"AN ANALYSIS OF THE IMPACT THAT ELECTRIFICATION HAS HAD ON THE RURAL DOMESTIC ENERGY MARKET IN NORTHERN KWAZULU NATAL, 1989 -1993 : IMPLICATIONS FOR THE MARKETING OF STRATEGIC INFRASTRUCTURAL SERVICES."

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A thesis submitted to the Faculty of Commerce, University of Natal, Pietermaritzburg, in fulfilment of the requirements of the degree of Master of Commerce.

OCTOBER, 1995

DEDICATION

This dissertation would never have been completed without the support of my wife Sue and the grace of my Lord, to both I am extremely grateful, and I dedicate this work.

ACKNOWLEDGEMENTS

I am grateful to my supervisor, Professor McCarney, Head of the Department of Business Administration and Dean of the Commerce Faculty, University of Natal, Pietermaritzburg. His professional input was greatly appreciated.

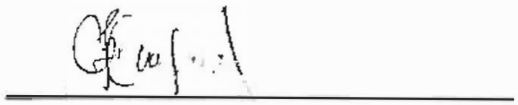
I would like to take this opportunity to thank the 144 respondents who gave of their time and volunteered personal information for this study. Their responses form the foundation of this dissertation.

Thanks also go to Data Research Africa for supplying two trained researchers to assist in the collection of data and to Research Surveys whose thorough investigation in 1989 provided a useful reference point for the empirical survey which was conducted in this project.

Finally, my sincerest thanks also go to Eskom Management, Ivan Coomer and Dave Oerder in particular, for endorsing this project and affording me the time to complete this dissertation.

DECLARATION

I declare that this dissertation is my own unaided work. It is being submitted for the degree of Master of Commerce at the University of Natal, Pietermaritzburg. It has not been submitted before for any degree or examination at any other university.



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ABSTRACT

The political history of South Africa tells a tale of unequal development, and world-wide trends in electrification point to the fact that South Africa is far less advanced with its electrification programme than numerous other developing countries which have neither the electricity generating capacity nor the economic standing of South Africa. The electricity industry in South Africa has historically been fragmented and decentralized in keeping with local political policies and structures. This has led to a less than optimum distribution of electricity at inefficient tariffs which have been designed to sustain the fragmented structure. But an unprecedented reformation in the electricity industry is imminent. The creation of NELF (The National Electrification Forum) and the ANC's Reconstruction and Development Plan will attempt to address the inequalities imposed by previous political ideologies.

The vast majority of the population have been confined, for years, in rural areas. These areas were starved of infrastructural services and the people deprived of economic and political franchise (Dingley 1990). Between 1990 and the date of writing, South Africa has undergone unprecedented change and the imbalances of the past have formed the priorities of the development agenda. Most writers including Dingley (1990), Viljoen (1990), and Du Toit (1993) suggest the most efficient way to address these issues is to begin with the sprawling informal settlements around the cities. This argument is logical in that they house large concentrations of people. However, parallel to this development programme should be a programme aimed at modernising the rural areas. The empowerment of the rural population could make economic development in rural areas a viability, while simultaneously arresting the alarming trend of urbanisation facing South Africa today.

The ANC, in its Reconstruction and Development Plan, has recognised the need to address the rural development problems. "An affirmative action programme must address the marginalisation of blacks, women and rural communities" (SACOB 1993). In particular the lot of rural people on farms is a concern of the ANC.

This dissertation attempts to make a contribution toward the development of rural areas, in particular the modernisation and empowerment of these communities through the electrification programme. It is proposed that electrification contributes significantly toward development, particularly if it forms part of an integrated programme including wider development issues as proposed by Steyn (1993). The working hypothesis used in this study was that the electrification programme has the potential to "kick start the South African Economy" (World Bank 1992) through the associated forward and backward linkages attached to electrification.

According to the Development Bank (1993), general consensus holds that rural electrification is purely a social obligation and cannot be justified on economic grounds. The argument put forward in this paper is that rural electrification need not have only one beneficiary (namely the rural recipient), but can indeed be a viable business undertaking should the rural economies begin to develop along the lines of the transitional model toward modernisation as put forward by Viljoen (1990). A strategic marketing plan is submitted in this paper which attempts to contribute to this end.

This dissertation is a detailed examination of the relationship between electrification and economic development with specific reference to the rural areas of Kwazulu - Natal. From this assessment

recommendations have been made to organisations who market services into these areas, with special attention being paid to the distribution of electricity.

The principal motivation for this study was to furnish Eskom Management with strategic information concerning the variable facets associated with their commitment to their "electricity for all" strategy (Eskom 1992).

Three principal issues were addressed: firstly, the extent of the impact of rural electrification; secondly, how this impact could be maximised and channelled for the economic development of the region; and finally the financial viability of the electrification programme.

The research methodology involved four steps. It commenced with a desk-top literature review. Articles and papers were studied from abroad as well as from the local context. This was followed by an opinion leader survey which took the form of personal interviews, making use of both open-ended and predetermined questions.

The main body of research was based on an empirical sample-based survey, conducted in the town of Frischgewaag (outside Paulpietersburg). The questionnaire elicited 116 acceptable returns. Each questionnaire was conducted by a trained interviewer, with the household head, in the privacy of the respondent's home. This method was validated by controlled checkbacks and was deemed to be statistically and qualitatively appropriate. The final step, in which the research results were further substantiated, was another opinion leader survey.

The results from Frischgewaag revealed a significant increase in the economic activity of the informal sector due to electrification. Furthermore this business potential is far from saturated and indications are that further stimulation to the small business sector could go a long way toward making the rural electrification programme financially viable.

During the electrification period the number of dwellings in Frischgewaag increased significantly and the quality of dwellings improved proportionately. Electricity has proved to be a status symbol and houses are being revamped to match the new quality of life.

Income levels have risen and investment and saving patterns have also changed significantly, revealing a higher level of financial responsibility.

Education levels have increased significantly since the introduction of electricity. Evidence of this is seen in the adult education programme which is run after hours in Frischgewaag. Electrification has led to the increase in the number of television sets in the area which has made informal education more accessible.

While employment levels have risen significantly, so too have the pensioner statistics. This indicates that "extended families" have grown as relatives have tended to move into Frischgewaag from other non-electrified centres. The exodus of migrant workers have also increased, exacerbating the already struggling earning potential of each household. The growth in the number of migrant workers might be attributed to the increased contact with the wider economy, facilitated by electrically driven media, or simply be in line with the wider urbanisation trends in the country.

Appliance ownership has increased proportionately with the duration of the electrification project, but there is evidence of significant room for growth in this area. Appliances are located primarily in the kitchen and are largely restricted to the smaller, less expensive variety.

There remains a significant level of ignorance and scepticism regarding electricity and the associated appliances, but in general electricity is believed to be the "way to a better life" (Gwala, interview 1993) and electricity was preferred to any other energy source.

Wood is still the most widely used source of energy in Frischgewaag. The average amount spent on electricity is R24 per month (when faulty meters and theft is accounted for, the average amount is R30 p.m.). This equates to approximately 140 kwh per month of consumption. There is also a high incidence of multiple energy consumption, with different sources of energy fulfilling different needs.

The research conclusions point to the need to continue with the rural electrification programme. This paper propagates a divergence from a popular belief that rural electrification is merely a "social obligation". It is suggested that it is possible to make the rural electrification programme a more viable business venture. That, with the appropriate market stimulation, each rural electrification project could be financially viable.

The factors which minimize the cost effectiveness of the rural electrification programme included: the disparities caused by political ideologies, the real costs of electrification, the decentralized

nature of the electricity industry, the current pricing structure and the fact that the electrification programme is in its infancy.

Various strategies have been developed in order to streamline the electrification programme in South Africa. The following factors are peculiar to the South African context and need to be considered: the process of urbanisation, the transitional model, the multiplier effect and the resultant effect on the country's balance of payments.

Against the aforementioned backdrop a marketing strategy is proposed for service rendering institutions in the rural areas of KwaZulu-Natal, with special emphasis on the provision of electricity.

It is recommended that the corporate vision of each utility be re-aligned to focus both on stimulating the demand for electricity, as well as expanding the focus on supply-side management. Both long and short term objectives are recommended which would serve to focus the marketing strategy toward the integrated development of rural communities.

In the immediate short term, strategies are proposed to stimulate household expenditure on electricity which would serve to revamp the running costs of the rural electrification drive. However, in the long run a far wider approach is necessary, one which would serve to stimulate the entire economy of the sub- region. Such an approach would bring lasting economic change, which would transform the rural townships into viable, modern economic centres. This would ensure a

long term return on investment to the service provider and would, simultaneously, address the wider socio-economic issues at hand in South Africa today.

The dissertation concludes with suggestions for the practical implementation of these strategies which would imply nominal structural changes for an organisation such as Eskom, but significant paradigm shifts for the respective company employees.

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SECTION 1

INTRODUCTION

1.1 MOTIVATION FOR DISSERTATION

The principle motivation for this study is to furnish Eskom Management with strategic information concerning the variable facets associated with their commitment to the electrification of every home in South Africa. The study encompasses a wide range of economic and market related issues which have a bearing, indirectly or directly, on other utilities and institutions providing infrastructural services to Third World Africa.

An attempt has been made to uncover the perceptions inherent in the market place concerning the provision of infrastructural services. These perceptions range from energy specific to service related expectations, and are vital in the assessment of the feasibility of providing these services.

The political dispensation in South Africa and the resultant monopilistic nature of public utilities has muffled the demand for infrastructural services in the rural communities in recent decades. This further highlights the need for the present decision makers in the South African Utilities to uncover the communities underlying perceptions.

Economic empowerment is a central issue in South Africa today. Associated with the transition the country is experiencing are economic demands from the traditionally less privileged classes. An understanding of the impact electrification has had, on rural settlements in particular, would make a positive contribution to management at regional government level.

In 1989 Research Surveys (Pty) Ltd was commissioned by Eskom to research certain areas in Kwazulu - Natal prior to electrification. Operating within the parameters of a feasibility study they established a data base, which held statistics on demographic, attitudinal, economic and lifestyle issues. This data base provides an ideal reference against which new findings can be compared.

The capital outlay Eskom is investing in rural electrification is substantial. It is important to Eskom, the public and the potential customer that this programme has a feasible return on investment if it is to succeed in the long-term. This dissertation will attempt to contribute toward Eskom's strategic marketing planning in this regard. It will also attempt to contribute to the understanding of broader economic development issues which face government institutions today. Issues such as unemployment, education and health etc.

Unemployment is of national concern. The creation of jobs through the development of small business is a means of alleviating the problem (Viljoen 1990). It is believed that electricity facilitates the introduction of technology which has the potential to stimulate the informal sector. The extent of the correlation between electricity and the spontaneous creation of jobs is an important one to ascertain. Another equally important hypothesis which is explored in this report is, as the World Bank (1992) puts it, "electrification promotes learning".

These issues, and others, are reviewed with respect to the rural township of Frischgewaag. This analysis is tabled against the aforementioned back drops in order to ensure that the conclusions and recommendations remain relevant in the national context.

1.2 STATEMENT OF THE PROBLEM

Electrification is taking place at an unprecedented rate in South Africa. A large capital investment of this nature has a ripple effect which permeates the entire economy. An understanding of the forward and backward linkages caused by electrification is vital in maximising the utility of the electrification process. The issues which need to be resolved can be classified into three main categories:

1.2.1 TO ASSESS THE IMPACT OF ELECTRIFICATION

In order to arrive at a balanced assessment of the impact that electrification has had on third world rural communities, multiple indicators need to be considered. Economic variables require identification and the impact that electrification has had on these variables needs to be measured.

The change in living standards caused by the introduction of electricity is considered significant, as are the underlying perception changes undergone within communities involved in the electrification programme.

Broader socio-economic issues, such as population migration and the inflation rate, also point to the impact that electrification has had in these communities.

1.2.2 TO EXAMINE STRATEGIC IMPLICATIONS FOR ESKOM MANAGEMENT

Without a clear understanding of the market that Eskom is serving, Eskom management will find it increasingly difficult to optimise the efficiency of its electrification programme.

Income levels, purchasing patterns and competitive awareness are issues that this dissertation will attempt to uncover in the context of rural electrification.

The position of the "electricity brand", will be explained. An investigation will also be made into a marketing strategy that will attempt to effect the domestic energy market.

Finally, an assessment on the likelihood of a return on investment to Eskom in the rural areas will also be conducted.

1.2.3 TO HIGHLIGHT THE NATIONAL ISSUES AT STAKE

Electrification has become a political focus point in South Africa and features prominently in the ANC's Reconstruction and Development Programme. The macro economic and political variables affected by electrification are explored.

Utilities have fundamental organisational, resource and environmental similarities, and therefore are able to learn from each other's experiences. An attempt will be made to draw comparisons and conclusions in this regards and within the context of third World communities.

1.3 HYPOTHESIS

The hypothesis explored in this paper is based on the World Bank's findings, that the electrification programme in South Africa has the potential to "kick-start" (World Bank 1992) the national economy in a relatively cost effective manner.

This statement holds the presupposition that electrification gives rise to forward and backward linkages in the wider economy. In particular this thesis holds that rural electrification stimulates business, facilitates job creation and socio-economically empowers the under-privileged. These far-reaching consequences in the broader economy serve to increase the financial viability of each rural electrification project.

1.4 WORLD-WIDE ENERGY TRENDS

According to Dingley (1990), the global figure for electrified houses is 60%, however in the developing world it is only 40%. The rural areas of developing countries average 30% while their urban counterparts enjoy 70% of their houses electrified. Electrification levels in Asia and Latin America are generally far higher than Africa, where it is estimated that only 5% of the rural population have electricity.

Dingley also gives three examples of countries which are allocating significant resources to electrification namely, Brazil, Costa Rica and Thailand. All three have per capita incomes

below that of South Africa. The Costa Rican government has a target to electrify 90% of the country by the year 2000.

This would mean virtually the entire population would have electricity. Brazil's current electrification figures are 90% for urban and 65% for rural areas. The Thailand electricity authority for the past decade has provided some 400 000 houses per annum with electricity. Virtually the whole of Thailand is now electrified.

