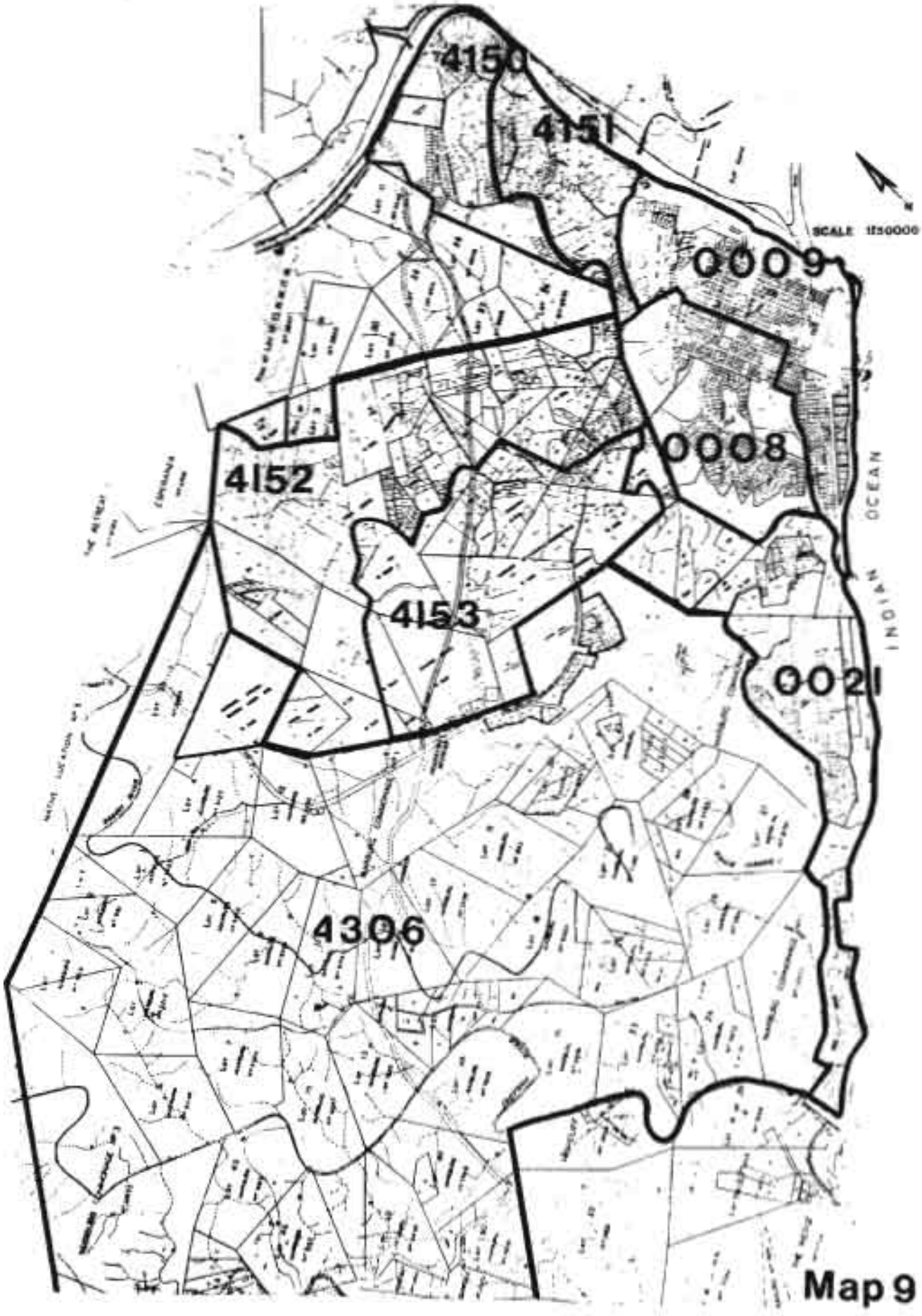
---

1. Refers to average annual compounded growth rate between censuses.
2. Refers to the area as indicated on Map number 8.
3. Total number of lots involved is 6.
4. Estimate based on E.S.D. 819 population and other sundry lot potentials.

The Population Census Enumerator Sub-Districts 1960



Map 8


4150
4151
0009
0008
4152
4153
0021
4306
INDIAN OCEAN
SCALE 1:50000

Map 9

formula should be applied:-

Let $Ni = 100 \left(N\sqrt{\frac{A}{P}} - 1\right)$

Where Ni = Growth rate per annum

A = 1970 census population

P = 1960 census population

n = Number of years between census (9,6 years).

Having established the mean growth rate for the extended sub-region in terms of the 1960 census area it is now possible to establish the net population living in Marburg at the time of the 1960 census in terms of the project area by decreasing the 1970 population figure by the sub-regions[1].

(iii) Growth rate established for the greater sub-region

Having successfully established population returns for two fixed points in time 'n' years apart, and having a similar population 'universe' it is thus possible to make an extrapolation of the population growth of the Indian community by 1 year periods between the years 1960 - 1970.

The value of such estimates lie in their application for:-

1. The estimation of the extent of natural increase and migration factors on population growth.
2. The formation of the basic assumption to be used in the future projection of the population for the period 1970-1985.

In any 'Exponential Growth Projection' it is necessary to establish:-

(a) What the mean annual 'compound' growth rate for the projection is in terms of the formula set out in 3.3.1(ii), and

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1. For the detailed estimates see Table III. The sub-region referred to is that indicated in Map 8.

(b) What the total growth is likely to be provided that the rate established in (a) above is maintained. For the purpose of calculating the total growth at a given rate for any time period the following formula is of application:-

Let $S = P(1 + i)^n$

Where S = Projected population of nth year

P = Population estimate at year 1

n = Number of months between projections (i.e. 12)

i = Mean annual growth rate as calculated.

(iv) The Calculation of population growth due to Natural Increase and Migration

By using the formulae set out in 3.3.11(iii) (a) and (b) Table V1 is compiled in which the overall population growth due to both migration and natural increase is plotted on a yearly basis for the period 1960-1970. Table V1 reveals the total growth and it is essential to determine what proportion of the total population increase can be attributed to natural increase or migration factors, so as to determine past growth trends.

Through the combination of the population estimates as set out in Table V1 with the data records of registered resident births and deaths it is thus possible to provide an accurate estimate of growth due to natural increase and migration on a yearly basis over an eight year period.

(v) The Estimation of population growth due to Natural Increase

The extent of natural increase is obtained from analysing the Bureau of Statistics Census Reports for resident births and deaths[1]. Since the returns are compiled for the whole Port Shepstone Magisterial Area it is necessary to decrease the returns

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1. The data records are obtained from Report on Births Vol 07-01-01 (1964-1971), Bureau of Statistics, Pretoria, p146, and the Report on Deaths.

proportionally in terms of the following formula:-

$$\text{Let } B_2 = \frac{B_1 \times P_2}{P_1}$$

Where B_2 = Estimated number of births and deaths in the project area

B_1 = Recorded births and deaths for sub-region (i.e. Port Shepstone Magisterial District)

P_1 = Population of project area

P_2 = Population of Port Shepstone Magisterial District

in order to estimate the true birth and death rate for the project sub-region.

Using the results obtained in Table Vl, and the birth and death records obtained from the population census returns (as amended), the natural increase on a yearly basis, can be assessed as set out in Table Vll. This is achieved by letting:-

$$X = N - \left(n + (B - D)\right)$$

Where X = Total natural increase

N = Gross population as at year $n_1{}^2$

n = Initial population at year $n_1{}^1$

B = Estimated births

D = Estimated deaths

(vi) The Calculation of Net Migration

Apart from population increase due to 'Natural Increase', in-migration too contributes towards the sub-region's growth. By studying migratory trends the planner is better able to observe what influences are being experienced in the sub-region, and thus he can make adjustments in his model to allow for minor changes in population growth.

In order to meet the theoretical requirements of this model (i.e. to provide a dynamic growth model) it is necessary to observe past and present trends in migration. This is best achieved in studying :-

A. The extent of net migration i.e. inward or outward movement of people into or out from the study area, and
B. The mean rate at which migration is taking place, and
C. The relationship which exists between population growth due to migration and natural increase.

Population growth is made up of natural increase (i.e. births minus deaths), and net in or out migration (i.e. number of persons immigrating into or leaving a specific defined area) [1]. The discounting of net natural increase from gross increase as is established in Table Vll reveals the net percentage and number of persons who have migrated into or out from the sub-region during any given time period. Thus to establish the yearly migration estimates the following formula should be applied :-

$$\text{Net migration} = (P_2 - P_1) - (B - D)$$

Where P_1 = Estimated or recorded census count
P_2 = A subsequent estimated or recorded census count
B = Total number of births between counts [2]
D = Total number of deaths between counts [2]

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1. Note that the areas used for the natural increase and migration analysis must coincide for meaningful comparative analysis.
2. Births and deaths obtained from census returns and collected for Project Area as set out in Table Vll.

3.3.2 Stage II Population projections

Thus far only past growth trends have been analysed and established and it now remains for projections to be made in the light of facts obtained from past experience.

Any projection can only be an estimate and consequently a number of assumptions have to be made in formulating such predictions. In respect of this Thesis three basic assumptions have been made, namely:-

(i) That the future population growth (i.e. both natural increase and migration) will increase at the rate as calculated for the period 1964 - 1970. (See Table V11).

(ii) That the respective birth and death rates will remain relatively stable[1].

(iii) That external political or economic pressures will not markedly affect the population growth rate and migration trends within the 15 year planning period, and that such factors be considered as constants.

In support of assumption (i) the relative growth rates obtained from Tables 1 and V11 indicate that population growth in the sub-region has occurred at a relatively constant rate and that negative growth trends have been of short duration and limited in size. The decline in the Port Shepstone area can be attributed to an extent to internal migration between Port Shepstone and Marburg[2]. The projections contained in Table V111 reflect that population growth in 5 year periods for both natural increase and migration, and are based on the estimate mean annual growth rate of 2,87 percent per annum[3] natural increase and 2,32 percent per annum migration. Theoretically it would be more

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1. J.B. McLoughlin (Urban and Regional Planning p185-186) states that death rates are relatively stable but that birth rates are subject to socio-economic influences and fluctuations. The results of Table V11 forms the basis for the assumptions used.
2. Evidence of this fact is obtained from the results of the Migration Survey 1975. See Table XV11.
3. Data drawn from Table V11.

desirable for the projections to be based on a larger time period, but since there is a lack of complete data records the estimates must of necessity be based on the limited returns. It can be expected that the projections will therefore tend to be more accurate for the initial forecasts, and decrease in accuracy for estimates made towards the end of the planning period, since only short term observations have been used in this study.

3.3.3 Stage III Household Structure Analysis

Once the demographic aspects of the study have been successfully dealt with it is necessary to investigate:-

A. What the past and present household composition has been, and
B. What the future household composition is likely to be, should a number of observed trends be maintained during the whole of the planning period.

In this study there are basically two types of households under investigation, i.e. those derived through natural increase of the existing community and others which are formed through immigration into the area. For the purpose of this Thesis therefore, the study is dichotomised into two sections namely:-

(a) A study of past, present and future household and family structures due to natural increase, and
(b) The investigation of the influence of migration patterns on family and houehold structure and formation.

In any traditional Indian society it can be expected that there will still be a high incidence of extended family living and that where housing shortages occur the number of non-family members i.e. lodgers will be proportionally high.

To make a meaningful housing estimate it is thus necessary to determine the relationship of family formation to household construction. This is achieved by:-

(i) Determining the mean family sizes of past, present and future family units.

(ii) Determining the influence which non-family members i.e. lodgers are likely to have on the total housing demand.

(iii) Determining the current position and future trends in extended family living and its influence on household formation.

(iv) Calculating future housing requirements in terms of the relevant findings drawn from criteria (i)-(iii) as aforementioned.

3.3.4 The Determination of Family Composition (Its size and distribution)

The first phase in this particular study requires that the distribution and mean family sizes of family units be established at two different points in time. To achieve this the Bureau of Statistics Census returns are analysed, the results of which are illustrated in Tables 1Xa,b and c and Histogram I. From these illustrations any potential differences in family formation can be observed.

In order to establish the mean family sizes it is essential to relate family members to the total population in terms of the following formula:-

Let $\overline{Z} = \frac{X}{Y}$ where $\overline{Z}$ = Estimated mean family size

X = Total family members drawn from census records

Y = Total number of families drawn from census returns

Using the aforementioned formula in respect of the 1960 and 1970 census returns as set out in Tables 1Xa, b and c, Table 1Xd is constructed in which a comparative analysis of the mean family sizes of the sub-region's family units is undertaken. From the aforegoing investigation both the distribution and mean family size of existing and past family units is acquired.

3.3.5 The Influence of Non-Family members on Household Formation

As has been previously stated, the mean family size of Indian family units, unlike its European counterpart, does not necessarily coincide with the household unit size since Indian families either live in an extended or multiple family household system or accept lodgers into the household to assist with the family's budget. Wherever shortages of housing occur it is expected that existing family units will enlarge themselves to help those in distress, thus in this study it is necessary to see to what extent changes in the proportion of non family members to family members will affect both the mean family unit size and future housing provision.

The calculation of non family members composition is a simple arithmetic computation of $Z = X - Y$

where Z = number of non family members

X = Total population at year N

Y = Total family members at year N

In order to observe changes and trends in the non family composition of the Indian community, a comparative analysis of both the 1960 and 1970 census returns (see Table X) is undertaken in terms of the above quoted formula and the rate of increase or decrease is estimated in

terms of:-

$$R = \frac{\frac{B}{A}}{N} 100$$

R = Mean annual percentage increase or decrease in the number of non family members in a community between censuses

B = Percentage of non family members in relation to total population at Census Count No. 2.

A = Percentage population of non family members in relation to total population at Census Count No. 1

N = Number of years between census counts

Using the results obtained therefrom, it can be established what influence lodgers are exerting on determining the unit size of dwellings in the sub-region, and to what extent they are affecting household formation.

3.3.6 The Extended family and its influence on Household Formation

The third and equally important determinant of household formation is extended family living.

Unlike western living patterns any analysis of Indian housing must study the incidence of extended family living and its influence on dwelling size and household formation. For the purpose of this model the Marburg Household Survey has been analysed (see Table Xl) to indicate:-

(a) To what extent the extended family living is occurring in the project area.

(b) The occupancy rates of families to households.

Using the results acquired from (a) and (b) above (see Table Xll) it

can be seen to what extent any future provision or recycling of housing can accommodate the maximum number of families and people, while at the same time cutting down upon the numbers of additional dwelling units required.

3.3.7 The Projection of family units for period 1970 and 1985

(i) Family Formation (Natural Increase)

From Table Vll it can be seen that there will be an equal increase in the population resultant fron 'Natural Increase' and 'In-Migration'.

In order to ascertain the total number of family units likely to accrue through natural increase, the results obtained from 3.3.4 and 3.3.5 are related to the total population increase caused by natural increase. Thus the expected number of 'Natural Increase' families likely to occur within the planning period is determined by letting:-

$$Y = \frac{\sum (P_1^N - P_2^N)}{\overline{X}}$$

where Y = estimated number of families

P_1^N = estimated population increase by natural increase per 5 year period as obtained from Table Vlll

P_2^N = estimated number of non family members in population at year n

$\overline{X}$ = estimated mean family size.

Assuming that the changes in family size and the proportion of family to non family members will increase or decrease at past rates, the projected population increase due to natural increase can be obtained (see Table Xll) for any given point in time.

(ii) Family formation (In-migration)

Unlike the 'permanent' community, no comparative analysis of the mean

size and distribution of migrant families can be undertaken because of the inadequacy of reliable data. It has therefore been assumed that the mean family size of migrants as estimated from the Migration Survey in Table XLV, will reflect the future size of families migrating into the area. Taking the population projections for in-migrants as set out in Table Vlll, and relating the same to the prevailing mean family size, the total number of families likely to accrue to the sub-region through in migration can be calculated.

(iii) Total projection of family units likely to accrue in the Sub-region

Combining the results of the projections made in 3.3.7(i) and (ii) for both 'Permanent' and 'Migrant' families, Table Xll is compiled in which the total projected increase in the number of families likely to accrue to the Marburg / Port Shepstone sub-region is assessed.

3.4 THE ANALYSIS OF MEAN HOUSEHOLD SIZES

Unlike the analysis of family sizes, which is a comparatively simple matter involving the investigation of past census returns, the estimation of mean household sizes is somewhat more complex. For any valid projections to be made it is necessary to establish a research framework which will indicate the future size, and composition of families likely to occur in the region.

In pursuance of this goal it is necessary to undertake two independent investigations i.e.

(a) The analysis of past trends, and
(b) The analysis of the existing housing composition (i.e. 1971 Survey) and an investigation of possible causes of variations in household sizes.

To obtain a reliable data base about the composition of households, it is desirable to compare the results of the 1967 Marburg / Port Shepstone Surveys in terms of the criteria listed in Appendix E and A respectively. From this study the respective distributions of households by size are illustrated in Table XIII, and it will be seen that there is a considerable difference between the two sample distributions.

Both the 1967 and 1971 Surveys constitute samples and therefore the tabulated mean household size results are subjected to a variety of errors caused by e.g. incomplete sampling, faulty information, clerical mistakes etc ... Having established the mean houehold sizes for both 1967 and 1971 it is essential to discover the degree of variance which may be caused through such errors listed above. Once the variance of the household mean sizes are established it is then possible to calculate the range of the growth or decrease taking place in the size of households. To establish the range within which the mean household sizes may lie the following formulae are of application:-

(i) The Calculation of the Standard Error for the Port Shepstone Socio Economic Survey 1967

In respect of the 1967 survey the sample comprises only approximately 20 percent of the total estimated population and consequently comprises only a small part of the whole population. To estimate the standard error the following formula should be applied[1] :-

$$\text{SE of mean} = \frac{\text{S.D.}}{\sqrt{n}} \qquad \text{Where S.D.} = \sqrt{\frac{x^2}{n} - \bar{X}^2}$$

And x is the variant

$\bar{X}$ is the arithmetic mean

n is the total number of samples

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1. Sampling, An Introduction for Social Scientists, F. Conway p112.

From the standard error the range of the variance of the sample mean can be established by setting the level of confidence. For the purposes of this study the confidence level has been set at 95 percent.

(ii) The Calculation of the Standard Error for the Marburg Household Study 1971

The 1971 survey which comprises an 85 percent sample[1] of the projected population universes forms an appreciable part of the whole population and the standard error must therefore be modified to take into account the size of the sampling fraction[2].

i.e. S.E. of mean = $\frac{S.D.}{\sqrt{n}} \times \sqrt{1 - f}$

where f is the sampling fraction

S.D. = Standard Deviation

n = Total number of samples

From the estimated ranges of the household means the rate of growth or decrease can be measured as follows:-

	HIGH	MEAN	LOW
1967	A	B	C
1971	D	E	F

High rate = A - F

Mean rate = B - E

Low rate = C - D

Where A - F represent the mean household sizes as estimated in terms of the aforementioned formula.

From Table XlV it will be seen that there is a decreasing household size, and that there is a relatively large decline in respect of High

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1. The population universe is the 1970 Bureau of Statistics Census Return for Marburg and Port Shepstone's Indians combined. The sample fraction = $\frac{\text{No of sample returns}}{\text{estimated No of H/H}}$ (See Tables Xlll and XVll).
2. F. Conway, Op cit pl35.

and Mean Rates. This decline must therefore be related to the mean family size as estimated in Table 1Xd, to determine whether households are shrinking faster or slower than families in the sub-region.

Although the extent and rate of the decline can be measured statistically it is necessary to explain the factors which might promote shifts in the composition of households, before making any assumptions about the nature of future households.

To a large extent observed differences in household sizes can be ascribed to :-

A. Changes in Marital status, age and sex structures of a community.
B. More families moving out of paternal homes to form nuclear household units.
C. Migrational influences. Since the migrant households are generally smaller than the residents units they are bound to have a long term effect on reducing the household size.

3.4.1 An analysis of the Existing Family and Household Composition

While it is essential to determine the rate and extent to which there is an overall increase or decline in the household size, it is also important to study the character of the family composition making up the household. When projecting housing requirements it is desirable to know what type of households are being planned for.

The planner must therefore ask three questions. Are the constituent families in the households:-

(a) Expanding,

(b) Stationary,

(c) Contracting.

The answers to the above three questions are acquired by establishing the relationship existing between (a), (b), (c) in terms of age, sex and marital status criteria.

For this Thesis the definitions used by R. Glass and Davidson[1] have been adapted for the classification and identification of family types. Thus each family unit in the Marburg Household Survey was analysed in terms of the following criteria, the results of which are contained in Table XV.

CATEGORY	QUALIFICATIONS
Expanding family	(i) Married man / woman under 40 years with no children
	(ii) Married man / woman under 40 years with children under 16 years
Stationary fanily	(i) Married man / woman (40-59) with no children
	(ii) Married man / woman (40-59) with children under 16 years
	(iii) Single / divorced / widowed man / woman of any age with children under 16 years
	(iv) Single / divored / widowed man /woman (20-59) without children under 16 years
Contracting family	(i) Married man /woman 60 and over with no children
	(ii) Married man / woman of any age with all children over 16 years
	(iii) Single / divored / widowed man / woman 60 and over without children under 16 years

1. The model is derived from a paper published by R.E. Glass and F.G. Davidson entitled 'Household Structure and Housing Needs', Population Studies Vol. 4 1950/51.

3.4.2 The Projection of Households for Period 1970-1985

While Tables Xlll, XlV and XV provide an indication of past, and present trends in houshold living patterns it is necessary to project the future mean household sizes and establish their relationship to future population growth. Population growth is determined by both natural increase and migration and it is therefore necessary to establish the influence of each separately in terms of estimated mean household sizes.

3.4.3

(i) Estimated Households due to Natural Increase

In Table Vlll estimates of population growth due to Natural Increase are given and in order to establish the future number of households which will result from this increase it is necessary to:-

(a) Establish past trends in the mean household side of the Indian community.
(b) Relate such trends of family size observations.
(c) Assume that the trends discovered in (a) and (b) will be maintained over the entire planning period.
(d) Divide the projected population in terms of the estimated mean household sizes to reveal the number of housing units required at any given time period in the projection.

In Table XlV it can be seen that there has been a decline in the size of Indian households in the sub-region, but it is not enough to assume that the current rates of decline will be maintained ad infinitum; thus the minimum size to which household units will decline must be calculated.

To calculate this minimum size it is necessary to relate both mean family size and the number of lodgers per family to determine the minimum living unit size. This is achieved by letting:-

$Z = \bar{X} + L_1^N$ where Z = Minimum living unit size

$\bar{X}$ = Mean family size at year N

L_1^N = Estimated number of lodgers per family at year N.

Assuming that the decline in household size as observed in Table XlV will continue at past rates to the minimum household size calculated in the abovementioned formula it is possible to estimate the range of the mean household sizes for the period 1970-1985 by decreasing the established mean as at 1970 by the expected decline in household size. To establish the total number of households at any given period in time, let:-

$N = \frac{P_2 - P_1}{\bar{X}}$ where P_1 = Population at year 1

P_2 = Population at Nth year

$\bar{X}$ = Estimated mean household size at Nth year.

Using the above quoted formula, Table XVl is constructed which sets out the calculated mean household sizes and the estimated number of households likely to occur due to natural increase during any stated time period.

(ii) The Projection of Households due to Migration for period 1970-1985

Whenever the planner attempts to estimate future housing requirements it is essential to ascertain the extent to which existing and future population growth due to migration will compete with locals for available

of past trends as is possible; so that the degree of 'fluctuation' or 'stability' of past migration rates can be estimated. Table XV sets out the relevant statistics indicating that there is a relatively inelastic movement in migratory trends. This data meets the requirements of condition A as aforementioned.

Criteria B - D required more detailed analysis and therefore a migration survey[1] has been undertaken - details of which have been described in sub-sections 3.2.3 and Appendix E, in order to provide a better data base for future migration projections.

For the purpose of this study the primary objectives of the migration survey are:-

A. To establish the total number of migrant houeholds existing in the project area at November 1971.
B. To calculate the extent of in-migration[2] into the sub-region as opposed to the inter-regional population shifts within the project area.
C. To estimate the household size characteristics of the in-migrants estimated in B above.

Objective A was easily achieved by the analysis of the 1971 Marburg Household Survey using the cirteria of 'residence under 1 year' as qualifying a household for 'migrant' status. From this migration survey the extent and characteristics of in-migration can be assessed. (See Table XVll for detailed returns).

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1. The migration survey referred to constitutes a sub-study carried out in July 1975 to record specific detailed data concerning changes in migration patterns and the nature of migrant houeholds.
2. It is necessary to classify the 'migrant households' into (i) immigrant, (ii) local migrant households i.e. immigrant households that have moved into the project area while 'local migrant' have merely moved within the project area.

Using the criteria findings in Table XVll it is thus a relatively simple task to compute the mean household sizes of migrant households where:-

$$\bar{X} = \frac{A}{B}$$

$\bar{X}$ = Estimated mean household size

A = Number of observed sample population living in immigrant households

B = Total number of observed immigrant households in sample.

Like the natural increase estimates, the Migration Survey constitutes a random sample and the results thereof are subject to a degree of error. To estimate the error the formula applicable to sub-section 3.4.3(ii) B is of application, the results of which will reveal the upper and lower limits of the mean household size of immigrants entering in the study area.

Unlike the natural increase projection method it is not possible to obtain 2 comparable data sources[1] and therefore it is necessary to make certain assumptions about the future patterns of immigration. These are:-

(a) That the range of the mean household sizes for immigrant households as observed in 1971 and corrected by the inclusion of 1975 immigrant households will remain representative of the households size during the entire 15 year planning period.

(b) That the mean annual compound growth rate for in-migration into the sub-region will remain constant at 2.3 percent as estimated in Table Vlll.

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1. There is no recorded migration data for the sub-region other than that established in the 1971 Marburg Survey. The 1975 Survey which is a check on the 1971 survey reveals more detailed data and has recorded additional immigrant families. Random sample studies of the sub-region to find immigrant households are statistically impossible since migration constitutes only 2,1 percent the total population thus making sample returns too small for valid analysis.

housing. The future potential homeownership therefore relies on the general ageing and expansion of the existing community, the acretion of migrant households,and the continued economic expansion or contraction of the sub-region.

Projecting population growth due to migration is one of the thorniest problems for demographers since net migration returns do not necessarily reflect the true rates of in and out migration occuring in a community. Although sub-section 3.3.1(vi) provides a formula for estimating the net migration occurring in a region it is considered essential to acquire additional data concerning:-

A. The extent to which past patterns of migration have influenced the development of the sub-region.
B. The nature and extent of migration and its influence on the existing housing supply.
C. The examination of household and family structures of migrants moving into the project area and their relationship to household structures derived from natural increase.
D. The prediction of future household / family structures in relation to the population estimates set out in Table Vlll.

From the aforegoing data it is possible to assess the effect of migration rates on past and existing population settlement patterns, and from these findings projections can be made.

Migration estimates can only be based on anticipated trends drawn from the findings of past experience. Such assumptions can be hazardous since the major 'cause effect' relationships of migrations are closely related to prevailing socio-economic and political influences. To counter this criticism it is desirable to analyse as wide a time span

Estimates of the number of households resultant from 'migration' can be obtained for any time period by relating the population growth to the estimated mean household size,

i.e. $A = \frac{B}{\overline{X}}$ Where A = Estimated number of households due to migration

B = Estimated population increase from migration

$\overline{X}$ = Estimated value for mean household size as derived from Table XVlll.

In Table XVlll the detailed estimates of the number of migrant households are displayed. It should be noted that there is a wide variation in the estimated mean household size which is resultant from the relatively small sample size. This variation therefore tends to support the underlying assumptions of (a) as aforementioned.

(iii) Summary of Projection of houeholds by acretion

From the methodologies enployed in sub-sections 3.4.3 (i) and (ii) it is now possible to estimate the total additional stock of housing which will be required within the planning period, to meet the needs of population growth, be it by natural increase or migration. By combining the results of Tables XVl and XVlll the upper mean and lower estimates of the future requirements can be obtained.

Thus far only the projected housing demand has been analysed and it now remains for the existing housing stock to be critically evaluated to ascertain the extent of additional accommodation requirements necessitated through inadequate housing provision within the study area.

CHAPTER THREE

PART III

THE ANALYSIS OF EXISTING HOUSING CONDITIONS AND THE DEGREE OF OVERCROWDING OCCURING IN THE MARBURG / PORT SHEPSTONE SUB-REGION.

3.5 GENERAL INTRODUCTION

While it is both desirable and necessary for planning models to project future housing requirements in the light of anticipated trends it is also essential for such models to examine the true position of the existing housing stock and its performance in providing accommodation to all sectors of the community. Using the two aforementioned criteria it is possible to establish what role the existing housing stock is playing in meeting the immediate needs of the community and what potential exists for providing shelter for future homeowners.

No study of housing in Indian areas can ignore 'overcrowding' which is a characteristic common to many Indian communities undergoing the rapid process of urbanization. It is therefore desirable to look at the historical, socio-economic, and political factors which have influenced the development of the Marburg / Port Shepstone sub-region since its inception, and which may or may not have contributed in part to the adverse state of the housing provision in the area.

From the communities earliest beginnings, the Indian pioneers suffered social, political and economic hardships which resulted in them occupying inferior dwellings. As the indentured 'Coolies' gained their freedom they erected wood and iron shanties in keeping with the type of house they had been used to on the sugar estates. Gradually the Indian community became more self reliant and were able to build more substantial and larger houses. In the absence of formal planning

and building controls until a fairly late stage[1] in the sub-regions development; the erection of dwelling's went largely unchecked and were subject merely to the dictates of family or 'Kutum' requirements; and additions to existing dwellings were applied as and when required.

As the housing shortage worsened, families began to increasingly erect outbuildings as accommodation establishments for their more underprivileged kinsmen.

Despite the imposition of town planning regulations which forbid the letting off of any part or parts of dwelling houses in special residential zones, it has become an increasingly popular phenomena to convert garages, outbuildings, servants quarters and basements as living accommodation, and it is from these sources of accommodation that much of the poor conditions of housing arise.

Resultant from large scale population growth, unfavourable Group Area designations,[2] the reticence of private developers to erect speculative housing, and a shortage of subsidised accommodation at economic rentals, many of Marburg / Port Shepstones Indian residents have been forced to seek inferior accommodation from a restricted number of wealthy landlords who extort unrealistic rentals from their dependent tennants.

In the light of the aforementioned factors it is essential to ascertain the true extent of the existing housing provision using specially designed criteria of investigation. Any model which attempts to analyse future housing provision should :-

(i) Examine the standard of existing housing to determine the extent of the inadequacies of the housing provision.

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1. Town planning controls only became effective in Port Shepstone in 1955 and in Marburg in 1972, approx 6 decades after the first housing developments.
2. The proclamation of Port Shepstone Central as a white group area in October, 1965, and the proclamation of Izotsha, The Band and Langagabella as controlled areas in the 1970's has forced Indian migration towards the proclaimed Indian Group Areas of Marburg / Port Shepstone.

(ii) Examine the existing housing situation in relation to the spatial requirements of households.

(iii) Investigate the possible recycling or reallocation of housing to provide for the maximum use of available accommodation.

(iv) Assess the future housing requirements in respect of projected increases in population, families and households.

The Model which is now to be described constitutes a multi-stage analysis in which :-

(a) The existing housing stock as recorded by the Marburg Household Survey, 1971, is classified in terms of 'permanent' and 'non-permanent' criteria, and

(b) The housing classified as being of 'permanent' status is subjected to critical examination in terms of predetermined criteria so as to reveal the extent of overcrowding prevailing as at 1971.

(c) Current road proposals are analysed to establish their effect on the current and future housing provision in the sub-region.

3.5.1. The Classification of Existing Housing Stock

In order to meet the requirments of 3.5.(i), it is necessary to determine the adequacy of the existing housing provision. This is best done by:-

(a) Defining the concepts of the 'permanent' and 'non permanent' dwelling unit in terms of easily discernable criteria, i.e. type of construction, intended useage of building, etc... and

(b) Analysing the detailed results of the Marburg / Port Shepstone Household Survey of 1971 in terms of the Dwelling Type Category.

In defining the concepts of 'permanent/non permanent' dwelling units, this study has taken cognisance of the town planning and local building bye-law requirements[1], i.e. in respect of the useage and construction of dwellings.

The concept of a 'permanent' household can therefore be described as a,

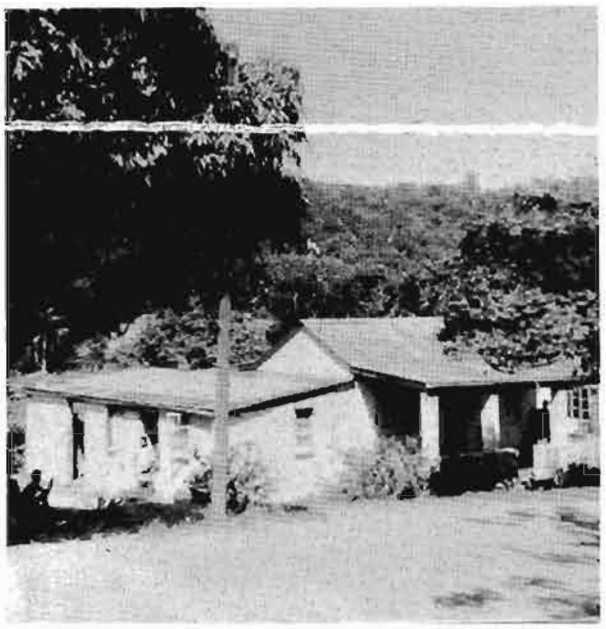
> 'Dwelling of a substantial nature which complies with normal town planning and building regulation requirements and which can be expected to remain as a viable dwelling unit throughout the 15 year planning period.'

> Whereas a 'non permanent' dwelling is classified as,
> 'A dwelling unit which in terms of contemporary town planning or building regulation requirements is not desirable for continued residential occupation, and should be demolished and vacated unless renovated to meet the planners prescribed minimum requirements.'

In terms of Appendix A, 6 categories of dwelling types are listed, 2 of which fall within the 'non permanent' category. It is therefore necessary to submit each household in the survey to critical analysis in terms of the following criteria:-

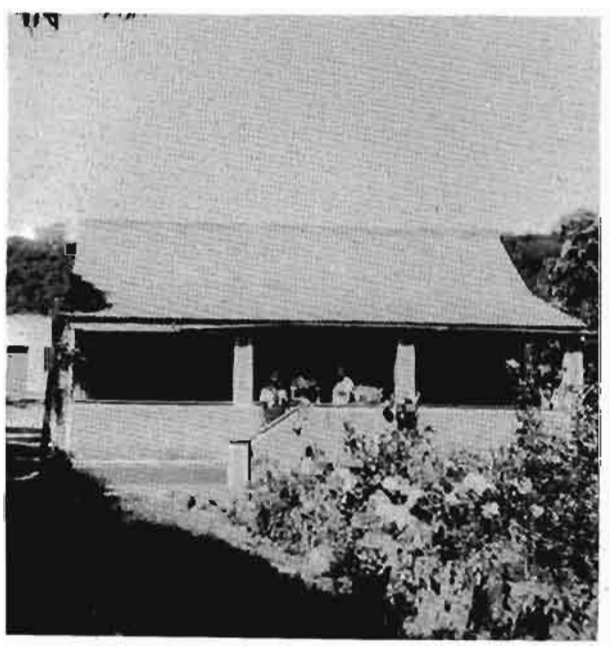
Permanent/non disposable households	Non permanent/disposable households	
Flats	Shacks	
Maisonettes	Wood and iron buildings constructed of non-permanent building materials	
Single/double storey dwelling houses	Garages	Basements
Wood and iron dwellings of a permanent nature and containing essential services	Outbuildings	Caravans/tents
	Store-rooms	Lofts/attics
Hostel/boarding house	Huts	

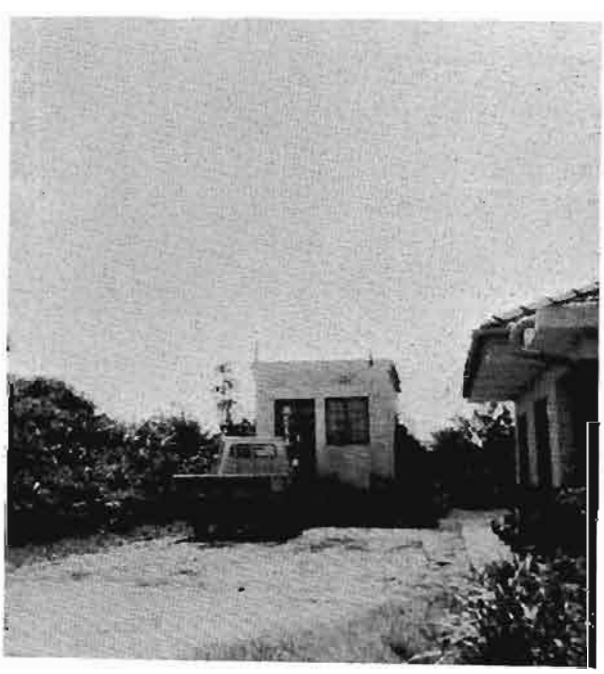
1. The dwelling type is classified in terms of the definitions employed in Schedule A - P6 while the classification of the structural qualities of the buildings i.e. permanent/non permanent has been governed by the regulations contained in the Standard Building Regulations, Chapter 2.



With greater affluence and changing family needs permanent additions were effected to the original wood and iron structures.

As a result of succession and invasion an increasing number of Indians acquired the former White colonial homes, and these were adapted to meet the Indian household requirements.





Owing to the scarcity of accommodation all available outbuildings are converted to provide remunerative accommodation.

Plate 3

to determine the dwelling units role in the continued provision of accommodation. In Table XX the results of such investigations and the proportions[1] in which 'permanent' and 'non permanent' housing units constitute the total housing stock are portrayed. Those units classified as 'disposable' must therefore be excluded from consideration in the provision of future housing accommodation, since they do not meet the minimum housing standard requirements. The inhabitants of 'non permanent' households are therefore to be considered as displaced persons requiring alternative accommodation, and are to be included in the estimate of the future housing provision.

3.5.2 The spatial analysis of households and the examination of the degree of overcrowding.

General Introduction

Although the extent of 'disposable' housing has been determined in Table XX, it cannot be assumed that all the remaining 'permanent' housing will be available for the future provision of accommodation since:-

(a) Conditions of overcrowding may exist making the existing 'permanent' dwellings inadequate to meet present requirements.
(b) The composition and structure of families and households are constantly undergoing change, thus requiring continual changes to the composition of the established housing stock[2].

In order to establish the net availablity of existing accommodation it is necessary to subject all 'permanent' classified households to

---

1. Since the Marburg Survey only represents 83 percent of the projected 'universe' i.e. the estimated population for 1971 drawn for Table VIII, it is necessary to estimate the number of units which are 'non permanent' in character. i.e. based on the assumption that the fixed proportions will remain relatively constant within prescribed confidence levels.
2. Changes in the existing housing stock will always be slower than changes in family or household structures due to socio-economic restrictions.

analysis in terms of the following three criteria[1] namely:-

(i) The analysis of overcrowding of households in terms of the maximum number of permissible occupants per household calculated in terms of a floor area space index.