Viljoen (1990) explains that Korea is the only country in the world where a "series of comprehensive rural transitions" have been planned and executed. The rapid urbanisation between 1961 and 1979 was accompanied by a change in energy consumption in that country. In 1961 woodfuel formed 57% of the total energy consumed. By 1979, 63% of the energy market was held by oil and 23% by coal. Viljoen notes that their energy strategy formed part of their comprehensive industrialisation and economic strategy. The fact that 98% of all their villages are electrified bears testimony to their success.

Mexico, reports Guzman (1981), has important parallels with South Africa in terms of GNP, population size, growth rates and inequality. Guzman criticizes the fact that the more traditional energy forms have been overlooked and the electrification and paraffin subsidies have not been in the long term interests of that economy. The Guzman report (1981) suggests that developing communities need to utilise the available resources in order to ensure sustained growth, instead of propping up first World technologies with government subsidies.

Sinha (1991) claims that although low load factors and long distribution lines make India's rural electrification schemes unattractive, remarkable progress has been made since 1951. Only about 90 000 villages, mostly small and remote, do not have power as opposed to 118 000 that do.

The first world countries show a vastly different picture to that described above. The UNIPEDE (1988) report claimed that electricity demand in the residential sector had grown in the European countries with an average rate of 3 to 9% per annum. This excludes England and Wales, where growth rates have been ± 0,2%, mainly because of the rapid penetration of North sea gas into the formally electrical heating market. These trends suggest that an integrated energy system will emerge as a product of first World development, and it is to this end that developing nations will aspire.

1.5 THE ELECTRICITY INDUSTRY IN SOUTH AFRICA

Eskom supplies more than half the electricity consumed on the African continent. Rated against other electricity utilities in the world, Eskom is one of the top five in terms of sales volume (Dingley 1990). The 1992 Eskom Annual Report claimed that "At the end of 1992, it had total assets of R42,5 billion, turnover for that year was R12,6 billion and net income was R1,5 billion" (Eskom 1992).

Eskom is an independent, self financing organisation managed on business principles. It has no shareholders and is a separate legal entity, which is funded solely from debt (largely raised on the capital market) and accumulated reserves. Eskom conducts its business under the Eskom Act of 1987 and the Electricity Act of 1987. The undertaking's policies are determined by the Electricity Council, which comprises delegates from the consumer bodies as well as independent experts. Eskom's management board is the functional unit in place, responsible for the day to day running of Eskom, and is appointed by the Council.

Eskom has a generating capacity of 39 060 megawatts from some 25 power stations. They include the only nuclear power station on the African continent and the world's largest dry-cooled power station. The total length of Eskom's network is 233 109 km, operating at voltages as high as 765 (kV). Electricity is distributed throughout South Africa as well as into neighbouring states. "Power is imported from Namibia when available" (Eskom 1993).

According to Eskom's 1993 annual report, "Eskom supplies most mines and many industrial users direct whilst 46% of its electricity is sold to local authorities and neighbouring countries who re-sell it to end users" (Eskom 1993). This statistic makes it evident that the electricity industry in South Africa is highly fragmented. It is estimated that 600 of the existing 1008 regional government bodies in the country have municipal status and the authority to supply electricity within their ambit of jurisdiction. Of these, "431 municipalities have exercised their right to supply electricity and have established Municipal

Electrical Undertakings (MEU's)" (Department of Mineral and Energy Affairs 1992). Of these, only 290 are financially viable.

The multiplicity of supply authorities has an associated complication in that there are variable price structures, expansion and maintenance policies for each authority. "These factors lead to the non-optimal use of resources needed to electrify the majority of the population who have no electricity in their homes" (Development Bank of Southern Africa 1993). In fact "only a third of South Africa's population have electricity in their homes, a level of domestic electrification which is low even by the standards of the developing world" (Dingley 1990).

According to the Development Bank (1993), the need for a restructured Electricity Distribution Industry is obvious. The previous "white municipalities" are charged with mismanagement of revenue, cross subsidising non-income generating services with high tariffs. The once "Black distribution authorities", on the other hand, are said to lack credibility, have small revenue bases, and have administrative weaknesses leading to a poor quality service.

It is Dingley's (1990) conclusion that if South Africa's electricity distribution resources were more effectively managed every household in the country could be supplied using the excess capacity which Eskom presently has.

The Development Bank has proposed various options as viable alternatives to the current status quo.

It is proposed by the Development Bank (1993) that development should be progressive in response to emerging social and political processes, with broad development goals and priorities as well as a modern approach to the development of South Africa. The Development Bank has listed four possibilities for the structure of the distribution industry in South Africa:

The first option is a single-purpose national distributor viz: one unified body to distribute electricity throughout Southern Africa.

The second option is single-purpose regional electricity supply authorities. viz: the amalgamation of the current Eskom distributors with the local municipal authorities which Eskom currently supplies on a regional basis.

The third option is single or multipurpose metropolitan supply authorities.

The final option is an amalgamation of adjacent municipalities, viz, the traditional townships and the more affluent municipalities should amalgamate in their specific area of supply.

Dingley (1990) believes that the problem with South Africa's fragmented electricity distribution structure is that "no part of the supply industry structure has seen itself as

having a clear responsibility or obligation to supply the disenfranchised section of the population."

According to Doppegieter (1993) the Development Bank of South Africa was approached by the Department of Mineral and Energy Affairs to convene an energy conference involving all interest groups in January 1992. In February of that year the Development Bank also facilitated the process started at the ANC's national meeting on electrification. After consultation with the various interest groups, the first National Electrification Conference was held on the 1st and 2nd of September 1992. Eventually in May 1993 South Africa's National Electrification Forum (NELF) was launched. The goals of NELF are to: accelerate electrification, to formulate a restructuring proposal and recommendations, to implement these proposals and to give guidance and to operate inclusively on a consensus basis. Bill Corbett of the ANC said he was optimistic about NELF as all the major players are involved (Doppegieter 1993).

Against this backdrop of accelerated change the electrification of South Africa is taking place. At this junction Eskom has the initiative in electrification by virtue of its monopolistic coverage of the South African market. However, the larger municipalities have embarked on rural and peri-urban electrification programmes themselves.

The total number of customers supplied directly by Eskom increased from 278 033 in 1991 to 541 866 in 1992. According to Eskom, "This massive 95% growth is due to three factors, namely the connection of new customers as part of our traditional business, the

electrification of more houses under our electrification programme and the transfer of existing customers from local authorities to Eskom" (Eskom 1993).

Although the domestic load presently constitutes only 15% of the national electric load, it contributes approximately 30% of the national peak demand (Doppegieter 1993), which is a significant figure when it comes to planning.

The Department of Mineral and Energy Affairs (1992) claim that 2,4 million of South Africa's 7 million households are electrified. About 125 000 houses are being electrified annually, however this does not keep pace with the number of houses being built annually, so the percentage of electrified South African homes is diminishing, despite the electrification programmes in place.

Eskom has made the commitment to electrify 3 million homes, directly or indirectly by 1996 (Eskom 1993). The Development Bank (1993) argues that 'there is considerable support among various political organisations, community groups, trade unions, development institutions and the electricity distribution industry to accelerate affordable and sustainable electrification to support growth and development. The ANC has called for 3 million connections in three to five years (World Bank 1992). It is evident that electricity is seen as a vital political tool in South Africa today. Senior management in Eskom have made an attempt to align themselves politically to the changes facing the country by adopting "equal opportunity affirmative action programmes as well as committing themselves to the

electrification of the aforementioned number of houses and to dropping the real price of electricity" (Coomer, interview 1993).

1.6 AN OVERVIEW OF FRISCHGEWAAG AND THE ELECTRIFICATION PROGRAMME IN THE TOWN

According to the Eskom segmentation policy document (Eskom 1994) the widely recognised "Living Standard Measure" (LSM) is used as a basis to segment the domestic electricity market. The LSM outlines a number of parameters, such as the degree of urbanisation, size of dwelling and the ownership of major appliances as a means of classifying customers into segments. Using these parameters Frischgewaag falls into the LSM category 3, (characterized by rising education levels, an average income of R780 p.m., with a rural base and some urban migrant dwellers). Frischgewaag has made the transition from being a predominantly rural community, with low income and education levels (LSM 2) to its current standing during the last 5 years. This is evident after comparing the current findings with that of the Research Surveys Report of 1989.

Viljoen (1990) explains that rural areas may be classified into outer and inner areas. In his terms the outer rural areas are furthest from the metropolitan areas, characterised by a high degree of migrancy and are "most undeveloped". The inner peripheral areas are more closely associated with the metropolitan areas and characterised by long distance commuting. Frischgewaag clearly falls into the category of the former.

The "Energy for development" research outline (1992) claims that less than 1% of rural households have access to electricity. This makes the changes experienced by Frischgewaag significant when compared with other rural areas.

1.6.1 LOCATION

Frischgewaag is a rural township situated 15km outside Paulpietersburg, in the direction of Piet Retief. (See Appendix 1 for a map).

1.6.2 LAND TENURE

The land is owned by the central government and is administered by the Natal Provincial Administration (NPA). "Tenants lease each lot at R1 per annum. To date approximately 3200 lots have been occupied and a similar number have been surveyed but not yet developed" (Gwala, interview 1993). The SAP staff sergeant in the area, Mr Mthala, explained how the town had grown because of the availability of land. A school teacher at Kwasa High School, Simon Sikhwanazi, said in an interview that Frischgewaag used to be viewed as a temporary settlement area. The land was originally allocated by the NPA as a resettlement area in accordance with the National Party policy of the day. The introduction of electricity and the resultant economic development has made it a "permanent residential area."

1.6.3 AUTHORITY STRUCTURE

Frischgewaag is an Inkatha political stronghold, and as such has experienced a traditional Kwazulu system of government. Chief Dlamini is the residing traditional leader. His ambit of authority extends mainly to judicial issues. His presence has more symbolic than operational relevance.

The NPA has an office in Frischgewaag. "Its prime responsibility being the surveying and allocation of plots" (Gwala, interview 1993), as well as other land-related issues, among which is the collection of revenue and allocation of land use.

The Kwazulu authorities, in the form of the Department of Works, fulfil a vital function in the region. The township supervisor, Mr V.A. Gwala explained that their function is primarily the provision of services. These include the upkeep of roads, provision of water reticulation, medical services, burial and educational facilities. While Mr V.A. Gwala is the functional representative of the Kwazulu government to the region, the Kwazulu member of parliament is a Mr Xaba, who is a local businessman. Mr Xaba represents the community at government level and his responsibilities include any issues the Department of Works cannot resolve. He is also the spokesperson for the "Inkatha Freedom Party" on party matters (Sukhwanazi, interview 1993).

The community has not taken the initiative in forming residents' councils possibly because of their strong allegiance to the Kwazulu government and their acceptance of the legitimacy of this institution. Diagram 1. indicates the levels of responsibility and accountability in Frischgewaag.

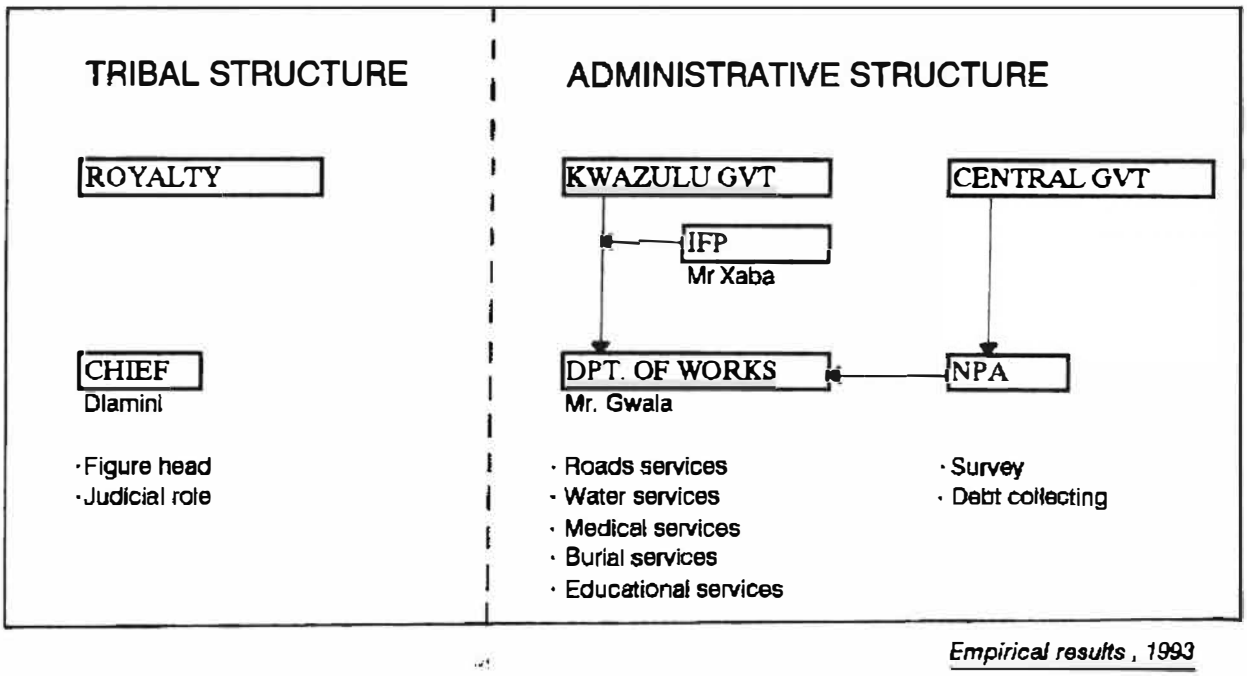

DIAGRAM 1: Authority Structure in Frischgewaag

1.6.4 POLITICAL CLIMATE

There is unanimous support for the Inkatha Freedom Party in Frischgewaag, even among the youth. It is therefore "comparatively stable when viewed alongside communities in other centres in South Africa" (Mabizela, interview 1993).

"In April of 1993 a taxi driver began to initiate an ANC following, this only lasted a month, and was subsequently squashed" (Mayaba, L. interview 1993). However, it is apparent that while Inkatha has the allegiance of the people, the party is poorly organised in the region. "There is very little, if any, campaigning or IFP interaction with the local population" (Mayaba, L. interview 1993).

Mr Mabizela voiced his concern about the stability of the region in the future due to the "population explosion", evident in the overcrowding of the schools. His thoughts were echoed by Lance Sergeant Mthali (interview 1993), who said that the unemployment figures were alarming.

While the future poses its problems the township at present can be described as stable and almost free of crime. Mr W. Mayaba (interview 1993), a school teacher at the local high school, confirmed that Frischgewaag was a "good area, the people are peaceful, in fact we have no street lights here and it is quite safe to walk around the town at night." The most serious complaint came from a

teacher at the Kwasa High School who said that "because the men in the households have been forced to go to Johannesburg to find work, there is a lack of discipline in the home" (Sikhwanazi, interview 1993). While this town has had a peaceful history, there is no guarantee that it will continue in the light of the over-population, unemployment and an increased exposure to the unrest elements elsewhere in the country.

1.6.5 TOPOGRAPHY

Frischgewaag is nestled in the hills outside Paulpietersburg. While not impossibly steep there are certain tracts of land not suitable for housing, however, 90% of the area is undulating and well suited to settlement. (See photograph 1). The soil is fertile, evidenced by numerous vegetable gardens in the community. The vegetation may be described as "grassland", however wooded areas have been planted and do exceptionally well in this area. "Timber is an important industry to Paulpietersburg" (Schikkerling, interview 1993). The region experiences reasonable rainfall, but is prone to extreme conditions. For example, it lay in the path of Cyclone Demoina in the mid 1980's.

PHOTOGRAPH 1: An example of the Topography of Frischgewaag

1.6.6 DEMOGRAPHIC PROFILE

There are an estimated 21 000 people resident in Frischgewaag. A significant number have become migrant workers, and only return home during long leave. For every 100 households there are 164 migrant workers. These are mainly men,

which leaves the demographic profile of the area dominated by women and children. Furthermore, there are a significant number of pensioners in the region.

Education levels are significantly below those in urban areas. 35% of the adult population have not reached Secondary School, and of those who have, only 20% have completed Secondary School.

As far as income is concerned, the estimated average household incomes vary between R569 p.m. to R1 200 p.m.

1.6.7 INFRASTRUCTURE

"Telephones arrived in Frischgewaag fifteen years ago" (Mayaba, L. interview 1993). Telkom have since stopped the expansion of the network in Frischgewaag owing to the impending change of the system to automatic dialling.

The Department of Works built a dam on the perennial river that runs through Frischgewaag (Gwala, interview 1993). This water is pumped to the highest point in the town, which is the site of the two original reservoirs. The water is treated here through a filtration process and gravity-fed to community taps. The option exists for any individual to connect their own home to the pipe network, provided they lay the piping themselves. Recently two more reservoirs were built

to cope with the growing population and they are fed by a borehole and a spring. At present the system is being expanded further. (See photograph 2).

The roads are made of sand and crushed stone, culverts and drainage are made by digging furrows, while the steeper slopes have their furrows lined with concrete and indigenous stones.

All sewerage is contained in pit-latrines, most of which are a fibreglass variety supplied by the Department of Works.

There is no immediate access to rail or air transport, yet, electricity was brought to the area in 1990 and to date 1846 installations have been made according to Eskom's Mr W.A Schikkerling (interview 1993).

PHOTOGRAPH 2: An example of the toilets used in Frischgewaag

1.6.8 AMENITIES AND SERVICES

The Kwazulu Works Department supplies most the services and amenities to the community. The clinic is in the process of being revamped. "A doctor comes to the township once a week to assist the local sister" (Gwala, interview 1993).

Trivial matters of justice are dealt with by the local chief, while the more important issues are referred to the magistrate at Paulpietersburg. "The South

African Police have a presence in the area in the form of a satellite station" (Mthali, interview 1993).

There are two high schools and a primary school in the township. "All three are hopelessly over crowded" (Gwala, interview 1993), but any student at Frischgewaag has the opportunity of obtaining a national matriculation certificate.

There are numerous churches in the area and an organised burial service. "At this stage there is no community hall or recreation facility" (Gwala, interview 1993).

1.6.9 ECONOMIC INFRASTRUCTURE

The economy of Frischgewaag may be described as a "subsistence" one. There are five general dealers, three panel beaters, many spaza shops (shops catering for the subsistence needs of the community, typically with low overheads and little capital outlay), welding shops, brick-makers, bottle stores, greengrocers, traditional food outlets and transport services.

The economic activity in the township is unable to sustain the community and the economic infra-structure is propped up by finances brought in by migrant

workers from major industrial centres. The township relies on regional government to provide essential services free of charge. Unemployment is reaching alarming levels, which has led to the high portion of migrant labour.

Against the background outlined in section 1.6, the empirical research study was conducted. The results of this study were analysed and conclusions were drawn. These conclusions form the basis for the marketing recommendations in the final chapter of this report.

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SECTION 2
METHODOLOGY

2.1 OBJECTIVE OF STUDY

Against a backdrop of dynamic transition on a national scale, this study attempts to assess the impact electrification has had on the economic and commercial development of third world, rural settlements in Kwazulu-Natal. As an ancillary objective a variety of linkages between electrification and economic growth are explored, and recommendations are made to Eskom management regarding the possible contribution Eskom could make to the economic upliftment of third world communities.

In order to do this the following information was collected by means of a personal questionnaire survey.

1. Economic Indicators:
   - 1.1 Types and levels of income
   - 1.2 Small business activity
   - 1.3 Expenditure on electricity
   - 1.4 The incidence of migrant labour
   - 1.5 Occupations
   - 1.6 Employment levels
   - 1.7 Type and condition of housing
   - 1.8 Balance sheet indicators

2. Appliance Ownership and Usage Patterns:

    2.1 Wiring of homesteads

    2.2 Type of energy used per appliance

    2.3 Location of appliance

    2.4 Intention to purchase appliances

    2.5 Ownership of appliances

3. Energy Consumption:

    3.1 Energy expenditure

    3.2 Comparisons between energy sources

4. Lifestyle Indicators:

    4.1 Interviewee details

    4.2 Numbers living in home

    4.3 Saving schemes

    4.4 Education levels

    4.5 Age profiles

    4.6 Frequency of visits to town

Furthermore, a separate survey of opinion leaders was also undertaken in order to identify subtle underlying influences and to verify the results of the empirical survey.

2.2 RESEARCH TECHNIQUE

A brief of this nature demands a multifaceted research approach in order to accommodate the diversity of variables at hand. The project commenced with a literature review, which covered electrification and economic development papers from South Africa and abroad. It also covered Eskom's in-house strategic planning documents and government statistics, reflecting a host of salient indicators. This review facilitated the selection of the settlement area which would form the basis of the empirical research.

Prior to the fieldwork, an opinion leader survey was conducted. Decision makers, influential community leaders and Eskom management who rendered the electrification service were interviewed. Based on their responses and aligned with the research brief a pilot study was conducted on three households in the Frischgewaag area. The questionnaire was adjusted accordingly and the empirical study was commissioned. This took the form of a sample based questionnaire, administered on a personal basis. This was followed by another opinion leader survey in order to verify the findings.

2.3 DATA ANALYSIS

The literature was scanned and manually sifted and organised in terms of the parameters being explored.

The sample-based questionnaire was captured on a data base, running on Quattro Pro 4 Software. A stats graphics package was employed to manipulate and present the results in a perceptual mapping format.

The opinion leader interviews were recorded on a dictaphone. This data was interpreted and analyzed from these tapes. Due to the nature of the interviews, the results required contextual analysis.

This dissertation records the secondary source findings in the opening rhetoric, specifically in Section 1.4. The empirical findings (both opinion leader based and sample based) are documented in Section 3 according to clearly demarcated subsections. These findings are also weighed against the findings in the literature.

2.4 DESIGN OF THE SAMPLE BASED PERSONAL SURVEYS

2.4.1 OBJECTIVE

This survey forms the essence of the empirical research in this project. The initial objective was to identify an appropriate township to draw a sample from. Frischgewaag was chosen because it fitted the following predetermined criteria. In order for the research survey to address rural issues, the township needed to be classified as rural. To be statistically relevant, a township was sought which

housed more than 10 000 people, and which had a history of more than 15 years. So as to isolate the effects of electricity, an area was sought which was relatively free from abnormal socio-economic stimuli. The rural township also need to have been electrified three years prior to the study, and ideally should have been researched by a recognised research institution prior to the electrification.

Frischgewaag was one of three rural Eskom pilot sites in KwaZulu-Natal, and was researched in 1989 by Research Surveys PTY. By comparing the findings of the Research Surveys report to the empirical research conducted for this paper, a gap analysis exercise was facilitated along certain parameters. Thus the quantification of the change within these parameters during the electrification period was possible.

The overall objective of this study was defined as being to contribute to current understanding regarding the "impact" electrification has made on the economic welfare of rural Third World communities in Kwazulu-Natal.

Three fundamental questions therefore needed to be addressed:

(i) The assessment of the economic change in third world rural settlements, in terms of being either positive or negative.

(ii) The link between electrification and economic empowerment of third world communities, and the extent of that link.

(iii) Considering its impact and the cost of the infrastructure investment, is electrification in the national interest, and what other options are available in

order to stabilise and strengthen the economic welfare of rural Third World Africa?

Key areas of investigation are detailed as follows: (Each variable is monitored over a 5 year period, 1989-1993).

* The respondents' usage of various energy sources, and how this relates to their economic well being.
* The perceptions of and attitudes regarding electricity, particularly in relationship to other fuel sources.
* The effects of migrant labour on the household's money supply and the practical applications of electricity.
* The usage of community saving schemes.
* The incidence of small business, and the influence electricity has had on small business development.
* The change in demographic variables since the introduction of electricity.
* The change in household income, especially in terms of "self-generating" income.
* The importance attributed to various community services and infrastructural developments.
* The use of appliances in terms of location and usage frequency.
* The condition and incidence of wiring
* Developments in education, in an attempt to establish a link between these developments and electrification.

* Observed quality of life indicators such as quality of housing, acquisition of assets etc.

2.4.2 TYPE OF RESEARCH

The empirical research was conducted as a sample based, structured questionnaire. The respondents were visited during the week, during working hours. If the head or substitute head of the household was not available, arrangements were made for a visit at a more suitable time.

The questionnaire (see appendix 2) took 45 minutes to administer and 32 questions were covered. The topics covered can be grouped into five subsections, namely: lifestyle, economic, energy consumption, customer perception and appliance ownership.

Although the questionnaire was structured, researchers were encouraged to probe extensively and record remarks which would add to the body of understanding concerning the attitudes and perceptions of the target market.

Each questionnaire was administered on a personal basis, and in the home of the respondent, without expressed incentives or threat from any quarter..

2.4.3 UNIVERSE AND SAMPLE

In their report on Edendale/Imbali, Data Research Africa (1989) acknowledged that statistical sampling in South African townships is prone to a number of difficulties. Quantification of total population is often impossible and there are a substantial portion of "illegal" residents. Household structure is fluid, with both extended families and tenants, and house structures themselves vary from large homes to a network of shacks. Regardless of these problems a probability sample is essential if any study is to be extrapolated to the entire population. Data Research Africa (1989) suggests that rule of thumb approaches in a 5, 10 and 20 percent sample are difficult to implement and often will imply excessive sample sizes. Consistent with this reasoning, it was decided on a sample size which would ensure an acceptable level of sampling error.

The sample of 124 households was deemed to be statistically significant when compared with "Research Surveys'" and Data Research Africa's sampling technique.

Frischgewaag is a peri-urban township with approximately 3000 households of which, 1800 are electrified (Vermaak, interview 1993).

Eskom electrified suburbs on a continuous basis, one suburb at a time. Only half of the 1800 consumers could be considered as the universe from which the

random sample was drawn. The reason lay in the need to maximize the benefit of a lengthy period of electricity ownership since the effects of electrification would hardly be felt immediately after connection.

From these, 900 households, stratified proportional sampling using probability sampling techniques were used in order that the same proportion of interviews were conducted in each subsegment of the universe area.

2.4.4 UNIT OF SAMPLE

To be consistent with research commissioned by Eskom in the past, the unit of sample was an individual household. A household is defined, by Data Research Africa (1989), as one or more families or a group of two or more persons, sharing the same residential facilities, usually living in the same abode and dependant on a common source of revenue. Also included were family members residing away from home, for example scholars, hospitalised and migrant workers, who were in some way an integral part of the household's economic system, either contributing toward its total revenue or dependent on its resources. More generally, a household consists of people who tend to eat and sleep under a common roof, and who have a common set of economic ties. These conditions should be seen as necessary but not exclusive.

The household head was interviewed, when they were not available responsible adults who acted as the substitute head were interviewed. Failing that, arrangements were made to return at a more suitable time.

2.4.5 PILOT STUDY

The original questionnaire was based on that used by Research Surveys in 1989. It was modified so as to accommodate the post electrification differentials and adapted according to the research brief. This modified questionnaire was piloted prior to the commencement of the project on 3 random houses. Changes were made and the revised version was used in the actual study.

2.4.6 RELIABILITY OF THE SURVEY

Research of this nature could be criticized along the following grounds:

(i) The statistical reliability of extrapolating results from one township to the rest of Natal Kwazulu.

(ii) The reliability of the respondents' answers.

(iii) The justification behind comparing changes in the 1989 and 1993 figures.

Given these issues and within the parameters of accepted research practice, this survey is deemed to be statistically significant. The researchers were independent

and unbiased. The respondents were not threatened or bribed, and a controlling officer was on duty to conduct random check backs. The questionnaires were scanned meticulously and those with obvious inconsistencies were discarded.

2.4.7 INTERNAL POLITICS

Many a well-meaning project coordinator has stumbled into a quagmire after ignoring the subtle political balance on which communities tend to be suspended. Eskom has gained a high degree of credibility in the Frischegewaag area since electrification commenced. . It was decided to use this to the advantage of the researchers. They were clearly labelled as being Eskom employees.