(ii) The analysis of overcrowding in terms of the maximum number of permissible persons per living room.

(iii) The analysis of overcrowding due to inadquate separation of the sexes.

3.5.3 The analysis of overcrowding in terms of the maximum number of occupants per household.

Any study of 'overcrowding' involves the analysis of the inter-relationship which exists between man and his buildings. Therefore it is desireable that the first step in this analysis should determine the dimensions of the existing housing units and relate the same to the populations who occupy such units.

In this particular study 3 criteria[2] are studied:-

A. To determine the distribution and mean living room sizes of existing houses and flats in both Marburg and Port Sheptstone.

B. To develop a minimum living space index per person which can relate total occupancy per household to the mean household size measured in square meters.

---

1. The criteria are drawn in part from the work of H.L. Watts in his study 'A Brief Housing Survey of the Township of Isipingo'pp16-20 and G.G. Maasdorp and P.N. Pillay, the research in 'The East Rand Indian Community'pp 50-52.
2. The 3 criteria used in this study are based on both the Slums Act Regulations, and research work carried out by H.L. Watts in 'A Brief Housing Study of the Township of Isipingo'. Op cit p16.

C. To determine the degree of overcrowding resultant from too many people occupying too small a dwelling unit.

In order to meet the requirements of criteria A, a specialised sample survey of the spatial aspects of 'permanent' dwelling units was undertaken. This was achieved by selecting a representative sample[1] of building plans drawn from :-

(a) The 'permanent' category of households
(b) Buildings which were erected between 1942 - 1975
(c) Buildings erected in both the Marburg and Port Shepstone areas of the sub-region.

In this study a sample of sixty building plans of 'permanent' classified houses and flats were drawn from the files of both the Marburg and Port Shepstone Local Authority files. Each dwelling unit's living areas were measured in terms of square and cubic meterage. For the purpose of this Thesis, a living room was defined as 'any habitable room or living space in a permanent household capable of acting as sleeping quarters for the inhabitants or guests in the household'.

Living rooms thus :-

	Constitute	Exclude
1.	All bedrooms	Kitchens
2.	Sitting rooms / Lounges	Bathrooms
3.	Diningrooms	Laundries
4.	Studies	Pantries
5.	Playrooms	Garages
6.	Enclosed porches or verandahs	Servant Quarters
		Outbuildings

---

1. The representative sample referred to is one in which different size households constructed at different time periods reflect the overall building size of housing units, in the sub-region.

Taking a random sample of plans which were representative of building types from 1942 - 1975 and measuring the floor and cubic areas, an index of the mean room and household size of 1 to 10 bedroomed units was derived (See Table XXI). In terms of the results of this aforementioned Table it is possible to guage what the mean living room size of units in the sub-region is and how the results compare with the minimum requirements set in the Standard Building Regulations, Chapter Two.

Having obtained the mean size of living rooms and households it is necessary to determine how many people can fit into a household of XM^2 in extent.

Taking the Union Slums Act[1] requirements, as a standard, i.e.

Category	Min floor space req	Min cubic air space req
Adults over 12 yrs.	$4M^2$	$4M^3$
Minors under 12 yrs.	$2M^2$	$2M^3$

the number of permissible persons occupy a dwelling can be calculated in terms of:-

Let $P = \frac{X}{Y}$ Where P = Estimated total number of persons permitted in a dwelling unit in terms of floor space index.

X = Estimated total living area of H/H (based on finding of mean room size in Table XXI)

Y = Sum of minimum living space indicies for resident adults and minors as calculated from the Union Slums Act as per above.

Thus if Z = Total number of recorded persons in household

Then if Z <= P Household not overcrowded : Z > P Household is overcrowded

1. The criteria are based on the requirements of the 2nd Schedule of the Union Slums Act No. 53 of 1934, as amended, and are modified in terms of the age classification. Whereas the Slums Act defines the 10th year as being the dividing line between adult and child, this survey uses the 12th year in order to conform with the 1971 Marburg Household Age classification.

By subjecting each Household Return of the Marburg 1971 Survey, an accurate record of the state of overcrowding per household is obtained.

3.5.4 Overcrowding in terms of the maximum number of persons per sleeping room.

The second stage in the analysis of overcrowding requires that each 'permanent' housing unit as established in Table XXI, be subjected to examination in order to determine whether the accommodation available in the housing unit meets the needs of the occupants requirements for privacy, and minimum state health requirements.

Whereas the National Housing and Planning Commission Standards for non europeans stipulate that not more than 2½ persons[1] aged 1 year or more may cohabit in a living room, it is felt that this standard would be unrealistic if applied to the Marburg / Port Shepstone situation since the sample mean living room size observed amongst the sub-regions households are :-

A. Considerably larger than modern day living room sizes both in cubic and square meterage.
B. The number of persons who can occupy such rooms in terms of the Union Slums Act criteria adopted for this Thesis are far in excess of the National Housing Commissions standards.

In order to obtain a more realistic occupancy ratio of adults and minors per room it has been deemed necessary to relate the mean living room size of 14 M^2 (established in Table XXI) to the floor area index per person i.e. 4 M^2 and 2 M^2 as set out in 3.5.3.

Relating the minimum floor space index per person on an age basis to the minimum room size, it is established that :-

(i) Not more than 3 adults of 12 years and over may reside in a living room i.e. of 14 M^2 in extent.

---

1. Minimum standards of housing accommodation for non Europeans National Housing and Planning Commission, 1951 P3.

(ii) Not more than 7 children of 12 years and under may cohabit in any one living room.

(iii) Persons of mixed ages but of the same sex may cohabit in the same room provided the sum of the individual floor space requirements does not exceed the mean living room size requirement.

(iv) A married man and wife may reside with a minor under the age of 3 years.

Subjecting each 'permanent' Marburg Household 1971 to analysis in terms of the aforementioned criteria it is possible to establish what conditions of overcrowding are occuring within the households in terms of over occupation of living rooms.

SAMPLE NO.	TOTAL NO. ADULTS ABOVE 12 YRS. OLD.	TOTAL NO. MINORS BELOW 12 YRS. OLD.	TOTAL NO. OCCUPANTS IN H/H.	TOTAL NO. LIVINGROOM REQD.			TOTAL NO. LIVINGROOMS IN H/H.	OVERCROWDED	NOT OVER-CROWDED.
				ADULTS	MINORS	MIXED			
XYZ	3	10	13	1	1	1	2	x	
ABC	2	3	5	1	1		3		x

The analysis is executed in the following manner and from an inspection of the individual returns it can be seen to what extent there is overcrowding within the number of living rooms available in any specified dwelling unit.

(ii) Not more than 7 children of 12 years and under may cohabit in any one living room.

(iii) Persons of mixed ages but of the same sex may cohabit in the same room provided that the sum of the individual floor space requirements does not exceed the mean living room size requirement.

(iv) A married man and wife may reside with a minor under the age of 3 years.

Subjecting each 'permanent' Marburg Household 1971 to analysis in terms of the four aforementioned criteria it is possible to establish what conditions of overcrowding are occuring within the households in terms of over occupation of living rooms. The analysis is executed in the following manner and from an inspection of the individual returns it can be seen to what extent there is overcrowding within the number of living rooms available in any specified dwelling unit.

3.5.5. Overcrowding due to inadequate sex segregation.

Wherever accommodation is in short supply and families are forced to rent accommodation which is inadequate to meet their demands, conditions of overcrowding due to inadequate sex segregation can be expected. Therefore it is essential to establish criteria which will reflect the desirable distribution of occupants of a household in terms of the living space available.

Towards this end the provisions of the Union Slums Act have been adopted and adapted to provide concepts for the analysis of such overcrowding. The criteria upon which this study is based is as follows :-

(i) Persons living together as man and wife shall occupy their own living room.

(ii) Persons other than husband and wife, or persons living together in permanent cohavitation who are of the opposite sex and are over 12 years in age may not share the same living room.

(iii) Minors under the age of 12 years may cohavitate in the same living room provided that they are of the same family in a household.

(iv) Individual unrelated persons who are of the opposite sex and over the age of 12 years must reside in separate living rooms.

(v) Persons living together as man and wife may cohabit with a minor under the age of 3 years of age.

Using the aforementioned criteria all 'permanent' households as

recorded in the Marburg 1971 Household Survey are analysed in terms of the following method. E.g.

MARITAL STATUS		MARRIED			SINGLE				NO. OF LIVING ROOMS IN H/H.	NO. OF LIVING ROOMS REQD.	IS OVER-CROWDED	IS NOT OVER-CROWDED
IDENTITY WITH H/H.		RELATED		UNRELATED	RELATED		UNRELATED					
AGE		- 12-60+		- 12-60+	0-12	12-60+	0-12	12-60+				
SAMPLE NO.	SEX											
00001	M	2			5				3	3		X
	F	2			1							
0002	M	1		1		3	1		3	4	X	
	F	1			2							

From these results the extent of inadequate sex segregation is determined in relation to the population composition and dwelling size of the household.

3.5.6. The determination of the extent of overcrowding.

From the combination of the three aforegoing approaches the extent of overcrowding occuring in each 'permanent' household recorded by the Marburg Household Survey 1971 is established. In Table XII the tabulated breakdown of households existing between 'overcrowded' and 'non overcrowded' permanent households is illustrated. However it should be noted that the Marburg Survey is only a sample and therefore it is necessary to estimate the total extent of the overcrowded households and population which are affected by conditions of overcrowding. Since

the ideal is to provide every inhavitant with suitable accommodation those households and people who are affected by overcrowded conditions are therefore to be considered as 'displaced' persons requiring additional accommodation. As will be seen in sub-chapter 3.7, a proportion of the displaced families and persons will be able to occupy recycled housing accommodation, thus the net displacement will be considerably lower than the gross estimates provided in Table XXIV.

3.6 THE ANALYSIS OF THE EFFECT OF MAJOR PLANNING DECISIONS ON THE PROVISION OF HOUSING.

Although socio-economic and political factors have been treated as constants in this research it is necessary to study the effects of any major planning decisions which might affect the future provision of housing.

(a) In the predetermined planning period, and
(b) In the designated project area.

In respect of this study it is imperative to investigate the effects which the major road planning decisions will have on the existing and future housing provision.

Map No. 10 indicates the freeway proposals as they affect the project area and it will be seen that a number of dwelling units will be affected by the implementation of these proposals. Therefore it is necessary to estimate the total number of 'permanent' households which will have to be demolished and the total number of people who are likely to be displaced. This is achieved by analysing the Marburg Household returns which reflect the household composition of the affected dwelling units[1], while Table XXIII sets out the relevant returns of the 'permanent' households which will have to be rehoused as a result of this single major planning decision.

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1. Refer to the permanent dwelling units situated on the lots described in Appendix G.

Freeway Proposals

Map IO

3.7 THE ANALYSIS OF GROSS OVERCROWDING AND THE RECYCLING OF BUILDINGS.

Although a measure of overcrowding has already been estimated in Table XXII, it is necessary to analyse the extent to which dwellings are classified as being of a 'permanent' nature, but which are inadequate in terms of size to meet their existing occupants requirements, can be recycled to other family units to match their specific needs. With constant changes taking place in the community's household and family structures (i.e. size, sex, age and density patterns) it is necessary to evaluate the role of the existing housing stock, in terms of the ultimate potential accommodation which such housing can afford to families / people affected by conditions of overcrowding.

3.7.1. The calculation of total disposable housing.

In order to determine the number of people and households who will require new accommodation in the future it is necessary to determine the total number of people who are likely to be rehoused owing to:-

A. The existing overcrowding of permanent households.
B. The 'non permanent' character of their present accommodation.
C. The effects of major planning decisions.

If the findings of Tables XX, XXII and XXIII are combined, Table XXIV can be compiled to show what the total displacement of households will be in the future.

3.7.2. The Recycling of Housing

Although the total extent of inadequate housing has been calculated in Table XXIV, it is not an accurate reflection of the true housing position, since a portion of the 'permanent' accommodation which has been

condemmed on the grounds of overcrowding can be adapted and recycled to meet the needs of a number of displaced families who require housing to suit their particular needs.

The term 'recycling' means for the purpose of this Thesis 'the reallocation of permanent housing' which has been condemmed as being overcrowded on the basis of size, sex and occupation ratios, to other families and households in the displaced group (See Table XXIV) who are best suited in age, sex, marital status, size and family relationship to the size and type of dwelling available for 'recycling'.

In any society, and more particularly in Indian groups, there is a constant ongoing recycling process, which is influenced by the continually changing demands of families and households alike, and which in turn are caused by shifts in the age, marital status and economic independence of the constituent members of a household. While recycling is a natural process, the enforced recycling of people, especially amongst the more economically deprived groups is a more hazardous operation. However, legislative powers do exist i.e. Expropriation Act or Land Procurement Act, whereby the state or local authorities could enforce the movement of people and thus for the purpose of this research study, the writer will be looking at the theoretical means for optimising upon the existing housing provision of overcrowded 'permanent' housing units, rather than the political consequences of such action.

(i) The Determination of the Extent of the Recycling Problem.

Before any detailed investigation of recycling can proceed it is essential to:-

A. Determine the size, number and distribution of displaced households in the project area.

B. Estimate the number of displaced persons who inhabit the aforementioned condemmed households.

In order to provide the answers to A and B above, it was necessary to submit each data record in the Marburg Household Study, 1971. To analysis in terms of the criteria set out in 3.5.1 to 3.5.5 and 3.6. From the results of this study, Table XXV was compiled in which the size of the households number of persons and households in the displaced group, together with their respective distributions were tabulated.

(ii) The Calculation of the Number of Housing Units suitable for Recycling.

Amongst the households listed in Table XXV are a number which offer themselves for recycling, and thus the next stage in the research programme attempts to establish the number, size and distribution of overcrowded 'permanent' households which can be salvaged as being acceptable (i.e. not overcrowded) units by:-

A. The removal of 1 person or 1 family from a unit[1] so as to meet the requirements of 3.5.4 to 3.5.6.

B. Restricing the occupancy of a 1 bedroomed dwelling unit of $14M^2$ to not more than 3 persons, and a 2 bedroomed unit to a maximum of 5 persons.

C. Limiting each dwelling unit to the housing of one family of optimum size so as to match and make use of the maximum accommodation available.

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1. Such persons or family removed must not be of primary importance to the continued functioning of the household unit.

Using the three criteria listed above the 'non permanent' households listed in Table XXV, are subjected to analysis and Table XXVI is compiled whereby the number of dwelling houses suitable for recycling together with the available accommodation are illustrated.

(iii) Estimates of the number of recycled units.

In every long established township a certain proportion of the available housing fails to meet the societies requirements, and therefore not all of the existing housing units are suitable for recycling. As a result thereof it is essential to determine the net number of units which are capable of being recycled and the following formula is of application:-

Let O = A - (B + C)

Where O = Net number of overcrowded 'permanent' housing units capable of being recycled.

A = Total estimated number of overcrowded units as estimated

B = Total number of housing units withdrawn from the 'overcrowded' housing categories by virtue of the withdrawal of household members thus making the housing unit 'not overcrowded'.

C = Total number of housing units withdrawn from the potential housing stock as a result of their inability to meet existing housing requirements.

Using the results obtained from the abovementioned formula, Table XXVII is derived, in which the net number of households capable of being recycled together with the population such households can accommodate are as illustrated.

(iv) The estimation of net housing requirements for displaced persons after recycling as at 1971.

Although a large proportion of the displaced persons can theoretically

be rehoused in existing housing units, it is necessary to determine how many families and people will require additional accommodation to meet their requirements. To establish the net additional requirements:-

Let X = Y - Z Where X = Estimated number of families / persons requiring alternative housing resultant from conditions of overcrowding or displaced through major planning decisions.

Y = Total number of families / persons living in overcrowded households.

Z = Total number of families / persons capable of being rehoused in terms of the results of criteria 3.7.2 (iii) (See Table XXVII).

From the results of the aforementioned investigation, Table XXVIII is compiled in which the true extent of net displacement due to overcrowding, sub-standard building construction or the effects of major planning decisions, is portrayed.

3.8 THE PROJECTION OF GROSS HOUSING REQUIREMENTS FOR THE PERIOD 1970 - 1985.

The final act in the 'Exponential Growth Curve' model is to calculate the total projected demand for housing by combining the results of numerous substudies which portray the immediate housing demand resultant from conditions of sub-standard housing; and that of future requirements resultant from population growth due to natural Increase and In-migration into the sub-region.

In order to calculate the total housing requirements for 1985:-

Let $A = X + Y + Z + W$

Where A = Estimated total number of households as at 1985

X = Estimated total number of households as at 1971 (see Table XIV)

Y = Estimated number of additional households to be formed due to natural increase from 1971 - 1985 (see Table XVI)

Z = Estimated number of additional households to be formed due to in-migration from 1971 - 1985 (see Table XVIII)

W = Estimated net number of households to be rehoused (see Table XXVIII)

By combining the results of Tables XIV,XVI, XIX, XX, XXII, XXIII, XXV, XXVI, XXVII and XXVIII, Table XXIX is compiled wherein the total existing and future projected housing requirements are clearly illustrated.

From Table XXIX the total additional requirements can be obtained in terms of the following formula:-

Let $I_1^N = A_1^N - P_1$ Where I_1^N = Total additional housing units required in N years.

A_1^N = Total number of units at year N.

P_1 = Estimated number of housing units at year 1 of the projection i.e. 1970.

To acquire the mean annual rate :-

Let $I = \frac{A - P}{N}$ Where I = Mean annual housing requirement.

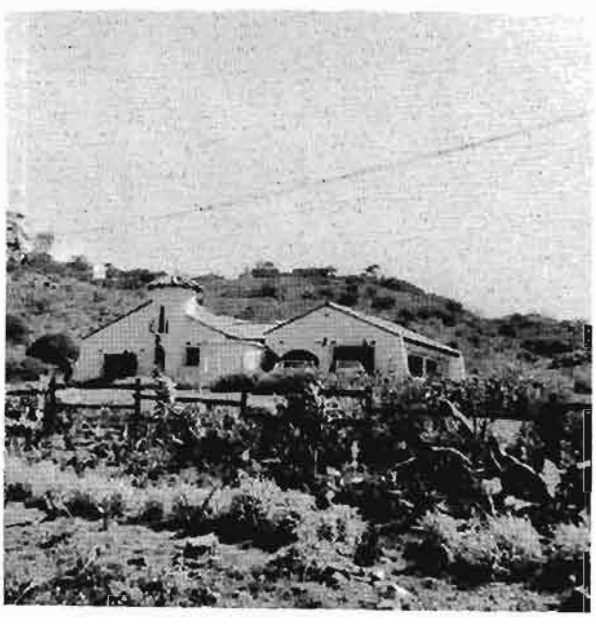
A = Total additional number of houses.

P = Estimated number of houses at year I.

N = Number of intervening years between A - P.

The completion of Table XXIX concludes the first model for the projection of housing requirements, in terms of the Exponential Growth Curve approach and it now remains for the writer to describe the mechanics of Model II (i.e. Age Cohort Survival) to obtain an overall view of the severity of the existing and projected housing shortage in the Marburg / Port Shepstone sub-region.

The extended dwelling as an integrated unit is now a common feature amongst the wealthier Kutums of the sub-region. In this house six families share a common dwelling each using their own separate facilities.



Due to the influence of westernization statutory building bye law and Town Planning controls an increasing number of conventional European type of houses are being constructed.

With the decline in cultural values and an increasing economic independence even foreign aesthetic designs are being incorporated into the modern home.

Plate 4

CHAPTER THREE

PART IV

AGE COHORT SURVIVAL METHOD

3.9 GENERAL INTRODUCTION

Model II, like its predecessor is yet another demographic technique for projecting future populations for the Marburg / Port Shepstone sub-region. From such estimates the future housing requirements are derived by relating the expected population increases to anticipated family and household structures.

Whereas the 'Exponential Growth Curve' approach treats the population as a single aggregation and bases its projections on an integrated universe of its component parts; the age cohort survival method attempts to disaggregate the component parts[1] of population change on the basis of age, birth / death and migration factors. The benefits of the latter approach will be seen later in this chapter, when a more detailed breakown of the factors inducing change in the population are analysed and when the true extent of the influences of such factors causing change are revealed. In essence therefore, it can be expected that a major benefit of the Cohort Survival Method will be to :-

A. Provide greater information about the causes of population shifts e.g. growth, migration, etc.
B. Provide a more accurate record and estimate of future population growth.

Shifts in the population structures of a community can normally be attributed to changes in birth, death and migration rates. Since each of the three aforementioned factors would appear to act independently of one another. Changes in fertility, mortality and mobility rates are

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1. Model I generalises about the influence of birth, death and age changes on population shifts in the sub-region and incorporates the aforementioned in the overall estimated rates of change.

not necessarily correlated and rely on their own influences - it is necessary to design a model which will analyse each separately but yet combine the findings of each to yield an overall pattern of population growth or decline in a region.

Given that these three factors are truly independent, it is likely that fairly regular trends in each of the three, will result in a composite that is erratic and difficult to analyse and project. Therefore it is essential that the planner should separately investigate the influence of birth, death and migration factors on the composition of the population structure and make projection on the basis of proven empirically observed data.

To carry out an analysis of specific categories of data e.g. birth and death rates, is not always possible since fairly large 'blanks' occur in existing data banks (e.g. population census returns) making detailed analysis impossible. So too with migration estimates lack of detailed statistics[1] severely restrict the analyst's ability to make a meaningful migration projection. In this model it can be seen how the findings of the straight line projection approach can be utilised in Model II in order to establish an essential data base for making migration forecasts.

In keeping with Model I, this approach requires that past growth be observed and analysed. This involves the observation and analysis of past records i.e. birth, death and migration rates, so as to provide a base upon which detailed 'specific age' rates[2] can be established. While the crude growth rates indicated in Model I provide an indication of expected trends in population growth due to natural increase in migration: the use of sub group 'specific' rates provides a more accurate

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1. An example of the data 'blank' referred to is the non publication of the Age/Sex/Marital Status breakdown for the Marburg / Port Shepstone sub-region, by the Bureau of Statistics. The data used in this thesis has been courteously supplied by the Director, Town and Regional Planning in conjunction with the Natal Provincial Administration Computer Department and is based on the 1970 Census Returns of the Bureau of Statistics, Pretoria.
2. Refers to Age Specific birth and death rates as estimated in Tables XXXlV and XXXVl.

assessment of each categories contribution towards the general assessment. This does not mean that the model has not to make a number of basic assumptions upon which the forecast is founded. To the contrary, it is necessary to assume that:-

(i) The sex proportions will remain relatively stable
(ii) Both specific birth and death rates will remain constant
(iii) Immigration into the sub-region will remain constant at 2,2 percent as estimated in 3.3.1(vi).

In essence therefore, the Age Cohort Survival approach makes use of:-

(a) Records drawn from the existing population data concerning age, sex, marital status and birth and death rates etc.
(b) A number of simple assumptions, each being limited in its scope of application, which indicates the specific inter-relationships which exist between components which are being projected.

The general methodological approach however requires that the study be undertaken in five stages as follows:-

Stage 1 The analysis of past and present growth, its changes and trends.
Stage 2 The determination of the projection parameters.
Stage 3 Running the projection.
Stage 4 Relating the results of the projections in 3 above to anticipated trends in household and family composition.
Stage 5 Combining the results of 4 above with observations contained in 3.5.

From the aforegoing, it can be seen that the model is highly flexible in that complete control over the projection can be exercised by the planner at all stages in the research process. This includes the analysts ability to determine the percentages of the research i.e. what is to be researched and to what level of investigation. In addition it affords the researcher a chance to introduce any special adjustments into the research programme if required at any stage in its process.

While it is both desirable and necessary for the model to be flexible in character, it must be remembered that the research programme needs an established form and an internal logic of its own. Any study of births, death, migration, etc. must therefore be preplanned and the relationships existing between the variables established in advance.

In Diagram 3, the general format of the investigation is revealed. This involves a 'Systems Analysis' approach to the study of the population growth and indicates the inter-relatedness of the three individual criteria in assessing future population dynamics.

In the age cohort approach it is essential to determine the basic composition of the population structure in terms of age, sex and marital status categories at year 1 of the projection.

Thereafter the study dichotomises with two separate studies being undertaken. The first involves the projection of the population composition of the sub-region for the designated planning period. This is aschieved by determining the extent of migration which can be expected in the sub-region and the reproductive qualitites of the existing population. Once the relevant crude and age specific birth and death rates are known it is possible to estimate the population increase in 5 yearly intervals.

Finish
THE HOUSING PROJECTION
The Population Projection 1970-1985
The projetion of future households likely to accrue to sub-region
The investi-gation of the potential for recycling
The analysis of Natural Increase Births and Deaths
The analysis of Population Growth due to Natural increase
The analysis of Population Growth due to migration
The analysis of migrant births and deaths
The analysis of family structure
The analysis of household structure
The analysis of overcrowding
The analysis of the 1970-1975 population structure in terms of age, marital status, sex
The analysis of the Marburg and Port Shepstone surveys 1967-1971
Start

Diagram 3

Whilst the planner is running the population projection he must at the same time determine the likely family and household composition of the sub-region during the planning period. This is achieved by determining trends from the 1967 and 1971 Surveys and using such observations the future unit sizes can be calculated.

In addition to this research it is necessary to incorporate the findings of 4.5 which indicate the extent of overcrowding and the potential for recycling of accommodation.

By relating the population structure to the projected household compositions the future housing requirements are obtained, and the gross extent of accommodation requirements are calculated by combining the results of the future and existing housing requirements, as set out in Table LV.

3.9.1 STAGE I THE ANALYSIS OF PAST, PRESENT AND FUTURE POPULATION STATISTICS

Stage 1 which constitutes the initial investigation in the research process, requires that the following factors, namely:-

(i) Population composition for period 1970-1975
(ii) Migration trends
(iii) Crude birth rates for period 1964-1971
Age Specific Birth Rates as at 1970
(iv) Crude death rates for period 1964-1971
Age specific death rates as at 1970

be analysed and correlated so as to provide the essential data base for the projection of future populations. From the findings of the above factors the disaggregated contribution of each component to the general projection can be assessed, and the planner can effect any variations to the model as he may require prior to the running of the projection.

3.9.2 The Population Composition

The first step in the projection requires that the 1970 Census Returns for the Marburg / Port Shepstone sub-region be analysed and classified in terms of 3 basic criteria:-

(i) Age grouping of the population in 5 year intervals
(ii) Segregation of the population in terms of sex standing
(iii) Determining the marital status composition of the existing community i.e. single, married, widowed, divorced or living together.

Table XXXVll sets out the relevant returns and indicates the near total composition[1] of the community in terms of the listed criteria. The mere analysis of the existing population structure is insufficient and thus it is necessary to determine the extent and nature of migration occurring in the sub-region, and add such returns to the existing population structure determined in Table XXXVll.

3.9.3 Migration

The importance of immigration can be best achieved by analysing the returns of both the Migration Survey and Table Vlll, which together indicate the nature and extent of migration. From the migration survey the proportional composition of migrants (i.e. in terms of the 3 listed criteria) can be ascertained, the details of which are contained in Tables XXXl and XXXll.

To determine the extent of migration between the period 1970-1975 it is necessary to make the assumption that the past growth rates established in Table Vll[2] will be maintained, and that the net

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1. The data source is the Town and Regional Planning Commission's Computer printouts drawn from the Bureau of Statistics 1970 Census Tapes.
2. Despite the care taken in ensuring the authenticity and quality of data returns in censuses, errors of content, errors of coverage, data processing errors, occur thus influencing the final results. For the purpose of this Thesis the data returns are assumed to represent the whole Universe.

immigration inflow into the region will be as estimated in terms of Tables V11 and V111. If it is assumed that there will be a constant inflow of immigrants, and having obtained an empirically observed breakdown of the composition of migrants i.e. age, sex and marital status it is possible to draw up a frequency distribution (see Table XXX1) reflecting the existing population structure of migrants as at 1971. To achieve this however, it is necessary to make a further assumption that the proportional relationships existing between the migrants as established in Table XXX1 will remain constant throughout the 5 year planning period (i.e. 1970-1975). Thus the results of the migration 1975 survey must be transcribed with the 5 year age categories required by the model as has been undertaken in Table XXX11. Combining the results of 3.8.2 and 3.8.3 a data base is established indicating the total estimated population composition of the sub-region for the period 1970-1975[1]. From this data base estimates of the total births and deaths likely to occur within the first 5 year projection period can be established.

3.9.4 Birth Rates

The study of fertility rates is a primary prerequisite since they reveal the extent and rate at which the population is reproducing itself which ultimately effects the future potential housing requirements of the area. In addition it is essential to discover what relationships exists between the number of child bearing married women and the total population so as to gauge what the future structure is likely to comprise.

In this study therefore, 2 sets of birth rates will be investigated,

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1. See Table XXXV11.

namely:-

(a) The crude birth rate

(b) The age specific birth rate

3.9.4.

(i) Crude birth rate[1]

The first requirement is to establish the ratio of live births accruing amongst the residents of the Marburg / Port Shepstone sub-region in any one calendar year, to that of the total population of the region and this can be expressed as:-

$i = \frac{B}{P}K$ where i = Crude birth rate

B = Total births per annum

P = Average population

K = Constant i.e. usually 1000 people.

Using the returns for the period 1964-1971 the mean annual crude birth rate for the Indian community is established (see Table XXXlll).

3.9.4.

(ii) Age specific birth rates

While the crude birth rate gives the overall state of reproduction a much more accurate index is the relationship of the number of live births to the total number of child bearing women in any specific age group. (This is known as the age specific birth rate).

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1. The crude birth rate is comprised of the toal births drawn from inhabitants of the sub-region and includes both migrant and existing population births. It should be noted that the births only record residents of the urban area.

Since no 'age specific' birth rates were available for the sub-region it was considered desirable to utilize the Durban metropolitan rates[1] since:-

A.[2] It has been found that relationships amongst age specific birth and death rates change much more slowly than the crude rates tend to change in the same direction in approximately the same proportional amount, and generally compare favourably for one of similar cultural and geographical location.

B. Histogram 2 reveals a close relationship between the proportional relationship of married females in both Durban and Port Shepstone.

To calculate the Age Specific Birth rate for the Marburg/Port Shepstone sub-region it is necessary to adjust the Durban Metropolitan rates in terms of the sub-region's estimated birth rate and age group relationships. In order to calculate the age specific birth rate it must be corrected in terms of the following formula:-

$$A = \frac{P\ B}{K1} K2$$

where A = Age specific birth rate

P = Estimated mean population of women capable of giving birth

B = Durban age specific birth rate

K_1 = Constant rate as 1000

K_2 = Constant - correction factor required to relate the mean crude birth rate to the age specific rate for the sub-region

so as to bring the Durban age specific birth rate into line with the mean annual crude birth rate established in 3.9.4(i).

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1. P.W. Johnston 'A Prediction of Indian Family Size for 1995' City Engineers Durban 1972.
2. Introduction to Demography by M. Spiegelman, 1955 pp44-79.

In Table XXXlV the age specific births[1] for the sub-region are recorded for the period 1970-1975, and they serve as an example of the methodological approach used in estimating the Age Specific birth rates of the sub-region.

Using the results of this research the planner is thus enabled to record the finite movements in expected population shifts between age groups at each segment of the research programme.

3.9.5. Death Rates

The study of mortality rates to a large extent reflects the standards of health services and climatic conditions prevailing in the area. Unlike birth rates, death rates are normally subjected to far less fluctuation and consequently provide more accurate statistics upon which projections can be founded.

The study of death rates is vital to this analysis since when compared to the birth ratios established in 3.9.4 the net extent in mean annual population growth can be established.

Like the study of birth rates, death rates are analysed in terms of:-

(a) Crude death rates
(b) Age specific death rates.

(i) Crude Death Rate

The crude death rate like the birth rate reflects the mean annual number of deaths per 1000 population which can be expected in the area,

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1. Represents the number of estimated births in terms of the population estimates. The age specific births are calculated individually for both the existing and migration populations although it is assumed that the established rates remain constant for both factors.

and can be expressed as:-

$$m = \frac{D}{P}K$$ where m = Crude death rate

D = Total number of deaths recorded in 1 year

P = Estimated population living in sub-region

K = Constant - taken as 1000

To establish the mean annual crude rate for the period 1964-1971 this is adjusted to read:-

$$m = \frac{\sum_{1}^{8} \frac{D}{P}K}{N}$$ where m = Mean annual crude death rate

D = Total number of recorded deaths

P = Estimated population

K = Constant - taken as 1000

N = Number of years.

Table XXXV provides an illustrated distribution of the respective death rates per 1000 people, and reveals a relatively low mortality rate. Taking the findings of the aforementioned Table the Age Specific rate can be calculated by relating the Durban metropolitan observations with those for the sub-region.

(ii) Age Specific Death Rate

Using the findings of (i) as aforementioned the age specific death ratios per age group can be established by relating the estimated mean death rate to that of the D.B.N. control factor. It should be noted that there is a high correlation between the sub-region's mean crude death rate and that of the mean age specific rate of the D.B.N. area which signifies a close relationship between patterns of death. The

'Age specific death rate' is thus estimated as follows :-

$$D = \frac{P\ d}{K_1} K_2$$

where D = Age specific death rate per category
P = Number of people in age group
d = Durban death rate
K_1 = Constant taken as 1000
K_2 = Constant correcting factor to align Durban and sub-region's crude death rates

Table XXXVl provides an example of the age specific death rates operating during the first 5 year period of the projection.

As can be seen from the rates, there is a marked increase in the number of deaths at both the top and bottom limits of the scale which is indicative of a relatively high mortality rate amongst infants and the older generation. It is to be expected therefore that this will have a progressively marked effect on the overall age composition of the society under investigation.

This completes Stage 1 of the model and the demographer is now called upon to set the projection parameters of the study, and in so doing make any adjustments to the relationships existing between variables which might be necessary.

3.9.6 The Determination of projection parameters

The computations which have been described in 3.9.1 reflect a number of empirical values for future projections since they:-

(a) Provide indices of past, present and future fertility and mortality rates
(b) Establish the fixed proportional relationships between age, sex and marital status of the community
(c) Determine the relationship existing between the existing population structure and the nature and extent of future migrants likely to immigrate into the region

Such values[1] as have been established are reliant on a number of basic assumptions, which where possible have been validated by empirical or observed findings. Further assumptions are however necessary since they will control the format of the running of the projection. These include:-

(i) The fixing of the ratios between components of the population
(ii) The acceptance of existing observed trends in mortality and fertility rates etc
(iii) The limitations of the extent of migration into the sub-region.

(i) Fixing of Ratios

The first assumption is that the age/sex ratios existing between males and females for the age groups 0-4 will remain constant for each 5 year period. This means that all births recorded in the 5 year period will for the purpose of establishing the following periods population data base be classified in terms of the following fixed ratios[2].

YEAR/PERIOD		1970	
AGE GROUP	SEX	PROPORTION	% OF TOTAL BIRTHS
0-1	M	25	13
	F	22	12
2-4	M	75	38
	F	88	37

1. Refers to the established birth, death ratios etc. established in Tables XXXll, XXXlll etc.
2. Ratios obtained from 1970 Census population breakdown as estimated in Table XXX.

It would seem reasonable to assume that the ratios will not vary significantly between sexes over a 15 year planning period. In addition the infants at the beginning of the projection would not have attained an age whereby they would affect[1] the age specific birth rates at the end of the 15 year planning period.

(ii) Mortality and Fertility Rates

The second assumption requires that the age specific birth and death rates be accepted as being representative of both males and females jointly. While it is generally accepted that males have a higher mortality rate the overall increase in the population due to the imbalance between births and deaths is not likely to be significant, especially where there is an equal distribution of males and females, and where 50 percent[2] of the total population is under the age of 25 (i.e. in the low death rate category).

(iii) Migration

As has been established in 3.9.4.(ii)(B) it is necessary to determine the extent of migration. For the purpose of this model therefore it is assumed that:-

A. The total population increases projected for the periods 1970 - 1975, 1975 - 1980, 1980 - 1985 due to migration will represent the net intake of migrants. Thus the immigrants establishing themselves in the sub-region are likely to reproduce and die within the 5 year planning

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1. None of the infants in 1975 would be at a marriageable age by 1985 thus it is not necessary to establish the age sex breakdown for such a limited forecast.
2. Figures established from Table XXXV.

interval. Thus the gross increase in immigration equals:-

$i = a + b - d$ where i = Total additions by immigration
a = Estimated net immigrants
b = Total births in 5 years
d = Total deaths in 5 years

B. The established birth and mortality rates will apply equally to the existing and immigrant population[1].

C. The existing age/sex/marital status structure established for 1970 will continue throughout the planning period[2]. Using the aforementioned assumptions in conjunction with the empirical observations of 3.8.4. the framework for running the model is established.

3.9.7 Stage III The Projection

The general form of running the projection is as follows:-

(i) The returns of the 1970 census are tabulated in quinary i.e. 5 year age groups in terms of sex and marital status

(ii) The net migratory influx of migrants is established from Table VIII and the population is proportioned in terms of the ratios established in Table XXXII (i.e. for age/sex/marital status).

(iii) The appropriate age specific birth rates - as estimated in terms of 3.9.4(ii)(B) - are then applied successively to each group of women in the child bearing age group

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1. Age/sex survival rates are relatively stable over a period of time and are adequate for the purpose of this projection. Goodman and Freund Op cit p66.
2. This latter assumption is suspect but is based on the only data available. Since the in-migrant contribution to the total population growth is relatively small i.e. by age group, the degree of error is considered to be small.

15 - 49[1] and the total number of potential births for the 5 year projection period are established by a process of simple multiplication. It should be noted that both married women and those living together are to be considered as potential child bearers but that divorces and single Indian women giving birth to illigitimate children are excluded from the calculation. The results of the age specific birth rates are entered in columns 10, 17 and 20 in Tables XXXVll - XXXlX thus revealing the total number of births in any one year.

(iv) Age specific mortality rates as established in 3.9.5(ii) then applied to each age group as in (iii) above in order to determine the numbers who will survive to the next 5 year projection period.

These results are collated in columns 9, 16 and 19 of Tables XXXVll - XXXlX.

(v) Finally the net survivorship is established by letting:-

$$S = P + B - D$$

where S = Total number of male and female survivors in each age group

P = Total males and females in age group (i.e. both existing and migrant)

B = Total births taken place in each age group i.e. both existing and migrant

D = Total deaths in each age group for both existing and migrant population.

(vi) To establish the following 5 year period projection the total survivors from the previous quinquenium are then projected,

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1. The generally accepted ages for female reproduction lie between 15-49 years with the peaks during the mid-twenties. The birth rate drops appreciably in the 40's. J.B. McLoughlin Op cit p184.

with each age group moving up one age category so as to represent the ageing of the community. At the beginning of each cycle the new infants (i.e. those births recorded in the previous quinquenium period) are placed in the 0-4 year age category in the proportion established from Table XXXVll.

(vii) This sequence is repeated for each 5 year projection until the ultimate projection date is reached (see Tables XXXVll - XXXlX).