Mr Mayaba is an influential community leader in Frischgewaag. Eskom uses him to dispense the electricity coupons in the area so he is viewed as the community spokesperson to Eskom. Prior to this project he was approached and he gave his consent to the research. Local police, the local Eskom depot and the chief of the area were all contacted to avoid suspicion of the researchers.

2.4.8 FIELDWORK

Three field workers were employed, two of whom were professional researchers from Data Research Africa. The third researcher, an Eskom employee, had been trained by Data Research Africa and had been in the research field for Eskom for 12 months prior to the commencement of this survey. All three were Zulu

speaking and were between the ages of 24 and 38 years old. They wore "casual-smart" clothes with Eskom identification. They drove a standard Eskom vehicle into the township. The author of this dissertation is conversant in Zulu, and acted as the controlling officer on the project. Random check backs were conducted from the entire sample.

The survey was conducted between the 3rd and 6th of May 1993. Because these were week days the interviewers started late morning and worked into the evening, so as to secure interviews with the heads of households. The interviewers were remunerated on a project basis, the only incentive being a favourable testimonial provided the work was conducted satisfactorily. This was an attempt to avoid the hasty completion of questionnaires, which is possible with pro-rata remuneration.

The field workers were briefed thoroughly by the controlling officer prior to the commencement of the research programme.

2.4.9 LIMITATIONS OF THE SURVEY

More desirable would have been a set of questionnaires conducted on a predetermined selection of houses, that is a follow-up of the exact houses interviewed by Research Surveys in 1989. This would have made possible the

direct comparison of data between 1989 and 1993. However, in the interest of respondent anonymity this was not feasible.

Furthermore, had a larger budget and time frame been allocated to the project, a larger sample would have been possible. Within these constraints the sample used seems appropriate.

2.5 DESIGN OF OPINION LEADER SURVEY

2.5.1 OBJECTIVE OF SURVEY

The opinion leader survey was conducted in two phases. The first was prior to the empirical sample based questionnaire and was used to gauge the broader issues at hand to guide the main body of empirical research and to uncover subtleties previously not considered. The second opinion leader survey followed after the sample based questionnaires had been processed. This survey was designed to clarify and to substantiate various results. There were therefore two distinct objectives:

(i) To give some background as to what to expect in the community, to give a basis from which to set questions and brief field workers, and

(ii) To verify the results obtained by the sample based questionnaire.

2.5.2 TYPE OF RESEARCH

All opinion leader surveys were conducted by the author in English. This was possible because the people being interviewed were educated and of high standing in the community. The interviews were recorded on dictaphone when the situation allowed, otherwise the results were recorded by hand at the interview. The interviews were conducted at the place of residence or work of the respondent being interviewed. The questions were not structured and a combination of open-ended and closed probes were used to collect the information required. Each interview was conducted on a face-to-face basis (except the interview conducted with the Acting Chief of Police in Paulpietersburg which was conducted telephonically.)

2.5.3 RESPONDENT

The focus of the opinion leader survey were issues relating to Frischgewaag. Therefore an attempt was made to interview the people responsible for the wellbeing of the township, those with responsibility and standing in the community.

Those spoken to were not always residents of Frischgewaag but were individuals who were willing and able to participate on matters relating to the town. They

ranged from businessmen to teachers, from supervisors to policemen, from Eskom managers to administrative officials and government officers.

2.5.4 RELIABILITY OF THE SURVEY

Every attempt was made by the interviewer to obtain unbiased results and to probe in a non-threatening, and explorative manner without jeopardising the mandate laid down in the objectives. Cross cultural communication has inherent shortcomings however, and there remains the possibility of a margin of error. It must be remembered that almost all the people selected as interviewees had been associated with the township from before the introduction of electricity in 1990. This factor would tend to enhance the reliability of these results.

LIST OF REFERENCES FOR SECTION TWO.

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SECTION 3

ANALYSIS OF RESEARCH RESULTS

SECTION 3: ANALYSIS OF RESEARCH RESULTS

The results of the sample-based research questionnaire form the basis of these results. For this reason they will provide the focus of this chapter. The results will be tabulated in terms of: (Section 3.1) Economic Indicators, (Section 3.2) Lifestyle measures, (Section 3.3) Appliance ownership, (Section 3.4) Customers perceptions and (Section 3.5) Energy consumption. These findings will be represented graphically with supporting tables and a textual analysis. The results will be explained, section by section, with reference to each variable covered by the sample-based questionnaire.

The opinion leader survey and the conclusions gleaned from the secondary source data will not be covered in a separate chapter since they cover the same issues as does the sample-based questionnaire. They will be included, section by section, with the main body of results to substantiate or refute the various conclusions arrived at.

3.1 ECONOMIC INDICATORS

Economic indicators were investigated in 1993 which could realistically be compared with the scenario in 1989 when the Research Survey's study was conducted. They included: type of housing, condition of housing, number of dwellings and number of rooms per dwelling, monthly income, small business activity, investment and savings patterns. Each issue is dealt with independently, with cross references being made to substantiate analytical claims.

Rogers (1991) points to a global economic crisis. Global demands for commercial energy will double within the next 20 years, with the bulk of the increase going to the developing countries. Rogers refers to the energy supply problem in Third World countries as a crisis of " rising expectations." He argues that unless there is a drastic upward revision of reserves or massive substitution of current fuels, economic development in the Third World may be seriously hindered. It is this economic development that is expounded upon in section 3.1.

3.1.1 THE EMERGENCE OF SMALL BUSINESS

The emergence of small business is an indicator of economic growth, where unemployed resources are combined to generate income and thereby increase spending power which gives an injection of cash into the economy of the region.

The Energy for Development Research report (1992) claims that a substantial number of the unemployed are forced to seek employment in the informal sector of the economy. "Currently most informal sector activity is in the provision of services and the buying and selling of goods, rather than the production of manufactured goods" (EDRC 1992). These trends were verified by the Frischgewaag results, where retailing is the principal small business activity.

Scott-Wilson (1990) reports that the informal small business sector is unquantifiable. Estimates of its importance to the total economy vary, ranging from 6% to 20% and even a high of 40% of South African's GDP. What is

interesting is that, though unquantifiable, the Frischgewaag results indicate a correlation between small business development and electrification.

In 1989, 271 of the households in Frischgewaag had a small business undertaking (Research Surveys 1989). The activities listed were dressmaking, vegetable sales, supermarkets, taxi services, green grocers, beer sales, chicken sales, meat sales and farming activities. Aside from the supermarket owners who used generators, there were no electric applications in these businesses.

Asked the question in 1989 as to whether they would start a business after the introduction of electricity, 27% said they would consider starting a business. They cited the following as their reasons for not having done so already: cash flow problems, 47%; lack of electricity, 18%; lack of licence to do so, 11%; lack of suitable premises, 4%; and 23% cited other reasons. Therefore it can be logically expected that after electrification there should have been at least an 18% increase in small business activity. The results of the sample based survey in Frischgewaag reveal that 35% of the population have initiated small business ventures. This is a significant number, and it is apparent that there is room for further increase should the other limiting factors, already mentioned, be addressed.

Mr Welcome Mayaba (interview 1993), a school teacher at Kwasa High School in Frischgewaag, said in an interview that electrification has had a great impact on established entrepreneurs. He says they used to run off generators which always had capacity limitations. The convenience and cost of electricity has given the

established entrepreneurs a competitive edge in the market place. They have also been targeted by external white good suppliers as retailers for their products.

Mr Louis Mayaba (interview 1993) agrees to an extent but feels that this advantage has been off set by the sudden surge of spaza shops. The emergence of small business scattered throughout the 3000 Frischgewaag homesteads has cost him dearly. "Customers used to walk to my shop from miles around, today they are happy to buy 50% of their goods at their neighbourhood spaza shops" (Mayaba, L. interview 1993).

Mr W.A. Schikkerling, of Eskom in Paulpietersburg, says that there are three large supermarkets in Frischgewaag, all have expanded since electrification and are able to boast milk dispensers, modern fridges, air conditioning and automatic tills. These appliances have raised their level of trade. But most of the business in Frischgewaag is need orientated. "There is nothing sophisticated about trading in Frischgewaag. There is a tuck shop on every second corner who seems to be a jack of all trades" (Schikkerling, interview 1993).

Mr V.A. Gwala (interview 1993) pointed out that the services found in the major centres were not in Frischgewaag yet, but it would not be long before they were. He cited the example of a hair salon which is about to open in the main street (See photograph 3).

Mr Patrick Mabizela says that panel beaters and engineering workshops have become more sophisticated. "Three phase electrical supply has enabled the entrepreneurs to purchase cutters, welders, grinders and spray guns" (Mabizela, interview 1993). The panel beating trade is extremely profitable, because stripping of vehicles can be labour intensive, and labour is very cheap in Frischgewaag.

PHOTOGRAPH 3: The interior of the salon soon to open in the main street of Frischgewaag

An interesting phenomenon has been the emergence of business which does not use electricity, but whose origin can be traced back to the introduction of electricity into Frischgewaag. For example "electrification has made people status conscious. They are no longer content with mud huts, they now want proper houses" (Gwala, interview 1993). This phenomenon has led to a booming block-making business in Frischgewaag as old mud huts are systematically being dismantled to make way for the new block houses. Thus it is evident that backward and forward linkages exist as the effect of electrification spills over into various aspects of economic activity.

What is interesting is that of the 35% of the people in Frischgewaag who have started businesses, 74% of them use electricity directly in the business (see figure 1). Liquor sales are thought to be understated for fear of being exposed to the law for illegal operations. This is supported by the 17% figure cited in the Research Survey's Report (1989). It is evident that the spaza shops are among the most popular small business developments in Frischgewaag. Electric fridges, freezers and lights make evening trading hours possible.

Businesses which do not use electricity directly in the process include shoemakers, taxi owners, farmers, brick makers, green grocers, etc (see figure 2). These businesses, by their very nature, do not lend themselves to electrical applications. The view of Patrick Mabizela is that the emergence of new business has happened in Frischgewaag, "especially spaza shops" (Mabizela, 1993), but that the major effect electricity has had has been to make these businesses more competitive. "It

has lifted the standard of trading, from 'hand to mouth, to something more Westernized" (Mabizela, 1993).

The World Bank Report (1992) sees electrification as a potentially major employment creator, both directly, through demand for installation, labour and materials, and indirectly, through demand enterprises. The World Bank estimates the electrification multiplier at 1,5 and job creation to be in the range of 1 job for every 4-20 connections. By implication, 1 million new electrical connections could result in between 50 000 and 250 000 jobs.

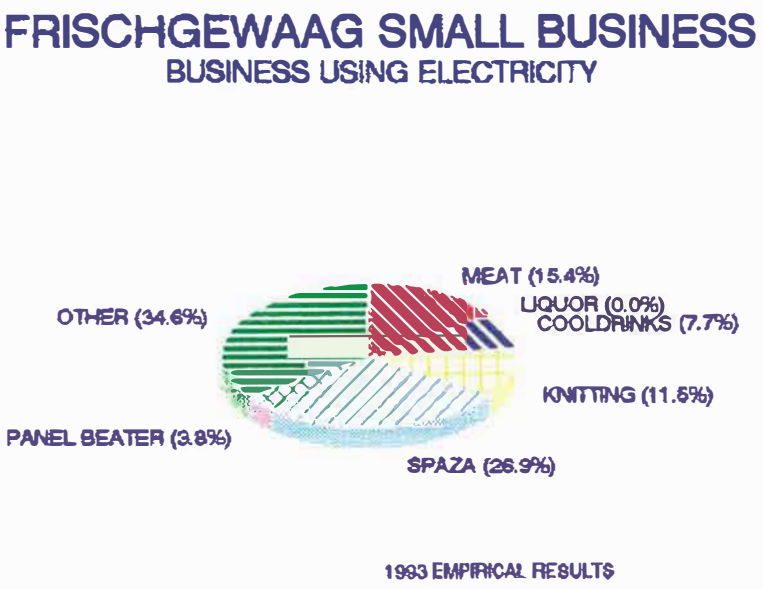


FIGURE 1: Businesses in Frischgewaag that use electricity

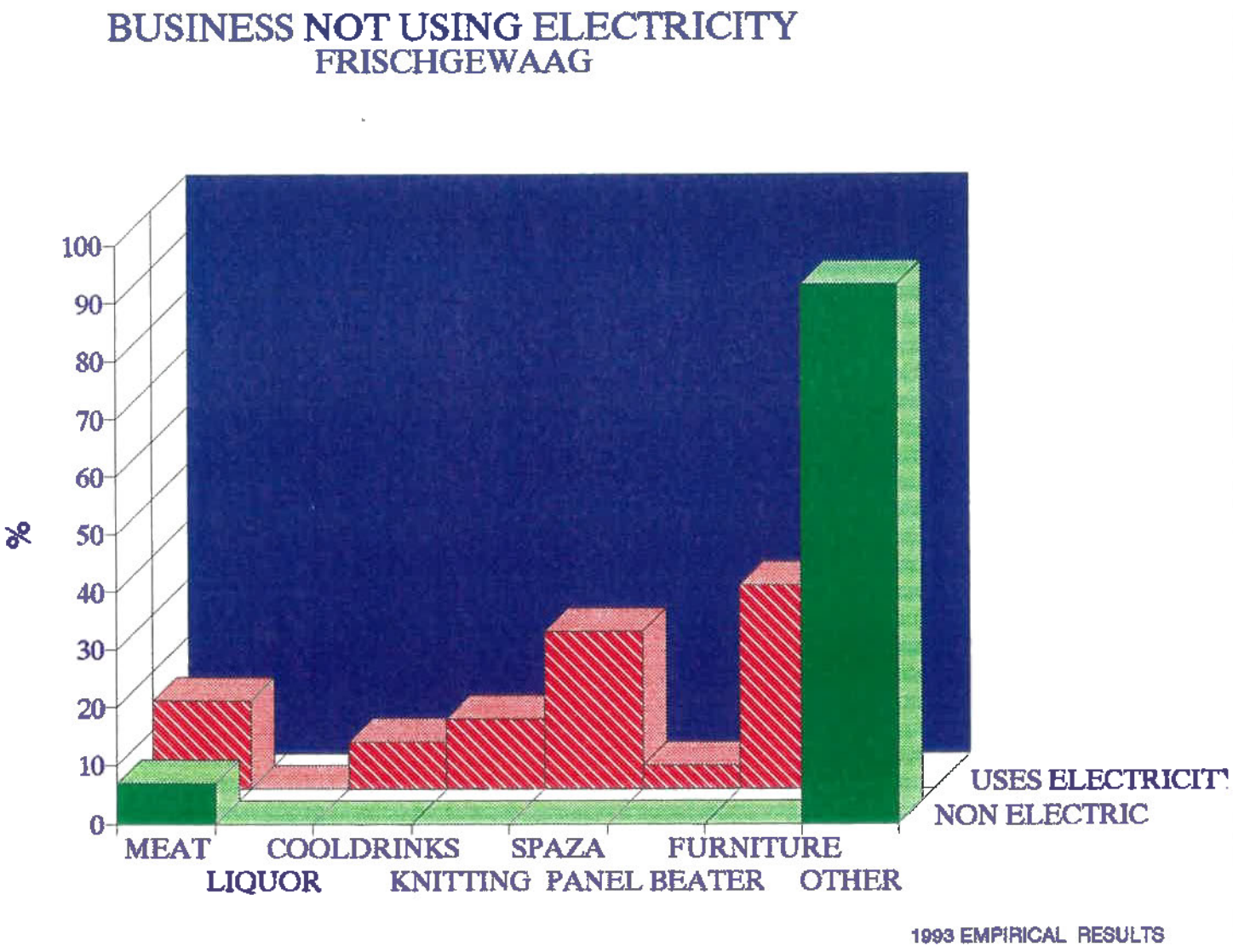


FIGURE 2: Small businesses in Frischgewaag that do not use electricity in their business