From the abovementioned tables a representation of the:-

(a) future structure of the Indian community, and

(b) the future quantitative population composition of the sub-region is acquired, which enables the planner to study the overall age/sex/marital status variations occurring within the community for any set period of time. Using the details of the population's structural composition it is possible to determine what the future trends in family size will be.

3.lO THE ESTIMATION OF FAMILY COMPOSITION

Thus far in the model, the sole accent has been focused on undertaking population projections for the sub-region. However, in order to determine future family size and its relationship to household size it is desirable to ascertain:-

A. Analyse the mean family size trends of both the permanent and migrant members of the society. It is therefore hypothesised that there is a significant difference between the two, and the research model thus has to attempt to test this assumption.

B. The relationship existing between family and non family (i.e. lodgers) members of the Indian community.

3.10.1 The analysis of mean family size

In order to ascertain statistically verifiable data about the nature of mean family sizes occurring in the project area, it is necessary to study:-

A. The 1970 census and 1975 migration census returns to establish the comparative distribution of families by size and determine their means.
B. The 1960 and 1970 census together with the migration survey information in respect of the relationship existing between family and non family members of the community.
C. The abovementioned census information to determine whether any meaningful variation has occurred in the mean family sizes over a period of one decade.

In respect of A above Tables XLlV and XLV set out the comparative distribution of families as determined from their respective survey results. Since the Marburg Migration Study represent approximately 50 percent survey, it is subject to degrees of error which can be easily calculated in terms of:-

3.10.2 The Relationship of the family to Non-family members

The next step in the research design is to analyse the influence of lodgers on the total accommodation available. This can be best achieved by comparing the percentage composition of family to non family members over as wide a period of time as possible[1]. An accurate assessment of the number of lodgers is important since it will indicate:-

A. What the state of the available accommodation is, and
B. To what extent the mean household sise is dependent on non family members for its structure.

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1. For the purpose of this Thesis the 1969 and 1970 Population Census returns are used as a comparative data base.

In addition to the permanent population the influence of lodgers on migrant families must be viewed. (As there were no recorded lodgers in the migrant households it has been assumed for the purpose of this study that lodgers exert insignificant influence on household formation and have consequently been ignored).

If it is assumed that the trends observed (for the combined results of the 'Permanent' and migrant studies) are maintained, then the future relationship of lodgers to family members can easily be computed. (See Table XLVl). In this table it is necessary to establish whether the relationship of family members to the total population will change dramatically since this will almost certainly affect the overall mean size of families in the future.

3.10.3 The Projection of Family Sizes

The final and last task in projecting future family requirements is to determine the mean size of family units over as wide a period as possible. Where again the 1960/1970 census reports provide a sound data source, which when combined with the results of 'Family - Non family study', provide an accurate record of variations (if any) in the mean family size. The mean family size is calculated by letting:-

$$\bar{x} = \frac{y - z}{f}$$

where $\bar{x}$ = Estimated family size

y = Total population

z = Observed member of non family members

f = Observed number of families

If once again it is assumed that the variation in mean family size determined in Table XLVl is maintained then:-

(a) The mean family size for each quinquenial projection period can be estimated, and

(b) The total number of families can be established

by relating the mean family size estimated in Table XLVll to the population estimates set out in Tables XXXVll - XXXlX.

For the estimation of migrant families an identical analysis takes place with one exception that the mean family size is established in terms of the upper and lower limits obtained from Table XLlX.

The total family projection is achieved by the combination of the results of both of the abovementioned studies and are based on the formula:-

$$x = \sum \left(\frac{A}{B} + \frac{C}{D}\right)$$ where x = Estimated number of families

A = Estimated number of permanent family members

B = Mean family size for permanent family members

C = Total migrant family members

D = Estimated mean family size of migrants

Having examined the family index in such detail it is necessary to determine its significance in relation to household structure and formation.

As can be seen from the findings in Chapter 4, the family unit exerts a tremendous influence on the form and size of the households. By analysing variations in family trends i.e. sizes, composition etc. the future housing demand can be determined; particularly once the relationship of families to households is established.

Thus if the findings of the age cohort survival analysis listed in Tables XXXVll - XXXlX, are related to those obtained from Table Ll, the peaks and troughs for future housing demand can be more accurately and closely scrutinised.

3.11 PROJECTION OF FUTURE HOUSEHOLDS

The study of household size and structure is more difficult to determine since changes in houehold composition are continually occurring due to:-

A. Pressures of overcrowding caused by inadequate accommodation
B. Changing cultural and economic ties and controls.

To estimate the future composition of households it is necessary to ascertain:-

(i) The percentage of the total population who are family member- of a community (See Table XLVll)
(ii) What the mean family size will be for each period in the projection (See Table XLlX)
(iii) The number of families per household which will indicate the extent and degree to which the community is adhering to multiple household living patterns.

Criteria (i) and (ii) have been determined in the estimation of the family size and it thus remains for the occupancy rate of families per household to be determined before the final estimate of household formation can be calculated.

The calculation of the ratio of families per household is achieved by studying both the 1967 Port Shepstone survey and 1970 Census returns, the results of which are processed in terms of the following formula to determine the mean annual increase or decrease in the ratio :-

$$R = \frac{\frac{P_1 - P_2}{H_1 \quad H_2}}{N}$$

Where R = Increasing/decreasing ratio of families per household per annum

P_1 = Total sample population of 1967 Marburg / Port Shepstone survey

H_1 = Total number of sample households

P_2 = Total population as at 1970

H_2 = Total households as at 1970

N = Number of years between observations i.e. 3.

Taking the rise or decline in the occupancy ratio of families per household, as observed from Table Lll as a guide, and assuming that the trend will be maintained the mean occupancy rate of families per household can be obtained (See Table Llll).

Combining the results of Table Ll (i.e. percentage of lodgers per population and mean family sizes for each 5 year projection period) with that of Table Llll, the relationship of each and its contribution to the overall change in household composition and size can be accurately gauged. This is done by letting[1] :-

$$\bar{X} = \frac{F.N.100}{R}$$

where $\bar{X}$ = Mean household size

F = Estimated mean family size from Table Ll

N = Estimated occupancy ratio of families per household obtained from Table Llll

R = Percentage of population who are family members in the community (see Table Ll).

Using this formula the total number of households likely to occur during each quinquenium can be observed.

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1. P.W. Johnston Op cit p6.

In Table LlV the final estimate of future housing demand is established in which age, sex, fertility and mortality rates, marital status, and family size composition have all been correlated to provide a controlled housing estimate.

As we have seen in Model I the projection of future housing demand represents only one stage in the total estimate since a large proportion of the existing housing is either inadequate or unsuitable to provide shelter for the existing population. Therefore it is necessary to combine the results of this projection with those obtained from the analysis carried out in Part III (i.e. overcrowding and recycling).

Since Model II's projection period originates in 1970 it is essential to determine the extent to which conditions of overcrowding persist and the scope for which the recycling of houses can counteract this condition. By combining the results of Table XXVll with those of LlV, Table LV is completed in which the gross demand for future housing is projected.

3.12 CONCLUSION

Model II is a sophisticated approach to the study of the problems of future housing demand in which disaggregated information and research studies are correlated to provide an overall picture of changing structures in the demand for accommodation.

Population growth is determined in terms of observed trends and this model unlike its predecessor is able to cater for and adapt to both short and long term variations in development trends. This advantage enables the Age Cohort Survival approach to mirror societal growth and change much more accurately than that observed in the 'Exponential Growth Curve' method.

Several sets of assumptions have been necessitated especially where data 'blanks' exist but it is to be remembered that the general methodological approach is being tested rather than the specific results

of the study.

In conclusion it can be seen from both of the aforementioned methodological approaches and the results of the studies contained in Chapter 4, that estimation of future housing demand is both practical and feasible provided the planner is granted a fair measure of latitude to make his basic assumptions.

CHAPTER FOUR

THE ANALYSIS AND INTERPRETATION OF DATA

'Analysis is not so much a matter of manipulating techniques as it is of the rigorous application of the basis of scientific method'

Goode and Hatte (1)

4.1 GENERAL INTRODUCTION

After completing the research design and acquiring the required data, the planner turns his attention to the 'analysis' and 'interpretation' of his results. Although detailed descriptions of the respective research methodologies used in deriving data have already been illustrated, no meaningful inferences can be drawn unless the correct and appropriate analytical tools have been used in the processing of the recorded data.

'Analysis' can be viewed as being the combination of these processes, namely:-

A. Interpretation
B. Explanation
C. Specification of data.

'Interpretation'refers to the examination of research data to determine what intervening variables are affecting the results of survey findings, while 'explanation' refers to the illustration of the relationship existing between variables. The third process namely, 'specification' controls the forces which govern the conditions under which correlations between variables will exist or change.

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1. Goode and Hatte : Methods in Social Research.

Analysis and interpretation have two basic functions to fulfil, these are the need to statistically describe the results of observed data in terms of an organised methodological approach and the ability to draw impressions from observed variables in order to provide answers to research questions posed. In essence therefore Chapter Four attempts to show how the possession of one attribute in a data bank is related to another, and also what measures are available for the illustration of the research findings.

4.1.1 The underlying principles governing the Analysis of Data

Although the analytical approaches used in this Thesis vary between models certain underlying principles are of universal application. These include:-

A. The systematic and orderly collation, processing and analysis of data, using suitable analytical tools
B. The constant cross referencing of data returns to indicate whether there are any potential flaws in the research methodology
C. The clear and concise display of data using graphical, tabular or statistical means.

(i) The order of Data Analysis

Although Chapter Three has dealt with the requirements of data collation and processing, it is also essential that data analysis should be systematically undertaken, for without it the mass of statistical data obtained and inferences made would be meaningless to the planner.

In this chapter data analysis has been undertaken in five stages

namely:-

A. The analysis of population growth
B. The analysis of family formation
C. The analysis of the incidence of extended family living
D. The analysis of overcrowding and the potential recycling of housing
E. The combination of the results of investigations A to E to derive the existing and future anticipated household size.

(ii) Cross Referencing of Data

In this chapter it will be seen how the results obtained from one particular analysis provides the data base for a further investigation and how independent analyses undertaken provide different results but make use of common data sources.

The cross referencing of data is an important control factor in any study since it provides the planner with means whereby he can gauge the accuracy of his work.

(iii) The Illustration of Data

The proper and precise illustration and presentation of data is a crucial aspect of any research programme. In order to analyse numerical data it is necessary to arrange the individual survey returns into a systematic order, whereby the planner can illustrate through statistical, graphical or mathematical means the theory inherent in the research programme. The success of a study depends on the clarity which can be achieved in representing the findings of a research study and therefore it is essential that there is both a logical ordering and accurate representation of data.

The illustration of data has two facets, namely

A. The measurement function which shows the extent of the distribution of data
B. The visual function which provides the means whereby the reader perceives the results of the respective investigations carried out in the study.

In respect of the measurement functions these two techniques have been used in this study, namely:-

(a) Measures of central tendency i.e. averages, means, medians, modes, etc.
(b) Measures of dispersion i.e. standard deviation, standard errors, correlation coefficients etc.

Both of the housing models used in this study have used a combination of the aforementioned techniques, and it is imperative that the planner knows what measure is to be applied and when it is to be used in any given situation.

The visual function is also served by two approaches, namely:-

AA. The construction of frequency distributions in tabular form
BB. The graphical representation of frequency distributions through graphs and histograms.

Both housing models make use of a combination of the aforementioned illustrated approaches and are designed in terms of the measurement criteria set out in AA and BB as aforementioned.

In designing a frequency distribution it should be noted that

(aa) There must be no overlapping of values

(bb) The quantities to be measured must be exclusive in character

(cc) All tabulations must have internal logic and order

(dd) Class intervals must be carefully chosen in terms of ascending and descending order, and that they should be of a uniform size.

(iv) The Analysis of 'Sample' and 'Absolute Data'

In this research use has been made of both 'absolute' and 'sample' returns each of which requires different measures of analysis.

In respect of the analysis of sample statistics it should be remembered that:-

A. Such returns are not necessarily accurate but mere representations of extracts from a 'universe'

B. The larger the sample the greater the accuracy and reliability of the returns will be since universes from which samples are drawn tend to be limited in size

C. An element of bias exists since it is not always possible to control all the variables where research studies are undertaken by independent research teams. No matter how refined a research programme's statistical analysis is, discrepancies are likely to occur between the absolute and relative findings of 'universe' and 'sample' surveys. The value of studying absolute data lies in its ability to provide an insight into the concrete relationship existing between variables, and an overall view of past trends in development. Sampling on the other hand provides a means whereby empirically derived observations and common sense ideas can be statistically described and interpretated within specified limits set by the planner.

Utilizing the theoretical requirements of the analytical approach advanced in this chapter the writer will now attempt to analyse and interpret the results of the respective studies carried out in pursuance of building up a picture of the existing population growth and housing situation occurring within the project area. The order of investigation will be that as set out in Chapter three of this study, so that a 'pyramid' model can be established, i.e. each source of information provides the basis for the following investigation. Easier cross referencing of data becomes possible.

4.2 MODEL I EXPONENTIAL GROWTH CURVE ANALYSIS

Model II which comprises 29 frequency distributions, which when combined, provide an estimate of the future housing requirements of the Marburg / Port Shepstone sub-region for the period 1970-1985. It will be seen that the analysis has attempted to interpret past growth trends i.e. population, family and household and has related such trends to projection methods.

4.2.1 The Analysis of Population growth

The initial requirement necessitates that the researcher obtain a clear view of the past development which has taken place in the sub-region. This can be effected by studying Table I in which past population growth is reflected.

TABLE I

POPULATION GROWTH 1911 - 1970[1]

ASIATICS

YEAR	1911	1921	1936	1946	1951	1960	1970	NET GAIN 1911-1970%
Marburg	57	80	563	909	1,328	2,134	3,172	3,115
Port Shepstone	119	136	661	895	1,153	1,233	1,975	1,856
Total - sub-region	176	216	1,224	1,804	2,481	3,367	5,147	4,971
Mean growth rate	-	2,1%	22,5%	3,4%	6,58%	3,45%	4,3%	7,1%

1. Urban and rural population of South Africa Report No. 02-02-01 Bureau of Statistics, Pretoria.

Of importance is to note that the growth has been reasonably stable except for two post war periods where there was an above average growth rate recorded. To some extent the mean average growth rate is unreliable since the growth of the 1930's has tended to skew the distribution quite considerably.

Within the period 1911-1970 the sub-regional population has multiplied twentyeightfold within 6 decades,which indicates a moderately high rate of growth. From the aforegoing Table it can be seen that relatively steady growth has taken place but that the growth rate has tended to quicken over the last 2 decades (i.e. 1950's, 1960's). This This is of primary importance for the assumptions to be made later in this chapter where short term projections are made on the basis of past trends discussed.

4.2.2 The Comparative Analysis of Population Distribution 1960-1970

In Tables II and III the respective census returns for 1960 and 1970 are illustrated. Since census enumerator district boundaries vary with each census undertaken it is to be expected that discrepancies will exist, and that the growth rates reflected in Table I might not reflect the true urban growth pattern.

TABLE II

THE COMPOSITION OF ASIATIC POPULATION (1960) BY ENUMERATOR SUB-DISTRICT AND SEX[1] (SEE MAP NUMBER 8 FOR E.S.D. BOUNDARIES)

E.S.D. NO	Area	Sex		
		Male	Female	Total
10	Marburg	1047	1087	2134
819	Shelly Beach farms	43	36	79
Sub Total	Marburg / Shelly Beach	1090	1123	2213
1	Port Shepstone	107	114	221
2	Port Shepstone	3	9	12
3	Albersville	505	495	1000
Sub Total	Port Shepstone / Albersville	615	618	1233
Total	Sub-region	1705	1741	3446

1. Data drawn from 'Abstracts of Enumerator Returns p11 (1960), Bureau of Statistics, Pretoria.

TABLE III

THE COMPOSITION OF ASIATIC POPULATION (1970) BY ENUMERATOR SUB-DISTRICT AND SEX[1] (SEE MAP NUMBER 9 FOR E.S.D. BOUNDARIES)

E.S.D. NO.	Area	Sex		
		Male	Female	Total
4145	Marburg	1,208	1,186	2,394
4153	Marburg	385	381	766
0021	Rathbonville	5	7	12
Sub Total	Marburg / Rathbonville	1,598	1,574	3,172
4150	Albersville	374	398	772
4151	Albersville	459	458	917
0008	Port Shepstone	87	76	163
0009	Port Shepstone	65	58	123
Sub Total	Albersville / Port Shepstone	985	990	1,975
4306	Shelly Beach farms	222	247	469
Total	Sub-region	2,805	2,811	5,616

Resultant from the analysis of Tables II and III it is apparent that discrepancies exist between the two census areas and that this is the result of the inclusion of a rural area in the 1960 returns. As this study is primarily concerned with the investigation of the urban Indian communities housing position it is necessary to equate the 1960 census with the thesis project area. In order to estimate the population living in E.S.D. 4306, it is necessary to estimate what the overall sub-regional growth rate is between 1960 and 1970 in terms of the formula set out in 3.4.2(ii), i.e.

$$N_i = 100\ (9{,}6\sqrt{\frac{5616}{3418}} - 1) = 6{,}09\%$$

and decrease the 1970 census return population interms of the mean annual growth rate i.e. 6,09 percent as calculated for the sub-region, together with its mean rural component.

1. Population Census Report No. 02-02-01(1970) p230 Bureau of Statistics, Pretoria.

TABLE 1V

ESTIMATED POPULATION AS AT MAY 1960 AND CORRECTED IN TERMS OF THE THESIS PROJECT E.S.D. BOUNDARIES (1)

Year	E.S.D. Number	Area	Sex Male	Female	Total
1960	3	Albersville	505	495	1000
	1 + 2 - 0021	Port Shepstone/ Rathbonville	105	116	221
	Sub Total	Albersville/ Port Shepstone/ Rathbonville	610	611	1221
1960	Net Marburg area				
	∑(10+819+0021)	Marburg and Shelly Beach	1095	1130	1933
	-(4306-D) (2)		138	154	292
	Sub Total		957	976	1933
	Total	Sub-region	1567	1587	3154

With the enumerator sub-districts equated for the 1960 and 1970 census returns the time growth rate for the project area is established. From Table V this growth rate is obtained for both the Marburg and Port Shepstone areas separately.

1. Statistics drawn from 'Abstracts of Enumerator Return' (1960, Bureau of Statistics, Pretoria.
2. To calculate D let = S - n (I + i)
   Where D = Total population increase in E.S.D. area 4306 between 1960-1970
   S = Total population in E.S.D. 4306 as at September 1970
   n = Time period (i.e. 9,67 years) between census
   i = Sub-regional growth rate referred to in 1 above.

TABLE V

A COMPARATIVE ANALYSIS OF POPULATION DISTRIBUTION BETWEEN CENSUS PERIODS 1960 - 1970[1] FOR THE THESIS PROJECT AREA

Area	(A) YEAR 1960			(B) YEAR 1970			DIFFERENCE B-A			MEAN ANNUAL GROWTH RATE
	SEX			SEX			SEX			
	M	F	T	M	F	T	M	F	T	
Port Shepstone / Albersville	610	611	1221	985	990	1975	375	379	754	5,10
Marburg / Rathbonville	957	976	1933	1598	1574	3172	641	598	1239	5,26
Total sub-region	1567	1587	3154	2583	2564	5147	1016	977	1993	5,19

1. Data drawn from Tables 111 and 1V.

The results reveal that there is less than a 1 percent difference in the mean annual growth rate between that of the project area and the entire sub-region, (i.e. including rural component), which tends to suggest that the rural growth rate is slightly higher than the urban growth occurring in the Port Shepstone area. It should be noted that there is only a marginal difference in the population growth rates of both Port Shepstone and Marburg, which indicates that both suburbs have developed simultaneously and at comparable rates.

These findings assist the planner in formulating the assumption that past growth trends will tend to indicate the future growth patterns unless affected by socio-economic, political or town planning factors which are beyond the scope of this study.

4.2.3 The Projection of the Annual Population Growth 1960-1970

Using the growth rate estimated in 4.2.2, Table V1 and Graph 1 can be compiled, which represents the estimated population increase for each of the constituent areas on a yearly basis. The estimates allow for an even

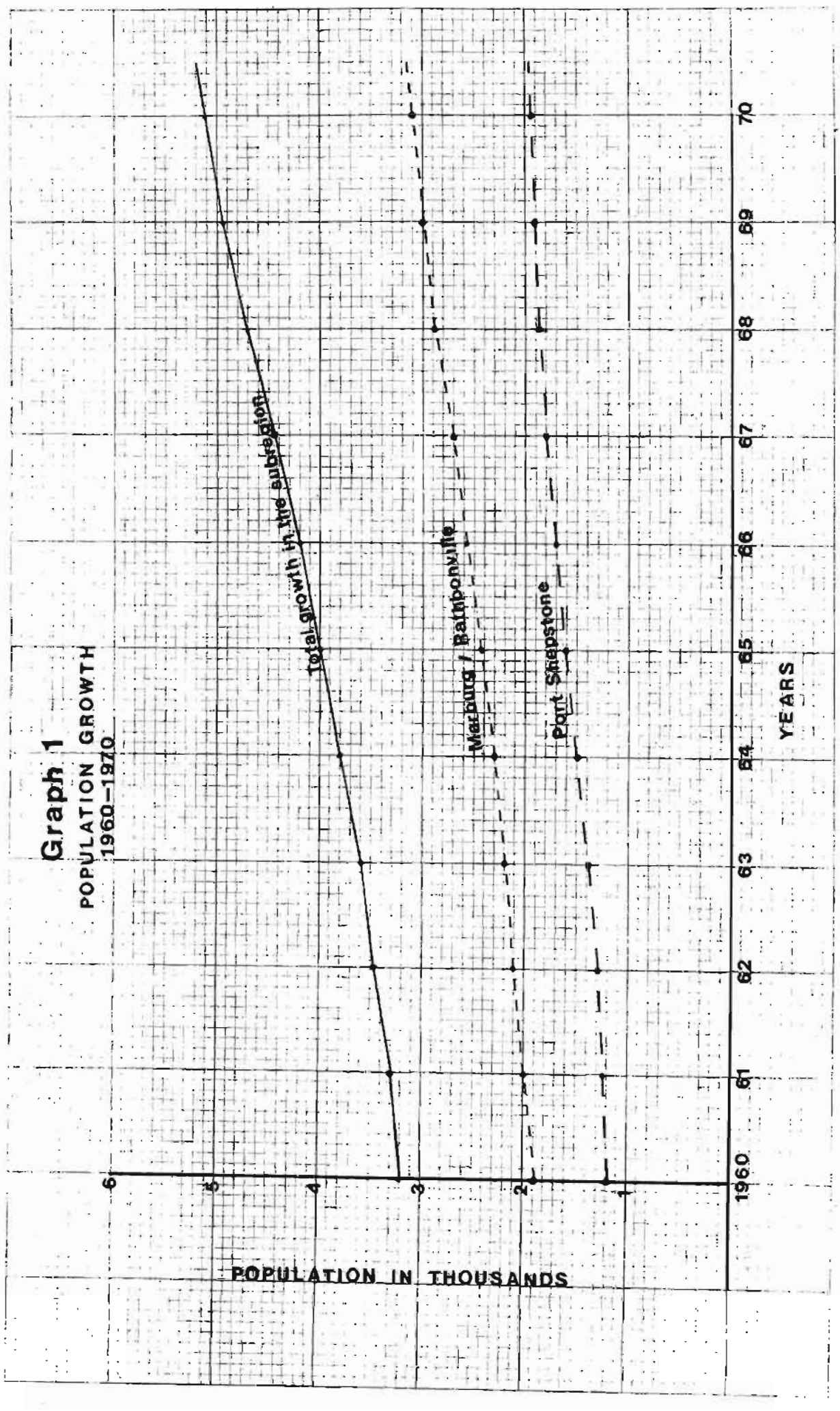
TABLE V1

POPULATION ESTIMATES FOR ASIATICS BY SUB-REGION

X YEAR

Area / Year	Marburg/Rathbonville	Port Shepstone/Albersville	Region Total estimated population
1960[1]	1933	1221	3154
1961	2035	1283	3318
1962	2142	1348	3490
1963	2255	1417	3672
1964	2372	1490	3862
1965	2497	1566	4063
1966	2629	1645	4274
1967	2767	1729	4496
1968	2911	1818	4729
1969	3065	1910	4975
1970[2]	3172	1975	5147

1. The 1960 population estimates are based on the population returns from Table 1V,
2. The 1970 population statistics are drawn from population census report 02-02-01, 1970, Bureau of Statistics, Pretoria.


Graph 1
POPULATION GROWTH
1960–1970
Total growth in the subregion
Maroubra / Ramponville
Port Shepstone
POPULATION IN THOUSANDS
YEARS
1960
61
62
63
64
65
66
67
68
69
70
1
2
3
4
5
6

upward growth curve of between 5,10 percent and 5,26 percent as estimated from Table V. From Table Vl a data base is acquired which can be used in the estimation of the net increase due to Migration and Natural Increase factors.

4.2.4 The Determination of Population Growth for Period 1964 - 1971

The results obtained from Table Vl only reflect the overall growth patterns, and for any housing survey to be successful it is necessary to examine the detailed composition of the population growth. The net growth can only be interpreted once a reliable data base is formulated and therefore the results of Table Vl are combined with the data returns drawn from the census reports covering births and deaths to reveal the true extent of population increase. (See Table Vll and Graph 2).

Graph 2

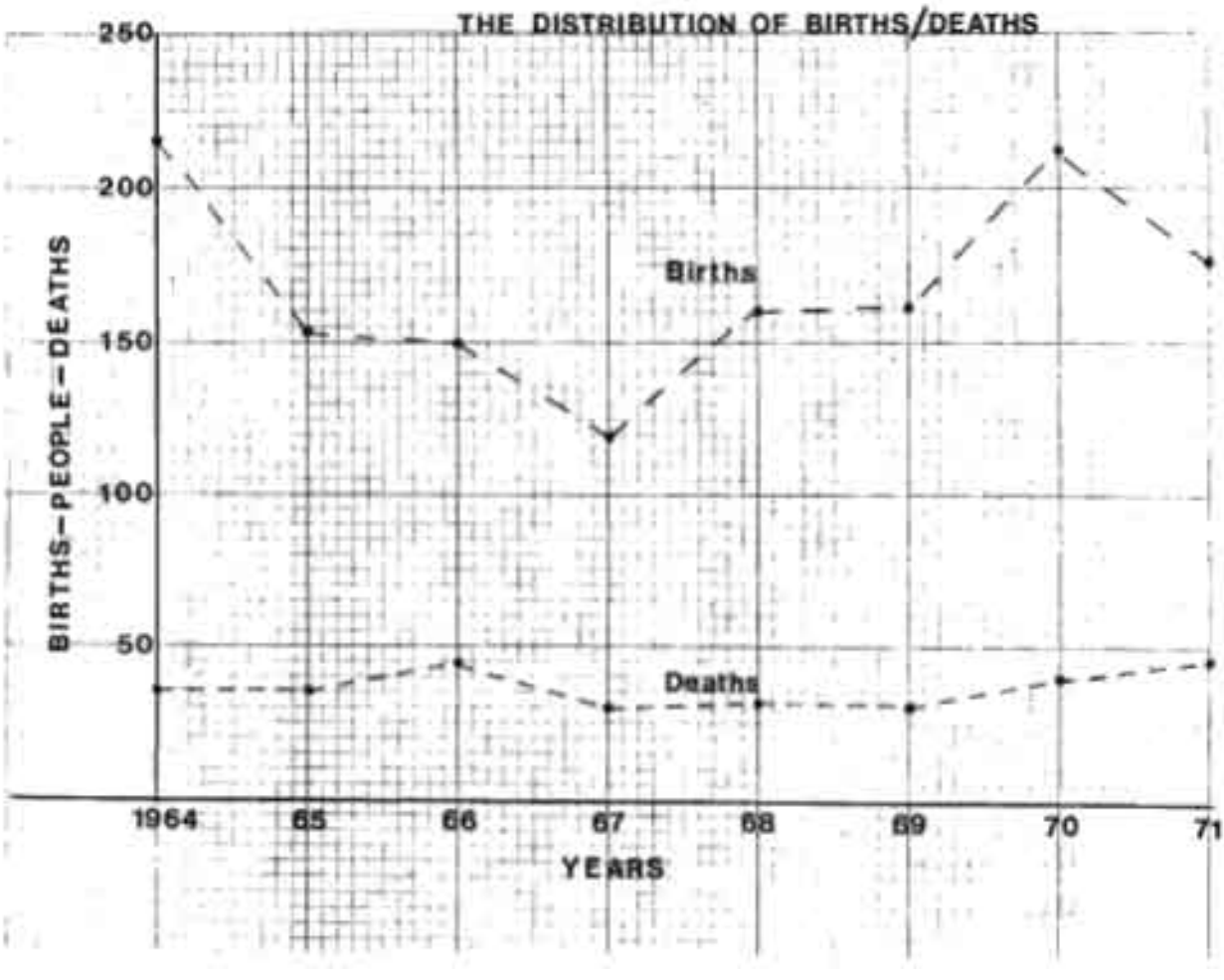


TABLE V11

THE ANALYSIS OF MIGRATION AND NATURAL INCREASE[1] TRENDS OF THE ASIATIC COMMUNITY FOR THE SUB-REGION FOR THE PERIOD 1964-1971

Year	Estimated Pop.	Recorded[2] Births in Sub-Region	Recorded[3] Deaths in Sub-Region	Estimated[4] Births in E.S.D. Area	Estimated Deaths in E.S.D. Area	Estimated Natural Increase	% Growth per annum Natural Increase	Estimated Net Migration	% Growth Per Annum Migration
1960	3154	91							
1961	3318	96							
1962	3490	124							
1963	3672	110							
1964	3862	231	39	216	37	+179	4,6	+22	0,6
1965	4063	164	38	154	36	+118	2,9	+93	2,3
1966	4274	160	58	150	45	+105	2,5	+117	2,7
1967	4496	128	34	120	32	+88	2,0	+145	3,2
1968	4729	172	35	161	33	+128	2,7	+118	2,5
1969	4975	174	34	163	32	+131	2,6	+128	2,6
1970	5234	227	45	213	42	+171	3,3	+101	1,9
1971	5506	191	48	179	45	+134	2,4	+152	2,8
1972	5792								
	Total	1868	321	1356	302	+1054		+876	
	Mean P.A.	155,67	40,13	169,50	37,75	131,75	2,87	109,5	2,32

1. The Births and Death estimates are based on the Bureau of Statistics Birth and Death Census Results.
2. Report on Births Report No 07-01-01 1971, Bureau of Statistics, Pretoria.
3. Report on Deaths Report No 07-03-01 1966, Vol 2 RP63/1965.
   Report No 10-03-02 1971
   Bureau of Statistics, Pretoria
4. The Estimated Births and Deaths are calculated in terms of 3.3.1(v)(vi).

From the results of Table V11 and Graph 1 it can be seen that:-

(i) An inordinately high population growth rate has been experienced in the sub-region. A comparative analysis of the growth rates for similar regions i.e. Park Rynie[1] 3,4 percent per annum (1975), Verulam / Tongaat 2,47 percent per annum (1970[2] and metropolitan Durban 3,5 percent per annum between 1960 and 1970[3] - reveals that the project sub-region's growth is substantially above that of other Indian areas in Natal.

(ii) Of the total population growth experienced 55,3 percent was derived from Natural Increase and 44,7 percent from Immigration[4]. The rate of net immigration is thus a major precipitator of population growth, and if left unchecked will pose considerable problems for the future provision of housing in the sub-region.

(iii) The overall growth rate is higher than for the period 1950-1970 but below the mean established in Table 1. Whether this growth of 5,19 percent per annum (See Table V11) can be maintained during the period 1970-1985 will depend on a variety of factors e.g. employment opportunities, socio-economic considerations, availability of land and political influences.

(iv) The current mean birth rate i.e. 40 births per 1000 people is substantially higher than that for metropolitan Durban area (i.e. 30 births per 1000)[5]; while the sub-region's estimated death rate of 8 persons per 1000 is higher than that for Durban (i.e. 7 deaths per 1000 people). Since births outnumber deaths

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1. Data obtained from Singh, consultant town planner for the area.
2. A Natal Indian Community G.G. Maasdorp, p12.
3. Bulletin of Statistics, Vol. 9 No. 1, pp1-2, Dept. of Statistics, Pretoria.
4. Data drawn from Table V11.
5. Metropolitan Durban Birth and Death rates drawn from P.W. Johnston's work Op cit p4.

as at 1970, by a 5:1 ratio it can be confidently expected that if the current trend continues that there will be a high population growth in the sub-region, due to natural increase. Since migration is also likely to have a pronounced influence on population growth it would appear certain that the high birth rate will be maintained during the planning period.

(v) There have been short term fluctuations in the growth rates of both natural increase and in-migration, but that such dispersions have not deviated significantly from the established means or modes[1]. The significance of this finding for the planner is that past growth over the period 1965-1971 has been relatively stable[2].

4.2.5 Population projections for the period 1970-1985

Assuming that past growth trends will continue and that the rates established in Table Vll will reflect the population increase for the following 15 year period, projections of population growth in 5 year periods become possible, the results of which are portrayed in Table Vlll and Graph 3.

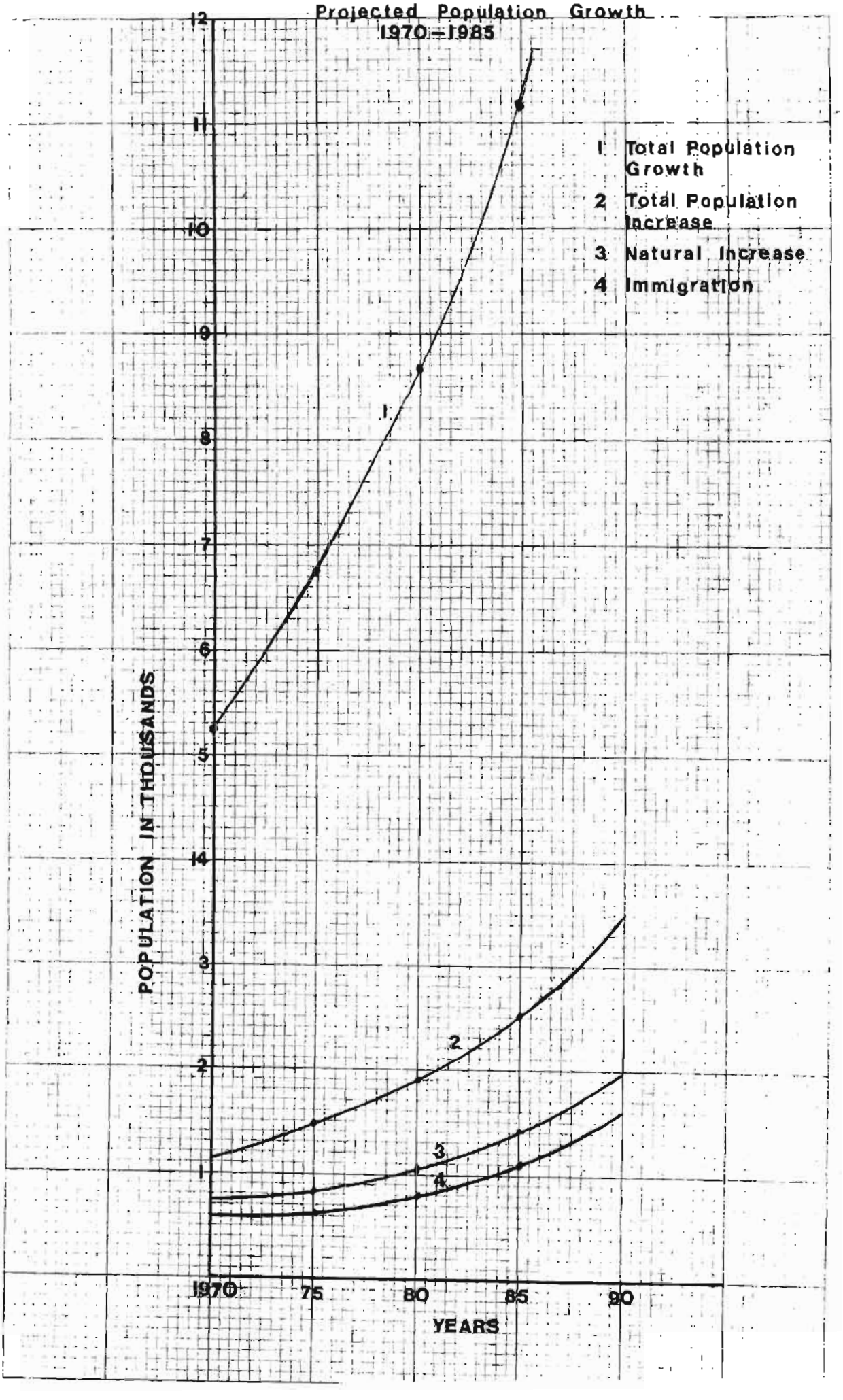
TABLE VIII

POPULATION PROJECTIONS FOR PERIOD 1970 - 1985[3]

YEAR	ESTIMATED POPULATION	ESTIMATED POPULATION GROWTH FOR 5 YEARS DUE TO NATURAL INCREASE	ESTIMATED POPULATION GROWTH FOR 5 YEARS DUE TO MIGRATION	ESTIMATED POPULATION GROWTH FOR 5 YEAR PERIOD
1970	5234	833	673	1506
1975	6740	1073	868	1941
1980	8681	1382	1117	2499
1985	11 180	-	-	-
TOTAL INCREASE		3288	2658	5946

1. The maximum deviation is 15 percent which is an acceptable limit for projection purposes.
2. The 1964 returns appear to be suspect, but if ignored the remainder of the returns appear valid and reliable for the purpose of this Thesis
3. The projections are based on 2,87 percent (compound) growth for natural increase and 2,32 percent (compound) growth for migration as estimated in Table Vll.

Graph 3


Projected Population Growth
1970–1985
1 Total Population Growth
2 Total Population Increase
3 Natural Increase
4 Immigration
POPULATION IN THOUSANDS
12
11
10
9
8
7
6
5
4
3
2
1
1970
75
80
85
90
YEARS

In terms of this Table it can be expected that the existing population of the Marburg / Port Shepstone sub-region will double itself[1] within the 15 year planning period and that a substantial portion (i.e. 42 percent) of this population increase will be resultant from in-migration into the area. This has important consequences for the future projection of housing needs as the rate of present housing construction will have to be vastly increased to meet future requirements.

4.2.6 The comparative analysis of the distribution of Indian Families in the Marburg / Port Shepstone sub-region as at 1960-1970

Having successfully projected the additional population it is necessary to determine what the characteristics of the past family formation have been, and what observed changes have taken place in the unit family size. From such estimates the planner obtains a rough guide as to what the future housing requirements will be. In Tables 1Xa,b and c the distributions of the family size structures of the Marburg / Port Shepstone areas are illustrated separately, while Table 1Xd provides a summary of the mean family sizes occurring in the sub-region between censuses.