3.1.2 NUMBER OF DWELLINGS AND NUMBER OF ROOMS PER DWELLING

It can be argued on two grounds that the number of dwellings on a property is an economic indicator of wealth. Firstly, capital outlay is required to build extra rooms. Secondly, extra rooms in a rural setting are more often than not used for housing people. There appears to be a direct correlation between the number of people living on the property and the household income (Section 3.1.3). This may be explained by one of two reasons. Firstly, extra tenants might mean the household head is able to collect subrentals. Secondly, if subrentals were not collected, added people living on a homestead would often imply added collective household income. While analyzing this data it should be remembered that nuisance variables such as education levels and the age of family members will also have a bearing on statistics relating to wealth. To isolate a variable such as the number of dwellings is therefore not prescriptive but purely indicative of a measure of wealth.

In 1989 the average number of one roomed dwellings on a property in Frischgewaag was 1,8. Of 2 or more roomed dwellings the average number at a homestead was 2,8. To see how this has changed since electrification examine figures 3 and 4.

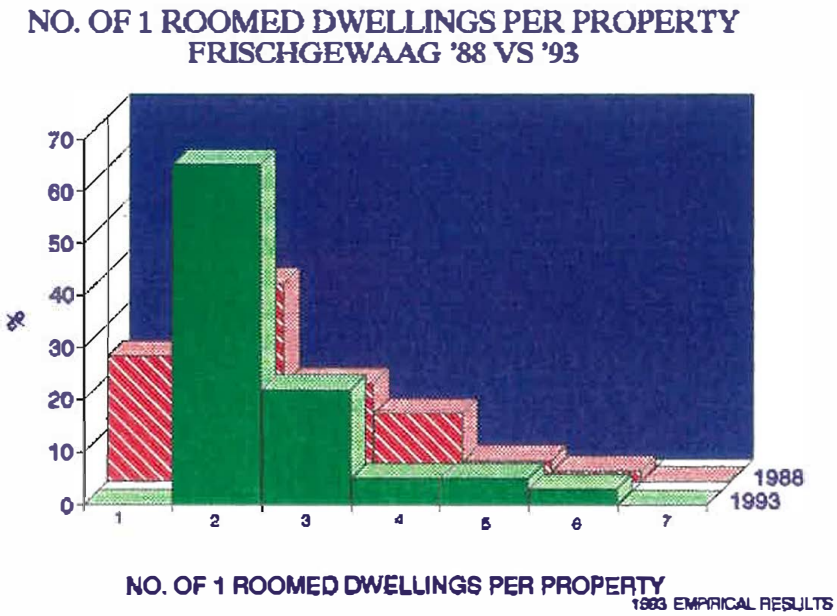


FIGURE 3: Number of one roomed dwellings in Frischgewaag

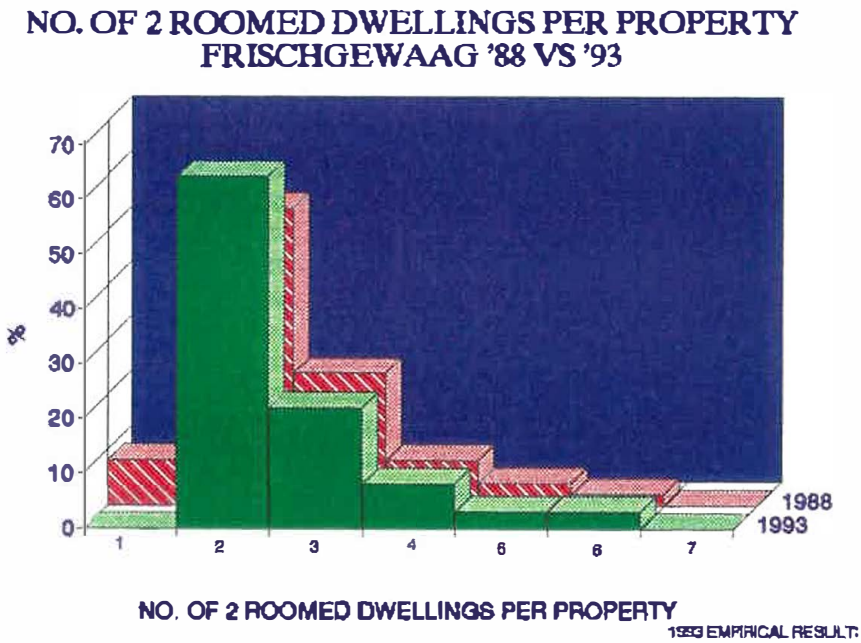


FIGURE 4: Number of two roomed dwellings in Frischgewaag

The trend in Frischgewaag shows that practically every homestead now has at least one, one-roomed dwelling (for example, a rondawel). Although there appear to be less homesteads with more than one of these single-roomed dwellings, this may be explained by the trend of adding another room onto a one roomed dwelling rather than building another stand-alone unit (see the increases in multi-roomed dwellings in figure 4). It is debatable whether or not this trend in Frischgewaag can be attributed to electrification. Patrick Mabizela seems to think not. He believes that the "natural population growth has necessitated the increased number of houses in Frischgewaag" (Mabizela 1993). This may be true, but, when one considers the extent of wiring in those homes (section 3.5), it is evident that the utility derived from electrification is being used in more than one dwelling. Mr W.A. Schikkerling thinks that the link is more direct, saying that "since electrification, houses have just sprung up everywhere" (Schikkerling, interview 1993). This statement is substantiated by the extensive block-making business which has developed in the area.

Mr Gwala attributes the increased building activity in Frischgewaag to "a series of bad weather patches, especially Cyclone Demoina, people saw that their old houses could not stand up to the elements" (Gwala, interview 1993). Although he also acknowledges that because the NPA is giving away "free lots" there has been a considerable migration of people into Frischgewaag. He argues that the "future of Frischgewaag was always uncertain because of its location in the middle of nowhere" (Gwala, interview 1993). Once electrification arrived it became a

"permanent area" and people could take seriously the prospects of moving into the area and developing it.

In conclusion, results at Frischgewaag show a marked increase in the number of dwellings per homestead, and increased building activity. Whether this can be ascribed to serious weather conditions, natural population growth, or the direct utility which could be derived from electrifying numerous rooms or the indirect effect electrification has had on making Frischgewaag a worthwhile place to develop, the fact remains that the capital outlay in real estate in the area has risen decidedly. With an increased capital outlay, there has been a positive effect on the micro economy of the region.

3.1.3 INCOME LEVELS AS AN ECONOMIC INDICATOR

The income earning capacity of the average household is a reasonable indicator of economic activity. However, Viljoen (1991) points out that black households in South Africa exhibit large spatial variations, from below R100 per month per household for rural settlements to R750 per month per household in the PWV, but with large standard deviations in both cases. But when compared with savings and investments as well as the injection of fiscal funding a more comprehensive picture is collated.

"As reliable responses to questions regarding monthly household income are often difficult to achieve" (Research Surveys 1989), this issue was approached from two

angles, consistent with the previous research work conducted in Frischgewaag. One question was asked at the beginning and the other almost at the end of the questionnaire.

The first income related question was directed along the lines of the types of income received by the respondents, and then the extent of remuneration they received per type of income. The next question was a direct one asking for the household's total monthly income.

In 1989, in terms of the types of income households in Frischgewaag relied on, the majority (53%) relied on money in the form of wages, while 49% relied on gifts from absentees, only 18% from pensions and 20% from small businesses. (See figure 5).

Using the standard income question the Frischgewaag results in 1989 were largely inconsistent with those using the "indirect" questions later in the questionnaire. The direct questions uncovered the fact that at least half the households earned in excess of R700, while the indirect question only uncovered an average income of R131,20 per household.

Because of the large discrepancies it was decided to treat each set of answers autonomously when comparing them with the 1993 Frischgewaag figures (which also revealed a level of inconsistency). The direct question in 1993 suggested a

monthly income of R569, while the indirect question suggested that at least half the households earned in excess of R1200 per month.

Assuming a 12% inflation rate over the five year period the real price comparison in 1993 figures is as follows:

TYPE OF QUESTIONS	ADJUSTED, 1989	ACTUAL 1993
Income Brackets (direct question)	206	569
Average Monthly Income (Indirect question)	1101	1200

It is difficult to make specific comparisons about figures with inconsistencies such as these, however there is a significant increase in the average household income of the residents at Frischgewaag. This is consistent with the view of the township supervisor that "electricity has set us free from slavery" (Gwala, interview 1993). The slavery to a poverty, subsistence- mentality has been broken.

When one considers what constitutes the average household income (see figure 5) it is evident that the residents have become resourceful in generating wealth. 34,7% of the wealth generated comes from wages earned by the inhabitants that live in Frischgewaag. 21,4% is generated by migrant workers who send the money

back to their families. Mr Mabizela says "this trend will continue because of the serious unemployment problem in Frischgewaag" (Mabizela, interview 1993). Pensions account for a sizeable 18,4%. Mr Gwala explains this by the fact that "since Frischgewaag became electrified the NPA made more lots available, the residents arranged that their relatives join them in the township" (Gwala, interview 1993). Hence a consolidation of family units from other centres as the township has developed. Businesses account for 23%, which is also assumed to be understated owing to the fear of having illegal operations closed.

The other question used in the interviews at Frischgewaag to generate "income-results" was an indirect one, probing each activity autonomously. When compared with the results in 1989, which in real terms read an average monthly income of R206, it is evident that significant increases have been made in the individuals earning capacity. It is debatable whether this is attributed to the consolidation of family units, the increase of trade due to migration to the township, the increases of wages in the larger centres where migrant workers are employed, or the direct result of electrification lifting the expectations, status and individual's perception of his earning capacity. However it is safe to say, because electrification has had a bearing on migration, status and small business development, that electrification is at least indirectly responsible for an increase in earnings, but at worst "it has lifted the living standards" (Sikhwanazi, interview 1993).

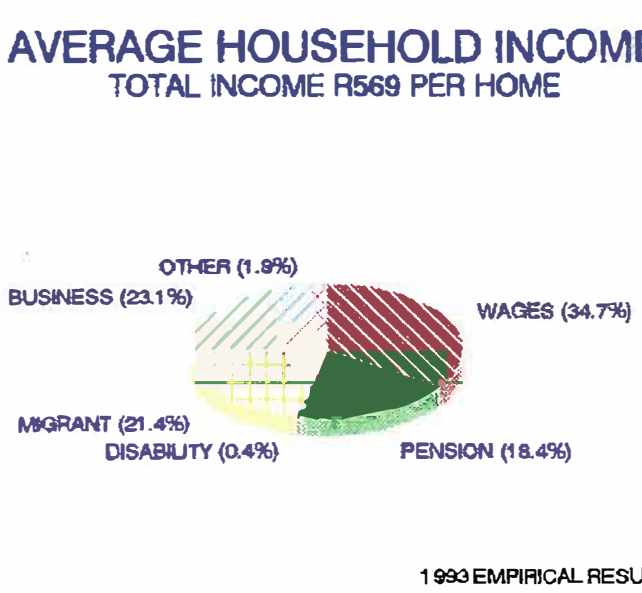


FIGURE 5: A breakdown of household income in Frischgewaag

3.1.4 TYPE OF HOUSING

According to the World Bank Report (1991), there is a shortage of over 2 million formal housing units in South Africa, and at least 7 million people are squatters. Traditionally houses in rural Kwa-Zulu take one of three forms: either, a wattle and mud hut (where a wattle frame is erected and stones are held in place by a secondary lattice work of wattle saplings while mud is applied to the frame to give

it a homogenous finish), or alternatively, a concrete block structure, or a combination brick construction. The third type is the traditional mud brick, where mud and cement are mixed together to form a homemade brick.

The classification of the combination type brick has made the comparison between 1989 and 1993 Frischgewaag figures difficult. In 1989 the mud brick was classified as a block house because of the shape of the blocks. However the 1993 researchers classified these mud blocks as mud houses due to the composition of block ie: largely mud, held together with concrete. Furthermore, according to Mr W.A. Schikkerling (interview 1993) most houses are plastered with a sand cement mix, which makes it very difficult to tell whether there are ash blocks or mud blocks under the surface.