TABLE 1X (a)

THE DISTRIBUTION OF FAMILIES X SIZE FOR PORT SHEPSTONE AS AT 1960-1970[2]

	NO. OF HOUSEHOLDS					POPULATION				
DISTRICT	PORT SHEPSTONE					PORT SHEPSTONE				
FAMILY	YEAR					YEAR				
SIZE	1960	%	1970	%	NET DIFF $\bar{X}$	1960	%	1970	%	NET DIFF %
2	22	10.4	40	10,1	-0,3	44	4,0	80	4,0	-
3	37	17,4	68	17,2	-0,2	111	10,1	204	10,3	+0,2
4	32	15,1	75	19,0	+3,9	128	11,7	300	15,1	+3,4
5	37	17,4	72	18,2	+0,8	185	16,9	360	18,2	+1,3
6	29	13,7	56	14,2	+0,5	174	15,9	336	17,0	+1,1
7	21	9,9	36	9,1	-0,8	147	13,4	252	12,7	-0,7
8	16	7,6	21	5,3	-2,3	128	11,7	168	8,5	-3,2
9	8	3,8	13	3,3	-0,5	72	6,6	117	5,9	-0,7
10+	10+	4,7	14	3,6	-1,1	106	9,7	164	8,3	-1,4
TOTAL	212	100	395	100	+0,2	1095	100	1981	100	0
$\bar{X}$ FAMILY SIZE										
SIZE						5,17		5,02		

1. These projections compare favourably with those of Messrs. Thorrington-Smith, Rosenberg & McCrystal in their publication entitled 'A Town Planning Report for the Borough of Port Shepstone', p27, in which the projected Asiatic population for the sub-region is estimated at 10 800 for the yr 1990.
2. Population Census Report (1960) Vol 11 No. 2 p239, Bureau of Stats,Pretoria. Population Census Report (1970) No. 02-03-01,p230, Bureau of Stats,Pretoria.

TABLE IX (b)

THE DISTRIBUTION OF FAMILIES X SIZE FOR MARBURG AS AT 1960 / 1970.

	NUMBER OF HOUSEHOLDS					POPULATION				
DISTRICT	MARBURG									
FAMILY SIZE	YEAR 1960	%	1970	%	NET DIF $\bar{X}$ %	YEAR 1960	%	1970	%	NET DIF %
2	40	10,7	44	8,7	-2	80	4,0	88	3,1	-0,9
3	60	16,1	77	15,2	-0,9	180	9,0	231	8,2	-0,8
4	63	16,9	72	14,2	-2,7	252	12,6	288	10,3	-2,3
5	52	14,0	76	15,0	+1,0	260	13,0	380	13,5	+0,5
6	40	10,8	68	13,4	+2,6	240	12,0	408	14,5	+2,5
7	37	10,0	84	16,6	+6,6	259	13,0	588	20,9	+7,9
8	32	8,6	32	6,3	-2,3	256	12,8	256	9,1	-3,7
9	27	7,3	23	4,5	-2,8	243	12,2	207	7,4	-4,8
10+	21	5,6	31	6,1	+0,5	229	11,4	364	13,0	+1,6
TOTAL	372	100	507	100	+1,8	1999	100	2810		0
$\bar{X}$ FAMILY SIZE						5,37		5,54		

TABLE IX (c)

THE DISTRIBUTION OF FAMILIES $\bar{X}$ SIZE FOR SUB-REGION AS AT 1960 / 1970

	SUB-REGIONS HOUSEHOLDS					POPULATION				
FAMILY SIZE	YEAR 1960	%	1970	%	NET DIF $\bar{X}$ %	YEAR 1960	%	1970	%	NET DIFF %
2	62	10,6	84	9,3	-1,3	124	4,0	168	3,5	-0,5
3	97	16,6	145	16,1	-0,5	291	9,4	435	9,1	-0,3
4	95	16,3	147	16,3	-	380	12,3	588	12,3	-
5	89	15,2	148	16,4	+1,2	445	14,4	740	15,4	+1,0
6	69	11,8	124	13,8	+2,0	414	13,4	744	15,5	+2,1
7	58	9,9	120	13,2	+3,3	406	13,1	840	17,5	+4,4
8	48	8,2	53	5,9	-2,3	384	12,4	424	8,9	-3,5
9	35	6,0	36	4,0	-2,0	315	10,2	324	6,8	-3,4
10+	31	5,3	45	5,0	-0,3	334	10,8	528	11,0	+0,2
TOTAL	584	100	902	100	+0,1	3093	100	4791	100	0
$\bar{X}$ FAMILY SIZE						5,30		5,31		

TABLE 1X (d)

ESTIMATES OF MEAN FAMILY SIZE X AREA X TIME[1] AS AT 1960 - 1970

YEAR AREA	1960 Population[2]	No of Fams	$\bar{X}$	1970 Population	No of Fams	$\bar{X}$
Port Shepstone	1094	212	5,16	1981	395	5,02
Marburg	1999	372	5,37	2810	507	5,54
Sub-region	3093	584	5,3	4791	902	5,3

From the aforegoing distributions certain traits reveal themselves. These being:-

(i) that there is a minimal variation in family size between the more urbanized Port Shepstone area and Marburg, its more rurally orientated hinterland.

(ii) little variation has occurred in the size of families between censuses, therefore it can be concluded that socio-economic factors together with family planning tuition have had little influence on determining the size of family structure. For the purpose of this study it would therefore appear safe to assume that the size of family structures will remain relatively constant unless external influences occur to change past trends.

(iii) medium sized families (i.e. from 5 to 7 persons per family) appear to be in the ascendancy while both larger and smaller family units appear to be in decline. This particular trait may, as will be investigated in Model II of this study, reveal a pattern of changing age structure in the community.

1. Population Census Report Vol 11 No. 2 p239 (1960), Bureau of Statistics, Pretoria.
2. The population referred to are family members and not the total populations.

(iv) that the mean family size is substantially below the estimated mean household size as estimated in Table XlV. This indicates that there is either a high incidence of multiple family dwelling in households or that there is a large proportion of non family members i.e. lodgers, residing in the community.

4.2.7 The analysis of the proportional relationship of family to non family members

In Chapter Three it has been seen that the mean family size does not necessarily represent the minimum household size and it is essential to determine what influence non family members have on raising the minimum household size. In Table X it can be seen that:-

TABLE X

THE PROPORTIONAL RELATIONSHIP OF FAMILY TO NON FAMILY MEMBERS OF THE COMMUNITY FOR 1960 - 1970[1]

YEAR	1960	%	1970	%
Total population	3418	100	5212	100
Total family members	3171	92,77	4791	91,92
Total non family members	247	7,23	421	8,08
Mean family size	5,30		5,31	
Number of lodgers per family	0,42		0,47	

(i) There has been a 0,005 increase per annum in the number of lodgers per family in the community. Assuming that this rate of increase is maintained throughout the planning period it can be expected that the minimum possible household size would be 5,85 persons per household (i.e. if the extended family living pattern was phased out completely from the sub-region).

1. Data drawn from Bureau of Statistics, Population Census Vol 11 No.2 1960 p239, and Bureau of Statistics, Population Census Report No. 02-03-01 1970 p230.

(ii) The number of family to non family members is in decline. This suggests that a large number of in-migrants coming into the area are unrelated to the existing community and that because of the housing shortage many migrants are being forced to seek accommodation within existing established households. Should this trend continue it can be expected that a large proportion of the additional housing requirements will be needed to acoommodate single migrants who have come into the sub-region in search of employment or educational facilities.

4.2.8 The extended family and its influence on the housing provision

As has been determined in Table X not all household members are family members and since lodgers constitute only approximately 8 percent of the total population they consequently increase the mean family unit size by 0,47 persons per household. The discrepancy which exists between the estimated mean household size as indicated in Table XlV and the mean family size illustrated in Table lXd is therefore not solely dependent on the influence of lodgers but also to a large extent on multiple family living. Thus an examination of Table Xl which is compiled from the Marbburg Household Survey 1971, reveals that the proportion of multiple households (i.e. 32 percent of total households) is low in comparison to former times and areas of comparable development. The ratio of l dwelling

TABLE Xl

THE ANALYSIS OF THE INCIDENCE OF EXTENDED FAMILY LIVING AS AT 1971 (1)

	RECORDED RETURN	% COMPOSITION
Total sample population	4555	100
Total family members	4325	94,91
Total non family members	232	5,10
Total families	808	100
Total households	643	100
Total multiple households	207	32
Ratio of families to households		1: 1,26
Ratio of non family members to households		1: 0,28

1. Data drawn from Marburg Household Study 1971.

to 1,26 families is considerably lower than the existing ratio in Isipingo[1] i.e. 1,7 families per household as at 1974, which suggests that:-

(i) there is an increasing incidence of nuclear family and household formation taking place in the Marburg / Port Shepstone sub-region,

(ii) resultant from (i) above, the cultural and social ties of the Indian community are being eroded indicating a definite movement away from the traditional life styles described in Chapter Two,

(iii) the mean household size is likely to drop in the future, as more nuclear families are established.

The anticipated decline in the incidence of extended family living is supported by the findings of G.G. Maasdorp and P.N. Pillay[2] who observed a decline in multiple household living amongst the Indian communities of the East Rand. The factors favouring such a trend would appear to be:-

A. Household discord
B. Greater personal independence both socially and economically
C. The decline in traditional ties
D. The need for greater family privacy.

Although it is expected that there will be a gradual decline in the incidence of multiple household living during the planning period, a number of factors may well however retard this process. The three most important restrictive conditions influencing multiple living patterns would appear to be:-

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1. H.L. Watts Op cit p19.
2. G.G. Maasdorp and P.N. Pillay Op cit p28.

(a) the effects of economic considerations which may enforce the continued residence of younger family units within their traditional homes,

(b) the shortage of housing and accommodation, the latter becoming more evident once the analysis of overcrowding is completed,

(c) the shortage of economically priced land which would enable prospective home owners to build their own homes.

The study of the effects of multiple household living is of particular importance for the evaluation of the possible recycling of housing, since housing units which are currently inadequate in terms of their existing family numbers, may well be capable of housing one or two families in a multiple household unit.

4.2.9 The projection of family formation for period 1970-1985

Assuming that past observed trends in changes of the mean family size and the proportional composition of family members to non family members in the community will be maintained throughout the planning period, it is possible to project the future family composition of the Indian community which is resultant from growth due to natural increase and in-migration. In Table XII it can be seen that the:-

(i) The proportion of lodgers (i.e. non family members) residing in the community will increase significantly by 1985, and that the number of lodgers will double within the planning period.

(ii) Conversely, the proportion of family members will decrease, but this will not have any marked effect on family formation which will continue to grow at the rate of 7,9 percent per annum, which is considerably higher than the 5,3 percent estimated for population growth.

TABLE XI1[1]

ESTIMATES OF THE NUMBER OF FAMILY AND NON-FAMILY MEMBERS LIKELY TO ACCRUE THROUGH IN-MIGRATION AND NATURAL INCREASE FOR THE PERIOD 1970-1985

Category	Total Pop	Total Fams	%	Projected Pop Inc	Projected Fam Inc	%	Projected Pop Inc	Projected Fam Inc	%	Projected Pop Inc	Projected Fam Inc	%	Pop Increase 1970-1985	Family Increase 1970-1985
Total Pop	5212		100	1506		100	1941		100	2499		100	5946	
Est Non-fam members	421		8,1	127		8,4	173		8,9			9,3	532	
Total family members	4791	902	91,9	1379	260	91,6	1768	334	91,1	2267	428	90,7	5414	1022
Projected natural inc families			55,3	763	144	55,3	978	185	55,3	1254	237	55,3	2995	566
Projection in-migrattion families			44,7	616	152	44,7	790	196	44,7		250	44,7	2419	598
SUB TOTAL		902		1506	260		1941	334		2499	428		5946	1022
GRAND TOTAL	5212	902	100	6740	1162	100	8681	1496	100	11,180	1924	100	5946	1022

1. Data drawn from Tables Vlll, lXd and XLVl. The percentage of family composition is calculated in terms of the formula in 3.

(iii) The higher family formation rate can therefore be attributed to changing age and marital status which indicate that more members of the community are likely to move into the family formation group i.e. 20-40 age group as the society progressively ages.

(iv) The projected number of families likely to accrue to the region by 1985 will be three times that of the existing number of families as at 1970. This provides clear evidence that in order to provide enough accommodation for families, i.e. excluding the increasing number of non family people who will combine to form units - a massive housing construction programme will be necessary to accommodate the future population increase. However a limited proportion of the projected increase in families are likely to reside in extended family households which will marginally reduce the overall demand for additional housing units.

4.2.10 The analysis of household formation

While estimates of the number of families accruing to the sub-region are desirable, by far the greater in importance for the planner is an estimate of the number of dwelling units which will be required to meet future needs. In Table XIII and Histogram I the respective distribtuion of households for 1967 and 1971 are displayed, and from these two data sources[1] an indication of short term shifts in household composition can be obtained.

In terms of the findings of the two sample returns there is a decline

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1. Both data sources are samples and are consequently subjected to a number of sources of error e.g. errors of content, inadequate sampling, non-response bias and probability factors, which can be statistically computed since both comprise 'controlled' stratified samples.

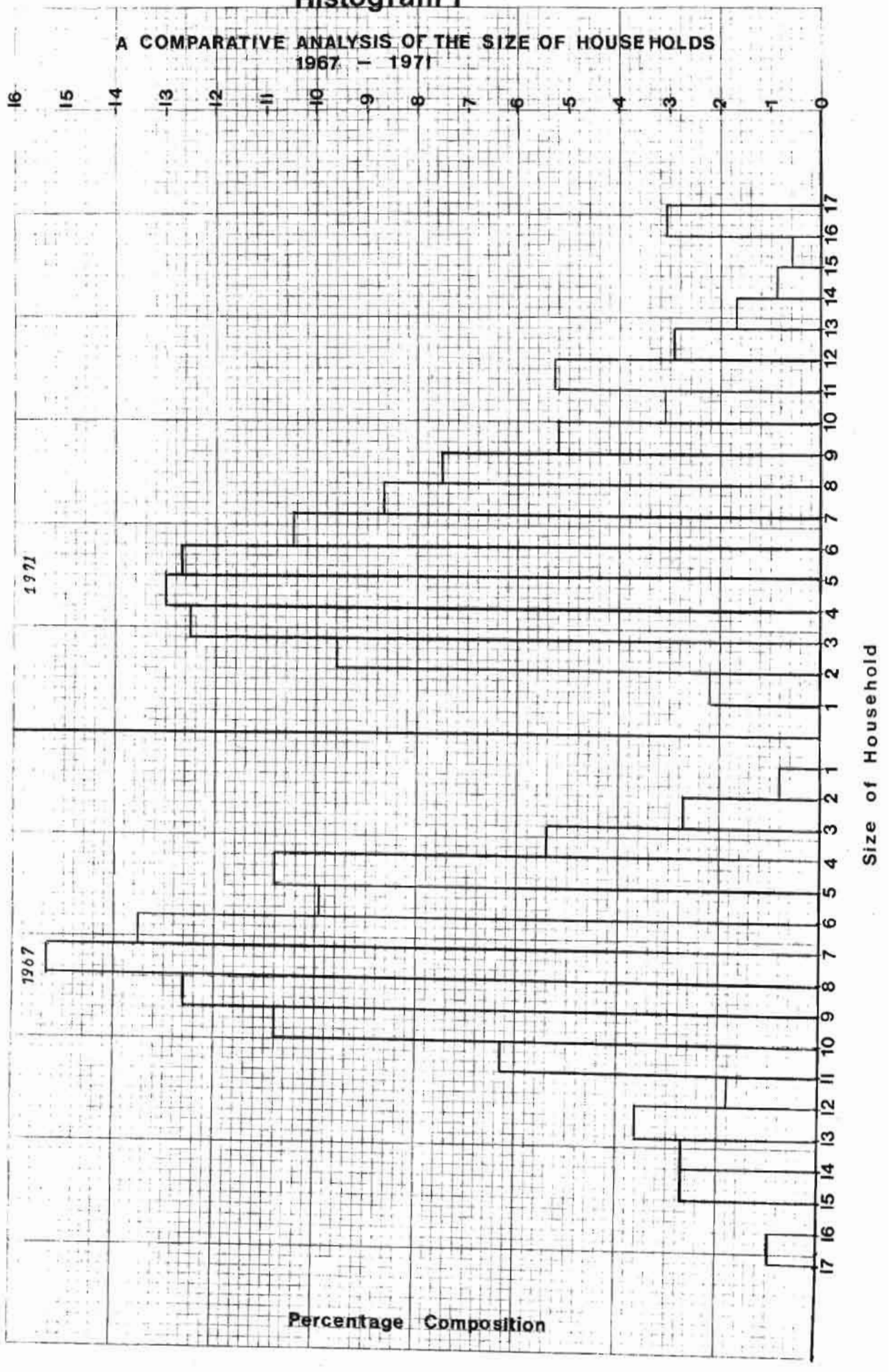
TABLE XIII

A COMPARATIVE ANALYSIS OF HOUSEHOLD SIZE X POPULATION FOR 1967-1971 SURVEYS

Year	1967 (1)				1971 (2)			
H/H size	No of H/H	%	Population	%	No of H/H	%	Population	%
1	-	-	-	-	1	0,02	1	-
2	1	0,9	2	-	14	2,18	28	0,61
3	3	2,7	9	0,10	62	9,64	186	4,08
4	6	5,4	24	2,65	80	12,44	320	7,03
5	12	10,8	60	6,63	84	13,06	420	9,22
6	11	9,9	66	7,29	82	12,75	492	10,80
7	15	13,5	105	11,60	68	10,58	476	10,45
8	17	15,3	136	15,03	56	8,71	448	9,84
9	14	12,6	126	13,92	48	7,47	432	9,48
10	12	10,8	120	13,26	34	5,29	340	7,46
11	7	6,3	77	8,51	20	3,11	220	4,83
12	2	1,8	24	2,65	34	5,29	408	8,96
13	4	3,6	52	5,75	19	2,95	247	5,42
14	3	2,7	42	4,64	11	1,71	154	3,38
15	3	2,7	45	4,97	6	0,93	90	1,98
16	-	-	-		4	0,62	64	1,41
17	1	0,9	17	1,88	20	3,11	233	5,12
TOTAL	111	100	905	100	643	100	4555	100

1. H/H size data based on extracts from the Port Shepstone Survey 1967.
2. H/H size data drawn from the Marburg Household Study 1971.

Histogram 1


A COMPARATIVE ANALYSIS OF THE SIZE OF HOUSEHOLDS
1967 – 1971
16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
1971
1967
17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
Percentage Composition
Size of Household

in the mean household size from 8,1 (1967)[1] to 7,1 (1971) which is consistent with prevailing trends in comparable Indian areas elsewhere in the country. Apart from the observed decline in mean household size there is a noticeable decrease in the incidence of large size households with a comparable increase in households of up to a maximum of six persons per housing unit. Since family size has been seen to be stable, the decline in household size must therefore be attributed to:-

(i) possible sampling error
(ii) a real decline in family size during the planning period
(iii) a decline in multiple household living with a resultant decrease in the recorded household sizes as measured in 1971
(iv) a reduction in the number of lodgers residing in established household.

Whereas the analysis of family structures make use of census data, which reflects the whole universe, the analysis of household data is only made possible through sampling means which provide a representation of the universe studied within the specified limits. All sample results are subject to errors and degrees of variance and for this purpose the formula set in 3.4.1 i.e. $\sigma = \frac{S.D.}{\sqrt{n}}$ must be used to determine what the possible variation in the limits of the mean household sizes for the two aforementioned data sources will be. For the 1967 study the standard error is calculated at σ = ,52[2] while the 1971 error is σ = 0,9 (both taken at the 95 percent confidence level).

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1. The mean household sizes are calculated by letting $\bar{z} = \frac{x}{y}$
   where $\bar{z}$ = mean household size
   x = sample population at year n
   y = number of families at year n
   (i) 1967 = $\frac{905}{111}$ = 8,1
   (ii) 1971 = $\frac{4555}{643}$ = 7,1
2. The 1967 survey result has a far higher standard error than that of the 1971 return because of the former's small sample size and universe.

Using the mean household size estimated in Table XIII, together with the deviations calculated in terms of the formula set out in 3.4(i), Table XIV is constructed in which it can be seen that:-

TABLE XIV

ESTIMATED NUMBER OF HOUSEHOLDS IN THE MARBURG / PORT SHEPSTONE SUB-REGION AS AT 1967 / 1971

YEAR	1967		1971
POPULATION	4496		5506
EST. $\bar{x}$ H/H SIZE	EST. NO OF H/H	EST. $\bar{x}$ H/H SIZE	EST. NO OF H/H
8,67	519	7,17	768
8,15	552	7,08	778
7,63	589	6,99	788

the total growth[1] in the number of households varies between surveys by:-

Minimum estimated growth 6,8 percent per annum
Maximum estimated growth 11,09 percent per annum

These results reveal a higher growth trend for household formation than that expected for either population (5,19 percent per annum) or family formation (6,8 percent per annum). This in turn suggests that:-

A. an increasing number of households are being formed beyond that essentially required to accommodate population growth due to natural increase and in-migration,

1. It is acknowledged that the growth trends indicated for such a small period of time may tend to be inaccurate but since this Thesis is primarily aimed at establishing a methodological approach to the study of housing, such deficiencies in interpretations (e.g. using small time based observations for projection purposes) as exist must be overlooked for the purpose of this study.

B. the difference existing between household formation and family formation must represent the extent to which non family members are occupying accommodation in the sub-region on a household basis. (i.e. groups of unrelated persons are setting up their own households).

C. there is a definite fragmentation of existing family units with most probably the younger members hiving off to form separate households or emigrating out of the sub-region.

4.2.11 The analysis of family formation

The findings of Table XV reveal that over 50 percent of the total

TABLE XV

THE ANALYSIS OF FAMILY FORMATION AS AT 1971

CATEGORY	NUMBER	%
Total number of expanding families	422	52,2
Total number of stationary families	309	38,2
Total number of contracting families	77	9,6
Total number of families	808	100

number of families as at 1971 were in the process of expanding thus it is to be expected that there will be a greater demand for larger sized dwelling units or a movement towards obtaining individual homes which are suitable to accommodate the expanding family. Table XXV however reveals that there is an acute shortage of accommodation within the permanent housing stocks which signifies that:-

A. those families who are currently expanding will either be forced to endure greater conditions of deprivation and overcrowding than are currently being experienced, or

1. The data obtained from a manual analysis of the 1971 Marburg Household study, and was undertaken in compliance with the provision of 3.4.2.

B. expanding families will have to move out of existing households and build their own homes in accordance with their requirements.

Since the proportion of contracting families is very small (being only 9,6 percent) in relation to the number of expanding families, there would appear to be very little liklihood of expanding families acquiring accommodation through descent or succession.

As the number of stationary and contracting families combined cannot be regarded as being responsible for the decline in household size, it would appear most likely that the expanding families are breaking away from the joint households and forming separate nuclear units. Since the family units most likely to detach themselves from the joint household, are likely to be the younger members of the community, this would help to explain the apparent decrease in the mean household size.

4.2.12 The analysis of the mean household size

An examination of Table XIII reveals that the rate of decline in household size between 1967 and 1971 has been:-

Maximum decline per annum	5,5 percent
Mean decline per annum	3,6 percent
Minimum decline per annum	1,6 percent

On inspection it would appear highly unlikely that the decline would be much above 3,6 percent per annum since the time period between census is small. Therefore the lower estimated decrease in the household size would appear more acceptable for use in the estimation of future housing requirements.

An additional analysis of the variance between the measures of central tendency indicated in Table XIII[1] shows:-

Score	1967	1971
Mean	8,15 P.P.H.[2]	7,08 P.P.H.
Median	7-8 P.P.H.	6-7 P.P.H.
Mode	8 P.P.H.	5 P.P.H.

that there is a significant shift in the size of households towards smaller units which will if the trend continues approximate that of the fmily size.

With the recycling of housing and an expected decline in multi-family living patterns it is expected that there will be a marked decline in the proportion of large households (i.e. above 8 persons) which will decrease the mean household size further.

Assuming that there will be a continuing decline in the mean household size, it is necessary to determine:-

A. how far the decline will proceed i.e. what the minimum household size will be during the planning period
B. over what time period the decline will continue.

Table IX(d) shows that the mean family size has been, and will continue to remain at 5,3 persons per family, which indicates that the minimum household size cannot decline below 5,3 persons per household. Since Tables X and XII have already shown that non family members constitute a significant portion of the community the minimum household size is considerably more than 5,3 and is estimated to be 5,85 by 1975 provided that the constant inflow of migrants is maintained.

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1. Refer to the frequency distributions of houeholds obtained from the Marburg Household Survey.
2. P.P.H. refers to persons per household.

4.2.13 The Projection of natural increase households between 1970-1985

While general trends observed in Table XlV indicates that there is a decline in the mean household size, of existing dwelling units it is necessary to observe and determine:-

A. To what extent the decline will take place in the future
B. Whether there is likely to be a significant difference between the mean size of households derived either from natural increase or migration factors.

An examination of Table XlV reveals that the rate of decline in households between 1967 and 1971 lies between 1,6 percent per annum and 6 percent per annum with the mean rate 3,7 percent per annum. Resultant from the variances caused by the sample fraction it is necessary to observe the maximum range in the size of households but on inspection the high rate of decline i.e. 6 percent would appear to be excessive. A better measure for estimating the future household size of households by natural increase would appear to be the examination of the measures of central tendency, i.e. mode and median scores of the frequency distribution illustrated in Table Xlll[1]. The highest frequency score (i.e. mode) indicates that 5 person households are the most numerous household types while the median score lies between 5 and 6 person households. It is obvious therefore that the established mean is skewed by a number of large households. With the recycling of housing and the provision of alternative housing, together with the expected decline in multi family households it can be confidently expected that the mean household size will decline[2] as a result of the diminishing number of large sized households. It is to be expected that the mean size of houeholds will approximate that of the established mode and median

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1. Refers to the frequency distribution of households obtained from the Marburg Household Survey.
2. Ref. P.W. Johnston Op cit p6, states that 'A reduction in the number of average families per household will reduce the household size'.

scores i.e. between 5-6 persons per household.

Having determined the rate of decline in household sizes from Table XlV and the extent to which the household size might decline (i.e. in terms of the formula set out in 3.4.4; the future number of households likely to accrue due to natural increase are calculated, as set out in Table XVl.

TABLE XVl

ESTIMATES OF THE NUMBER OF HOUSEHOLDS ACCRUING DUE TO NATURAL INCREASE

PERIOD	1967	1967 - 1970		1970 -1975		1975 - 1980		1980 - 1985	
POP INCR	4496	347		833		1073		1382	
EST MEAN H/H SIZE	EST NO OF H/H	EST $\bar{X}$ H/H SIZE	EST NO H/H	EST $\bar{X}$ H/H SIZE	EST NO H/H	EST $\bar{X}$ H/H SIZE	EST NO H/H	EST $\bar{X}$ H/H SIZE	EST NO
8,67	519	7,17	48	6,53	128	5,96	180	5,85	236
8,15	552	7,08	49	6,01	139	5,85	183	5,85	236
7,63	589	6,99	50	5,85	142	5,85	183	5,85	236

In terms of Table XVl it can be seen that:-

(i) at the lowest rate of decline (i.e. 1,6 percent per annum) in the household size it will take the full 15 years planning period for household units to match family units in size

(ii) at the higher rates of decline an equalization of households and families will be achieved by 1880

(iii) there is only a 5 percent variance in the projected number of households likely to occur due to natural increase in 1985

(iv) the projected increase in households (i.e. between 4,06 - 4,20 percent per annum) will absorb 55 percent of the total increase in population while at the same time doubling the number of dwelling units established as at 1967.

4.2.14 The projection of migrant households for 1970-1985

No housing study would be complete without an investigation into the influence of migration on housing demand. Towards this end Table XVll has been compiled, to illustrate the characteristics and composition of migrant households. From this table the following observations can be made:-

TABLE XVll

TABULATED DATA RESULTS OF MIGRATION SURVEY
1975

	MARBURG	PT SHEPSTONE	TOTAL
Number of H/H's under 5 years at 71	34	35	69
Number of sample H/H's	14	18	32
Number of non-returns	1	1	2
% of sample H/H's	38	49	43
Total population (migrants 1971)	252	207	459
Total sample in-migrants population	41	57	98
Number of original H/H's	8	11	19
Number of H/H's under 4 years	5	6	11
Number of in-migrant H/H's	10	6	16
Number of internal migrant H/H's	4	12	16
Mean H/H size of in-migrants	4,1	4,5	6,1

(i) Of the 32 households sampled it was discovered that there were two categories of migrants, namely:-

(a) In-migrants (i.e. people who have moved into the project area from without)

(b) Internal migrants (i.e. people who move around within the sub-region seeking better accommodation.

(ii) The majority of the new immigrants in the region settled in the Marburg area, which is resultant from the shortage of accommodation currently being experienced in the urban sector of Port Shepstone and the relatively low density of development in Marburg which

makes resettlement possible.

(iii) 'Internal migration' from Marburg to Port Shepstone or within Port Shepstone itself, is substantial and is most likely caused by families seeking superior accommodation at a more favourable economic price as it becomes available.

(iv) The mean household size of in-migrant households (i.e. 6,1 persons per household)is substantially below that of the established community (i.e. 7,1 calculated for the sub-region). This is to be expected since the immigrants tend to be younger and constitute smaller family units.

Since the migration survey results constitute a sample, the standard error must be obtained in terms of the formula described in 3.4.1(ii), i.e.

S.E. $= \frac{SD}{\sqrt{n}} \times \sqrt{1 - f}$ and is calculated at σ = 1,17 at the 95 percent confidence level. Therefore the mean size of in-migrant households lies between:-

A.	Minimum in-migrant household size	4,83 persons per household
B.	Mean in-migrant household size	6,13 persons per household
C.	Maximum in-migrant household size	7,30 persons per household

Whereas it has been possible to determine whether there has been any change occurring in the mean household sizes of existing households, this is not possible in the study of migration. Thus the assumption is made that the in-migrant household size will remain within the wide limits calculated above since they conform fairly closely to the anticipated 'natural increase' household size.

Using the established mean household size as estimated above, together with the projected population increases as indicated in Table Vlll, projections of the future number of households derived from migration can

be made. (See Table XVlll).

TABLE XVlll

A PROJECTION OF THE NUMBER OF HOUSEHOLDS LIKELY TO ACCRUE TO THE SUB-REGION DUE TO MIGRATION[1]

YEAR	1967-1970	1970-1975	1975-1980	1980-1985	1970-1985
POP INCR	391	673	868	1117	2658
EST $\bar{X}$ H/H SIZE	ESTIMATED NO OF H/H's	ESTIMATED NO OF H/H's	ESTIMATED NO OF H/H's	ESTIMATED NO OF H/H's	ESTIMATED NO OF H/H's
4,83	81	139	180	231	550
6,13	64	110	142	182	434
7,30	54	92	119	153	364

In terms of the projections contained in Table XVlll it can be expected that:-

(a) the number of migrant households will triple those of 1971 by 1985

(b) all the additional housing requirements will have to be acquired from additional resources and not from the existing housing stock

(c) the growth rate for migrant household formation will lie between 5,1 and 5,2 percent per annum which is akin to the population growth currently being experienced in the sub-region, but more than twice the expected migrant population growth (i.e. 2,3 percent as estimated in Table Vll). This finding re-enforces the belief that the migrant families tend to be younger and have a higher family and household formation than their 'existing community' counterparts.

1. Based on S.E. = 1,17 and mean H/H size of $\frac{98}{16}$ (total in-migrants) (total in-migrant H/H's)
= 6,13 as estimated from Table XVll.

4.2.15 The projection of the total housing requirements for 1970-1985

Combining the projections contained in Tables XVI and XVIII the sum of the future household requirements due to natural increase and immigration are obtained (See Table XIX).

TABLE XIX

PROJECTED HOUSEHOLD REQUIREMENTS

1971-1985

PERIOD	1970			1970-1975			1975-1980			1980-1985			1970-1985		
TYPE OF INC	LOW	MED	HIGH	LOW	MED	HIGH	LOW	MED	HIGH	LOW	MED	HIGH	LOW	MED	HIGH
Total H/H due to natural inc				128	139	142	180	183	183	236	236	236	544	558	561
Migr.				92	110	139	119	142	180	153	182	231	364	434	550
Proj. incr of H/H's				220	249	281	299	325	363	389	418	467	908	992	1111
TOTAL	648	665	693	868	914	974	1167	1239	1337	1556	1657	1804	2464	2649	2915

From Table XIX it can be seen that:-

(i) The projected combined increase in households due to natural increase and in-migration will approximate between 389 and 408 percent increase on the existing housing stock as at 1970.

(ii) Between 40 and 49 percent of the total anticipated housing requirements will be necessitated through in-migration into the sub-region.

This means that to a large extent the local community will be called upon to provide the land to accommodate such increase, and that there will be increasing rivalry between the existing and migrant members of the community to acquire the additional accommodation, which will be required to meet future demand.

(iii) The mean annual requirements for household construction to cater for future population growth due to natural increase and migration, indicate that between 164-194 housing units will be required to provide accommodation for the following generation.

4.3 THE ANALYSIS OF EXISTING HOUSING

In addition to the projected housing needs it is necessary to ascertain what the state of the existing housing is. This is achieved by:-

(a) classifying the existing housing stock in terms of structural requirements, and

(b) undertaking three detailed analyses to determine the extent of overcrowding in the sub-region.

4.3.1 The examination of the existing housing stock

The first step involves the examination of Table XX which reflects the estimates of the current housing stock as at 1971. This table is compiled by classifying all households[1] in terms of the 'permanent' and 'non-permanent' criteria set out in 3.5.3.

From the distributions reflected in Table XX it can be seen that:-

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1. The data is obtained from the individual inspection of the Marburg Household Survey records of 1971. As the returns are only samples an estimate of the total number of houeholds has been made by:-
   (i) assuming that the proportional relationship between dwellings will remain constant
   (ii) by relating the proportional composition to the estimated number of H/H's as indicated in Table Xlll.

TABLE XX

THE DISTRIBUTION OF HOUSEHOLDS BY DWELLING TYPE AND CONSTRUCTION

TYPE OF DWELLING	PERMANENT					NON PERMANENT 'DISPOSABLE'				
CATEGORY OF HOUSING UNIT	RECORDED NUMBER[1] DWELLINGS	% OF TOTAL DWELLINGS	ESTIMATED NUMBER OF DWELLINGS[2]			RECORDED NUMBER DWELLINGS	% OF TOTAL DWELLINGS	ESTIMATED NUMBER OF DWELLINGS		
			P_1	P_2	P_3			P_1	P_2	P_3
Single/Double House	517	80,53	619	626	634	-	-	-	-	-
Flat	17	2,65	20	20	20	-	-	-	-	-
Maisonette	4	0,06	5	5	5	-	-	-	-	-
Boarding House	-	-	-	-	-	-	-	-	-	-
Shack	-	-	-	-	-	58	9,03	69	70	72
Other	-	-	-	-	-	46	7,17	55	56	56
TOTAL	538	83,80	644	652	660	104	16,20	124	126	128

1. Marburg Survey Returns.
2. Based on proportional relationship established in Col. 1.

A. 16,2 percent of the total housing stock is substandard in terms of accepted town planning and building byelaw regulations, and is therefore to be disregarded as a potential source of accommodation for the future.

B. Virtually all of the disposable housing consists of shacks, huts and lean-to's which are definitely undesirable sources of accommodation.

C. Individual dwelling houses are preferred above all other forms of accommodation and that flat dwelling is a virtually unheard of pattern of living. With increasing urbanization and population growth combined with a decrease in available land resources it is considered highly likely that these preferences will change as a direct result of economic influences.

It is not the purpose of this Thesis to predict what the future form of housing will be but merely the extent to which housing will be required and therefore it is necessary to examine the acceptability of the existing 'permanent' housing provision.

4.3.2 The analysis of 'Permanent' housing

Not all the 'permanent' housing constitutes a viable housing stock either, since conditions of overcrowding can occur in approved dwelling structures. To test this assertion an analysis of individual sample returns for the 1971 Marburg Household Survey was undertaken, the results of which are contained in Table XXl.

The first step involved the investigation of the relationship between man and his dwelling. In Table XXl the frequency distributions drawn from the results of the 'Household size' study are presented. From these distributions the following characteristic about the dwelling units can be observed:-

TABLE XXl

THE DISTRIBUTION OF HOUSEHOLDS X SIZE X POPULATION X AREA FOR SAMPLE RETURNS OF 'PERMANENT' HOUSEHOLDS

SUBJECT		PORT SHEPSTONE HOUSES					
No of living rooms per H/H	No of H/H's	Total M^2	Mean M^2 per H/H	Total No Living Rooms	Mean M^2 per room	Estimated Mean H/H Size High	Low
2	1	35	35	2	17,5	29	28
3	8	350	44	24	14,6	44	43
4	7	393	56	28	14,0	58	57
5	5	329	66	25	13,2	72	71
6	9	793	88	54	14,7	87	85
7	4	416	104	28	14,9	102	99
8	-				-		
9	-	-			-		
TOTAL	34	2316	$\frac{393}{6}$	161	14,8		
		MARBURG HOUSES					
2	2	46	23	4	11,5	29	28
3	-	-		-	13,2	-	-
4	8	421	53	32	14,1	58	57
5	3	223	74	15	11,3	72	71
6	3	203	68	18	14,0	87	85
7	3	293	98	21	12,4	102	99
8	2	198	99	16	19,1	116	113
9	2	344	172	18		131	128
TOTAL	23	1729	81,1	124	13,9		
		MARBURG / PORT SHEPSTONE SUB-REGION HOUSES					
2	3	81	27	6	13,5	29	28
3	8	350	44	24	14,6	44	43
4	15	814	54	60	13,6	58	57
5	8	552	69	40	13,8	72	71
6	12	996	83	72	13,8	87	85
7	7	709	101	49	14,5	102	99
8	2	148	99	16	12,4	116	113
9	2	344	172	18	19,1	131	128
TOTAL	57	4044	81	282	14,34		
		FLATS					
		MARBURG AND PORT SHEPSTONE SUB-REGION					
34	2	128	64	6	21		

(i) That the Port Shepstone's housing living area conform much more closely to the mean living room size[1] than do Marburg's living rooms.

(ii) That the mode and mean living room sizes coincides, thus indicating that the floor space index in use reflects the size of the greater majority of living rooms in the sub-region.

(iii) That the variations between Marburg and Port Shepstone's living room sizes are not significantly different.

(iv) That the sample mode for houses reflects 4 living room units as being the most popular housing unit. Such accommodation is emminantly suitable for the housing of between 5-8 person housholdes which as has been established in Table XlV is the current mean.

(v) The results of the flat survey must be treated with circumspection since they only represent a small proportion of the total accommodation available.

4.3.3 The analysis of overcrowding

Using the criteria listed in 3.5, an indication of the degree of overcrowding prevailing in the sub-region can be ascertained. From Table XXll it can be seen that approximately 14,1 percent of the 'permanent' households are suffering from conditions of overcrowding, and that 13,7 percent of the Indian population of the sub-region are living in 'permament' overcrowded accommodation. This is in addition to that established as being unfit for human habitation, as set out in Table XX.