The most noticeable result from the questions regarding the type of housing in Frischgewaag is the increase in block houses. This was verified by all opinion leaders without exception. The emergence of block and concrete block housing has been a development since electrification. "Throughout the township there is evidence of the old building being broken down with a new, more solid one taking its place" (Schikkerling, interview 1993). (See photograph 4).

PHOTOGRAPH 4: The old Frischgewaag houses replaced by new concrete block houses

Patrick Mabizela (1993) said "most people, even if they have a mud base, have now plastered their house". Mr W.A. Schikkerling (1993) said that guniting of houses (ie: the blasting of mortar onto the wall surface) has become popular. This is evidenced by the apparent drop in "combination housing". Combination houses are made of more than one of the following : mud, blocks, wattle and bricks. In most cases they have simply been coated with plaster to bring about uniformity.

The increase in mud houses is more difficult to explain (see figure 6). There are two schools of thought regarding this issue. Eskom management (Oerder, interview 1993) says that the likelihood exists that those on the lower end of the income scale have used their disposable income to buy appliances, this would diminish the likelihood of them being able to build new brick houses when they extended their homesteads.

The second theory is that of migrants coming to the area. According to the Township Supervisor, "Those who have come to the area have typically come from outlying farming areas" (Gwala, interview 1993). These people themselves do not tend to have large disposable incomes.

The rise in the number of mud huts may probably be attributed to a combination of both explanations, with poor migrants erecting mud houses until they are established in the area. At which time they will follow the systematic trend of dismantling their original house in favour of the new block house. However it is evident that the quality of housing in the last five years has appreciated sharply. This is the view of Mr Mayaba (interview, 1993), who ascribes it to the "status issue", which he says has been a direct result of electrification. Because electrification has been a gradual process, in that not every home was connected at once, those that had electricity were regarded as having accrued an asset which the rest of the township envied. While "vindictive vandalism did occur on a minor scale" (Schikkerling, interview 1993) from the resultant jealously, the most significant trend was the status attached to having one's own electricity. "This has

had the effect of the local people trying to make their houses more beautiful in keeping with their newly acquired status" (Mayaba. W, interview 1993).

The Research Surveys report (1989) made no mention of the condition of housing with reference to roof-type or fencing materials. In the empirical study in 1993 these issues were examined. 90% of the homesteads had a wire fence, 1% had a hedge and 9% had nothing at all. Amps (1993) statistics classifies fencing as an economic indicator, under this classification almost the entire community of Frischgewaag would fall into the lower end of the economic scale. 92% of the homesteads had a galvanised roof while 43% had a room with a grass roof as well as a room with a galvanised roof. Less than 2% of the homes have a tiled roof, reiterating the low economic status ascribed to Frischgewaag. Notwithstanding the introduction of electricity into the area, Frischgewaag remains a poor community.

The type of housing, or the capital outlay in real estate, is an economic indicator worth considering. The extent to which electrification has effected the type of housing in Frischgewaag is not clearly ascertainable from these results, suffice to say that the trend since electrification has been to more durable housing types.

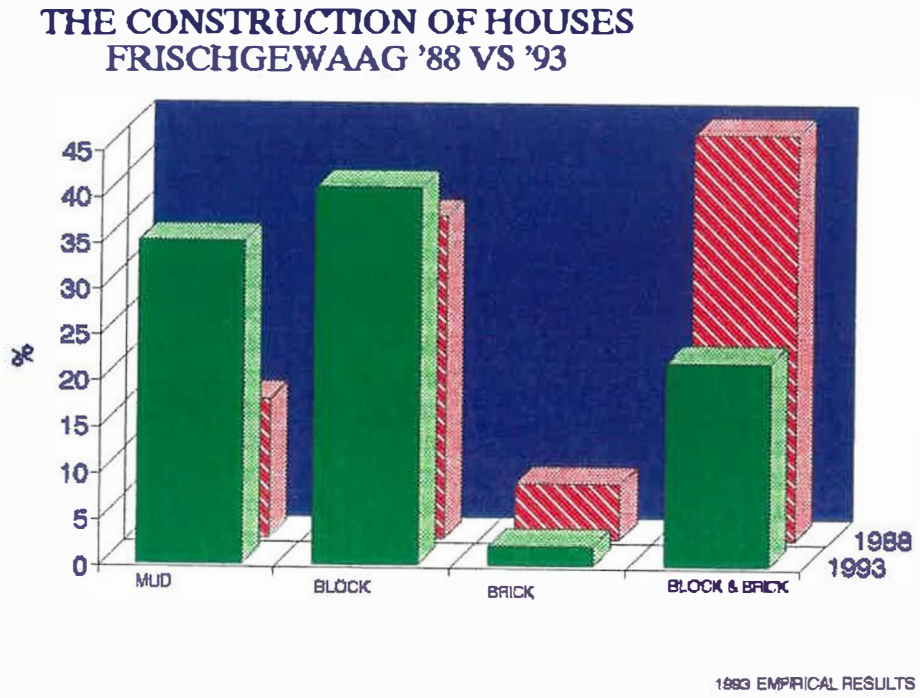


Figure 6: The construction of houses in Frischgewaag

3.1.5 CONDITION OF HOUSING

This is not a particularly strong measurement in terms of statistical significance in that it is arrived at by the value judgements of the field workers, which in itself has inherent inconsistencies. However as an indicator it makes interesting reading (see figure 7).

According to the results in Frischgewaag, 80% of the houses have remained in fair to good condition. An interesting trend is the increase by 8% in the number of houses in poor condition. This would suggest that those at the bottom end of the economic strata have not managed to sustain the condition of their houses over the past five years. However, the extreme weather conditions which have been experienced in the area would have aggravated the conditions of housing.

If anything, these results reveal the trend of a slight deterioration in the top and bottom end of the social strata with the larger middle-class enhancing the condition of their homesteads. This trend is unequivocally denied by the opinion leaders, where the overwhelming consensus has been "an upliftment of living standards" (Gwala, interview 1993).

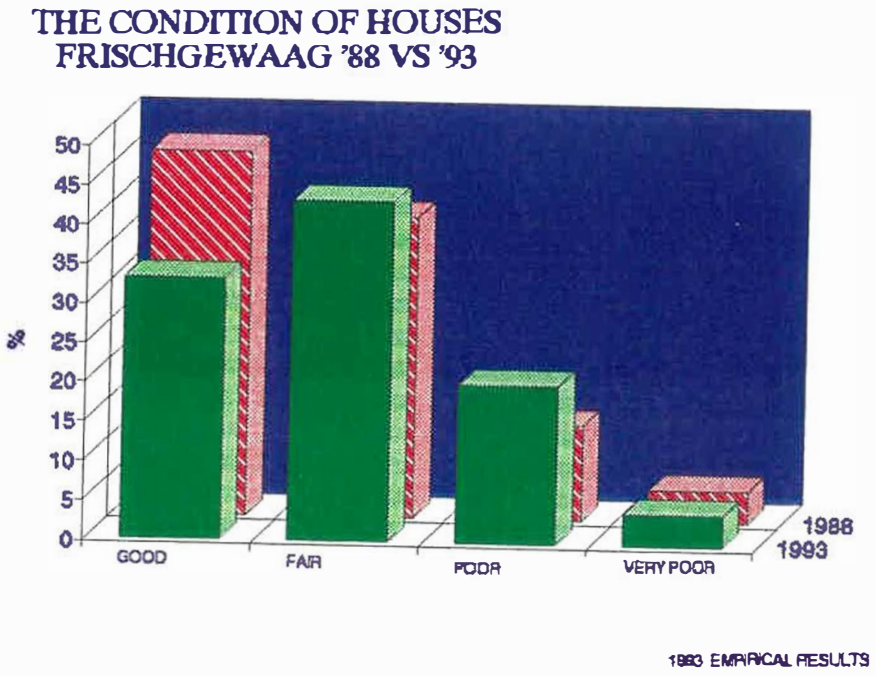


FIGURE 7: The condition of houses in Frischgewaag

3.1.6 INVESTMENTS AND SAVINGS

Traditional rural communities may be classified as subsistence economies, where households engage in barter activities or purchases which meet their primary needs. When households begin to save or invest their income one may deduce that their immediate needs have first been met (McArthy 1993). It may therefore be argued that investments and savings are an indicator of wealth.

The question was put to the residents of Frischgewaag in 1989 "Where would you save your money if you wanted to save up for the purchase of white appliances?" 82% said they would save in a commercial bank (the closest being Paulpietersburg) 15 km away. 18% said they would hide money at home, while only 1% said a savings scheme in the community would be a viable option.

An interesting development has occurred over the last five years in Frischgewaag (see figure 8), namely the increased popularity of the community savings scheme. A community savings scheme is a collective saving mechanism, run by the community and endorsed by building societies, in an attempt to encourage and facilitate saving. This trend seems to indicate a sense of autonomy, a sense of trust in their own ability to safeguard finances. Proof of the viability of these schemes is seen in the extent of the distribution of "white goods" and other capital goods in the area, as there has been a significant increase in recent years (section 3.3.1).

By 1993 the 18% who had previously hidden their money at home had completely changed their saving methods. According to the empirical research, nobody saved money by hiding it at home. This is probably not motivated out of fear of theft as "this is a very peaceful township" (Mthali, interview 1993), but is more likely attributed to the fact that the population has become educated as to the value of investing money. This view is supported by a school teacher at Kwasa High School, who is also a teacher in the adult training centre in Frischgewaag, "There is a growing need among the adults in the community to be educated" (Mayaba, W. interview 1993). Electricity has made study at night plausible, and the introduction of television into the community has also had a positive effect on adult education. The net result of this education is not only evident in education statistics, but also in the changes in lifestyles such as the aforementioned investment and savings methods.

Of importance is the decline in the interest in the commercial banking sector. This is probably due to the banks' lack of involvement in the development of Frischgewaag as well as the effectiveness of community run saving schemes.

Notwithstanding the improved saving methods evident in the community, 55% of the population would rather spend their money immediately than save up for a major purchase. This could be interpreted in two ways. One interpretation is that Frischgewaag is a subsistence community, living "from hand to mouth". While this might be true for the lower end of the social strata, the increase in local trading and the increase in household suggests that this is probably not true for the majority of

the community. Another interpretation is that there is a tendency to purchase high cost commodities without saving. The monthly household income often being able to carry the whole cost of the purchase of the goods required. This is consistent with Mr L. Mayaba's theory of a "status driven community" (Mayaba, L. interview, 1993), which has been discussed in section 3.1.4.

Irrespective of the reasons behind the change, the last five years have seen a definite shift in the thinking of the community in terms of savings and investments, which mostly tend to suggest an increase in the turn over of capital in the area.

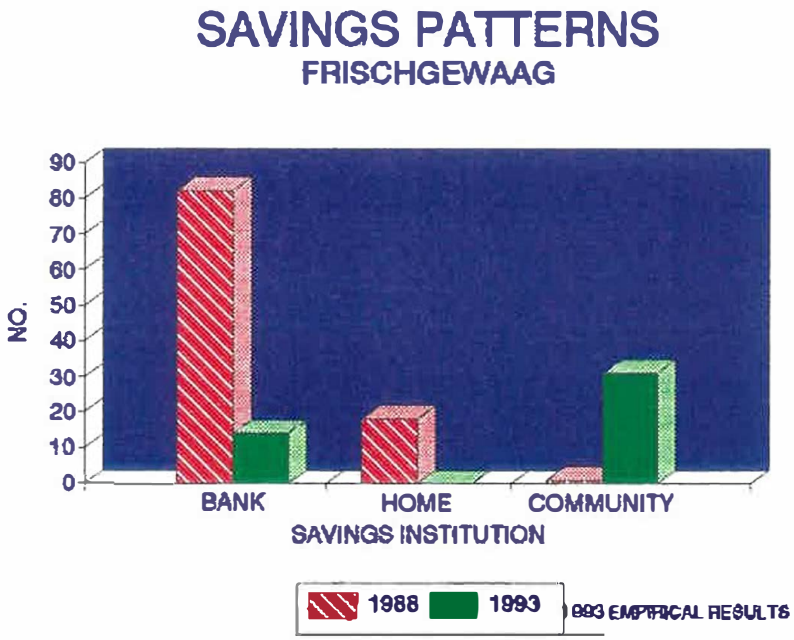


FIGURE 8: Banking habits of households in Frischgewaag

3.2 LIFESTYLE MEASURES

The reason behind these questions was to monitor the impact of electrification on aspects other than the bottom line cash flows of each household, and to explore the subtle lifestyle patterns of the area which could contribute to the effective marketing of goods into Frischgewaag.

3.2.1 THE PROFILE OF THE RESPONDENT IN FRISCHGEWAAG

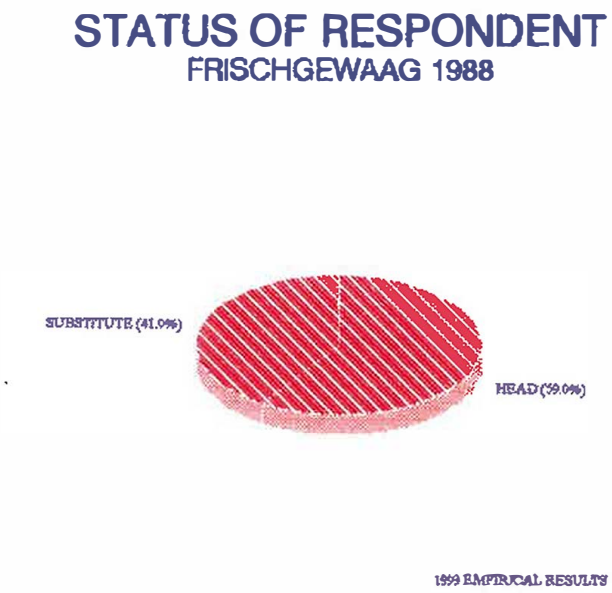
Because in both the 1993 and 1989 surveys the respondent was guaranteed anonymity, it was impossible to trace the original 1989 respondents for the 1993 survey, but every effort was made to interview a credible interviewee.