By far the largest single cause of overcrowding is inadequate sex segregation, which accounts for all the overcrowded households recorded. This tendency is to be expected especially where :-

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1. It should be noted that the mean living room size represents the sum of all rooms capable of providing sleeping accommodation i.e. lounges, diningrooms, laundries etc. The aforementioned method has been designed to coincide with the Slum Act requirements i.e. of livable floor area.

TABLE XXII

THE DISTRIBUTION OF HOUSEHOLDS IN TERMS OF SELECTED CRITERIA OF OVERCROWDING

LIVING ROOM SIZE INDEX SEX SEGREGATION X OCCUPANCY PER LIVING ROOM

CATEGORY OF HOUSEHOLD / INHABITANT	OBSERVED SAMPLE RETURN	% OF SAMPLE	ESTIMATES		
			H_1	H_2	H_3
Total Number of 'Permanent' Households	538	83,80	631	639	645
Total Number of Overcrowded Households					
inadequate living area	20	3,13	24	24	24
inadequate sex segregation	92	14,33	108	109	111
too high occupancy per room	50	7,79	59	59	60
Total Number of Overcrowded Households	92	14,33	108	109	111
Total Number of Persons in permanent Households	3932	86,32	4612	4670	4719
Total Number of Persons in permanent Households (i.e. other than overcrowded households)	3310	72,67	3882	3951	3964
Total Number of Persons living in overcrowded households	622	13,66	730	737	750
Total living rooms in 'Permanent' Households	2239	-	2626	2659	2684
Total Number of living rooms in over-dwellings	166	-	205	207	209

A. Accommodation is in short supply

B. Household incomes are relatively low

C. Multiple household living patterns are maintained forcing the constituent families to share accommodation.

Whereas inadequate living areas per person constitute only a minor factor in the incidence of overcrowding, the measurement of occupancy ratios per living room provides a far better indicator of the degree of overcrowding. An examination of Table XXll reveals that overcrowded households have a mean occupancy rate of 3,74[1] persons per living room, as compared to the 1,47 persons occupying non overcrowded accommodation. In terms of the 'Occupancy per Living Room' standard adopted for this study, the degree of overcrowding recorded does not indicate a severe condition, however, it can be said that occupants of overcrowded accommodation are much worse off than their counterparts in 'non overcrowded' accommodation. This occupancy index is important since it reflects the occupancy rates for households which have evolved without:-

(a) Any organized provision of economic or sub economic housing to distort the findings

(b) Formal town planning or building bylaw control until the latter stages of the sub-region's development.

Comparing the overall mean occupancy rates per living room of the sub-region's households i.e. 1,75 with that for Metropolitan Durban i.e. 2,05[2] - the latter being to a large extent distorted by large scale preplanned housing development - it becomes obvious that the older unplanned housing units in the Marburg / Port Shepstone area are less able to provide adequate and suitable accommodation than their preplanned counterparts in Durban. The rationale behind this statement lies in the

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1. The mean occupancy rate is obtained from Table XXll i.e.
$Z = \frac{x}{y}$ where x = number of people
y = number of living rooms.

2. An extract from 'A survey of Indian Housing in Durban', Dept. of Economics, University of Natal 1966 - Unpublished report taken from files of the Director, Town and Regional Planning Commission, Pietermaritzburg.

fact that the Port Shepstone sub-region has a lower gross occupancy rate per living room than Durban, but the former still has a high degree of overcrowding despite:-

(i) having a lower occupancy rate per room and
(ii) a high mean living room area of 14 m^2 (1)

4.4 THE EFFECTS OF KNOWN PLANNING CONSIDERATIONS (FREEWAY DEVELOPMENT)

The third and final cause of the displacement of persons from their accustomed accommodation can be attributed to the planning proposals in respect of road development programmes which are likely to take place in the project area within the predetermined planning period. Plans for the extension of the existing South Coast freeway have been drawn(2) and therefore it is an essential pre-requisite to establish what effects of such proposals will be on the current housing situation.

Table XXlll indicates that only approximately 3,4 percent of the estimated

TABLE XXlll(3)

THE ANALYSIS OF HOUSEHOLDS AFFECTED BY ROAD PROPOSALS

Category of Household	Total No of households	Total No of families	Total No of displaced persons
Permanent households	23	31	131
Non permanent	3	4	22
Total displaced households	26	35	153

1. A normal modern day bedroom is approximately 9 m^2 in extent and with the addition of living rooms, 1 lounge etc., this can be expected to rise to 10-12 m^2 per mean livingroom area.
2. Ref. N.T.C. Maps N1/528/R14 by kind courtesy of Messrs. Jeffares
   N1/528/R15 & Green, Consulting Civil Engineers,
   N1/526/R16 Pietermaritzburg.
3. See Appendix F and Map 10 for the detached breakdown of the households affected by the planning proposals.

number of householders[1] are affected by the road proposals i.e. excluding the 'non permanent' stock which have already been effectively removed from the viable housing stock in Table XX. Since these housing units will almost certainly be demolished within the planning period, they are to be ignored in estimating the future housing stock of the area.

The incidence of multiple household living amongst affected owners is seen to be relatively high and thus the replacement of the destroyed housing will tend to be larger than the amount expropriated, i.e. if the tendency towards the declining household sizes prevails and nuclear family units are afforded the chance to establish their own homes, then more housing units will have to be provided than are to be demolished.

4.5 ESTIMATES OF TOTAL DISPLACEMENT

Combining the findings of Tables XX, XXll and XXlll the gross extent of the inadequate housing provision can be calculated.

TABLE XXlV

AN ESTIMATION OF TOTAL DISPLACED HOUSEHOLDS AS AT 1971

REF	NATURE OF DISPLACEMENT	OBSERVED NO OF HOUSEHOLDS	ESTIMATED NO OF HOUSEHOLDS		
			E_1	E_2	E_3
	Total No non permanent Households				
A	shacks	58	68	69	70
B	other, e.g. huts, out-buildings etc.	46	54	55	55
	Total no overcrowded H/Hs				
C	inadequate living area	20	24	24	24
D	inadequate sex segregation	92	108	109	111
E	Too high occupancy per room	50	59	59	60
F	Total non permanent housing units affected by planning proposals	23	23	23	23
Total displaced households i.e. A + B + D + F		219	253	256	259

1. As at 1971.

From the findings of Table XXlV it can be seen that:-

(i) approximately 1/3 of the total housing stock existing at 1971 is considered as being inadequate or redundant in terms of this analysis

(ii) 40 percent of the total redundant housing is due to inadequate sex segregation which indicates that:-

(a) either the local Indian communities cultural values play down the importance of sex segregation, or

(b) inadequate accommodation resources force families to occupy unsuitable housing establishments for their needs, or

(c) socio-economic considerations prescribe the living patterns of the poorer sections of the community.

While Table XXlV indicates that there is already a severe housing shortage, it can be anticipated that the situation will deteriorate as a result of the projected large scale population growth, unless suitable remedial action is taken in the immediate future.

4.5.1 Recycling and its effects on reducing conditions of overcrowding and displacement

All is not lost, however, in that a proportion of the existing housing which has been comdemned in terms of the overcrowding criteria etc., can theoretically be recycled to provide accommodation which will:-

A. Make optimum use of the accommodation available

B. House the maximum number of displaced persons

C. Reduce the number of families requiring alternative accommodation while at the same time retaining kinship bonds etc., where multiple households are in existence.

Before the process of recycling can take place it is necessary to determine what the gross extent of condemned accommodation is, thus in Table XXV the total number of displaced households and the population accommodated in such housing units is calculated from the findings of Tables XX and XX11.

TABLE XXV

THE DISTRIBUTION OF INHABITANTS IN CONDEMNED HOUSING AS AT 1971

H/H size	No of displaced Households			Estimated No of Households[1]			Estimated population		
	Non Perma-nent	Over-crowded	Planning considerations	E1	E2	E3	P1	P2	P3
1	-	5	-	6	6	6	6	6	6
2	4	3	-	8	8	8	16	16	16
3	13	6	2	25	25	25	75	75	75
4	21	19	6	54	54	55	216	216	220
5	15	14	4	39	39	40	195	195	200
6	13	12	1	30	31	31	180	186	186
7	10	12	3	29	30	30	203	210	210
8	9	7	2	21	21	22	168	168	176
9	5	3	1	11	11	11	99	99	99
10	3	1	3	8	8	8	80	80	80
11	2	1	1	5	5	5	55	55	55
12	6	4	-	12	12	12	144	144	144
13	1	-	-	1	1	1	13	13	13
14	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-
16	1	-	-	1	1	1	16	16	16
17	-	1	-	1	1	1	17	17	17
18	-	-	-	-	-	-	-	-	-
19	1	1	-	1	1	1	19	19	19
20	-	-	-	-	-	-	-	-	-
21	1	1	-	1	1	1	21	21	21
24	-	-	-	-	-	-	-	-	-
25	-	1	-	1	1	1	25	25	25
33	-	1	-	1	1	1	33	33	33
TOTAL	104	92	23	255	257	260	1581	1594	1611

1. E1, E2 and E3 obtained from proportional relationship to the estimated number of households as at 1971 (See Table X111).

The results of this table show that:-

(i) Between 28,7 and 29,2 percent of the estimated population of the sub-region are living in substandard housing conditions or are likely to lose their present accommodation through major planning decisions, and that approximately 33 percent of the households are substandard in terms of the criteria employed for this study.

(ii) Of the displaced households, 51 percent are less than 5 persons in size. This signifies that there is considerable overcrowding amongst the smaller household and family units. This is consistent with the hypothesis that economic and marital status factors are closely related to housing demand, thus it is to be expected that the younger newly marrieds who have limited financial resources will be the worst affected by the housing shortage, and constitute the major portion of the displaced households.

(iii) By far the larger proportion of the displaced housing (i.e. 47 percent of estimated displaced households) is resultant from poor housing structures which have inadequate services and promote in the main, bad conditions of overcrowding. Thus it can be assumed that a substantial portion of the displaced households will have to be rehoused in additional dwelling units rather than through the recycling process.

(iv) Overcrowded households constitute approximately 27,42 percent of the displaced housing and it is from this housing stock that the potential for recycling will eminate.

(v) Although displaced housing due to planning considerations constitutes only 11 percent of the total displacement, it is still a significant factor in determining the total loss of housing in the sub-region. Thus when added to the findings of (iii) it can be seen that 58 percent of the total displaced housing is lost to the sub-region, and that approximately 817 people will ultimately have to be rehoused in recycled or additional dwellings.

4.5.2 The calculation of the gross number of housing units suitable for recycling

Not all of the displaced households recorded in Table XXV need necessarily be rehoused in additionally constructed dwelling units since some of the displaced households can be transferred to existing permanent dwelling units which have been found to be overcrowded but which after recycling can provide suitable accommodation to meet the exact needs of the recycled displaced family or household requirements.

Thus in Table XXVl the total number of households suitable for recycling in terms of 3.7.2(ii) is calculated and it can be

TABLE XXVl

AN ESTIMATE OF HOUSING UNITS SUITABLE FOR RECYCLING

Dwelling size in terms of living rooms	Observed No of households for recycling	Estimated No of households			Estimated No of living rooms		
		H1	H2	H3	L1	L2	L3
1	23	27	27	28	27	27	28
2	36	43	43	43	86	86	86
3	2	2	3	3	6	9	9
4	2	2	3	3	6	9	9
5	1	1	1	1	5	5	5
6	1	1	1	1	6	6	6
7	1	1	1	1	7	7	7
8	-	-	-	-	-	-	-
9	1	1	1	1	9	9	9
TOTAL	67	78	80	81	152	158	159

seen that:-

(i) Approximately 26,3 percent of the estimated displaced households obtained in Table XXV can potentially be recycled to meet the needs of some of the existing displaced families and

provide additional accommodation to the already hardpressed Indian community of Marburg / Port Shepstone. By rehousing people in these 80 dwelling units the gross demand for additional housing is reduced.

(ii) Approximately 88 percent of the units suitable for recycling are one or two bedroomed units. This means that only the smaller sized family units will benefit to any great degree from such recycling, and that many of the larger family units will have to continue to await the construction of additional housing before any relief can be expected to be forthcoming.

4.5.3 The calculation of the net number of households suitable for recycling

Not all of the housing available for recycling need necessarily be suitable to meet the specific requirements of displaced families, thus it is essential to determine the net amount of housing suitable for recycling.

Using the criteria set out in 3.5, Table XVll is derived in which it can be seen:-

TABLE XXVll

ESTIMATES OF HOUSEHOLDS CAPABLE OF BEING RECYCLED

No of H/H's for recycling			Size of recycled house in livingrooms	No of displaced households rehoused			Size of displaced H/H rehoused (i.e. persons)	Total people rehoused		
E1	E2	E3		H1	H2	H3		P1	P2	P3
27	27	28	1	6	6	6	1	6	6	6
				8	8	8	2	16	16	16
				25	25	25	3	75	75	75
43	43	43	2	43	43	43	4	172	172	172
2	3	3	3	2	3	3	5	10	15	15
2	3	3	4	2	3	3	6	12	18	18
1	1	1	5	1	1	1	16	16	16	16
1	1	1	6	1	1	1	17	17	17	17
1	1	1	7	1	1	1	19	19	19	19
1	1	1	9	1	1	1	33	33	33	33
78	80	81		90	92	92		376	387	387

that:-

(i) all of the housing available for recycling can be redistributed

(ii) the existing housing stock which can provide shelter for 15 percent[1] more households than is currently achieved without incurring conditions of overcrowding

(iii) approximately 73[2] families can be rehoused within the existing housing stock

(iv) the estimated 80 households suitable for recycling can provide additional accommodation for approximately 380 displaced persons without incurring any additional capital expenditure on new housing development.

4.5.4 The calculation of net housing requirements for displaced persons as at 1971

The final step in the estimation of net housing requirements lies in the analysis of Table XXVlll which combines the findings of Tables XXV, XXVl and XXVll. By subtracting the total number of housing units capable of being recycled from the gross number of displaced households, the true extent of the net housing requirements for existing inhabitants (i.e. as at 1971) can be gauged.

The most important findings of Table XXVlll reveal that:-

(i) whereas the gross extent of inadequate accommodation approximates $\frac{1}{3}$[3] of the existing housing stock, after recycling this is reduced to 22 percent[4]. This signifies that by recycling housing

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1. The housing stock available for recycling is presently overcrowded but through the judicious use of recycling 15 percent more households and possibly even more families can be rehoused by making the available accommodation fit the individual household structure more accurately.
2. The estimate is based on
$$Z = \frac{X}{Y} = \text{Estimated persons to be rehoused}$$
Estimated mean family size i.e. 5,3.
3. See Table XXV.
4. The net housing is obtained for Table XXlX where $Z = \frac{100X}{Y}$
Z = % of households seeking alternative accommodation
X = Net housing shortage
Y = Total estimated number of households in the sub-region as at 1971.

TABLE XXVIII

ESTIMATES OF NET HOUSING REQUIREMENTS AS AT NOVEMBER, 1971

Size of Household	No. of Households to be rehoused.			No. of Households capable of being recycled			Net Shortage			Total population to be rehoused			No. capable of being rehoused			Net population seeking accommodation		
	E1	E2	E3	R1	R2	R3	S1	S2	S3	P1	P2	P3	PR1	PR2	PR3	PA1	PA2	PA3
1	6	6	6	6	6	6	-	-	-	6	6	6	6	6	6	-	-	-
2	8	8	8	8	8	8	-	-	-	16	16	16	16	16	16	-	-	-
3	25	25	25	25	25	25	-	-	-	75	75	75	75	75	75	-	-	-
4	54	54	55	43	43	43	11	11	12	216	216	220	172	172	172	44	44	48
5	39	39	40	2	3	3	37	36	37	195	195	200	10	15	15	185	180	185
6	30	31	31	2	3	3	28	28	28	180	186	186	12	18	18	168	168	168
7	29	30	30	-	-	-	29	30	30	203	210	210	-	-	-	203	210	210
8	21	21	22	-	-	-	21	21	22	168	168	176	-	-	-	168	168	176
9	11	11	11	-	-	-	11	11	11	99	99	99	-	-	-	99	99	99
10	8	8	8	-	-	-	8	8	8	80	80	80	-	-	-	80	80	80
11	5	5	5	-	-	-	5	5	5	55	55	55	-	-	-	55	55	55
12	12	12	12	-	-	-	12	12	12	144	144	144	-	-	-	144	144	144
13	1	1	1	-	-	-	1	1	1	13	13	13	-	-	-	13	13	13
16	1	1	1	1	1	1	-	-	-	16	16	16	16	16	16	-	-	-
17	1	1	1	1	1	1	-	-	-	17	17	17	17	17	17	-	-	-
19	1	1	1	1	1	1	-	-	-	19	19	19	19	19	19	-	-	-
33	1	1	1	1	1	1	-	-	-	33	33	33	33	33	33	-	-	-
TOTAL	255	257	260	90	92	92	163	163	165	1581	1594	1611	376	387	387	1159	1161	1178

to fit individual households requirements 11 percent more people can be accommodated within the existing housing stock, thus marginally reducing the need for additional housing development.

(ii) nearly 30 percent of the existing inhabitants of the project area are in need of urgent rehousing. It should be noted that the population requiring housing is noticeably higher than the housing requirements and is likely to widen owing to the high rates of Natural Increase and Immigration

(iii) conditions of overcrowding in the sub-region are not quite as severe as comparable Indian areas of Natal where Isipingo[1] has 3/5 of the existing housing stock being overcrowded (1974) and Wyebank 53 percent (1971)[2]. Should the present rates of overcrowding continue, the housing position will progressively become worse as the population is growing at a high 5,3 percent per annum

(iv) the greatest need for additional housing lies in the medium to high household size category. This is to be expected especially where a high mean household size exists.

Having observed and analysed the position of the existing housing stock it now remains for these findings to be related to the future requirements estimated earlier in this model.

4.6 THE HOUSING PROJECTION

Thus far, in Model I the research framework has concentrated on separately analysing:-

(a) the nature of existing housing requirements (i.e. as set out in Table XXVIII), and

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1. 'A Brief Housing Survey of the Township of Isipingo' p21 - I.S.R. Publication, March 1974.
2. 'The Indian Community of Wyebank' p12 - I.S.R. Publication, H.L. Watts, March 1971.

(b) the future housing requirements in terms of demographic projections (i.e. as summarized in Table XlX).

As the final stage in the research process it is necessary to collate and relate the results of the two sub research programmes, so as to provide an overall assessment of the total housing requirements of the sub-region.

In Table XXlX the findings of the related sub-studies are combined and tabulated so as to provide an overall view of the total housing requirements of the sub-region. From this table it can be seen:-

(i) that the existing 'permanent' housing stock will have to be increased by between 224 and 248 percent within a 14 year period in order to cater for future population growth and to accommodate the existing community in approved dwelling units.

(ii) that 83 percent of the additional housing requirements will be needed merely to provide shelter for population growth i.e. by natural increase and immigration

(iii) that approximately half (48,3 percent) of the additional accommodation is required merely to house the natural increase in population

(iv) that just over 1/3 of the additional housing requirements will be needed to accommodate migrants entering the sub-region from areas outside the project area. The significance of this finding is that the migrants are usually low-income, young and members of small expanding families and thus it can be expected that to a large extent the burden of providing the additional housing will most probably fall on the shoulders of the existing community

(v) that in order to meet existing and future demand for housing, an average of between 71 and 85 dwelling units will have to be

TABLE XXIX

A SUMMARY OF THE PROJECTED HOUSING REQUIREMENTS FOR PERIOD 1970 - 1985.

FACTOR NUMBER	TABLE REFERENCE NUMBER	HOUSING CATEGORY	YEAR / PERIOD															TOTAL ADDITIONAL HOUSEHOLDS 1970-1985		
			1970			1971			1975			1980			1985					
			L	M	H	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H
1	XIV XIX	Estimated Number of Households	648	665	693	768	778	788												
2	XX	Estimated Number of 'Permanent' Households as at 1971				644	652	660												
3		Estimated Number of Additional Households due to :-																		
	XVI	Natural Increase							128	139	142	180	183	183	236	236	236	544	558	561
	XVIII	In-Migration							92	110	139	119	142	180	153	182	231	364	434	550
4		Estimated Number of Overcrowded Households due to :-																		
	XXII	Inadequate Living Area				24	24	24												
	XXII	Inadequate Sex Segregation				108	109	111												
	XXII	Too high occupancy per room				59	59	60												
5		Estimated Number of Non Permanent Households																		
	XX	Shacks				69	70	72												
	XX	Other				55	56	56												
6	XXIII	Total Number of Permanent Households affected by Freeway Proposals (Planning)				23	23	23												
7	XXV	Estimated Gross Number of Households needing rehousing				255	257	260												
8	XXVII	Estimated Number of Households capable of being recycled				90	92	92												
9	XXVIII	Estimated Net Number of Households to be rehoused				163	163	165										163	163	165
10	XXVIII	Estimated Total Number of Households at Yr_1^{15}										1249	1313	1393	1638	1702	1860	1071	1155	1276
		i.e. F 2 + 3 + 9				807	815	825	950	988	1030									

L = Low
M = Mean
H = High

constructed per year, to meet the Indian community's anticipated requirements. This represents a mean annual growth (compound) of 6,24 percent in the number of households required, and is thus higher than the anticipated population growth of 5,3 percent per annum calculated in Table V11.
The higher household growth rate suggests that any future home building programmes will have to provide accommodation for the existing backlog at an ever increasing rate and that with a general ageing of the community combined with a rising migration rate, the present housing shortage will become even more critical in the years to come.

(vi) that approximately 230 dwellings are required immediately to bring relief to the existing community who are living either in sub-standard dwellings or in overcrowded households. Once this backlog is erradicated the mean annual building rate will decrease to a maximum 69 units or 5,25 percent which approximates the mean annual population increase.

4.7 THE CONCLUSION OF MODEL I

From the aforegoing results it can be seen that a viable method exists for the projection of existing and future requirements. However, while statistical analysis can and does assist in the proper interpretation of research data, it must be remembered that the results are based on:-

(i) the assumptions made by the planner undertaking the research
(ii) the definitions and concepts used in presenting the form of the investigation
(iii) the analytical measures and tools used in the interpretation process.

While every effort has been made to establish reliable trends, it is inevitable that decisions made on short term experience could be

inaccurate and thus the research findings must be treated more as an indicator of future and existing requirements than as an 'absolute' prediction.

In Model II far fewer assumptions have been in the demographic aspects of the study, and therefore the quality of the population projections can be considered to be somewhat higher, i.e. in statistical terms. However, the advantage which Model I exhibits is its relative flexibility and its ability to interpret rather than being prescribed by fixed analytical lines as is necessitated in Model II.

In respect of the findings of this study it has become abundantly clear that there is an existing housing shortage and that these conditions will deteriorate unless immediate remedial action is taken.

The indications are clear that the public sector i.e. both Government and the Local Authorities will have to shoulder an ever increasing burden in the provision of housing for the Indian community of Marburg / Port Shepstone, and that unless a massive assisted housing project is started within the next decade, that the areas growth will either be stilted, or conditions of overcrowding and squalor will become a permanent feature of the housing situation in the sub-region.

4.8 MODEL II AGE COHORT SURVIVAL ANALYSIS

In Model II an attempt will be made to determine:-

(i) what affects specific factors i.e. birth, death and migration rates, have on population growth

(ii) how past experience, and established trends will affect future development in the sub-region

(iii) what influence the general ageing of the community will have on the future marital status/sex/age structure of the community

(iv) whether the influence of migration will alter the community structure to any great extent

(v) the relationship existing between birth and death rates as used in calculating net survivorship rates.

Model II like its predecessor takes cognisance of the immediate housing needs of the community and in so doing incorporates the findings of Chapter 3.5[1] to provide an overall evaluation of the future accommodation requirements.

In keeping with the general principles established in Chapter 4.1, the analysis is undertaken in three stages i.e. explanation, specification and interpretation. It will be seen that although each factor is analysed separately (i.e. birth and death statistics investigated individually) that each component bears a relationship to another factor, the combination of which, if correctly interpreted, provides an overall estimate of the total configuration of the existing and future population.

4.8.1 An analysis of the community structure as at 1970

The first step in the analysis involves the tabulation of the community structure as at 1970. Table XXX provides this illustration and is drawn from census records.

Amongst the more important characteristics to be observed are:-

(i) that 75 percent of the total population are under the age of 35 years, which signifies that the Marburg / Port Shepstone Indian community is very youthful in character

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1. This refers to the analysis of overcrowding and recycling and to the projected requirements established in Chapter Three Part III.

TABLE XXX[1]

THE DISTRIBUTION OF MARBURG / PORT SHEPSTONE POPULATION IN TERMS OF AGE X SEX X MARITAL STATUS AS AT 1970.

AGE GROUP	SEX	Single		Married		Widowed		Divorced		Living Together		TOTAL		Cummulative % of Total Population
		Actual	%	Actual	%	Actual	%	Actual	%	Actual	%	Actual	%	
1 +	M	100	51,28									100	51,28	1,9
	F	95	48,72									95	48,72	3,7
1 - 4	M	300	47,92									300	47,92	9,5
	F	326	52,08									326	52,08	15,7
5 - 9	M	419	62,91									419	62,91	23,8
	F	347	37,09									347	37,09	30,4
10 - 14	M	324	49,85									324	49,85	36,7
	F	326	50,15									326	50,15	42,9
15 - 19	M	292	48,11	5	0,82							297	48,93	48,6
	F	263	43,33	41	6,75					6	0,99	310	51,07	54,5
20 - 24	M	143	29,85	59	12,32					10	2,09	212	44,26	58,6
	F	120	25,05	133	27,77	1	0,21			13	2,71	267	55,74	63,7
25 - 29	M	73	16,33	123	27,52					11	2,50	207	46,35	67,7
	F	49	10,96	184	41,16	2	0,43			5	1,10	240	53,65	72,3
30 - 34	M	30	9,0	140	41,18	1	0,58	1	0,58	8	2,39	180	53,73	75,6
	F	17	5,07	129	38,51	4	1,19	2	0,60	3	0,90	155	46,27	78,6
35 - 39	M	15	4,60	146	44,79					4	1,23	165	50,62	81,8
	F	15	4,60	125	38,34	13	3,99	4	1,23	4	1,23	161	49,38	84,8
40 - 44	M	5	2,23	124	55,36					3	1,34	132	58,93	87,4
	F	14	6,25	65	29,02	9	4,02	1	0,44	3	1,34	92	41,07	89,1
45 - 49	M	4	2,31	76	43,93	2	1,16					82	47,40	90,7
	F	2	1,16	75	43,35	11	6,36	1	0,57	2	1,16	91	42,60	92,5
50 - 54	M	3	2,33	64	49,61	1	0,78					68	52,72	93,8
	F	1	0,77	43	33,33	15	11,63			2	1,55	61	47,28	94,9
55 - 59	M	3	3,00	50	50,00	3	3,0					56	56,00	96,0
	F	1	1,00	24	24,00	18	18,0	1	1,00			44	44,00	96,8
60 +	M	2	1,28	60	38,46	15	9,62	2	1,28	4	2,56	83	53,20	98,4
	F	1	0,65	20	12,82	52	33,33					73	46,80	100
TOTAL	M	1713		847		22		3		40		2625		
	F	1576		839		125		9		38		2587		

1. Data drawn for Director, Town and Regional Planning Census Computer Records (1970) as provided by the Bureau of Statistics, Pretoria. (Unpublished Report).
2. The percentage returns refer to proportional composition within an age group.

(ii) resultant from the youthfulness of the community and high marriage rate (32 percent of total population are married), it can be expected that the existing high birth rate as indicated in Table XXXlll will be maintained throughout the planning period

(iii) since the masculinity rates show an even distribution of males to females in the community under the age of 23 it can be expected that there will be a high rate of family and household formation in the future, once such youths reach a marriageable age

(iv) only 10 percent of the population are above 45 years of age, which suggests that there will only be a limited amount of housing stock recycled through succession, within the 15 year planning period. The additional accommodation required to meet future demand will consequently have to be developed by the future homeowners themselves or through an assisted housing scheme subsidised by the local community.

4.8.2 The distributions of migrants 1971/1975

The second stage in the analytical process is to determine the characteristics of the migrant community. This is achieved by:-

A. analysing the Migration Survey[1] results of 1975, and

B. readjusting the age distributions in terms of the 1970 census age categories.

(i) The Distribution of Migrants as at 1971 in terms of Marburg Household Study

Table XXXl represents the findings of the Migration Survey and it can be seen that:-

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1. Refers to the Migration Survey 1975 carried out by the writer as set out in 3.2.3.

(i) approximately 90 percent of the migrants in the sub-region are under the age of 40 years and that 40 percent of the immigrants are married with young children. There is thus, a clear indication that migrants are predominantly young married couples with young children

(ii) since 46,3 percent of the total population are of school going age it can be expected that there will be a large demand for housing within the planning period as each quinary age group reaches marriageable age.

As the migration survey age group categories do not meet the requirements of the Age Cohort Analysis, it is necessary to adjust them accordingly. This is achieved in Table XXXll through the proportional redistribution of people within 5 year age groupings, as used by the Bureau of Statistics Census methods.

(ii) The Distribution of Immigrants in terms of Quinary Age Groups

An analysis of Tables XXXl and XXXll reveals that:-

(i) 56,3 percent of the total migrants are young single people who are likely to form separate households - finance and socio-cultural circumstances allowing - and will therefore exert an influence on housing demand within the planning period

(ii) a relatively high proportion i.e. 22,2 percent of the total population consists of persons in the 15-49 year age category who are potential child bearers. This is significant in that migrant births will ultimately influence the overall demand for accommodation i.e. the migrants will, with expanding families require larger housing units to accommodate their numbers, which will inevitably affect the opportunities of

TABLE XXXI[1]

THE DISTRIBUTION OF IN-MIGRANTS FOR MARBURG / PORT SHEPSTONE SUB-REGION IN TERMS OF THE MIGRATION SURVEY AGE X SEX X MARITAL STATUS CATEGORIES

MARITAL STATUS	MARRIED				SINGLE				WIDOWED				TOTAL		TOTAL		CUMULATING
SEX	M	%	F	%	M	%	F	%	M	%	F	%	M	F	M+F	%	%
AGE GROUP																	
Infant School					16	6,6	14	5,8					16	14	30	12,4	12,4
Preschool					11	4,5	11	4,5					11	11	22	9,1	21,5
Primary school					29	12,0	17	7,0					29	17	46	19,0	40,5
Secondary School					7	2,9	7	2,9					7	7	14	5,8	46,3
Post School					8	3,3	7	2,9					8	7	15	6,2	52,5
20 - 39	32	13,2	39	16,1	12	5,0	4	1,7			3	1,2	44	46	90	37,2	89,7
40 - 59	11	4,5	8	3,3							1	0,4	11	8	20	8,3	98,0
60 and over	4	1,7									1	0,4	4	0	5	2,0	100
TOTAL	47	19,4	47	19,4	83	34,3	60	24,8			5	2,0	132	110	242	100	

. The Table is drawn from the records of the Migration Survey using the Marburg age and marital status classifications.

TABLE XXXII

THE DISTRIBUTION OF IN-MIGRANTS FOR SUB-REGION IN TERMS OF (i) 5 YEAR AGE GROUP
(ii) SEX
(iii) MARITAL STATUS

CATEGOREIS, FOR THE PERIOD 1970 / 1975 AS OBTAINED FROM TABLE XXXI.

MARITAL STATUS	MARRIED				SINGLE				WIDOWED				TOTAL		TOTAL		CUMULATIVE
SEX	M	%	F	%	M	%	F	%	M	%	F	%	M	F	M+F	%	%
AGE GROUP																	
0 - 1					18	2,8	14	2,3					18	15	33	5,1	5,1
1 - 4					53	8,3	51	8,0					53	51	104	16,3	21,1
5 - 9					53	8,3	32	5,1					53	32	85	13,4	34,8
10 - 14					42	6,6	30	5,1					42	30	72	11,4	46,3
15 - 19					21	3,4	18	2,8					21	17	38	6,2	32,5
20 - 24	10	1,6	25	3,9	17	2,7	7	1,1			1	,2	27	33	60	9,5	62,0
25 - 29	23	3,6	32	5,1	9	1,4	2	,3			1	,2	32	35	67	10,6	72,6
30 - 34	25	3,9	23	3,6	3	,5	1	,2			1	,2	28	25	53	8,4	81,0
35 - 39	26	4,1	23	3,6	2	,3	1	,2			4	,7	28	28	56	8,7	89,7
40 - 44	11	1,8	7	1,1									11	7	18	2,9	92,6
45 - 49	7	1,1	8	1,2							1	,2	7	9	16	2,5	95,1
50 - 54	6	,9	4	,7							1	,2	6	5	11	1,8	96,9
55 - 59	4	,7	4	,7									4	4	8	1,4	98,3
60 and over	11	1,8	2	,3							2	,3	11	4	15	2,1	100
TOTAL	123	19,4	128	19,4	218	34,3	156	24,8			11	2,0	341	295	636	100	

the local established community to find suitable accommodation in the future

(iii) there is a fairly even distribution of males to females i.e. 53 percent male - 47 percent female which is more marked amongst the under 20 age group. This indicates that there should be, in the future a high level of family formation, especially when compared to the findings in Table XXXV on the existing population composition

(iv) while a high migrant birth rate is to be expected because of the youthfulness of the population, the death rate is likely to remain very low. This trend is expected since the lure of educational and job opportunities tends to attract younger migrants. With Group Area controls operative in the surrounding districts, as has been seen from Chapter Two younger families are forced to relocate themselves while the older inhabitants tend to remain in their existing accommodation

(v) Although In-Migrants presently constitute a minor influence on the total housing requirements, it will be seen in Tables XXXVll-XXXlX that it will gradually become a major precipitator of structural change in the community with consequent results for the housing demand for the future.

4.8.3 The calculation of crude birth rates

As has been determined in 3.8.4(i) the analysis of the crude birth rate is a vital function in deriving the 'age specific birth' rates for the sub-region.

Table XXXlll is derived from the analysis of the Bureau of Statistics Census reports on Births and Deaths for the period 1964-1971, and is corrected for the survey area as set out in 3.8.4(i).

TABLE XXXlll

THE RECORD OF LIVE BIRTHS IN THE MARBURG / PORT SHEPSTONE SUB-REGION FOR THE PERIOD 1964 - 1971[1]

YEAR	ESTIMATED POPULATION	ESTIMATED LIVE BIRTHS	ESTIMATED CRUDE BIRTH RATE/1000 PEOPLE
1964	3862	216	55,93
1965	4063	154	37,90
1966	4274	150	35,10
1967	4496	120	26,69
1968	4729	161	34,05
1969	4975	163	32,76
1970	5234	213	40,70
1971	5506	179	32,51
TOTAL		1356	295,64
$\bar{X}$ B.R.			36,96

From the results obtained in the above illustrated table it can be concluded:-

(i) that there has been a marginal decline in the birth rate during the period 1968-1971. The rate of decline being 0,9 persons per 1000 population per annum. This finding is in accordance with the observed national trends established by Professor Sadie[2] for the Indian race group

(ii) the existing crude birth rate is moderately high and is twentyfive percent higher than that for metropolitan Durban[3]. It is to be

1. The records of births are drawn from p146 and Table Vll Report No 07-01-01 1964-1971, Bureau of Statistics, Pretoria, and are corrected for the urban area of Port Shepstone. The estimated yearly population for period 1964-1971 are obtained from Table Vl.
2. Professor Sadie of Stellenbosch University has established that there is a general national decline occurring in the birth rate of Indians in South Africa. S.A. Journal of Economics 1963.
3. The estimated metropolitan birth rate for Durban's Indians is calculated at 29,6 births/1000 population. Most of this community lives under urban conditions which tends to lower the overall rate. Data drawn from work of P.W. Johnston Op cit p4.

expected that there will be a higher crude birth rate amongst Port Shepstone / Marburg Indian community since they are still regarded as being rural in character and lack the western family planning and education facilities

(iii) while all the pointers appear to show that the existing birth rate is too high to be maintained and that an eventual decline must eventuate, it should be borne in mind that Table XXXll has shown that there is likely to be a high level of family formation when the bulk of the population now under 25 years reaches maturity. An increase in family formation will boost the birth rate, and halt the decline currently being experienced. For this reason it is assumed that the existing rate i.e. 36,96 births/1000 people will approximate the future rate of growth in the sub-region.

4.8.4 The age specific birth rates

The age specific birth rate determines the gradual change likely to occur in the distribution of the population and reflects the total acretion of population within each specified age group. While the infants likely to be born subsequent to 1970 are unlikely to affect the housing estimates in themselves (i.e. they will not constitute new families by 1985), they are likely to affect the current and future demand in respect of the housing unit size requirements of present households. From Table XXXlV the actual specific birth rate is established by relating the number of live births per age category to the potential number of child bearing women. For the purpose of this Thesis illegitimacy has been ignored since it is considered unlikely that such a factor would markedly affect the age specific rates estimated for the sub-region.

From the findings of Table XXlV it can be expected that:-

TABLE XXXIV

THE CALCULATION OF AGE SPECIFIC BIRTH RATES FOR THE SUB-REGION.

AGE OF MOTHER	RECORDED NO. OF MARRIED FEMALES 1970 - 1975	DBN AGE SPECIFIC BIRTH RATE / 1000 AS AT 1970 (1)	ESTIMATED LIVE BIRTHS IN SUB-REGION IN TERMS OF DBN BIRTH RATE	ESTIMATED NO. OF LIVE BIRTHS IN SUB-REGION AS CORRECTED IN TERMS OF EST $\bar{X}$ (2)	NO OF BIRTHS PER 100 MOTHERS	PERCENT OF TOTAL BIRTHS.
15 - 19	46	578,7	26,62	33,24	72,26	40,84
20 - 24	146	398,3	58,15	72,61	49,73	28,11
25 - 29	189	225,4	42,60	53,19	28,14	15,91
30 - 34	132	131,7	17,38	21,70	16,44	9,29
35 - 39	129	64,0	8,26	10,31	7,99	4,52
40 - 44	68	16,5	1,12	1,40	2,06	1,17
45 - 49	77	2,4	0,18	0,23	0,30	0,10
TOTAL	787	1417	154,31	200,67	176,92	100
$\bar{X}$.B.R.		20,24	29,6	36,96	25,27	

1. Durban Corporation Health Department - P.W. Johnston OP CIT P4
2. The Port Shepstone mean birth rate is .2486 times higher than Durban and therefore the live births must be adjusted accordingly.

(i) since 69 percent[1] of all births occur amongst females under the age of 25 years, and 63,7 percent of the total population is below 25 years of age (as at 1975) that the moderately high crude birth rate will be maintained

(ii) the number of expanding families will continue to grow particularly amongst the younger age group of the society. This will result in a high demand for additional housing accommodation in both the short and long term situation

(iii) with a rising number of resident population (i.e. both existing and settled migrants) the upward growth curve of births per 1000 population will increase quite dramatically thus causing an eventual change in the overall structure of the community.

If it is assumed that the age specific rate will not change dramatically within the 15 year planning period - as has already been determined from (i) above - then the number of births per year and in 5 year categories can quite easily be computed as can be seen in Tables XXXVII - XXXIX.

4.8.5 Crude death rates

Like birth rates, mortality rates reflect the changing character of the community, which gives the model its dynamic character.

TABLE XXXV

THE ESTIMATED CRUDE DEATH RATE FOR SUB-REGION FOR THE PERIOD 1964-1971

TOTAL	YEAR	POPULATION	ESTIMATED DEATHS	DEATH RATE/1000 PEOPLE
	1964	3862	37	9,58
	1965	4063	36	8,86
	1966	4274	45	10,53
	1967	4496	32	7,12
	1968	4729	33	6,98
	1969	4975	32	6,43
	1970	5234	42	8,02
	1971	5506	45	8,17
TOTAL	8		302	65,69
	$\bar{x}$ D.R.		37,75	8,21

1. Data drawn from Table XXXVII.

In contrast to the high crude birth rate established in Table XXXlll, the death rate is relatively low. With the rapidly increasing growth in population the net survivorship rate is likely to climb since the ratio between births (on upward swing) and deaths (relatively static) is expected to widen. The low crude death rate therefore indicates that the future population explosion will have to look to additional sources of accommodation rather than relying on the provisions of inheritance.

Taking the distribution of Table XXXV as a guide it is essential to discover the spread of mortality over the entire community, this will now be attempted in 4.8.6.

4.8.6 Age specific death rate[1]

As is to be expected, the highest mortality rates are most likely to occur in the youngest and older age groups. Table XXXVl indicates that there is a relatively high infant mortality rate (approximately 13 percent of all deaths) during the first five years of a child's existence. However, in comparison to the number of children being born the high mortality rate is unlikely to seriously deplete the additional population obtained through natural increase. It is assumed that the age specific death rates are similar for both existing and immigrant populations and therefore the sum of the populations in each age cohort, are utilised for the calculation of empirical death returns.

Of interest is to note that the death rates are lowest during the reproductive life cycle of the inhabitants, and thus it can be expected that with the general ageing of the society (see Tables) that the death rate will remain constant or increase marginally.

---

1. Since the Durban mortality rate is 0,1262 percent too high in terms of the crude death rate estimated for the Marburg / Port Shepstone sub-region, the age specific rates have to be proportionally lowered to come into line with the established mean crude death rate obtained from Table XXXV.

TABLE XXXVI

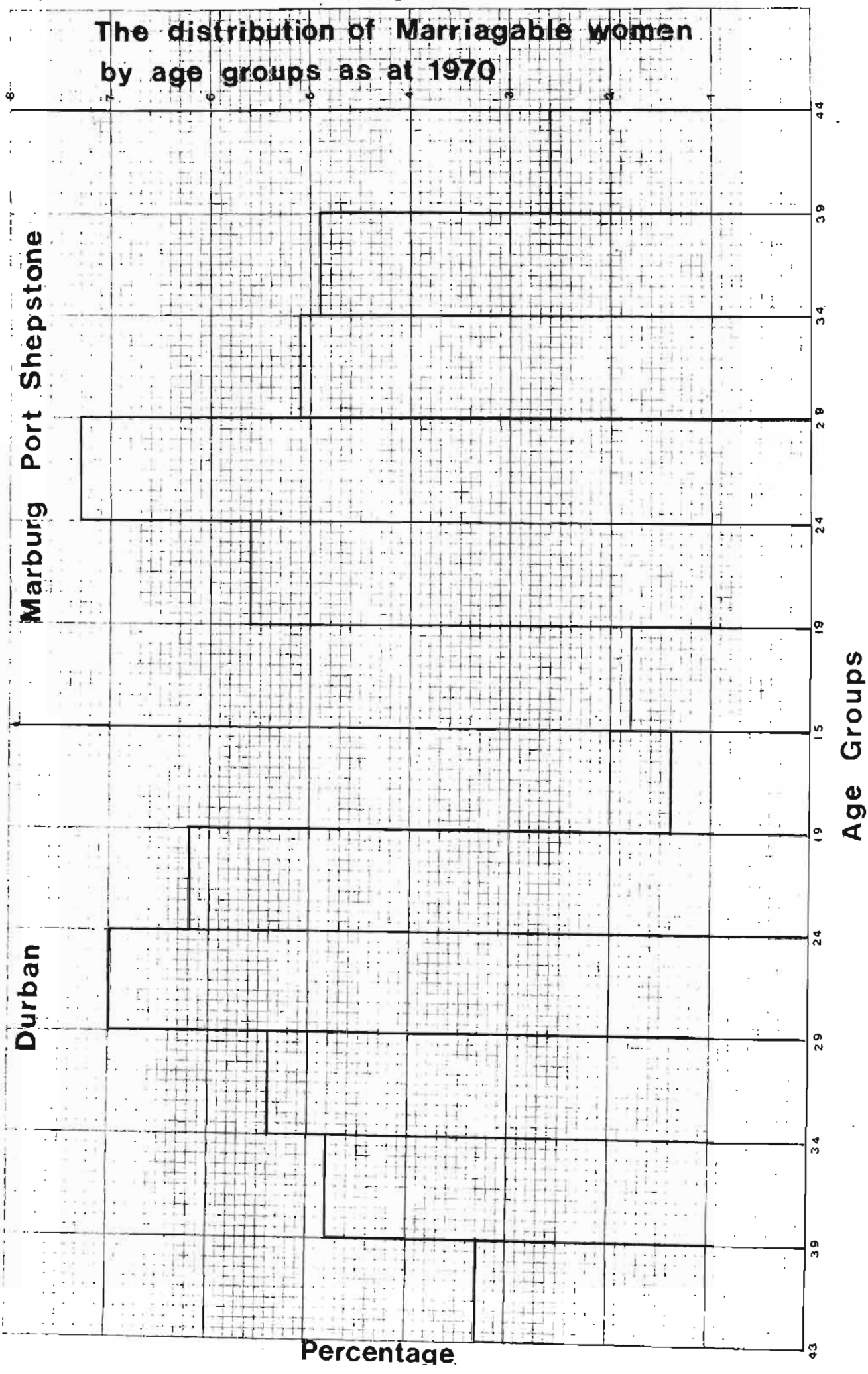
THE ESTIMATED AGE SPECIFIC DEATH RATES [1] FOR THE MARBURG / PORT SHEPSTONE SUB-REGION

AGE GROUP	POPULATION	DURBAN DEATH RATE [2] PER 1 000 PEOPLE	EXPECTED DEATHS IN SUB-REGION IN TERMS OF DURBAN DEATH RATES	EXPECTED DEATHS IN SUB-REGION AS CORRECTED FOR MARBURG / PORT SHEPSTONE SPECIFIC DEATH RATE i.e. 8,21 [1]	SUB-REGIONS DEATH RATE PER 1 000 PEOPLE
0 - 1	195	41,1	8,01	6,69	34,31
1 - 4	626	2,4	1,50	1,25	2,00
5 - 9	766	0,8	0,61	0,51	0,67
10 - 14	650	0,4	0,26	0,22	0,34
15 - 19	606	1,6	0,97	0,81	1,34
20 - 24	479	4,0	1,92	1,60	3,34
25 - 29	447	3,8	1,70	1,42	3.18
30 - 34	335	3,9	1,31	1,09	3,25
35 - 39	326	6,1	1,99	1,66	5,09
40 - 44	221	5,8	1,28	1,07	4,84
45 - 49	176	11,2	1,97	1,65	9,38
50 - 54	129	19,0	2,47	2,06	15,97
55 - 59	101	15,9	1,61	1,35	13,37
60 +	155	221,7	34,36	28,70	185,16
TOTAL	5212		59,96	50,08	
$\bar{X}$ DEATH RATE		9,83	11,50	8,21	

1. The Port Shepstone Death Rate is 12,62 percent below the Durban Metropolitan rate for Indians and therefore the sub-regions crude rate must reflect the downward adjustment.

2. P.W. Johnston OP CIT P2.

Histogram 2


The distribution of Marriagable women
by age groups as at 1970
Marburg Port Shepstone
Durban
Age Groups
Percentage

4.9 1970-1975 POPULATION DISTRIBUTION TABLE XXXVll

The proper and accurate analysis of Table XXXVll is the most vital process in the whole of the age cohort research programme. By combining the results of the empirically observed data (i.e. population distribution obtained from census returns) with those derived from sample statistical means (e.g. features of migration distribution etc) an overall picture of the community's structure is derived.

The effects and influences of birth and deaths are accurately plotted and recorded, and their effects on the ageing and growth of the population for the 5 year period under review are established.

The basic findings which are of primary importance to the estimation of future housing needs are:-

(i) of the total births expected in the region between 1970-1975 only 13,8 percent can be attributed to inward migration, the rest being resultant from natural increase. This indicates that migrant households should be able to occupy their existing newly acquired homes for the initial period of residence, without the need to search for larger housing units

(ii) population growth due to the births for the period 1970-1975 represents an increase of 28,23 percent on the existing population, and an overall 5,15 percent per annum net growth[1] rate for the entire sub-region. It is therefore to be expected that there will be an immediate need amongst the local populace to seek more suitable accommodation with the growth in family size

(iii) the optimum number of births occur in the 15-29 age group amongst the younger married couples. These couples either have to bear greater conditions of overcrowding in their existing paternal households, or seek new accommodation, the

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1. Net growth comprises births minus deaths.

TABLE XXXVII

POPULATION ESTIMATE - AGE X SEX X MARITAL STATUS - FOR PERIOD 1970 - 1975

SOURCE		NATURAL INCREASE										MIGRANT						COMBINED		
	SEX	MARITAL STATUS										MARITAL STATUS						TOTALS		
AGE GROUP		SINGLE	MARRIED	WIDOWDED	DIVORCED	LIVING TOGETHER	TOTAL POPULATION	EXPECTED DEATHS IN 5 YRS.	SURVIVORS NATURAL INCREASE	EXPECTED NATURAL INCREASE BIRTHS IN 5 YRS.	SINGLE	MARRIED	WIDOWDED	TOTAL POPULATION	EXPECTED MIGRANT DEATHS IN 5 YRS.	MIGRANT SURVIVORS	EXPECTED MIGRANT BIRTHS IN 5 YRS.	TOTAL DEATHS	TOTAL BIRTHS	TOTAL SURVIVORS
0 - 1	M	100					100	33	162		19			19	6	29		39		191
	F	95					95				16			16						
1 - 4	M	300					300	6	620		56			56	1	109		7		729
	F	326					326				54			54						
5 - 9	M	419					419	3	763		56			56		90		3		853
	F	347					347				34			34						
10 - 14	M	324					324	1	649		44			44		76		1		725
	F	326					326				32			32						
15 - 19	M	292	5				297	4	603	148	23			23		42		4	148	645
	F	263	41			6	310				19			19						
20 - 24	M	143	59			10	212	8	471	363	18	11		29	1	62	65	9	428	533
	F	120	133	1		13	267				7	26	1	34						
25 - 29	M	73	123			11	207	7	440	266	10	24		34	1	70	48	8	314	510
	F	49	184	2		5	240				2	34	1	37						
30 - 34	M	30	140	1	1	8	180	5	330	109	3	26		29	1	54	20	6	129	384
	F	17	129	4	2	3	155				1	24	1	26						
35 - 39	M	15	146			4	165	8	318	52	2	27		29	1	57	10	9	62	375
	F	15	125	13	4	4	161				1	24	4	29						
40 - 44	M	5	124			3	132	5	219	7		12		12		19	4	5	11	238
	F	14	65	9	1	3	92					7		7						
45 - 49	M	4	76	2			82	8	165			7		7	1	15	4	9	4	180
	F	2	75	11	1	2	91					8	1	9						
50 - 54	M	3	64	1			68	10	119			6		6	1	11		11		130
	F	1	43	15		2	61					5	1	6						
55 - 59	M	3	50	3			56	7	93			5	1	6		11		7		104
	F	1	24	18	1		44					5		5						
60 +	M	2	60	15	2	4	83	144	12			12		12	15	1		159		13
	F	1	20	52			73					2	2	4						
TOTAL	M	1713	847	22	3	40	2625	-	-	-	231	130	1	362	-	-		-		-
	F	1576	839	125	9	38	2587	-	-	-	166	135	11	311	-	-		-		-
GRAND TOTAL		3289	1686	147	12	78	5212	249	4964	945	397	265	12	673	28	646	151	277	1096	5610

latter being the trend most likely to prevail provided financial and housing resources are available

(iv) the specific birth rate[1] i.e. $\frac{1096}{827}$ = ,27 (i.e. rate of births to married females capable of reproduction, although higher than the Durban Metropolitan rate of 0,19 births[2], is not regarded as excessive for a rural community, but is indicative of a high population growth rate. Since housing is in short supply as has been established in Chapter 3.5, the rise in births will inevitably affect the housing situation since families will tend to outgrow their housing units

(v) mortality rates are low i.e. $\frac{6706}{277}$ = 4,84 deaths per 1000 population which is surprisingly lower than the Durban rate[3] of 9,83 deaths/1000 population. With a ratio of 4:1 births to deaths it can be expected that there will be a high overall increase in the population due to migration and natural increase. Much of the population growth can be expected amongst the infant age group (i.e. 73 percent of total population growth), which will ultimately lead to a high natural increase. With only an estimated 223 deaths occurring in the potential home ownership age group i.e. 20-60+, and with multiple household living continuing to play a part in the structure of the community, the prospect of the reallocation of acoommodation through inheritance would appear to be slight

(vi) the gross population increase represents a 28,66 percent acretion on the existing population which indicates that there will be a substantial demand for new housing during this period. A large proportion of this demand will be caused by expanding families, while the remainder will be necessitated through a high rate i.e. 2,4 percent per annum of immigration into the sub-region.

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1. The specific birth rate reflects live births per female capable of bearing children and is compiled by the addition of all females in the 15-49 age group with marital status if married or living together. Widows and divorcees are excluded from the rate.
2. P.W. Johnston Op cit p4.
3. Ibid

Through the consolidation of the results obtained in Table XXXVlll, and using the methodology explained in Chapter 3.9.7, Table XXXVlll can be prepared so as to reflect the population structure for the period 1975-1980. The initial population structure used thus makes allowance for the ageing of the community and changing sex/marital status during such period.

4.9.1 1975-1980 Population distribution (Table XXXVlll)

Once again the findings reveal a compound upward growth in the population, and therefore it is essential to discover the factors governing the change in the community's structure.

Observations of the distribution reveal:-

(i) that there is a definite ageing amongst the 0-39 age groups, and more particularly amongst the 20-34, when compared to the 1970-1975 population age group distribution.
Whereas in 1975, 11,3 percent of the population were over 40 years in age, as many as 28 percent fell into this category as at 1980. While 21,28 percent of the 1975 population comprised the 20-34 year age group by 1980 this had risen to 30,72 percent which indicates that the high population growth rate estimated in (ii) will be maintained by the general ageing and composition of the 20-34 age group of the community

(ii) population growth is estimated at 29,9 percent with a mean average of 5,37 percent per annum. This reflects a 4,2 percent rise in the population growth rate over the 1970/1975 estimate and indicates that there is a continuing upward trend in the population growth of the sub-region

(iii) of the total population growth, migration only accounts for 11,6 percent of the increase. However since approximately 41 percent of the migrants fall within the household forming

TABLE XXXVIII

POPULATION PROJECTION - AGE X SEX X MARITAL STATUS - FOR PERIOD 1975 - 1980

SOURCE		NATURAL INCREASE									IN-MIGRATION							COMBINED		
	SEX	MARITAL STATUS									MARITAL STATUS							TOTALS		
AGE GROUP		SINGLE	MARRIED	WIDOWED	DIVORCED	LIVING TOGETHER	TOTAL POPULATION	EXPECTED DEATHS IN 5 YEARS	SURVIVORS NATURAL INCREASE	EXPECTED NATURAL INCREASE BIRTHS IN 5 YRS.	SINGLE	MARRIED	WIDOWED	TOTAL POPULATION	EXPECTED MIGRANT DEATHS IN 5 YEARS	MIGRANT SURVIVORS	EXPECTED MIGRANT BIRTHS IN 5 YEARS	TOTAL DEATHS	TOTAL BIRTHS	TOTAL SURVIVORS
-1	M	135					135	44	217		24			24	8	36		52		253
	F	126					126				20			20						
1-4	M	404					404	8	827		72			72	1	140		9		967
	F	431					431				69			69						
5-9	M	579					579	3			72			72	1	115		4		1032
	F	341					341				44			44						
10-14	M	425					425	1	852		57			57		99		1		
	F	428					428				42			42						
15-19	M	349	6				355	5	720	196	30			30		54		5	196	774
	F	314	49			7	370				24			24						
20-24	M	193	79			13	285	9	636	487	23	14		37	1	81	85	10	572	717
	F	162	179	2		17	360				10	34	1	45						
25-29	M	87	147			13	247	8	524	318	12	31		43	1	89	61	9	379	613
	F	58	220	2		6	285				3	43	1	47						
30-34	M	46	210	3	3	12	274	8	502	166	4	34		38	1	70	25	8	191	572
	F	26	197	6	3	5	236				1	31	1	33						
35-39	M	18	171			5	194	10	374	61	3	36		39	4	73	12	14	73	447
	F	18	147	15	5	5	190				1	31	6	38						
40-44	M	8	208			5	221	9	366	12		16		16	1	25	1	10	13	391
	F	23	109	15	2	5	154					10		10						
45-49	M	6	105	3			114	11	277	2		10		10	1	20		12	2	247
	F	3	103	14	1	3	124					10	1	11						
50-54	M	4	89	2			95	14	166			8		8	1	14		15		
	F	1	60	21		3	85					6	1	7						
55-59	M	4	65	4			73	9	121			6		6	1	11		10		132
	F	1	32	23	1		57					6		6						
60+	M	2	45	10	2	3	62	108	9			15		15	19	1		127		10
	F	1	15	39			55					3	2	5						
TOTAL	M	2260	1125	22	5	51	3463	-	-	-	297	170	-	467	-	-	-	-	-	-
	F	1933	1111	137	22	51	3243	-	-	-	214	174	13	401	-	-	-	-	-	-
GRAND TOTAL		4193	2236	159	17	102	6706	247	6459	1242	511	344	13	868	40	828	184	287	1426	7286

age group i.e. 15-49 years, it is likely that there will be an increased demand for additional accommodation, and that such migrants will have to increasingly compete with the existing community for suitable accommodation

(iv) the mean annual birth rate of 0,26 reflects a marginal decline on the 1970-1975 rates while the mean annual death rate of 3,29 deaths/1000 population reflects an even larger decline on the previous estimates. Thus despite the decline in the birth rate the net difference between the lowered death rate and static birth rate, provides a definite indication that there will be an acceleration in the general population growth rate due to natural increase

(v) The relevance of the aforementioned research findings underlines the fact that the high demand for housing necessitated by population growth due to natural increase and migration will be maintained and will increase roughly in proportion to the mean annual growth in the population. A large proportion of the demand will be necessitated by the higher family and household formation rates of the immigrant community who will exceed proportionally that of the established community. With an observed ageing of the community it is to be expected that there will be both a short and medium term boom in birth rate and this is borne out by the findings in 4.9.1(i).

4.9.2 1980-1985 Population distribution Table XXXIX

From the results of this projection it can be seen that:-

(i) population growth during this period is projected to reach 5,30 percent per annum which is marginally i.e. 0.07 below that for the previous projection. Despite the decline in the growth rate it is estimated that the net number of people

POPULATION ESTIMATE - AGE X SEX X MARITAL STATUS - FOR PERIOD 1980-1985

SOURCE		NATURAL INCREASE									MIGRANT							COMBINED		
	SEX	MARITAL STATUS									MARITAL STATUS							TOTALS		
AGE GROUP		SINGLE	MARRIED	WIDOWED	DIVORCED	LIVING TOGETHER	TOTAL POPULATION	EXPECTED DEATHS IN 5 YRS.	SURVIVORS NATURAL INCREASE	EXPECTED NATURAL INCREASE BIRTHS IN 5 YRS.	SINGLE	MARRIED	WIDOWED	TOTAL POPULATION	EXPECTED MIGRANT DEATHS IN 5 YRS.	MIGRANT SURVIVORS	EXPECTED MIGRANT BIRTHS IN 5 YRS.	TOTAL DEATHS	TOTAL BIRTHS	TOTAL SURVIVORS
- 1	M	175					175	58	281		31			31	10	47		68		328
	F	164					164				26			26						
1 - 4	M	525					525	11	1076		93			93	2	180		13		1256
	F	562					562				89			89						
5 - 9	M	768					768	4	1216		93			93	1	149		5		1365
	F	452					452				57			57						
10 - 14	M	514					514	2	1030		74			74	-	128		2		1158
	F	518					518				54			54						
15 - 19	M	458	8				466	6	945	264	38			38	-	69		6	264	1014
	F	412	64			9	485				31			31						
20 - 24	M	231	95			16	342	13	761	587	30	11		41	21	97	109	15	696	858
	F	194	215	2		21	432				12	44	2	58						
25 - 29	M	117	197			18	332	11	706	426	16	40		56	3	115	80	14	506	821
	F	79	295	3		8	385				3	57	2	62						
30 - 34	M	55	252	4	4	15	330	10	603	198	6	44		50	2	92	33	12	231	695
	F	31	236	7	4	5	283				2	40	2	44						
35 - 39	M	26	257			7	290	15	557	90	3	46		49	3	96	16	18	106	653
	F	26	219	23	7	7	282				2	40	8	50						
40 - 44	M	10	247				263	11	436	14		20		20	1	31	21	12	15	467
	F	28	130	18	2	6	184					12		12						
45 - 49	M	9	172	5			186	18	273	3		12		12	1	26		19	3	399
	F	5	169	24	2	5	205					13	2	15						
50 - 54	M	6	122	2			130	20	227			10		10	2	18		22		245
	F	2	82	29		4	117					8	2	10						
55 - 59	M	5	90	5			100	12	168			8		8	1	17		13		185
	F	2	44	32	2		80					8		8						
60+	M	2	55	14	2	5	78	133	11			20		20	25	1		158		12
	F	1	18	47			66					3	3	6						
TOTAL	M	2901	1495	30	6	67	4499	-	-	-	384	211	-	595	-	-		-		-
	F	2476	1472	185	17	65	4213	-	-	-	276	235	21	522	-	-		-		- 11,275
GRAND TOTAL		5377	2967	215	23	132	8712	324	8388	1582	660	436	21	1117	53	1066	239	377	1821	11,275

who will accrue to the sub-region will be higher than for any previous period

(ii) 71 percent of the total population growth will be resultant from births, and migrant births will constitute 42 percent of the overall increase

(iii) the mean annual birth rate of 0,27 reflects a marginal increase over the previous quinquenial period which indicates that the general ageing of the community is having an effect on the overall size of the family unit. The mean annual death rate of 6 deaths per 1000 population is a marked increase on the 1975-1980 estimate and is probably related to the increase in the birth rate (i.e. there is a higher mortality rate amongst children under 5 years) and the ageing of the community (i.e. whereas in 1980 approximately 7,8 percent of the survivors were aged 45 years and over, 8,9 percent fell into this category as at 1985). Once again an increasing mortality rate occurring amongst the older members of the community has lead to the observed rise in the death rate

(iv) unlike the period 1975-1980 there was a marginal decrease in the number of people falling within the primary family and household formation age group i.e. 19-45 years; with the decrease being from 48,2 percent to 47,7 percent i.e. 0,5 percent; and the decline in the percentage of married persons aged 15-44 between 1980-1985 approximately 23,04 and 22,78 percent respectively. The decline in the marriage rate is significant in that it also constitutes a possible cause for the declining birth rate established in (i)

(v) The significance of the aforementioned findings reveals that during 1980-1985 it can be expected that there will be a levelling off of population growth and that with the family formation being maintained at a steady rate of $\pm$ 23 percent of the population, that housing demand will remain at the

previous levels for the period 1975-1980, although the absolute unit demand will be higher than before. With the high birth rate and a relatively high family formation it can be expected that the family size will be maintained since the increase in family size through additions to the extended family will be counterbalanced by the greater splitting up of families to form nuclear households.

4.9.3 1970-1985 General observations of population distribution

Using the results of the observations drawn from Tables XXXVll to XXXlX it can be seen that:-

(i) the birth rate is likely to decline throughout the planning period, although the decrease will tend to level off in the final quinary period.
In contrast to the period 1970-1980 it is to be expected that there will be a slight decline in the crude birth rate after 1980. A comparative analysis of Table XL shows that the birth rate is likely to rise for the first decade, but fall

TABLE XL

ESTIMATED BIRTHS PER MARRIAGEABLE FEMALE (1970-1985)

Period	1970-1975	1975-1980	1980-1985
$\overline{X}$ B.R. P.A.	1,00	1,25	1,16

in the final quinary period, which suggests that the rate of population growth will accelerate in the short term but even off in the latter stages of the projection

(ii) in respect of the observed death rates (see Table XL1), it can be seen that there is a cyclical movement in the death rate with the rise in the number of deaths in the period 1975-1980 contributing to a slight decline in the infant birth rates. The rise in the death rate during the late 1970's however is expected to even out during the early 1980's with the result that the overall population growth rates will be maintained as experienced during the 1975-1980 period.

TABLE XL1

ESTIMATED CRUDE DEATH RATES FOR SUB-REGION FOR PERIOD 1970-1985

Period	Estimated deaths in 5 years	Estimated Population	Annual rate per 1000/people
1970-1975	277	6706	4,84
1975-1980	287	8712	6,07
1980-1985	377	11,275	5,98

While there is evidence to suggest there will be a marginal decline in the birth rate during the latter projection period such decline will only marginally affect the decline in the family size.

Although a declining birth rate has been observed in Table XL1, Table XL11 has revealed an increasing death rate which indicates that the widening gap between births and deaths will result in a substantial portion of the gross population increase being derived from natural increase in addition to that derived from migration

(iii) despite the decline in the birth rate it can be expected that there will be a rise in the percentage of married persons. See Table XL11.

TABLE XL11

THE PERCENTAGE OF MARRIED PERSONS IN 5 YEAR INTERVALS[1]

PERIOD	MARRIED	%	TOTAL POPULATION
1970 - 1975	1951	29,09	6706
1975 - 1980	2580	29,61	8712
1980 - 1985	3403	30,18	11,275

Whereas 37,88 percent[2] of the 1970 population were contained in the primary marriage age group i.e. 20-34 years, by 1985 56,38 percent[3] of the total population are expected to fall within the family formation age groups. This will inevitably lead to greater demand for new housing as younger families move out to start their own nuclear household units.

(iv) Using the results obtained from Tables XXV11 to XXX1X, Table XL111 and Histogram 3 are compiled which predicts that:-

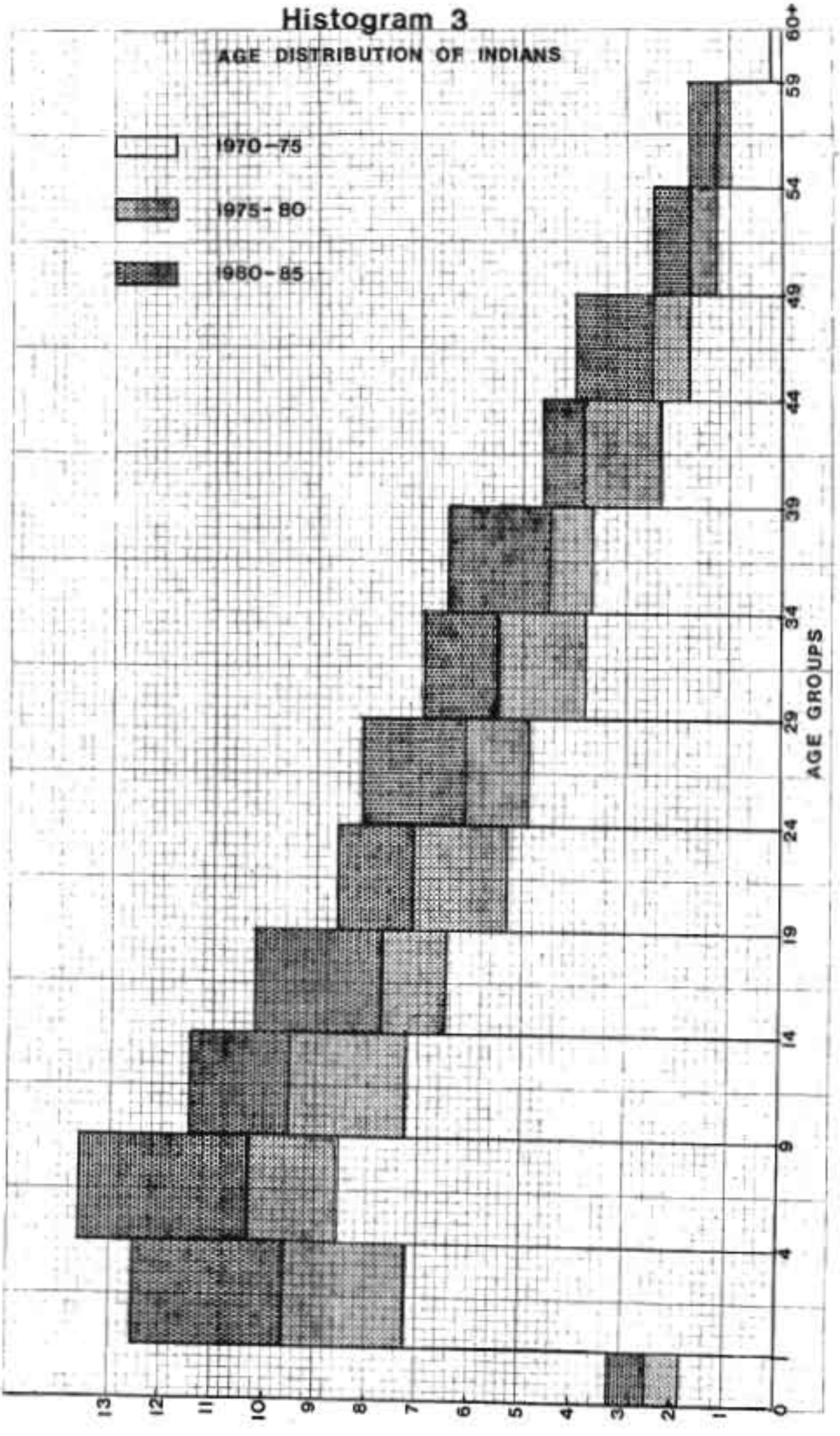
TABLE XL111

THE PERCENTAGE DISTRIBUTION OF AGE GROUPINGS 1970-1985

AGE GROUP	1975	1980	1985
0-20	46,9	45,7	45,4
20-40	43,2	43,3	43,0
40-60	9,9	11,0	11,6

1. Estimates obtained from Tables XXV11-XX1X.
2. The percentage composition is obtained from Table XXV11 by simple addition of total people in age groups 20-34 (i.e. existing and migrants) divided by total population.
3. As per above except data drawn from Table XX1X.

Histogram 3


AGE DISTRIBUTION OF INDIANS
1970-75
1975-80
1980-85
60+
59
54
49
44
39
34
29
24
19
14
9
4
0
AGE GROUPS
13
12
11
10
9
8
7
6
5
4
3
2
1

(a) there will be a decline in the percentage composition of the under 20 year age group with a concomitant increase in the over 40 year olds

(b) since the 20-40 age group forms the bulk of the marriageable and household forming portion of the community, the demand for accommodation in the future will be relatively constant since there is little variation between the 1975 and 1985 estimates

(c) the 40-49 age group will experience the greatest growth i.e. approximately 122 percent by 1985 on the 1970 levels. Such groups fall outside the reproductive age group and this is likely to affect future birth rates by lowering them. Histogram 2 indicates that there is not likely to be any inordinate variation in the age distribution of the populace and that there will be a steady decline in absolute terms of the number of people per age category, from the 5th year of life onwards. This expected decrease in age groups fits closely to the exponential curve and thus it can be expected that there will not be any large scale fluctuations in housing demand within the planning period although there will be a gradual increase in demand resultant from the general ageing of the community and hence more people falling within the marriageable age group.

4.10 FAMILY SIZE

In this particular approach to the study of housing requirements it is necessary to ascertain whether:-

(A) there is any meaningful difference between the family size of the existing and future migrant families, and

(B) the existing and future migrant families, and what the size, extent and distribution of families is in relation to their migrant or non-migrant status.

The first step is to determine the nature of the mean family size of the existing population and migrant population as at 1970. In Table XLlV it can be seen that:-

TABLE XLlV[1]

THE DISTRIBUTION OF FAMILIES BY SIZE AS AT 1970

District	Marburg	Port Shepstone	Sub-region	
Family size	Number of families	Number of families	Total families	Total population
2	44	40	84	168
3	77	68	145	435
4	72	75	147	588
5	76	72	148	740
6	68	56	124	744
7	84	36	120	840
8	32	21	53	424
9	23	13	36	324
10+	31	14	45	528
Total	507	395	902	4791

(a) the mean family size is 5,3[2] persons per family, and

(b) there is a fairly even distribution of families over the entire family size scale, and

(c) the model family size is between 4-5 persons per family while the median lies within the same limits. This suggests that

---

1. Population census report on Families Report No 02-03-01 p230 (1970), Bureau of Statistics, Pretoria.
2. The mean family size is determined by letting:

$\bar{Z} = \frac{P}{F}$ where $\bar{Z}$ = Mean family size for sub-region
P = Total number of family members
F = Total number of families in the sub-region

thus

$$Z = \frac{4791}{902} = 5,31.$$

the larger units are tending to increase the unit size.

In respect of the migrant family unit sizes there would appear to be a significant difference between the migrant family and existing family unit sizes. Table XLV reveals that:-

TABLE XLV[1]

THE DISTRIBUTION OF IN-MIGRANT FAMILIES AS AT 1975

Family size	No of families	No of people
2	5	10
3	5	15
4	5	20
5	1	5
6	3	18
7	-	-
8	1	8
9	1	9
10+	-	-
Total	21	85

(i) there is a significant difference between the mean family size of the 'permanent' and 'in-migrant' family units. Whereas the 'permanent' units have an established 5,31 persons per family, the migrants have a size varying between 2,98 and 5,18 persons per family unit with a mean of 4,05

(ii) because of the small sample and universe of the migration survey there is a wide variance in the mean family sizes. However since both the mode and median scores reflect 4-5 person family units as being the most popular size, it can be deducted that the migrants mean unit size lies somewhere in the upper quandrant.

1. Data drawn from Migration Survey 1971.

(iii) it is clear that migrant families in general tend to be smaller than the existing community and this can be attributed to:-

(a) the youthfulness of the migrants
(b) the marital status of the migrants
(c) the socio-economic conditions which assist migration.

iv) the lower size of migrant families is likely to reduce the overall family unit size in the medium to long term, once the migrant becomes assimulated into the community.

4.10.1 The Calculation of non-family members

As has been established in 3.3.6 there are always a proportion of non-family members who influence the composition of a household. Therefore the next stage in the research programme:-

A. attempt to establish the ratio of family to non-family members in a community and establish any trends which may indicate any potential change in such structure
B. uses the findings in A above to establish projections wherein the future 'permanent' and 'migrant' community structure can be ascertained.

In respect of A above Table XLVl provides a comparative analysis of the 1960 and 1970 population.

TABLE XLVl

THE PROPORTIONAL RELATIONSHIP OF FAMILY/NON-FAMILY MEMBERS OF THE COMMUNITY FOR 1960-1970

Year	1960	%	1970	%
Total population	3418	100	5212	100
Total family members	3171	92,77	4791	91,92
Total non-family members	247	7,23	421	8,08

The rise in the number of lodgers between 1960-1970 cannot easily be explained, but has most likely occurred as a result of a combination of the following:-

(i) increasing employment opportunities
(ii) a shortage of housing so forcing single people to seek accommodation with families
(iii) the influence of cultural, religious and kinship ties compelling existing residents to provide shelter to others less fortunate than themselves
(iv) economic factors whereby families have to take in lodgers to balance their family budgets.

With increasing high population growth and a shortage of accommodation it can be expected that the proportion of lodgers in households will continue to climb, unless alternative low cost housing is provided.

Thus if it is assumed that this increase in the proportion of lodgers will be maintained during the planning period, then the total number of family and non-family members of the permanent society can be established. An analysis of the migration survey revealed that there was a nil incidence of lodgers amongst immigrants into the community and thus for the purpose of this Thesis it is assumed that the proportional relationship established in Table XLVl applies only to 'permanent' residents and that in-migrant families coming into the area constitute whole family units.

TABLE XLVll

THE PROJECTION OF FAMILY AND NON-FAMILY[1] MEMBERS OF THE MARBURG / PORT SHEPSTONE SUB-REGION FOR THE PERIOD 1970-1985

Period	1970	%	1970-75	%	1975-80	%	1980-85	Prop
Est Pop	5212	100	5909	100	7698	100	9970	100
Est family members	4791	91,9	5413	91,6	7013	91,1	9043	90,7
Est non fam members	421	8,1	496	8,4	685	8,9	927	9,3

1. Ref: Population Census 1970 Report No 02-03-01 p230, Bureau of Statistics, Pretoria.

In terms of Table XLVll it can be concluded that:-

(a) there will be an increasing proportion of lodgers[1] in the community who will ultimately acquire separate accommodation

(b) conversely the number of family members will diminish with a resultant decline in family size and demand for large scale housing units i.e. if the incidence of lodgers boarding with families remains static or declines.

4.10.2 The projection of mean family size 1970-1985

Having successfully determined the potential family member composition of the society the next task is to predict the family unit size likely to occur throughout the planning period in the sub-region.

Since the number of non-family members varies by a maximum 1,2 percent it is inevitable that there will be a variation in the family size and household composition of the area.

From Table XLVlll it can be seen that there has been a ,002[2] persons per family increase per annum in the unit size which is indicative of a very stable family unit.

TABLE XLVlll[3]

A COMPARATIVE ANALYSIS OF MEAN FAMILY SIZES AS AT 1960-1970

Period	1960	1970
Total population	3418	5212
Total family members	3171	4791
Total families	600	902
Mean family size	5,29	5,31

1. The percentage lodgers is increased by ,085 per annum to a maximum of 9,3 percent component of the total population as at 1985.
2. Derived from the difference between the 1960-1970 Census Mean Family size over a period of 10 years.
3. Population Census 1960, 1970 Reports No. 02-03-01 p230 (1970), Vol 11 No 2 p239 (1960).

However resultant from the changing proportion of family/non-family members and the minor upward trend in family size, it is necessary to determine the:-

A. anticipated mean family size over the entire planning period, and
B. the number of families likely to accrue to the sub-region.

4.10.3 The projection of permanent families likely to accrue to the sub-region 1970-1985

In Table XL1X the permanent families are analysed to reveal that a small increase in the family size can be expected as a result of the birth rate

TABLE XL1X

THE PROJECTED NUMBER OF 'PERMANENT' FAMILIES FOR THE PERIOD 1970-1985

Period	1970	$\bar{X}$ family size 1970	1970-75	$\bar{X}$ family size 1970-75	1975-80	$\bar{X}$ family size 1975-80	1980-85	$\bar{X}$ family size 1980-85
Est family members	4791		5413		7013		9043	
Est no of families	902	5,31	1017	5,32	1316	5,33	1693	5,34

rising faster than the contraction in the death rate (see Tables XL and XL1). This will consequently lead to a decline in the number of families as a result of the enlarged family size which in turn suggests that:-

(a) the overall demand for additional housing in the long term future should slacken, and/or
(b) existing dwellings will have to be enlarged to avoid further conditions of overcrowding.