In both the 1989 and 1993 surveys, an attempt was made to interview the head of the household. In 1989, 59% of the household heads were interviewed. This is significantly high when one considers the proportion of migrant workers in the township (see section 3.2.2). In 1993 the statistic was not as high, with 47% of the household heads being interviewed. This is still a significant figure. All other interviews were conducted with the substitute head, typically the mother or a pensioner (see figure 9).

An indicator of the credibility of the respondents is the age of the respondent (see figure 10). In both surveys the age profile of the respondent was similar, with slightly fewer in the 18 to 24 year old category and those older than 50. The results revealed a slightly older age average in 1993 than in 1989.

The respondent profile can therefore be described as being significantly similar to justify comparison. The majority of the heads of households in Frischgewaag were over the age of 35. Substitute heads tended to be younger than the heads of households (Research Surveys 1989).

Since 1989 it can be said that 5% of the older generation have "handed over" the authority in the homestead to their middle-aged children. There has been a natural progression in age of the head of the household in the middle-age category. This, while happening since electrification, is independent of electrification, but it has bearing on the selection of marketing strategy due to the change in profile of the target audience.



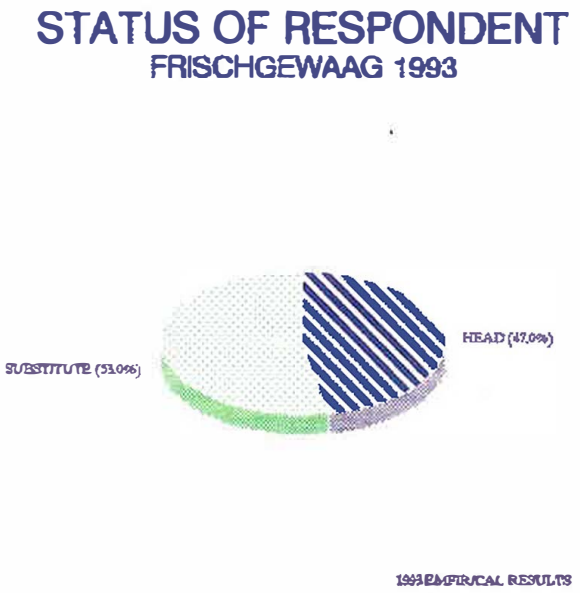


FIGURE 9: Frequency of the head of the household being interviewed in Frischgewaag

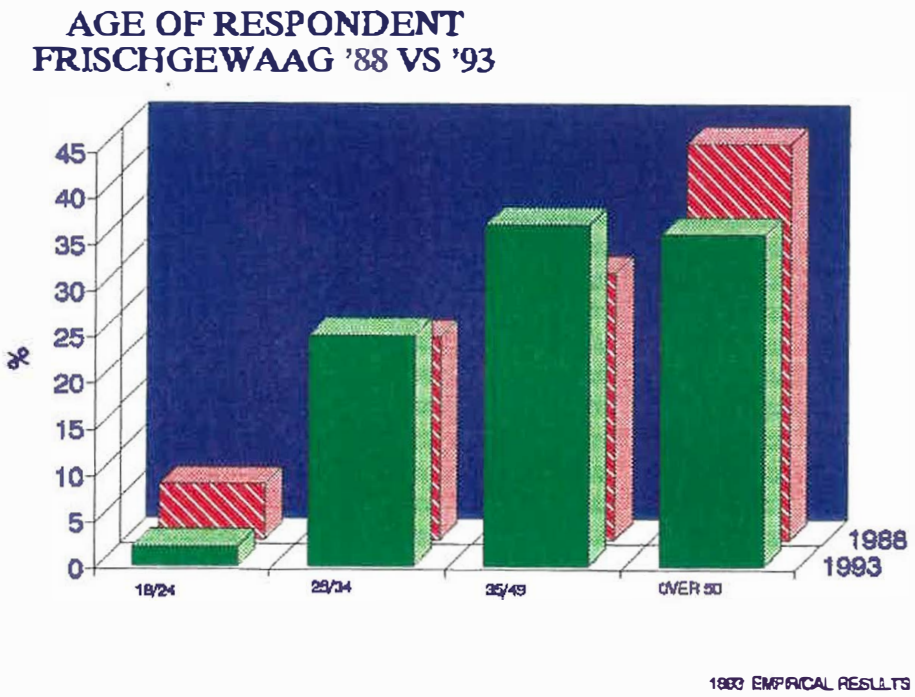


FIGURE 10: Age of the respondent in Frischgewaag

3.2.2 EDUCATION LEVELS

In the short to medium term education does not have a substantive impact on the economy but for long term growth and stability education is seen around the world as a key to unlock communities from the grip of poverty. According to the World

Bank (1991) nearly 40% of South Africans are functionally illiterate. The population of Frischgewaag proved to be no exception, however the trend in literacy is changing in this area. The level of education of the family member with the highest level of education was examined. Research Surveys (1989) claimed the level of education of this family member had an effect on the households' income.

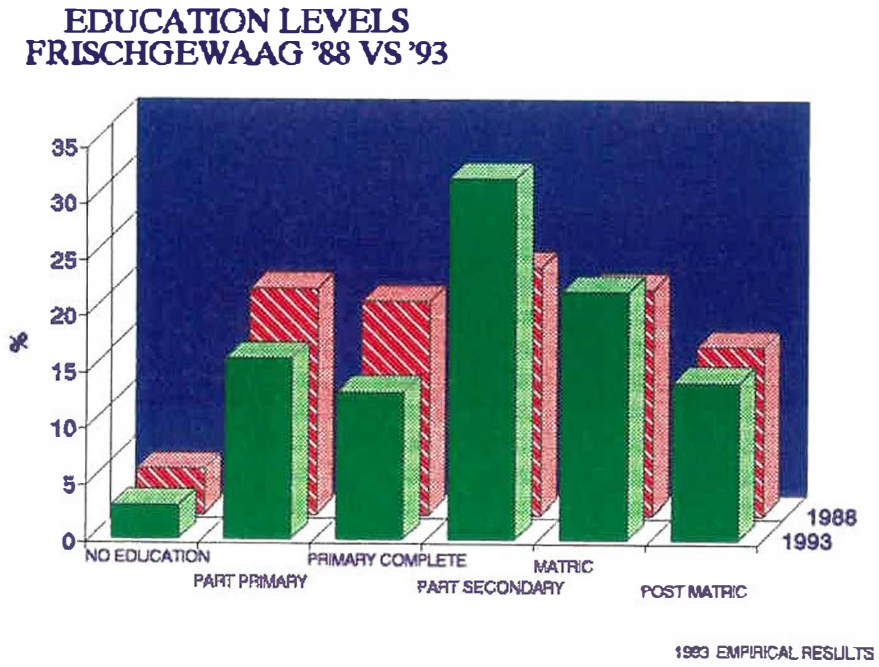


FIGURE 11: Education level of the most educated person in the household in Frischgewaag

Morgan (1993) claims that there are 22 000 black schools in the greater Southern African region. Of these over 86% are not electrified. Lack of electricity severely impairs teaching techniques.

In Frischgewaag in 1989, 4% had no schooling, this statistic had dropped by 1% by 1993. The number of those with partially completed primary schooling had also decreased by 1993 from 20% to 16%. The number of residents who had completed primary school had also dropped to 12% from 19%. The figures representing those who had partly or fully completed high school education had increased markedly, so much so that 66% of the homes to date have a member either at high school or a graduate from high school (see figure 11). "This has largely to be attributed to the building of the second high school at Frischgewaag which has been fully electrified, namely Kwasa High School" (Gwala, interview 1993).

The photograph below indicates how the school, which is the most modern in the area, makes do with the simplest of amenities. There are no official playing fields, or facilities for extramural activity. "At this stage teachers take their private Television sets and video recorders to the school in order to enhance teaching methods" (Mayaba, W. interview 1993).

PHOTOGRAPH 5: The High School at Frischgewaag

The development in adult education has been remarkable in Frischgewaag. The programme had been operational for over a year at the time of writing. Mr Gwala (interview 1993) tells of how his nursing sister's assistant at the medical clinic needed a standard 8 to qualify for the job. From being someone without direction in life, she went to evening classes, attained her standard 8 and subsequently has become integrated into the community

According to one of the teachers, Mr Simon Sukhwanazi (interview 1993), the adult education class has 36 students at present who are at various stages of their high school education. Classes are run in the evening now that electricity makes this a viable option. The developments in Frischgewaag seem to substantiate Dingley's (1990) claims that there is a positive correlation between literacy and household electrification.

Frischgewaag has one primary school with 2 976 children, 29 classrooms and 31 teachers. Two or sometimes three children sit at a desk at a time, the facilities are extremely inadequate. See photograph 6.

PHOTOGRAPH 6: Children in a Frischgewaag classroom

Another pressing problem for the community, according to Patrick Mabizela is "what will happen to these children in 5-10 years time? They will certainly not find work here" (Mabizela, interview 1993). Lance Sergeant Mthali (interview 1993) voices similar reservations, "how will they survive without major industry arriving in the town". General consensus seems to suggest that "there is no reason for business to arrive at Frischgewaag because it is in the middle of nowhere" (Gwala, interview 1993). What is likely is that, once educated, these children will find their way to major trading centres to further their studies or find work as many of their forefathers have done. A statement made by the organisers of the 1994 AGM of the Institute of Future Research, highlights the need to address the crisis of the youth in our society. "Investment in the welfare and development of the young people of today, as well as assuming their safe development are essential prerequisites for a prosperous future South African society". (IFR 1994).

Informal education has increased markedly in Frischgewaag since the introduction of electricity. In 1989, 18% of the homes had Television sets (mainly run on batteries or generators). The 1993 survey revealed more than double that, 38% of the households had Television sets. This trend will have made the population more informed and enlightened as to national developments.

In conclusion, a major role that electrification has played in education in Frischgewaag is in the facilitating of an after hours adult education centre, in encouraging the purchase of television sets (which is a means of informal education) and as Mr Gwala (Township Supervisor) points out "our children are

now able to study at night, even old people like me have a problem reading by candle light, the lights mean we can all read at night" (Gwala, interview 1993).

3.2.3 EMPLOYMENT

The empirical questionnaire addressed the employment issue in Frischgewaag along two lines. Firstly, an attempt was made to ascertain the number of people in each household who earned an income. In 1989, 39% of the households had one member employed, 20% had two members employed while an alarming 14% had no family members bringing in finance. It is in the latter arena that the most significant changes have occurred. In the last 5 years the figure of households without income has dropped to 6%. What is also interesting is that the households with more than two employed working has remained unchanged at 14%. Hence, one could be led to deduce that recent socio-economic changes have had a significant effect on employment opportunities in the region (See figure 12). More than half of the households that were without income in 1989 have become recipients of some sort of income.

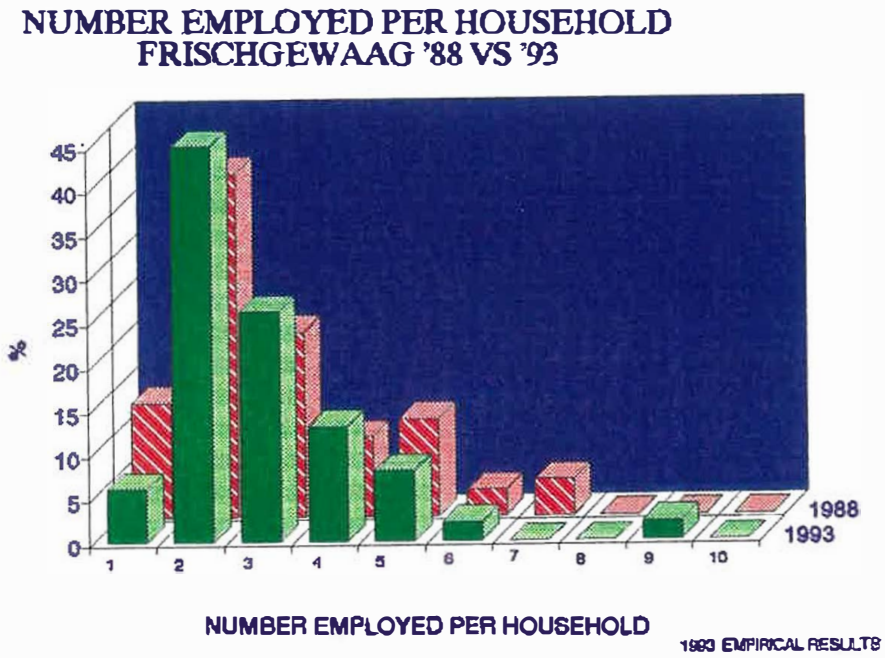


FIGURE 12: Number of Frischgewaag household members employed

The Frischgewaag employment figures were borne out by Mr Louis Mayaba (interview 1993) who believes that Frischgewaag has become an acceptable area for migrant workers to invest their earnings (in either property or white appliances). Formerly, less money was sent back to Frischgewaag as it was deemed to be a waste of effort, but he is quick to point out that should labour intensive industry move to the area, the economic spin offs would be unparalleled

in their impact on the Frischgewaag micro-economy. Another factor which has had a positive contribution to the Frischgewaag economy is the employment generated by increased public works programmes, especially the water storage and reticulation projects, as well as road building and maintenance. The projects which are planned for the immediate future of Frischgewaag are: a Taxi Rank, Community Hall, Soccer Field, two new filtration reservoirs (Gwala interview 1993).

Notwithstanding the improvements however, there is still an acute unemployment problem in Frischgewaag. The Township Superintendent has indicated that a minimum of 20 people queue at his door every Monday morning looking for work (Gwala interview 1993). This problem is exacerbated by the great deal of unproductive time spent by "women walking ever increasing distances to collect firewood" (EDRC 1992). This wasted time limits the opportunities available to women for skill acquisition and the finding of employment in the township or neighbouring town.

Another angle from which to examine the employment issue is the measurement of the change in occupation of the head of the household. The results in figure 13 draw a comparisons between the occupation of the head of the household in 1989 to that of the head of the household in 1993.