4.10.4 The projection of migrant families

Unlike the fixed mean family sizes established in Table XL1X for 'permanent' families, 'migrant family' units have a variable mean as has been established in Table L. If it is assumed that the mean family sizes lie between the lower limit i.e. 2,98 and upper limit 5,15, then the estimates of the number of families likely to accrue to the sub-region through immigration can be estimated.

TABLE L

THE PROJECTED NUMBER OF MIGRANT FAMILIES[1] FOR THE PERIOD 1970-1985

Period		1975	1980	1985	Total increase 1970-1985
Population		797	1012	1305	3114
Est No Fams	$\bar{X}$ Fam size				
E1	2,98	267	340	438	438
E2	4,05	197	250	322	438
E3	5,12	156	198	255	255

Table L which is a representation of future immigrant family formation shows that:-

(a) for every three new families being formed, one will be resultant from immigration into the area

(b) family formation for 'migrants' is proportionally higher than that of the 'permanent' families

(c) the estimated growth rate for migrant families is 5,02 percent per annum as opposed to the natural increase of 4,28 percent for the

1. Table L which indicates the expected variance of the mean family size within a prescribed confidence level of 95 percent. E1-E3 represents the estimates for low - mean - high limits. The population projections are based on Tables XXXV11-XXX1X.

existing community. Migrant family formation can be seen to be significantly higher which will tend to boost the overall rate. However family formation will remain below population growth which signifies that much of the population growth will be amongst the under 19 year old age group.

4.10.5 The calculation of the total number of families likely to accrue to the sub-region

The final step in estimating future family formation involves the combination of the results of Tables XLIX and L to reveal the projected community structure (see Table Ll).

TABLE Ll

PROJECTIONS OF FAMILY SIZE X NUMBER OF FAMILIES FOR THE PERIOD 1970-1985

Period	1970	$\bar{X}$ fam size 1970	1970-75	$\bar{X}$ fam size 1970-1975	1975-80	$\bar{X}$ fam size 1975-1980	1980-85	$\bar{X}$ fam size 1980-1985	Total increase
Total Pop	5212		6706		8712		11 275		6063
Est fam members									
permanent	4791		5413		7013		9043		5557
migrant			797		1012		1305		
Total no of families									
E1	902	5,31	1378	4,51	1784	4,50	2305	4,49	1403
E2	902	5,31	1308	4,75	1694	4,74	2189	4,73	1287
E3	902	5,31	1267	4,90	1642	4,89	2122	4,88	1220

From the findings in the aforementioned table it can be concluded that:-

(i) the overall family formation growth rate will be approximately 5,85 and 6,43 percent per annum which is considerably above the mean population growth of 5,19 percent per annum. This indicates that there will be a general ageing of the community with more people moving into the 19-30 years age group, thus resulting in the higher family formation

(ii) the major portion of the family formation will be derived from the ageing of the 'permanent' community's youth

(iii) the high rate of family formation will result in a high demand for accommodation, which will escalate as the individuals socio-economic status and asperations rise.

Although an indication of projected family formation has been obtained it is necessary to determine what the relationship of multiple family living will be, to household formation. This is achieved by:-

A. examining past records, and

B. using the findings of (A) above to determine trends.

4.11 ESTIMATES OF FUTURE HOUSEHOLDS

As has been seen in the foregoing sub-analyses a falling family size and death rate combined with a rising birth rate can be expected. This is likely to exert considerable influence on the household structure of family units in the area.

In attempting to estimate future household size it is desirable to determine what the ratio of families per household is likely to be. Using the survey records of the 1960-1970 census as a data base Table L11 is compiled, in which it is seen that there has been a decline of 0,10 families per household during the period 1967-1970. This represents a 2,43 percent or 0,033 families per household unit, per annum, decline in family unit size. Assuming that this decline will continue at the

TABLE L11

THE ESTIMATED NUMBER OF FAMILIES PER HOUSEHOLD AS AT 1967-1971

	1967	1971
Estimated mean household size	7,63	7,12
Estimated mean family size	5,30	5,31
Number of families per household	1,44	1,34

observed, past rate, then Table L111 can be projected.

TABLE L111

THE PROJECTED NUMBER OF FAMILIES PER HOUSEHOLD FOR THE PERIOD 1970-1985

Period	1967	1971	1975	1980	1985
Estimated number of families per household	1,44	1,34	1,18	1,02	1,00

From the above Table it can be seen that there will be:-

(i) a gradual equilization of families with households i.e. each family will have its own dwelling unit
(ii) a decline in multiple family living patterns
(iii) a greater demand for houehold formation resultant from the effects of (i) and (ii) above.

The observed decline in families per household is in line with current trends and is resultant from:-

A. siblings moving out of their paternal household to establish
B. their own households
a decrease in multiple family living.

4.11.1 The household projection due to population growth

The final stage in the projection of additional housing requirements due to population growth is obtained by combining the results of Tables XLVll, Ll and Llll in terms of the formula set out in 3.11.

e.g. $\frac{5,31}{91,92} \times \frac{100}{1} \times 1,34 = 7,7$ persons per household.

Table LlV which illustrates the future household requirements of the sub-region indicates that:-

(i) the number of households required to accommodate the projected population increase until 1985, will be approximately three times the existing housing stock, which means that on average approximately 110-124 housing units will have to be built to satisfy potential demand

(ii) the household size is likely to decline in direct relation to the increase of lodgers and the contraction of the family unit

(iii) the demand for housing will be in advance of population growth since projected population growth is 5,32 percent per annum and household growth between 5,36 - 5,85 percent per annum. This provides clear evidence that there is a decline in the multiple family patterns and that a greater number of the population are falling within the household formation age groups.

4.11.2 The projected total housing requirements 1970-1985

Apart from the future housing requirements it is necessary to analyse the existing housing situation and incorporate the results of the degree of overcrowding established in Table XXVlll. Since the 'overcrowding' and 'recycling' procedure has already been fully analysed and interpreted earlier

TABLE LIV

THE PROJECTION OF THE POTENTIAL NUMBER OF HOUSEHOLDS LIKELY TO ACCRUE TO THE SUB-REGION FOR PERIOD 1970 - 1985

PERIOD	1970	ESTIMATED MEAN H/H 1970	1970-1975	ESTIMATED MEAN H/H 1970-1975	1975-1980	ESTIMATED MEAN H/H 1975-1980	1980-1985	ESTIMATED MEAN H/H 1980-1985
Total Population	5,212	100	6,706	100	8,712	100	11,275	100
Total family Members	4,791		6,210		8,025		10,348	
Total non-family Members (lod)	421		496		687		927	
Total family								
F1	902		1,284	4,84	1,656	4,85	2,131	4,86
F2	902		1,214	5,12	1,566	5,12	2,015	5,14
F3	902		1,173	5,29	1,514	5,30	1,948	5,31
Total House-Hold								
H1	732	7,12	1,076	6,23	1,604	5,43	2,104	5,36
H2	732	7,12	1,016	6,60	1,520	5,73	1,986	5,67
H3	732	7,12	985	6,81	1,469	5,93	1,927	5,85

in this Chapter it would appear essential to view the immediate housing demand in relationship to the total projected requirements due to population growth. In Table LV the overall requirements are displayed, and it can be seen that:-

(i) a vibrant growth is predicted for the sub-region. Whereas the population growth is projected to average 5,32 percent per annum between 1975-1985, the demand for housing will approximate 7,25 to 7,83 percent per annum which is substantially in advance of the population growth gained through natural increase or migration. Since the demand for accommodation is expected to grow exponentially it can be anticipated that there will be a pronounced housing shortage towards the latter half of the planning period unless the existing and more immediate backlog is erradicated.

(ii) in terms of the overall accommodation requirements the existing demand after recycling, represents approximately 10 percent of the total future demand. Although only $\pm$ 163 units are required to rehouse the existing community, this means that between 18 months and 2 years of the future building programme, will be required purely to rectify the current maladies in the housing situation, since the mean housing demand between 1970-1985 is calculated at 90-102 units per year. Thus if the existing housing is satisfied within the not too distant future the overall home building rate could be reduced to between 80 and 90 units per year, which is adequate to meet future demand resultant from natural increase and immigration

(iii) while the total housing demand represents a 210 percent increase on the 1970 housing stock approximately 32 percent[1] will be required to accommodate immigrant families who are expected

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1. Data drawn from Tables L and LV where

$$Z = \frac{X}{Y} = \text{number of immigrant families} / \text{total number of households to accrue to the area.}$$

TABLE LV

ESTIMATES OF TOTAL HOUSING REQUIREMENTS FOR PERIOD 1970 - 1985

PERIOD	1970	1970-1975	1975-1980	1980-1985	TOTAL INCREASE
Total H/H	732				
Estimated No. of H/Hs to be rehoused					
RH1		163			
RH2		163			
RH3		165			
Estimated Total future requirements					
FH1		1,076	1,604	2,104	1,372
FH2		1,016	1,520	1,986	1,254
FH3		985	1,469	1,927	1,195
Total H/Hold Requirements					
H1	732	1,239	1,767	2,267	1,535
H2	732	1,179	1,683	2,149	1,417
H3	732	1,150	1,634	2,092	1,360

to move into the area. Since such a large proportion of additional housing demand is likely to come from non residents of the sub-region it is clear that the existing community will have to make sacrifices and will have to carry the burden of future development unless the state or local authorities are prepared to shoulder their responsibilities in assisting with the provision of much needed accommodation.

It is also clear that unless a construction programme for the provision of mass economic and sub-economic housing is embarked upon within the near future that the existing conditions of overcrowding and perennial housing shortages will reach critical proportions and the longer such development takes, the harder it will be to achieve the already high development rates required to house the existing and anticipated community.

4.12 CONCLUSIONS

Population growth will be rapid and higher than that projected in Model I. This is largely due to:-

(i) variations in the assumed growth rate
(ii) population growth amongst migrants
(iii) the general ageing and changing marital status of the society.

Since a positive population growth is indicated the demand for housing is likely to arise especially since:-

(a) the existing housing is incapable of being more intensively utilised than in its present position
(b) an expected decline in multiple household living is expected

(c) socio-economic factors and declining kinship and cultural ties, together with better work opportunities are more likely to stimulate the incidence of in-household lodging as opposed to residential living in hotels, boarding houses, etc.

The incidence of flat, hotel, hostel or boarding house living is very low[1] and unless marked changes occur in the existing living patterns it is to be expected that separate household formation in conventional Special Residential dwelling units will be maintained. The trend towards flat dwelling however could possibly be stimulated by the rehousing of some of those displaced families presently living in outbuildings or basement accommodation, who are used to the group living life styles required for higher density living.

Both household and family sizes are seen to be in a state of decline and it is anticipated that such decline will continue in sympathy with observed trends in the national context.

With a rising death rate and declining birth rate, which is above normal expectations, it is to be expected that there will be a high rate of natural increase. Migration, too, is likely to take on a more significant role in speeding up the population growth of the sub-region, provided however that employment, education, health facilities and favourable Group Area designations continue to attract people into the area.

In this particular study it has not been possible to investigate the individual requirements of household sizes e.g. number of one, two, three bedroom dwelling unit requirements etc. nor the economics of household acquisition, but it is hoped that by providing estimates of gross potential demand, the planners of the future will have a data base upon which more detailed research can take place.

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1. The Marburg / Port Shepstone 1971 study reveals that only 20 percent of the total housing units are not conventional single dwelling units.

CHAPTER FIVE

THE CONCLUSION

5.1 GENERAL INTRODUCTION

In this the concluding chapter, the writer provides a summary of the relevant findings and attributes which the planner must examine when designing or undertaking any housing study. While the primary objective of this research programme has been to examine existing and future housing conditions in the Marburg / Port Shepstone sub-region in terms of two differently constructed statistical models which apply social criteria in their investigation; it will now be seen seen how relevant both models are for general application in housing studies amongst Indian Communities of South Africa.

This Chapter comprises 4 sections namely :-

(i) 'The importance of good research design'. Under this heading the more important criteria which influence data collation and interpretation are highlighted.

(ii) 'The significance of the research findings'. This sub-section deals with some of the general trends and observations obtained jointly from the two studies undertaken.

(iii) 'Indications for future development'. The final analysis deals with the prospects for future development and the general implications for the future planning of the sub-region.

(iv) 'The final conclusions'.

and shows how important it is that some form of model should be constructed for the projection of existing and future housing needs; and to what extent social criteria alone can influence future planning decisions.

5.2 THE IMPORTANCE OF GOOD RESEARCH DESIGN

The first and foremost observation to be made from this research study, is that the assessment of existing and future housing requirements amongst the Marburg / Port Shepstone Indian Community is not a straight forward arithmetical calculation but rather a complicated projection based on the intertwining of research findings drawn from numerous social studies which reflect both minor and large scale changes in the community structure.

As the analysis becomes more complex so too must the analytical tools used in the study become more sophisticated and refined. From the aforegoing it can be seen that the mere inspection of raw data is not enough and that a statistically sound research methodology must be designed to control the anlaysis of housing at all stages of the investigation.

The success of this study can be largely attributed to :-

(i) The availability of data.

(ii) The compatability of data sources.

(iii) The existance of suitable statistical measures for the measurement of the research findings.

The availability of suitable data is always a source of concern to the planner since he is generally restricted in time and financial resources from undertaking detailed research. From this study it can be seen that the Bureau of Statistics provides a wealth of data at many levels of sophistication, and if properly collated and cross referenced it can provide valuable data bases and sources of information which would otherwise be unavailable to the planner.

Census returns do have their limitations and it is essential to determine what type of information is necessary to supplement the Bureau of Statistics data. Whereas the Census returns can provide detailed information about population, family size and birth and death statistics, they cannot provide data about the household living patterns of Indian Communities. This is due largely to the Western European bias of the research design and therefore any planner who wishes to study the peculiarities of Indian household requirements must undertake his own research to obtain information about the size of and distribution of households in any particular sub-region.

In this particular Thesis four main data sources were used and it was somewhat fortunate for the writer that the University of Natal had undertaken a socio economic sample survey of the sub-region in 1967. The data obtained from this study has proved invaluable for the analytical process and it is thus clear that in any future survey of housing requirements, there must be a continual monitoring of the housing situation so as to obtain as many sources of data over as wide a time period as possible.

The availability of data is also closely related to the compatability of data sources e.g. the use of census returns would be useless for comparative purposes unless the emunerator sub-districts were similar in extent. It was indeed fortunate that the structural composition of the 1960 and 1970 census enumerator districts corresponded closely between surveys, and as a result thereof meaningful comparative analysis of data were undertaken and the relative growth patterns determined. In addition to the census data it was also opportune that the respective definitions used in the two surveys[1] corresponded closely, which once again facilitated meaningful cross referencing of data.

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1. Refers to the Socio Economic Survey of Port Shepstone 1967 and the Marburg Household Study, 1971.

While no empirical data existed in the project area concerning the age specific birth and death rates of the Indian population, it was considered acceptable to utilise the Metropolitan Durban Rates since the proportional population distribution was similar between the two areas. Had there been a marked variance in the population structure per age group between studies it would not have been possible to have accurately projected the future births and death of the community and Model II's validity and reliability would have suffered as a result thereof.

While every attempt has been made to obtain reliable data sources with a high degree of compatability it should be noted that all of the findings are based on relatively short term observations. This has been necessitated as a direct result of the lack of available data with a high degree of comparability, in particular during the 1950's. It should therefore be remembered that the aim of this study is primarily to produce a workable model for the calculation of housing demand, and is not necessarily a true and accurate reflection of the long term housing forecast for the sub-region since it is based on present and immediate past trends and conditions.

Population growth and household formation due to natural increase are relatively simple studies to undertake since a wealth of reliable and empirically derived data is available to the planner for use in his study. Migration however, is a hard measure to calculate since little or no comparable data sources or reliable research material exists. Each sub-region, town or suburb has its own characteristics which induce or dissuade migration and thus is is not possible to directly relate the results of one particular area to another. As has been seen from this study, the net inward or outward migration can be assessed by the application of a combination of research techniques. The planner is however, not enabled to determine the gross migration between

urban centres and this is a definite handicap since the influence of out-migration on the structure of the society cannot be accurately caused. Despite the aforementioned limitation on this study, there is clear evidence that inward migration is currently, and will in the future continue to exert a major influence on the population and social structure of the community.

While demographic factors are readily discernable the characteristics of household formation and composition are somewhat more difficult to ascertain. Thus in this study it can be seen how essential it is for the planner to provide a clear and concise definition of the criteria to be used in the investigation of household characteristics. From this study it can be seen that direct analysis of household data can only be entertained where the two data sources are compiled on the basis of common assumptions or common definitions i.e. a household as defined in the 1967 survey must be comparable with the definition employed in the Marburg Household Study of 1971.

This Thesis has to a large extent been made possible by the execution of four surveys, namely the 1960 and 1970 Census Surveys and the Social Surveys of 1967 and 1971; and although each was carried out independently of one another and at different time periods they used a limited number of methodological approaches and definitions in their research design. This has enabled a fair degree of comparative analysis between social survey and census material.

The third attribute, namely the 'Existence of Suitable Statistical Measures' looks at the tools and techniques with which survey data can be analysed and interpreted. This project has made use of both 'Universe' (i.e. full census counts) and 'Sample' (i.e. proportional counts) surveys, which each in its own right provides a graphic representation of the universe

which it has studied. It should be remembered that sample returns only provide an indication of the characteristics of a population universe and therefore both the 1967 and 1971 Household Surveys need not necessarily accurately illustrate the physical Universe under study, be it either for population or household data. However their accuracy is determined by the planner, through his control over the research design and levels of significance which he is prepared to accept.

Since housing construction programmes involve high capital outlay, it is essential that housing forecasts should be as accurate as possible so as to avoid unnecessary capital expenditure. In response thereto this Thesis provides two statistical models which provide population, family and housing estimates within limits set out by the planner. Thus the results obtained are a direct reflection on the planners skill in manipulating his research design and the acceptability of the studies' findings are closely correlated with the assumptions used, levels of confidence set in the study and the validity and reliability of the research material used.

As there is no one commonly accepted approach to the appraisal of existing and future housing conditions this Thesis investigated the problem using two separate approaches. In respect of the Exponential Growth Curve Analysis it has become clear that housing projections can only be made once numerous sub analyses of population,family,and household growth trends have been completed. Through the combination of the results obtained from the study of migration and natural increase factors, an eventual picture of future demand can be acquired and it is reasonable to expect that in the absence of any marked variations in the observed past growth trends, that the future scatter of the projected findings will lie close to the extrapolated growth curve.

The Age Cohort Survival Analysis also depends to a large extent on the availability and compatability of data. This particular aspect of the research study was only made possible through the co-operation of the Director of Town and Regional Planning Commission who made available Census information which was hitherto unavailable to the planning community. In addition thereto the Model has relied on the compatability of the Port Shepstone and Durban Metropolitan Age specific birth and death rates and owing to a comparable distribution of populations for age groups and similar birth and death rates, between communities, the use of Durban's age specific rates became possible.

In addition to the need to provide calculations about future accommodation requirements this Thesis also shows how existing housing conditions can, and have been evaluated. The model shows that the existing standard's adopted for the analysis of overcrowding do not necessarily reflect the true position of the prevailing housing conditions and that any investigation undertaken must take cognisance of the type of dwelling structure and the age / sex characteristics of the households occupants.

While a proportion of housing may be currently unsuitable for its existing inhabitants it is necessary to ascertain to what extent a redistribution of accommodation would alleviate the current housing situation. This aspect has been adequately covered in Chapter 3.5.8 and from it can be seen that nearly 15 percent of the discarded housing could be recycled for future use. While theoretically it is desireable to reallocate housing according to a families requirements there would appear to be numerous practical difficulties which could only be overcome through the application of harsh legislative measures e.g. Slums act, Expropriation Act etc....

5.3 THE SIGNIFICANCE OF THE RESEARCH FINDINGS.

This Thesis which constitutes two separate investigations into the

Marburg / Port Shepstone housing problems, provides many different indications of the state of past and present growth in the sub-region. Such observations show that there has been an above average growth rate in terms of population, family and household growth, and that this has been attributed to a high incidence rate of in-migration into the area, a high birth rate with a comparable declining death rate, and a general ageing of the community. All the current indications point to the fact that there is a serious overcrowding amongst the Indian Community and that as a result of the delay in providing state aided housing combined with the reticence of private developers and individuals to build houses that this chronic housing shortage will continue and increase in severity over the period 1970 to 1985.

It can be seen that there is a marked preference for conventional detached housing units and that the proportion of flat or hostel accommodation is currently minimal in relation to the standard dwelling house. Whether such preferences will exist in the future is hard to determine but it is likely that when assisted housing is made available in the sub-region that a larger percentage of future housing will have to constitute higher density dwelling units in order to offset exceptionally high land costs.

A brief summary of the major research findings reveal that:-

5.3.1. Population Growth

The Indian population of the Marburg / Port Shepstone sub-region has increased at a rapid rate. During the inter-censal period 1960 - 1970 the average annual rate of increase has been between 5,19 and 5,22 percent per annum, which is considerably higher than that for the Province of Natal.

As the generally regarded physiological maximum population growth rate is estimated at 3,5 percent per annum it is clear that a large proportion of the sub-regions growth is derived from immigration. The evidence obtained from the migration studies proves conclusively that there is both a significant movement of Indians from the surrounding rural areas to the sub-region, and within the project area itself.

Furthermore it is clear that the lure of greater employment, educational and health facilities combined with the effects of Group Area legislation are attracting immigrants to the sub-region despite the knowledge that there is already a serious housing shortage in the area.

5.3.2. Population Projections

Population projections can never be precise since they are dependent on many variables and assumptions which the planner chooses to use in his analysis. In addition thereto, a wide range of errors have to be controlled for, and thus the best which the planner can hope to achieve is to provide a projection with a high level of confidence and validity within the dictates of the statistical model used.

Provided that population growth occurs at past rates it can be expected that the existing population (as at 1970) will double by the early 1880's and that of this increase, 44 percent will have been derived from immigration into the area.

In order that there should be any population growth at all it is necessary to have high birth rates amongst the reproductive female members of the population, comparable low death rates amongst all members of the community and last but not least, a high incidence of immigration.
The results of the various investigations into the sub-regions Indian birth rates show that there is a high birth rate which is considerably higher than

that for Metropolitan Durban. This tends to suggest that there is both a large scale inflow of migrant young married couples into the project area and that the existing couples are reproducing at an abnormaly high level.

5.3.3. Family Formation and Unit Structure.

From the results obtained from Census returns there would appear to have been very little change in the family unit size and distribution over the last decade. What changes have been observed are of little consequence and thus it can be expected that the mean family unit size with approximate 5,3 persons (i.e. for the nuclear family). While the family unit size has been seen to be relatively stable there is every indication that the extended family unit size will decrease under the impact of increasing westernization and a decline in cultural ties and values amongst the younger generations of the Indian Community. Although a high population growth rate has been forecast it must be remembered that many of the existing families will absorb a population of the increase while other extended families will split thus forming several smaller households. Housing demand is therefore not soley dependent on either family composition or population growth, and as has been ascertained from this Thesis, both non family membership and the extent of multiple family living are major determinants in the projection of housing requirements.

5.3.4. The Nature, Extent and Composition of Existing and Future Housing and future Housing in the Marburg / Port Shepstone Sub-region.

In the earliest period of the sub-region's development, by far the larger proportion of Indian housing was provided by the sugar and tea estates. With the emancipation of the early 'Coolie' workers and a rise in the number of Passenger Indians moving into the area, gradually more and more housing construction was left to the devices of the Indians themselves. Today virtually all Indian housing is constructed by private small scale developers or owner builders, and in the absence of local

authority participation housing conditions have rapidly deteriorated. While progress has been made in raising the standard of housing construction through the application of Town Planning and Building byelaw controls little has been done to provide mass housing which is within the financial reach of the ordinary semi or unskilled Indian worker. Resultant from the lack of new building development, many of the older housing units are being retained and utilized beyond their capacities and useful life span. This has resulted in conditions of overcrowding occurring, and has led to the unsatisfactory acceptance that the use of outbuildings for residential purposes is a 'fait accompli' for the forseeable future.

As is to be expected in a long established Indian Township, many of the dwellings are of wood and iron construction with the minimum of services installed (i.e. only 46 percent of all dwellings posess water, electricity and sewerage). In addition to the general lack of services, a large proportion (i.e. 16 percent) of the total housing stock is 'non permanent' in character and is thus capable of being condemmed in terms of the provisions of the Union Slums Act or the building byelaws. Should steps be taken against these potential slum dwellers, nearly 900 people would be affected by the action and this would bring untold misery to a large section of the Indian Community.

The evidence is clear that there is an urgent need to provide economic and sub-economic housing facilities in the sub-region, and that the community cannot rely solely on its own economic resources to meet the impending housing crisis. With increasing migration it is clear that the competition for housing will intensify and that the overspill will continue to erect temporary structures or outbuildings to satisfy their accommodation needs and while population growth is assured owing to the favourable employment, educational and land availability facilities of the sub-region, the affects of a prolonged housing crisis might ultimately affect the overall rate of migration into the sub-region and force immigration to decline below the estimated 2,4 percent per annum.

In respect of the existing and projected household composition the evidence suggests there will be a decline in the mean household size and the number of large households. The criteria favouring this decrease are the possible decline in family size and a marked decrease in extended family living. With an increasing non family membership, it is expected that more groups of unrelated persons will set up separate households and that this will effectively reduce the family and household sizes. From the evidence obtained in this research project it is abundantly clear that there is an ever increasing trend towards the formation of nuclear family households amongst the Indian community; and that planners should in the designing of any housing scheme in the sub-region allow for the development of standard 2 and 3 bedroomed dwelling units which can be extended at will, rather than promoting the 'Extended Residential Dwelling' which has currently found favour amongst the planning profession.

5.4 THE PROSPECTS FOR THE FUTURE DEVELOPMENT OF THE SUB-REGION

Given that there will be a doubling of the population and a trebling in housing demand by 1985; it is necessary to see how much growth can be accommodated within the confines of the Indian Group Area as it exists today in terms of Map 7.

It is clear that there is no provision within the existing housing stock to meet even a small portion of future demand and therefore the bulk of the additional housing will have to be provided either through the construction of a massive economic and sub-economic housing scheme or through offering financial concessions to private developers.

The problem of providing suitable accommodation at economic rentals is further complicated by the limited economic resources and

purchasing power of a large section of the Indian Community. With a per Capita income of R280,46[1], and 61 percent[2] of the households earning combined household incomes of less than R2 000 per annum, it is clear that the ability of the local community to build or acquire their own homes is very limited.

Due to the poor financial position of the local populace, combined with entrenched socio-cultural values whereof land cannot be developed for gain, much of the land lies sterilised from development. Whereas it is normally the perogative of the local authority to provide a substantial amount of low cost housing, both local authorities in the sub-region are unable to meet their commitments owing to their inadquate financial and land resources. It is thus obvious that if any meaningful attempt is to be made to relieve the existing housing shortage, that the local authorities will be forced to expropriate large amounts of land for development purposes and that the densities of development will have to be raised to offset the capital costs of the land acquisition.

As has been determined in Chapter 2 and Map 5 , a high proportion of the sub-region is topographically unsuitable for residential development and therefore the overall density of development must of necessity be restricted unless General Residential i.e.flat development is undertaken.

The prevailing density at 1971 see Map 11, indicates that the mean gross population density for the sub-region approximates 7,5 persons per household with a residential density of approximately 1 unit per Hectare. Since a considerable extent of the Indian area is predominantly agricultural in character, it can be expected that the gross population density will be low. However the density factor is related to the degree of urbanization and thus one finds that the gross population density varies between 12,1 (in the vicinity of Lot 36 Marburg Settlement Lands)

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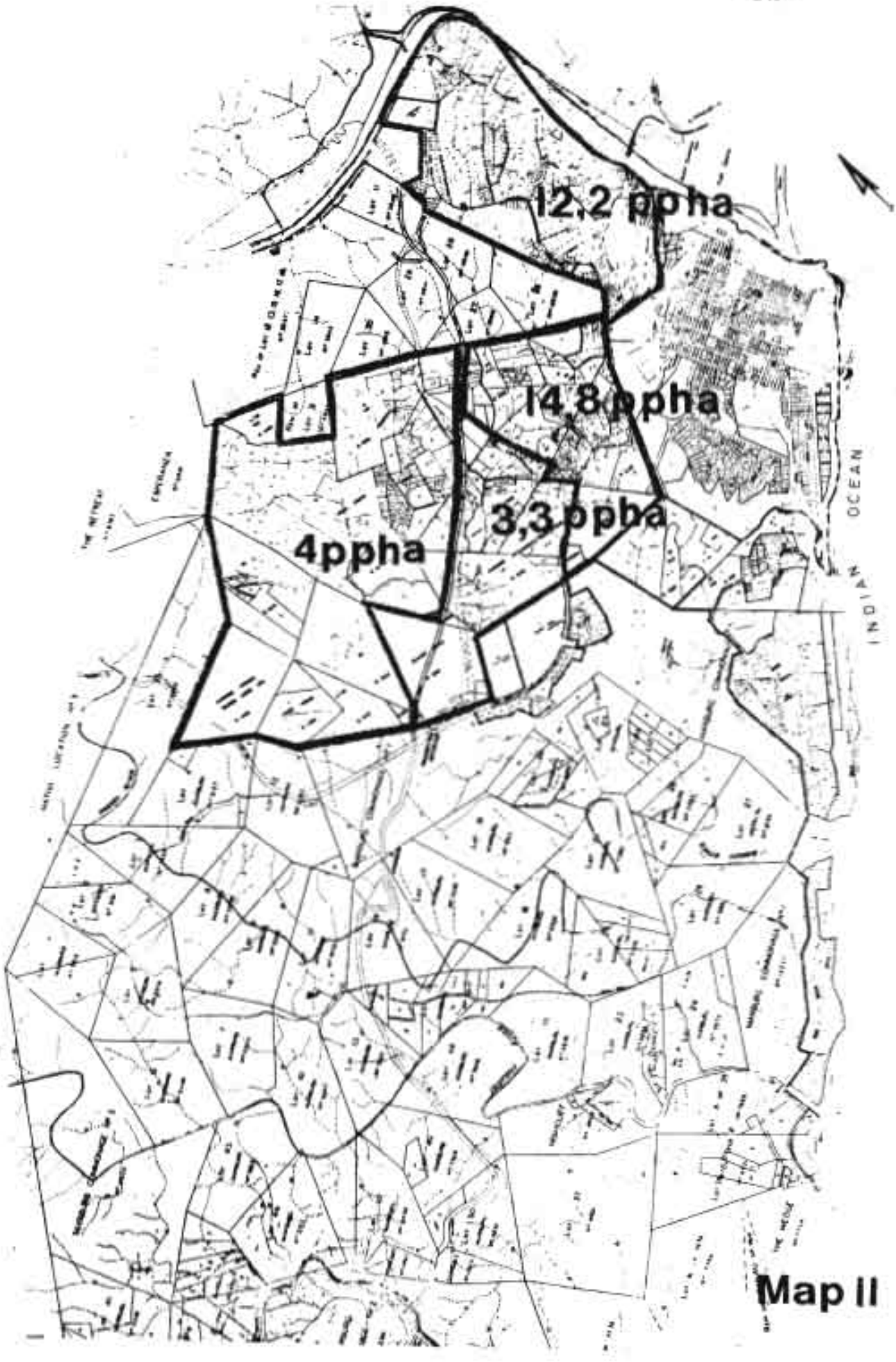
1. The per Capita income is derived from the Marburg Household Study and is based on the assumption that there is a random distribution of incomes amongst all sections of the community.
2. The Marburg / Port Shepstone Study Appendix I, The Director Town and Regional Planning, PMB. P23.

Existing Density of Development



Map II

and 3,6 persons per hectare[1] (i.e. on the alluvial flats lying adjacent to the Umzimkulu River.

From Map 12 the relevant Town Planning controls can be seen. In the Marburg Area the planners have allowed for a potential density of 9 dwelling units per net hectare[2] in Special Residential Zones (i.e. single dwelling per lot zone) with a maximum 25 units in General Residential Zones. The effects of the larger Agricultural land holdings with lower densities tend to counterbalance these higher densities and thus the projected development can be estimated as being in the region of 9-10 dwellings per net unit hectare.

In the Port Sheptsone sub-region it is proposed to allow slightly higher densities for development with Special Residential Zones of 10 dwellings per hectare and General Residential Zones of 20[3] units per developable hectare. Since there is virtually no agricultural land and some 5,09[4] Hectares of General Residential zoned land it is expected that the density of development will be higher in the urban area of Port Shepstone.

Combining the information contained in Maps 5 and 12, and tabulating it in terms of Table LVI, it can be seen that :-

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1. Data obtained from the Port Shepstone / Marburg Sub-Regional Study. Appendix 1 - Director, Town and Regional Planning PP 23,26.
2. Data drawn from Marburg Town Planning Scheme where lot size $1100M^2$
3. E. Thorrington Smith OP CIT P 67
4. E. Thorrington Smith OP CIT P 67

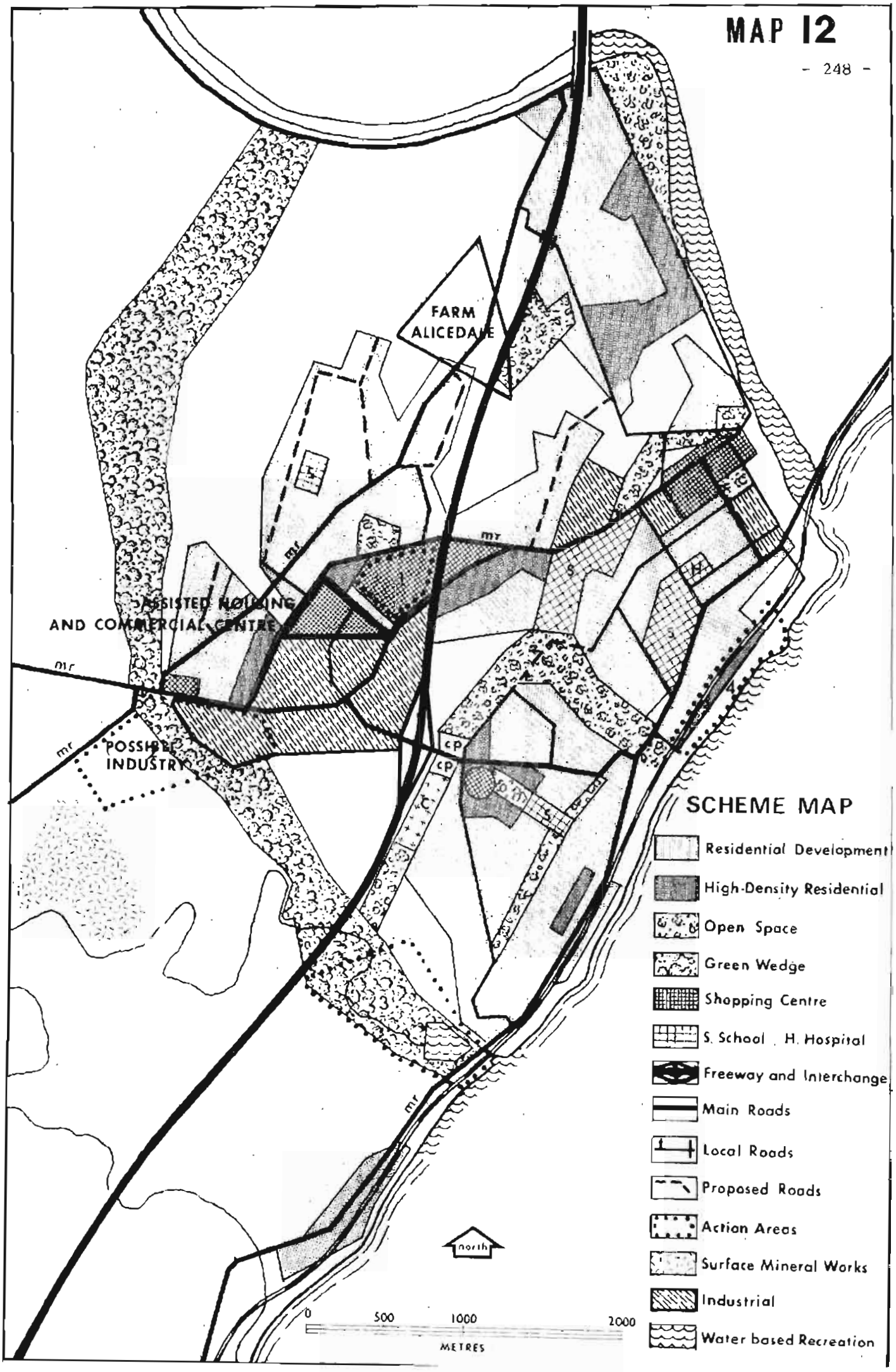
TABLE LV1

AN ANALYSIS OF THE POTENTIAL FOR FUTURE DEVELOPMENT IN THE SUB-REGION

CATEGORY	PORT SHEPSTONE	MARBURG	SUB-REGION
Developable land with slope less than 1:6,7(1)	181 Ha	320 Ha	501 Ha
Total Residentially zoned land(2)			
Special Residential	119 Ha	486 Ha	605 Ha
General Residential	5 Ha	33 Ha	38 Ha
Total Residential Land already used(3)			
Special Residential	77 Ha	343 Ha	420 Ha
General Residential	Nil	-	-
Total Residential Land available for future use			
Special Residential	42 Ha	143 Ha	185 Ha
General Residential	5 Ha	33 Ha	38 Ha
Estimated Number of S.R. Plots(4) available for future development	420	1300	1720
Estimated number of E.R. units(5) available in the E.R. Zones	100	770	870
Estimated Population to be housed in			
Special Residential Zone(6)			
At 7,08 P.P.H. (Existing 1971)	2,974	9,204	12,178
At 5,85 P.P.H. (Projected 1985)	2,457	7,605	10,062
General Residential Zone(7)			
At 4,09 P.P.H. (Existing 1971)	409	3,149	3,558
At 4,00 P.P.H. (Projected 1985)	400	30,080	3,480
Total Population catered for			
E1 (at existing densities)	3,383	12,353	15,736
E2 (at projected densities)	2,857	10,685	13,542

1. E. Thorrington Smith, Rosenberg and McCrystal, Op Cit p64.
2. Data obtained from Marburg and Port Shepstone Valuation Polls 1972.
3. Data obtained from report held in Director, Town and Regional Planning Files, Pietermaritzburg.
4. The number of special residential plots (i.e. SR plots) has been obtained by dividing the net zoned area by the minimum plot size i.e. $1000M^2$ Port Shepstone and $1100M^2$ Marburg.
5. The number of general residential units has been calculated in terms of the Town Planning Schemes i.e. 20 units per Ha in Port Shepstone and a ,35 FAR with unit size $150M^2$ in Marburg.
6. The mean household population density is obtained from Tables XlV and XVl.
7. The mean flat occupancy rate has been obtained from the Marburg Household Study 1971 where 90 people occupy 22 flats.

MAP 12


FARM
ALICEDALE
ASSISTED HOUSING
AND COMMERCIAL CENTRE
POSSIBLE
INDUSTRY
mr
cp
north
0
500
1000
2000
METRES
SCHEME MAP
Residential Development
High-Density Residential
Open Space
Green Wedge
Shopping Centre
S. School . H. Hospital
Freeway and Interchange
Main Roads
Local Roads
Proposed Roads
Action Areas
Surface Mineral Works
Industrial
Water based Recreation

(i) Ample provision has been made in the existing town planning schemes for the provision of Residential land to meet future requirments at both the existing and projected densities of development. Whereas Table LVI estimates that there will be adequate land available in 1985 to erect 1720 conventional dwelling houses together with 1870 flat units which combined are likely to house 13,00 - 15,000 additional population, Tables XXIX and LV indicate that between 1,200 - 1,500 units housing approximately 6,000 people will be required. This reveals a large scale surplus of land irrespective of whether flat development is forthcoming in the future.

(ii) In addition to the adequacy of the existing zoned land it can be seen from Table LVI that there is additional land with a suitable slope (i.e. below 1 : 6,7 gradient) which is emminently suitable for housing provision should the demand exceed the current zoned supply.

(iii) Owing to the projected lowering of the household size overall population densities per gross unit hectare will fall if the existing minimum lot sizes of plots are maintained. Whereas the current gross density of development (i.e. as at 1971) has been observed at 1,03 units per gross hectare this will rise to an average 6 units per gross hectare at current densities once all development has taken place. It is evident that such levels of development will remain far below normal urban standards, and a selective increase in the density of areas close to the existing urban concentrations can be expected in the future.

In terms of population the current gross density is 7,5 persons per gross hectare but this is likely to increase to 35 persons per gross hectare by 1985 when the mean household size is established at 5,85 persons per household.

It is evident therefore that densities will have to be increased to accommodate growth but that there need not be any dramatic increase in the density of development beyond current planning proposals.

(iv) While everything would appear to augure well for the future housing development of the sub-region it should be remembered that land is not freely available to all sections of the community or the local authorities, since large land holdings are held by a relatively select group of Indian landlords. For the projections to be achieved it is thus essential that there must be a redistribution of land and this is already taking place through the use of legislative controls (i.e. 7 lots of Marburg Settlement Lands No. E5490 have recently been expropriated for future housing development).

Homeownership and land tenure are vital requirements for any Indian family and therefore it is necessary for the planners of the future to provide adequate housing at economic rentals. Owing to the effects of Westernization, lowering cultural values and ties, the cost of construction of dwellings and increased competition for urban land, the traditional Indian household system has collapsed resulting in the splitting up of the extended family and the promotion of the nuclear family structure. With the collapse of the social order, economic and status problems have developed amongst the older age groups and thus it is clear that the physical distance separating family groups will become increasingly important in the future. Although there has been an observed decline in the incidence of extended family living 'Kutums' or clansmen prefer to live in adjacent neighbourhoods and thus the ideal solution for any future housing scheme which may be developed would appear to be the provision of homes for nuclear families and elderly persons or couples in close proximity to one another, rather than the erection of 'extended households' (i.e. large compartmental unit households) which will be unsuitable for the future household composition.

5.5 THE GENERAL CONCLUSION

The research methodologies which have been described and illustrated herein have been carried out in order to focus attention on the social and demographic influences on housing provision for one ethnic race group in one localised area. The limitations imposed by the labour and financial resources have severely restricted the scope of the study and it is acknowledged that an analysis of economic considerations is just as important an influence on housing demand as social factors. It is therefore hoped that with the existing research data available, that at some future date an additional study will be launched into the analysis of the economic and employment opportunities in the project area and that such research may complement the work of this Thesis.

While every attempt has been made to control the validity and reliability of the data quoted it is natural that shortcomings will exist owing to the relative recent collation of data material and the lack of adequate historical records. However since research is an on-going process the continual collation and updating of data on the basis of the aforementioned procedures, will ultimately lead to the refinement of the model and greater accuracy in the projection process.

The work contained herein has been of a pioneering nature and has indicated some of the basic demographic and social techniques and planning tools, whereby existing and future housing requirements can be appraised. It is hoped that this study will not be the first and last undertaken in this field and this sub-region and that it will provide a basis for future research into the many and varied socio-economic problems which confront Asiatics in their quest for adequate and suitable housing.

APPENDIX A

MARBURG / PORT SHEPSTONE HOUSEHOLD STUDY 1971

FIELDWORKERS MANUAL

1. AIM AND PURPOSE OF STUDY

This study is being carried out for the Director of the Town and Regional Planning Commission in order to obtain data about the socio-economic position of the Indian community living in the Marburg / Port Shepstone sub-region. The data obtained will assist the Provincial Administration in the general planning of the area and in particular assist with the provision of future housing schemes.

2. AREA

Each fieldworker has been allocated a specific study area as is designated on the Enumerator Subdivisional Map (see attached Map 13). It is essential that all the households as shown on the map are interviewed and in the event of any further unchartered households (as defined in terms of this schedule) being discovered you are to interview the same and indicate the approximate position of the dwelling unit on the plan. Please indicate the sample number of the household next to the appropriate dwelling as indicated on the map referred to above.

3. CONFIDENTIAL NATURE OF STUDY

In order to increase the response rate it is essential for you, the interviewer, to indicate to the respondent that all information obtained will be kept strictly confidential and that the information required is to be used solely for statistical analysis purposes. Please do not indicate

the name of the householder on either the schedule or the map but merely the lot number in the appropriate column of the schedule.

In the event of you as the interviewer finding that there is a negative response from the respondent do not persist with the question as participation in this study is purely voluntary. Where there appears to be distortions in the answers try and stress the importance of accurate response. (Inaccuracies will soon come light).

4. OPERATING INSTRUCTIONS

4:1 When undertaking a survey please indicate the nature of your visit to the householder and show the letters of authority given to you if required. Stress the importance of the need to carry out the survey and assure yourself that all persons are accounted for in the survey.

4:2 When first arriving on a lot ascertain as accurately as possible the number of separate independent houeholds on the property. For the purpose of this study a household may consist of the following social groups living under one roof:-

(i) A single inhabitant, or
(ii) A family, or
(iii) A family with additional persons, or
(iv) Several families, or
(v) A group of unrelated persons living together.

For each household, on a plot, a separate schedule is to be completed and located on the map as indicated in Clause 2.

Where too many respondents occur in a household an additional schedule must be used. Clearly indicate on both schedules that the schedules are combined.

4:3 When filling in the schedules please use a ball point pen and make bold crosses in the appropriate columns. Try to minimise errors by recording the data on the schedule once the respondent is certain of his reply.

4:4 All questions are to be filled in where possible. Answer each respondent on a different line in sequence and try not to skip a line. Where questions e.g. Number of living rooms etc ... require figures clearly indicate the number in the box provided.

Certain parts of the schedule require the official interviewers code data etc ... Please check that this, together with all other data, before leaving the household.

4:5 When completing the schedule make sure that the correct lot number has been entered in the address column of the schedule.

4:6 Please enter in the remarks column any additional information which you might wish to bring to the attention of the researcher.

4:7 When all the surveys in your area have been completed please check that all schedules are fully completed and submit the completed forms together with the enumerator subdivisional maps to the supervisor.

4:8 It is of the utmost importance that the survey should be completed within the two week period stipulated and your co-operation in completing your tasks is requested. Delays in submitting returns will detract from the reliability of the survey and delay the processing of the research data.

4:9 Should you experience any difficulty in interpreting any of the definitions or have any other fieldwork problems do not hesitate to contact your research supervisor.

4:10 Finally, it is hoped that all interviews will be conducted in a friendly and cordial manner and that all respondents will be thanked for their participation in the survey.

DEFINITIONS

1. HOUSEHOLD

A household consists of a person or group of persons (including one or more families) living in a dwelling unit under one roof. Basements, outbuildings, garages, huts, flats in a block of flats, shacks etc ... each constitute a single household.

2. RACE Category 01

A persons race is determined by his classification in terms of the Group Areas Act, Section 12, No. 36 of 1966.

3. HOUSEHOLD TYPES Category 03

There are seven categories into which a household can fit.

1) 1 person household: self explanatory

2) 1 family household:
   a) A family consists of the Western nuclear family i.e. mother, father and children. It does not extend to older generations, blood or affinal relatives.
   b) For the census purposes a family consists of:
      (i) husband and wife, or
      (ii) father and mother with one or more unmarried children, or
      (iii) father with one or more unmarried children, or
      (iv) mother with one or more unmarried children, or
      (v) male and female living together in permanent union with or without dependent children.

The term 'children' includes step-children, adopted children but not foster children, orphans etc ... Members of the family who are away for a short period of time e.g. schooling etc ... must be included in the family. Children working or living away from home are not to be included in the family.

NOTE A single person does not constsitute a family.

3) 1 kinship group: A kinship group consists of a nuclear family plus a widowed parent and may consist of

(i) husband and wife (with or without children) living together with a widowed parent from either side of the family or both together, or

(ii) mother (with or without children) living with a parent from either side of the family, or

(iii) father (with or without children) living with a parent from either side of the fanily.

4) 1 family and relations: Consists of the nuclear family plus and blood relatives provided that the relatives are not married and living together.

(i) mother and father and children living together with aunts, uncles, nieces, nephews and cousins.

5) Family and non relations: Consists of a nuclear family plus lodgers and may consist of

(i) husband, wife and children and lodgers

(ii) husband and children and lodgers

(iii) wife and children and lodgers.

6) 2 or more families: The provisions of 3:2 apply. Where there are two married brothers or sisters living in a household together with their parents there will therefore be three families. Married children living with parents therefore constitute separate families. Parents, for the purpose of this study, consist of the oldest married couple in the household.

7) Unrelated persons: Applies to all households where unrelated persons cohabit under one roof.

4. IDENTITY WITHIN HOUSEHOLD Category 04

A husband is an adult male either married or living in permanent union with an adult female.

A wife is the converse of the aforegoing.

NOTE The definition as indicated is intended to include people 'living together' as opposed to being legally married. Where a polygynous marriage occurs the male must be registered with the family that he is living with.

A son is a direct male offspring or step-child resultant from a marriage or permanent union of two adult mates.

a daughter is the converse of the above.

Nil refers to no direct relationship to husband or wife either by marriage or blood relationship.

5. SEX Category 05

This is self explanatory and is registered as 1 or 2 in the appropriate column. The sex is registered as that taken at birth.

6. MARITAL STATUS Category 06

Married: For the purpose of this census a married person is a male or female living in permanent cohabitation with a member of the opposite sex either legally or by custom.

Unmarried: Refers to single people living independently from the opposite sex.

Widowed: Refers to persons who have lost their permanent marriage partner through death. In the case of polygynous marriages both wives may be registered as widows on the death of the husband.

Divorced: For the purposes of this census divorced persons shall be those legally separated from their marriage partner in terms of a court order.

7. AGE CLASSIFICATION Category 07

In terms of the designated categories the following age limits shall apply

(i)	Infant school	0 - 23 months
(ii)	Pre-school	24 - 59 months
(iii)	Primary School	6 - 13 years
(iv)	Secondary school	14 - 17 years
(v)	Post school	18 - 19 years
(vi)	(Middle age)	20 - 39 years
(vii)	(Ageing)	40 - 59 years
(viii)	(Older community)	60 years and over

8. WHAT TYPE OF DWELLING DO YOU OCCUPY? Column 74

Flat: A flat shall be defined as a self contained private habitation which contains its own kitchen, bathroom and toilet facilities and is located in a building commonly called a block of flats.

NOTE Each flat in a block of flats must be treated as a separate household and dwelling unit. A sub-let portion of a house shall not constitute a flat.

Maisonette: Consists of any house which has been sub-divided into separate self contained dwellings whether horizontally or vertically that does not include basements in the double houses.

Single/Double house: A house consists of any permanent structure made of approved building material e.g. brick, tile, etc ... which contains kitchen, batheroom and toilet facilities, lounge and bedrooms, and is more than 40 m^2 in extent.

NOTE The size of unit is restricted so as to exclude the inclusion of garages as permanent dwellings i.e. houses.

Shack: A shack shall consist of a temporary structure made of non-permanent materials without foundations and normally consisting of wood and iron structures.

NOTE Dwellings of 'wood and iron' which are of a permanent nature and contain kitchen, toilet and separate living facilities are to be treated as single dwelling houses.

Hostel/Boarding house: A hostel or boarding house shall consist of a dwelling or series of dwellings where all occupants of the institution gather together for communal meals and pay a monthly boarding rate for the services rendered.

Other: This category contains the following structures, garages, outbuildings, storerooms, huts and basements.

9. HOW MANY LIVING ROOMS DO YOU HAVE? Column 29

This item is self explanatory and includes all bedrooms, lounges, diningrooms, studies, nurseries and enclosed porches but excludes kitchens, bathroosm storerooms, laundries, passages and hallways not designed for sleeping or living purposes.

10. PLEASE ESTIMATE TOTAL INCOME OF THE HOUSEHOLD FROM ALL SOURCES Column 31.

For the purpose of this study the total income of all members of the household excluding lodgers is required. (Please try to acquire accurate figures since inflated or deflated figures will detract from the accuracy of the survey).

11. HOW LONG HAVE YOU OCCUPIED YOUR PRESIDENT DWELLING: Column 120

For the purposes of this study estimate the length of time that the respondent has resided in the dwelling. In the event of new dwellings superceding older structures count the period from the original structure. All structures both permanent and non permanent are to be classified as dwellings.

12. HOW MANY HOLIDAY VISITORS DO YOU EXPECT IN YOUR DWELLING IN ANY ONE YEAR? Columns 56-57

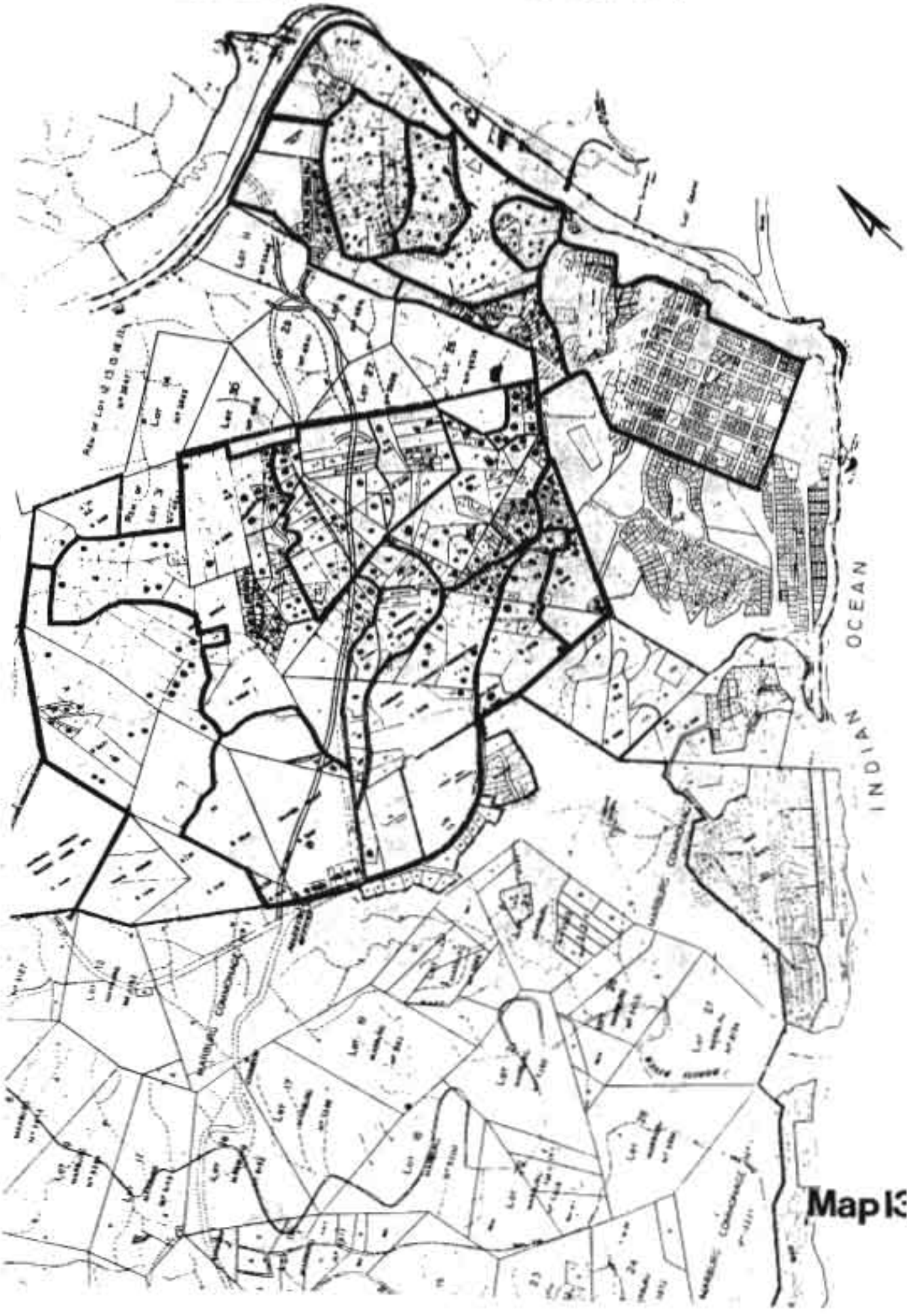
Indicate the total number of visitors i.e. excluding permanent residents of the household, likely to spend three or more days at a time visiting the household in any one year.

Ref: Census Definitions 1970 Form 14 pp 1-17

Ref: G.C. Maasdorp and P.N. Pillay 'The East Rand Indian Community' Vol. 1

NOTE Only those definitions which have particular reference to this thesis have been included in this manual. The complete survey form is submitted.

Marburg Household Enumerator Map



APPRENDIX B

MARBURG HOUSEHOLD STUDY	Enquiries: THE DIRECTOR, TOWN AND REGIONAL PLANNING, PTE BAG 9038, PIETERMARITZBURG	OFFICE USE ONLY. Checked / Refer Back / Accepted / Refused	ADDRESS	CODE OF FIELDWORKER

FOR EACH MEMBER IN THE HOUSEHOLD/FAMILY, PLEASE INDICATE THE APPLICABLE INFORMATION WITH AN X

No.	Section	Columns	Codes
01	RACE	(Col 13)	1 EUROPEAN; 2 COLOURED; 3 ASIATIC; 4 BANTU
02	SAMPLE No	(5 - 8)	601 (CODE No)
03	HOUSE-HOLD TYPE	(21 - 22)	11 1 PERSON H.H.; 12 1 FAMILY; 13 KINSHIP GROUP; 21 FAMILY & RELATIONS; 22 FAMILY & NON RELATIONS; 23 2 OR MORE FAMILIES; 24 UNRELATED PERSONS
04	IDENTITY WITHIN HOUSE-HOLD	(38)	0 NIL; 1 HUSBAND; 2 WIFE; 3 SON; 4 DAUGHTER
05	SEX	(42)	1 MALE; 2 FEMALE
06	MARITAL STATUS	(44)	1 MARRIED; 2 UNMARRIED; 3 WIDOWED; 4 DIVORCED
07	AGE CLASSIFICATION	(45)	0 INFANT SCHOOL; 1 PRE-SCHOOL; 2 PRIMARY; 3 SECONDARY; 4 POST SCHOOL; 5 20 - 39 YEARS; 6 40 - 59 YEARS; 7 60 AND OVER
08	OCCUPATION	(48 - 49)	01 PROFESSIONAL; 02 ADMINISTRATION; 03 CLERICAL; 04 PRIMARY; 05 SALES; 06 TRANSPORT; 07 CRAFTSMAN; 08 SERVICE; 09 UNEMPLOYED; 10 NOT ECONOMICALLY ACTIVE
09	TYPE OF OCCUPATION	(19)	0 AGRICULTURE; 1 MINING, QUARRYING; 2 MANUFACTURING; 3 CONSTRUCTION; 4 ELECTRICITY; 5 TRANSPORT; 6 SERVICE; 7 STUDENT; 8 VISITOR
10	LOCATION OF WORK SCHOOL	(61 - 62)	00 SHELLY BEACH; 01 OSLO BEACH; 02 MARBURG; 03 PT SHEPSTONE; 04 ALBERSVILLE; 05 MARGATE; 06 UMTENTWENI; 07 OTHER
11	MODE OF TRANSPORT	(64)	1 CAR; 2 BUS; 3 TRAIN; 4 FOOT; 5 OTHER

Person	01	02	03	04	05	06	07	08	09	10	11
PERSON No 1											
PERSON No 2											
PERSON No 3											
PERSON No 4											
PERSON No 5											
PERSON No 6											
PERSON No 7											
PERSON No 8											
PERSON No 9											
PERSON No 10											
PERSON No 11											
PERSON No 12											

ADDRESS:	FIELDWORKERS CODE:	

INDICATE WITH AN X, IN THE APPLICABLE BOX.

1. WHICH OF THE FOLLOWING SERVICES DO YOU HAVE IN YOUR DWELLING? (Col. 72)

Septic Tank Sewerage [1] Telephone [2] Electricity [3]

Garage [4] Bathroom with Fixed Bath [5]

Piped Running Water Supply [6]

2. WHAT TYPE OF DWELLING DO YOU OCCUPY? (74)

Flat [1] Single Storey-Double Storey House [3] Hostel Boarding House [5]

Maisonette [2] Shack [4] Other [6]

3. HOW MANY LIVING ROOMS DO YOU HAVE? (29)

Living Rooms include Lounge, Dining Room, Bedroom, Study, Nursery

Excludes Kitchens, Bathrooms, Storerooms.

Indicate No. Here ⟶ [ ]

4. PLEASE ESTIMATE TOTAL FAMILY INCOME OF THE HOUSEHOLD FROM ALL SOURCES (31)

0 - R999 [1] R2000 - R3999 [3] R6000 - R7999 [5]

R1000 - R1999 [2] R4000 - R5999 [4] R8000 & over [6]

5. HOW LONG HAVE YOU OCCUPIED YOUR PRESENT DWELLING? (70)

Under 1 Year [1] Over 2 yrs. under 5 yrs. [3]

Over 1 yr. under 2 yrs. [2] 5 yrs. and over [4]

6. HOW MANY HOLIDAY VISITORS DO YOU EXPECT TO STAY IN YOUR DWELLING (56, 57) IN ANY ONE YEAR?

Indicate No. Here ⟶ [ ]

7. HOW MANY MOTOR VEHICLES IN RUNNING ORDER DO YOU HAVE IN THE HOUSEHOLD? (66)

I.e. Used for Private Purposes & including Commercial Vehicles used for Private Journeys.

Indicate No. Here ⟶ [ ]

APPENDIX C

MARBURG / PORT SHEPSTONE HOUSEHOLD STUDY 1971

CODING INSTRUCTIONS

Before processing the schedules check to see that all schedules are properly completed.

Take Coding form and fill in the relevant data in pencil in the appropriate columns. Read Coding instructions carefully before completing form.

1. CARD NUMBER (1 Column field)
   This column is already completed and coded 1 in all cases.

2. RACE (1 Column field) Col 3
   Fill in appropriate number

E - 1 i.e. Europeans coded 1
C - 2 Coloureds coded 2
A - 3 Asiatics coded 3
B - 4 Bantu coded 4

3. SAMPLE NUMBER (4 Column field) Cols 5 - 8
   This is the number printed on Schedule. Fill in all 4 Columns
e.g. Sample No. 48 - coded 0048 as follows:-

Columns	5	6	7	8
	0	0	4	8

4. ZONE NUMBER (Composite Number within 7 Column field) Cols 10 - 17
   This is a composite number which is coded according to the zonal list e.g. sub-zone and enumerator sub-divisional numbers.

5. TYPE OF OCCUPATION (1 Column field) Col 19
e.g. Agriculture coded 0
coded 1 etc.

6. HOUSEHOLD TYPE (2 Column field) Cols 21 - 22

Single households : 1 person household Coded 11
1 family household Coded 12
1 Kinship group Coded 13

Multiple household : Family and relations Coded 21
Family and non-relations Coded 22
Group of unrelated persons Coded 24

7. HOUSEHOLD SIZE (2 Column field) Cols 24 - 25

	1 person	2 persons	3 persons	etc
Coded -	01	02	03	

8. DWELLING TYPE (1 Column field) Col 27

Flat - 1 : Maisonette - 2 : House - 3 : Shack - 4 :
Hostel / Boarding House - 5 : Other - 6
Other includes basements, huts, outbuildings and garages. Shack includes buildings of non-permanent nature.

9. LIVING ROOMS (1 Column field) Col 29

Coded 1 - 9 according to schedule return.

10. INCOME (1 Column field) Col 31

Coded 1 - 6 as per table on schedule. Refused answer coded 0.

11. FAMILY ORDER (1 Column field) Col 33

Column already completed and coded 1 in all cases.

12. PERSON NUMBER (2 Column field) Cols 35 - 36

Persons in household coded 01, 02, 03 ..... in sequence even if two schedules are used for one household.

13. IDENTITY (1 Column field) Col 38

Nil coded 0
Husband coded 1
Wife coded 2
Son coded 3
Daughter coded 4

14. RELATIONSHIP (1 Column field) Col 40

Pre-coded 0 in all cases

15. SEX (1 Column field) Col 42

Male coded 1
Female coded 2

16. MARITAL STATUS (1 Column field) Col 44

Married coded 1
Unmarried coded 2
Widowed coded 3
Divorced coded 4
Living together coded 1 as per married group.

17. AGE (1 Column field) Col 46

Infant School	coded 0
Pre-School	coded 1
Primary School	coded 2
Secondary School	coded 3
Post School	coded 4
20 - 39 years	coded 5
40 - 59 years	coded 6
60 years and over	coded 7

18. OCCUPATION (2 Column field) Cols 48 - 49

e.g. Professional, Technical and Related worker coded 01
Administrative worker coded 02 etc.

Coded as per schedule.

19. FACTOR (3 Column field) Cols 51 - 54

Pre-coded 1.00 in all cases.

20. NUMBER OF VISITORS (2 Column field) Cols 56 - 57

Coded 00-99 according to schedule return.

21. NUMBER OF WORKERS (1 Column field) Col 59

Coded 0 - 9 as per schedule.

22. LOCATION OF WORK (2 Column field) Cols 61 - 62

Coded 00 - 09

Not economically active 10

23. METHOD OF TRANSPORT (1 Column field) Col 64

Car coded 1

Bus coded 2

Coded as per schedule.

24. NUMBER OF CARS OR OTHER VEHICLES (1 Column field) Col 66

Coded 0 - 9 as per schedule return.

25. LENGTH OF OCCUPATION (1 Column field) Col 70

Coded 1 - 4 as per schedule.

ALL SHADED AREAS ARE ( ) PRIME APOSTROPHE – (10,6,8) N.P.A. CODING FORM • Decimal (10, 3, 8) ! Exclamation Mark (10, 7, 8)

C Φ C	Race	Sample No.	ZONE Pr.	ZONE Dist.	ZONE Town	Typ/Occ	H/Hold Type	H/Hold Size	DW/Type	Liv. Rms	Income	Fam. Ord	Person. No.	Identity	Relation	Sex	Mar. Stat.	Age	Occupation	FACTOR	No. of Visitors	No./Work	Loc. of Work	Transport	No. Cars		Lgth. Occ
1									4			1			0					•						!	
1									4			1			0					•						!	
1									4			1			0					•						!	
1									4			1			0					•						!	
1									4			1			0					•						!	
1									4			1			0					•						!	
1									4			1			0					•						!	
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1									4			1			0					•						!	
1									4			1			0					•						!	
1									4			1			0					•						!	

APPENDIX D

U N I V E R S I T Y O F N A T A L

DEPARTMENT OF ECONOMICS

RESEARCH PROJECT - EDUCATION AND EMPLOYMENT OF INDIAN YOUTH IN THE DISTRICT OF PORT SHEPSTONE

ALL INFORMATION WILL BE STRICTLY CONFIDENTIAL

Date: November 1967. Questionnaire No.....

INSTRUCTIONS : TAKE THIS FORM HOME. FIRST READ IT CAREFULLY. SOME QUESTIONS WILL REQUIRE DISCUSSION WITH YOUR PARENTS OR GUARDIANS AND OTHER MEMBERS OF YOUR HOUSEHOLD. THEN COMPLETE THE QUESTIONNAIRE AND BRING IT BACK TO SCHOOL THE NEXT DAY.

S C H E D U L E 1

SOCIO-ECONOMIC DATA

Scholar's Personal Information

1. Name: (Surname).....
   (First name/s).....
2. Address: Home.....
   .....
   Postal.....
   .....
3. Sex; (Indicate by X)

Male		Female	

4. Date of birth: Month.....Year 19.....
5. Place of birth: .....
6. Name of school: .....
7. Standard: .....
8. Which language do you
   (a) (i) Read best..... (ii) Read second best.....
   (b) (i) Write best..... (ii) Write second best.....
   (c) (i) Speak best..... (ii) Speak second best.....

Information about your FATHER

9. Name: .....

10. Religion

Hindu	Islam	Christian	Other

If Other specify.....

If Christian, state denomination, e.g.Catholic, Anglican, Methodist, etc.

.....

11. (a) Father's age.....Years

(b) Place of birth .....

(c) If your father was not born in the district if Port Shepstone, state the year in which he first settled in this area..... (approx.)

(d) Did your father attend school? Yes/No .....

(e) If so, to what class/standard? .....

12. Your Father's Present Employment Position (Indicate by X)

(a) Actively working - Permanent	
(b) Casually employed	
(c) Of independent means	
(d) Pensioned, disabled, too old to work; retired	
(e) Out of work temporarily - unemployed	

13. If your Father is Unemployed

(a) How long has he been out of work? .....Yrs.....Mths.

(b) Has he registered as being unemployed with the Department of Labour? Yes/No.....

(c) (i) Is he in receipt of unemployment benefits? Yes/No.....

(ii) If yes - what amount is received? R.....per wk/mth.

14. Your Father's Occupation

NOTE: Only one section to be answered - either Section A or Section B

Section A. Own Business, Self-employed or Independent Profession.

State exactly the kind of business or profession your father is conducting today or used to conduct:

e.g., Retail store; tea-room keeper; hawker; farmer; cane grower; market gardener (vegetable or fruit farmer); doctor, etc.

Section B. Employee (worker) in shop; factory; garage; hotel; sugar mills; labourer on farm; etc.

State exactly what kind of work your father does today or used to do, for his employer:

e.g., Shop employee; salesman; bookkeeper; clerk, etc.

Sugar mill - field labourer; mill worker; crane driver; weighbridge clerk; sirdar, etc.

Clerk - commerce (retail shop or wholesale firm), legal office.

.....

15. (a) Name of your father's employer/firm.....

(b) Employer's address .....

.....

(c) Race of employer:

White ☐; Coloured ☐; Indian ☐; Bantu ☐;

(d) How long has your father worked for this employer/firm?.....Yrs.

(e) If less than two years in employment for the same employer/firm, state the number of jobs he has had in he past two years.....

(f) Besides the present job he is doing, is he also engaged in any part-time work for gain? Yes/No.....

(g) If so, what part-time work is he doing? .....

(h) What is your father's income from his permanent occupation? R.....per wk/mth.

(i) What is your father's income from other sources?

R.....per wk/mth.

16. Information about your MOTHER

(a) Your Mother's present occupation: (Indicate by X)

(i)	Household duties only	☐
(ii)	Paid employment outside the home (permanent)	☐
(iii)	Paid employment outside the home (casual)	☐
(iv)	Conducting own business	☐
(v)	Helping in family business - e.g., shop, farm, market garden	☐
(vi)	Pensioned, disabled, too old to work, retired	☐
(vii)	Of independent means	☐

(b) (i) If your mother is employed (permanently/casually) please state type of work as fully as possible

.....

(ii) How long has she been so engaged? .....Yrs.(approx.)

(iii) Race of employer: White ☐ Indian ☐ Coloured ☐

Bantu ☐

(c) If your mother had been permanently employed, but is now unemployed, state:

(i) How long has she been so unemployed? .....Yrs.....Mths.

(ii) Is she registered for unemployment benefits? Yes/No.....

(iii) Is she in receipt of unemployment benefits? Yes/No.....

(iv) If so, how much? R.....per wk/mth.

(v) Is she seeking other employment? Yes/No.....

17. Please state if your parents have any other regular income beside what you have already indicated above? Yes/No.....

If so, state as fully as possible the source of this income and the amount received.

Source: .....

.....

Amount Received: R.....per wk/mth.

18. Language of your Parents

Please indicate your parents language below :

	Tamil	Telugu	Hindi	Urdu	Gujerati	English	Other
Father's language						-	
Mother's language						-	
Language spoken at home							

S C H E D U L E 2

INFORMATION CONCERNING EACH MEMBER OF YOUR HOUSEHOLD, I.E. ALL PERSONS ACTUALLY LIVING IN THE HOUSEHOLD EXCLUDING YOURSELF, YOUR FATHER AND MOTHER, MUST BE FILLED IN ON THIS SCHEDULE.

PERSONAL INFORMATION					ECONOMIC ACTIVITY									INCOME (SPECIFY PER WEEK, MONTH OR YEAR IN EACH CASE)					FOR OFFICE USE ONLY
					ACTIVE			INACTIVE (Indicate by X)						Wage	Supplementary				
State Relationship to you	Sex	Age in years	Present Marital Status(1)	Highest Standard Passed	In employment(2)	If unemployed, indicate if registered		Household duties	Scholars	Pre-school age	Pensioners	Retired	Other	Present nett wage income	Pensions, grants, etc. (Specify)	Nett rental income	Unemployment benefits	Other income (Specify)	
						Yes	No							R c	R c	R c	R c	R c	

(1) Indicate S, M, W or D for single, married, widowed or divorced.

(2) Indicate P or C for permanent or casual.

S C H E D U L E 6

PRESENT ACCOMMODATION DATA

(Indicate by X)

A. Please indicate the type of accommodation and occupation :

Type of Accommodation	Type of Occupation			
	Own	Tenant	Tenant at Will	Rent Free
Barracks				
House				
Flat				
Shack				
Other (Specify)				

B. Accommodation Details :

	Accommodation Facilities							
	Lounge	Dining room	Lounge cum dining room	Bed-rooms	Kit-chen	Bath-room	Toilet	Other
Personal and exclusive to household				No.				
Shared								

If other, specify .....

C. (i) Is there land available for:

General Farming		Gardening			
		Market		Kitchen	
Yes	No	Yes	No	Yes	No

(ii) State approximate extent of land, e.g., ¼ acre, 5 acre, etc.

.....acres.

D. Is the building constructed of :-

Brick	
Cement block	
Wood and iron	
Part brick and part wood and iron	
Other materials, (e.g. wattle and daub)	

E. Cost of Accommodation :

If the premises are rented, state rental paid :

E.....per month/annum.

APPENDIX F

THE MARBURG / PORT SHEPSTONE MIGRATION SURVEY

ALL ENQUIRIES TO:-
J.E. Bradley,
Private Bag 4,
UMHLANGA.

LOT NO:-
ADDRESS:-

M/P

DATE:-
INTERVIEWER:-
SAMPLE NO:-

1. WHAT TYPE OF DWELLING DOES YOUR FAMILY / HOUSEHOLD OCCUPY?

Flat	☐	Single/Double Storey House	☐	Hostel Boarding House	☐
Maisonette	☐	Shack	☐	Other e.g. Hut, Basement	☐

2. HOW LONG HAS YOUR FAMILY / HOUSEHOLD OCCUPIED YOUR PRESENT DWELLING?

Under 1 year	☐	Over 2 years under 4 years	☐
Over 1 year, under 2 years	☐	Over 4 years	☐

If over 4 years state how many

3. WHAT WAS YOUR FAMILY'S / HOUSEHOLD'S LAST PLACE OF RESIDENCE?

LOT / STREET ADDRESS:-
TOWN / TOWNSHIP :-

4. WHAT WAS YOUR FAMILY'S / HOUSEHOLDS APPROXIMATE DATE OF ARRIVAL IN MARBURG / PORT SHEPSTONE?
(DATE TO BE GIVEN TO THE NEAREST MONTH)

MONTH :-
YEAR :- 19

5. HOW MANY OCCUPANTS ARE THERE IN THE HOUSEHOLD?

6. HOW MANY FAMILIES ARE THERE IN THE HOUSEHOLD?

7. WHAT SIZE ARE THE FAMILY('S) IN THE HOUSEHOLD?

FAMILY UNIT 1	
FAMILY UNIT 2	
FAMILY UNIT 3	
FAMILY UNIT 4	
FAMILY UNIT 5	
FAMILY UNIT 6 +	

8. WHAT IS THE IDENTITY WITHIN HOUSEHOLD, AGE, SEX AND MARITAL STATUS OF EACH MEMBER OF THE HOUSEHOLD?

PERSON IDENTITY WITHIN HOUSEHOLD											AGE		SEX		MARITAL STATUS			
NO.	N	H	W	S	D	IS	PS	PR	SP	P	20/39	60+	M	F	M	U	W	D
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

9. UNDER WHAT TYPE OF TENANCY ARE THE FAMILY / HOUSEHOLD OCCUPYING THE PRESENT DWELLING?

LEASEHOLD OWNERSHIP

FREEHOLD OWNERSHIP

RENTING

SQUATTING

BOARDING

10. WHERE DID THE PREVIOUS TENANTS MOVE TO?

LOT OR STREET ADDRESS :-

TOWN / TOWNSHIP :-

11. WHY DID YOUR FAMILY / HOUSEHOLD LEAVE YOUR FORMER DWELLING?
(Give full particulars)
REASONS:-

12. WHY DID YOUR FAMILY / HOUSEHOLD MOVE TO THE MARBURG / PORT SHEPSTONE SUB-REGION?
(State full reasons)
REASONS:-

13. HAVE THERE BEEN ANY NEW ADDITIONS TO THE FAMILY / HOUSEHOLD IN THE LAST 4 YEARS? YES NO

IF YES STATE NO

14. WHAT IS THE RELIGION OF THE MEMBERS OF THE FAMILY / HOUSEHOLD?

ISLAM

HINDU

MUSLIM

CHRISTIAN

UNSPECIFIED

APPENDIX G

RECORDS OF PROPERTIES TO BE AFFECTED BY THE DEVELOPMENT OF THE SOUTH COAST FREEWAY

LOT NO.	AREA	NO. OF DWELLINGS TO BE AFFECTED	TYPE OF DWELLING PERM	NON PERM	NO. OF FAMILIES	NO. OF PEOPLE
Sub 46 of 9 of 36	Marburg	3	3	-	5	19
63/9/36	"	1	1	-	1	8
9/36	"	3	3	-	5	24
31/A/35	"	1	1	-	3	10
1/B/4/34	"	3	3	-	3	17
A/4/34	"	2	2	-	2	8
1/C/34	"	1	1	-	1	4
1/O/37	"	1	1	-	1	5
Rem/O/37	"	2	-	2	2	10
G/37	"	1	1	-	1	7
E/37	"	1	-	1	2	12
B/39	"	1	1	-	1	5
35/36	"	1	1	-	1	7
20/36	"	2	2	-	3	11
1/958	Pt. Shepstone	1	1	-	1	4
1/956	"	1	1	-	1	4
TOTAL		26	23	3	35	153

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