OCCUPATION OF HEAD OF HOUSEHOLD	1989	1993	CHANGE
UNSKILLED	36	15	-21
BLUE COLLAR (SEMI-SKILLED)	22	27	+ 5
PENSIONER	11	27	+16
HOUSEWIFE	9	4	- 5
SELF EMPLOYED	7	6	- 1
UNEMPLOYED	5	14	+ 9
WHITE COLLAR	4	3	- 1
PROFESSIONAL	4	3	- 1
STATE EMPLOYEE	2	1	- 1

FIGURE 13: Occupation of the head of the household in Frischgewaag

While these figures need to be perceived within the constraints tabled in section 2.4.6, three trends are clearly noticeable. Firstly, the number of unskilled workers has dropped in Frischgewaag in the last 5 years. This might be explained by any one of four factors.

i. They are the most likely type of workers to have lost work as they lack the expertise which make them valuable to their employers. This would probably explain the higher unemployment rate of 9%.

ii. The older generation is typically less educated and more likely to hold unskilled posts so the noticeably high rise in pensioners can possibly explain the proportional drop in those employed as unskilled labour.

iii. The younger generation has access to training and education, (e.g. night classes, mentioned in section 3.2.2) so the rise in blue collar workers could also explain the drain on unskilled labour.

iv. Notwithstanding the increase in public-works activity, employment figures do not seem to be able to keep pace with the growth in population. This is borne out by the increase in unemployment figures, which suggests a relative drop in the number of unskilled jobs available.

The second trend is the rise in the number of pensioners in Frischgewaag. This was explained by Mr Schikkerling (interview 1993) who described how electricity has uplifted the area socio-economically, which has seen a flood of family members joining the extended family in the homesteads in Frischgewaag.

The third trend is the alarming rate of unemployment in Frischgewaag. An extrapolation of the figures would suggest an unemployment growth rate of 2% p.a. These concerns are echoed by Patrick Mabizela (interview 1993) who voiced concerns about the future of the thousands of school children currently resident in the community. The World Bank report (1992) claims that less than 15% of the

new labour force entrants will find work in the formal sector. These statistics are exacerbated in the rural context.

3.2.4 MIGRANT WORKERS

For every 100 households in Frischgewaag in 1989 there were 141 migrant workers. This constituted a significant number and was an indication of the limited job opportunities available in Frischgewaag. However by 1993, notwithstanding the upliftment of the area, and notwithstanding the creation of jobs through the introduction of electrotechnology, the number of migrant workers for the same number of houses has risen by 16% to 164. The possible reasons for this trend are: firstly, the increased contact that the residents now have with the wider-economy owing to the introduction of television (which has been a direct result of electrification); secondly, "the increased standard of education will result in the school leavers trying to find work in the cities" (Mayaba, interview 1993).

The net economic result of an increased migrant worker population has been the injection of money from outside the township, and an alleviation of the unemployment problem. Gander (1989) suggests that migrants do not necessarily remit regular amounts each month but they can be depended on for special requests (such as appliances or electricity connections etc.).

3.2.5 SIZE OF HOUSEHOLD

In 1989 there were an average of 7,08 people resident in each household in Frischgewaag. The majority of households having seven people each. In 1993 this trend had shifted slightly to 8,44 people in the average household, with 28% of the homesteads having more than 10 people belonging to them.

These results bear out Mr Schikkerling's observation that the extended families are growing as relatives move into Frischgewaag. He said that because electrification has been delayed in reaching the outlying areas "people have become impatient and have moved from other rural areas into Frischgewaag" (Schikkerling interview 1993).

Mr Gwala (interview 1993) said that more residential plots were to be made available to meet demands. Plots in this area are not bought, the prospective tenant merely registers with Kwa-Zulu and has to wait for an official approval.

3.2.6 DAY TO DAY MOVEMENT OF POPULATION

This was examined from two angles:

i. Where groceries were purchased.

ii. The frequency of visits to the nearest town.

In 1989 the following results were obtained from Frischgewaag. The head of the average household visited town 3,68 times per month, while most of the people shopped at Louis Mayaba's store in Frischgewaag (Research Surveys 1989). It is not surprising that there has been an insignificant variance in these statistics since electrification. In 1993, visits to town had increased to 3,98 times per month, while Louis Mayaba's store remained the principal shopping centre. The reason for the latter could be the fact that Eskom acted on the Research Survey results and made Louis Mayaba the sole distributor of electricity coupons, thereby making a visit to his store a prerequisite to the purchase of electricity coupons.

3.3 APPLIANCE OWNERSHIP

Appliance ownership is seen as an indicator of both economic welfare and the degree to which electrification has made an impact on the life styles of the community.

It is examined along the following lines:

* Ownership of appliances and the associated energy consumed.
* The intention to purchase various appliances.
* The room in which each appliance is housed.

3.3.1 OWNERSHIP OF ELECTRICAL APPLIANCES

According to Doppegieter (1993), in developing communities a strong correlation exists between the ownership of appliances and the use of electricity.

In 1988, prior to the electrification of Frischgewaag, the only electrically powered equipment were radios and televisions, which were powered off car batteries. They were found in 35% and 18% of the homes respectively (Research Surveys 1989). The other appliances were fridges in 28% of the homes, heaters 96%, irons 83%, kettles 79% and stoves 96%. Kettles and irons were regarded as multipowered items, relying on direct heat from any source of energy available. Heaters, stoves and fridges are regarded as principal energy consuming apparatus in the household. They were gas, paraffin or coal fired and pointed to a primitive way of life. The introduction of electricity has had a revolutionary effect on the residents' lifestyles in Frischgewaag. Mr Louis Mayaba (shop owner) reiterated this point by saying that: "the full impact of electrification is only evident when the power is cut off, it has become so much part of our lives now" (Mayaba interview 1993).

By 1993 the households with television had increased by 20% and hi-fi's by 8% (See figure 14). Mr Simon Sukhwanazi, a school teacher in Frischgewaag, said that "the fact that lights are available has meant people stay up much later to study and to watch Television" (Sukhwanazi, interview 1993).

Geysers and washing machines have not yet been sold in Frischgewaag as there are very few houses with running water. In terms of electricity consumption, this would explain why rural areas consume far less than urban areas. Thom (1993) suggests that households with hot water systems consume 1,5 times the amount that households without water heating consume. Microwaves, toasters, tumble dryers and vacuum cleaners are also almost non existent in this area. This suggests that, although Frischgewaag has felt the impact of electrification, the people have only recently been introduced to first world technologies.

The electrical appliances which have made the greatest inroads into the community have been irons, which are in 64% of the homes, kettles in 37% and two plate stoves in 32%. This is in line with Eskom's domestic appliance marketing strategy.

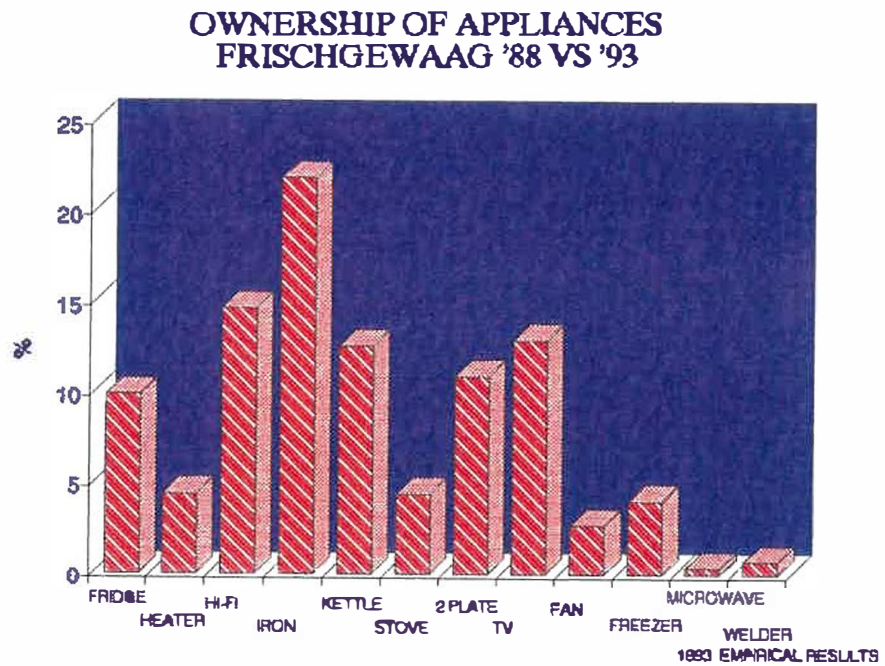


FIGURE 14: A schedule of the change in ownership of appliances

Only 13% of the houses in Frischgewaag have electric stoves. This, according to Patrick Mabizela (interview 1993), is because coal stoves cost a great deal and the people are unwilling to dispose of them. The Grey report (1987) suggests that electric stoves consume a considerable amount of electricity, thereby making them less attractive. The high percentage of fridges (In 29% of Frischgewaag homes) is also reflected in the numerous small businesses that have emerged in the area which use refrigeration in their process (e.g. sale of meat, ice cream, cooldrinks and alcohol). The heaters (13%) and fans(8%) were found in the homes of those with above average incomes. The Grey report (1987) found that heater elements broke too easily, and their replacement was prohibitively expensive and therefore not popular with the lower income groups.

In conclusion, the purchase of electrical apparatus, particularly television and lighting, has revolutionised the lifestyles of most the residents in the Frischgewaag area. The purchase of basic appliances is an indication of a degree of welfare, while the lack of more sophisticated white goods indicates the fact that Frischgewaag is very much a third world developing region. These statistics are in line with the conclusions of Doppegieter, who suggests that "the average number of appliances owned by new electricity consumers (less than five years) is approximately 6 (hotplate, kettle, iron, T.V, fridge and sound system)" (Energy Scan 1993, 1:2).

3.3.2 INTENTION TO PURCHASE

The intention of the household head to purchase an appliance may also be seen as an indicator of the extent to which electrification has affected lifestyles. To verify the validity of such reasoning the actual appliance ownership figures in Frischgewaag in 1993 could be compared to what the respondents said in 1989 regarding their intention to purchase. (See figure 15). Appliance ownership and energy consumption have a direct bearing on economic status. Gander (1989) suggests that the ownership of a refrigerator, and having spent R500 on new furniture in the preceding two years is an indicator of wealth in the rural setting.

	1993	1988 HOUSEHOLD INTENTION TO PURCHASE		
	HOUSEHOLD APPLIANCE OWNERSHIP	3 MTHS	6 MTHS	12 MTHS
FRIDGE	29	18	25	14
HEATER	13	32	36	4
HI-FI	43	n/a	n/a	n/a
IRON	64	75	5	1
KETTLE	37	68	20	4
STOVE	13	12	20	18
2 PLATE	32	40	35	n/a
T.V.	38	n/a	n/a	n/a
FAN	8	n/a	n/a	n/a
FREEZER	12	n/s	n/a	n/a
MICROWAVE	1	n/a	n/a	n/a
WELDER	2	n/a	n/a	n/a

FIGURE 15: Intention to purchase appliances, validated

Insight can be gained regarding the market for appliances in Frischgewaag by examining the correlation between "intentions to purchase" in 1989 and the "actual ownership" figures of 1993, particularly with reference to the immediate intention to purchase (i.e 3 months).

All indications are that the 2 plate, iron and stove markets have all but met initial demand. Fridges have far exceeded expectations, the reason behind this can at least partially be attributed to small business development.

An area where intentions have not been realized is that of heaters. Only 30% of those intending to purchase heaters in 1989 had done so by 1993. This might be attributed to the fact that heaters use a significant amount of power (Grey Market Research 1987).

Nevertheless, the fact that the intentions of 1989 had significantly been realized by 1993 lends credibility to the respondents' intentions in 1993, where kettles, 2-plates and irons were on the respondents' priority lists of purchases. These results endorse the conclusion reached in the previous chapter, which suggested that the Frischgewaag community is exploring the electrotechnology market rather tentatively before purchasing the more sophisticated "white goods".

In order to verify the above findings, a further question was asked regarding intention to purchase electrical goods. On this occasion there was no prompting as to examples - it was left open-ended. In this instance heaters and stoves, were

cited as priorities (26% and 43% respectively.) As were kettles (33%), and fridges.

These items represent what a more affluent Frischgewaag customer would purchase. If economic growth continues the purchase of these goods might result.

3.3.3 APPLIANCE LOCATION

Examining where appliances are used in the home has a two fold benefit:

i. It verifies the number of appliances bought.

ii. It gives some indication as to the quality of life of the residents.

Only 3% of the homes in Frischgewaag had lights in their bathrooms. This is because very few houses have bathrooms, washing being done outside or in bedrooms or kitchens.

In the Frischgewaag community the hub of the home is the kitchen. In fact, according to Mr Schikkerling (interview 1993) unless otherwise requested the electrical installation is made in the kitchen. 86% of kitchens had a lightbulb, 40% had stoves, 2% had Televisions, 34% had kettles, 35% irons and 12% had fridges or freezers. But what is of significance was that 8% of the kitchens had Hi Fi's and 2% Televisions endorsing the suggestion that the kitchen is the central meeting point in the home. 85% of the bedrooms had lighting while all other appliances were nominally present.

Since it was seldom that any homesteads in Frischgewaag had a separate lounge and dining room these statistics are viewed together. 27% had Televisions, 15% had fridges, 5% heaters, 14% irons and almost 100% had lighting. 68% of all homesteads had an outside light, this was cited as being for security reasons. In conclusion the distribution of appliances tells a tale of third world living patterns, but it is evident that while a majority of homes have maintained the ethos of the kitchen as a gathering point, a lounge with a Hi Fi and Televisions in numerous homes represents a shift away from third world standards.

3.4 PERCEPTIONS

3.4.1 ENERGY PREFERENCE

The Development Bank report (1995) claims that energy ranks amongst the basic human needs such as food, shelter, water, sanitation and health. The need for energy to cook, provide heat and lighting exists globally. This does not *ipso facto* apply to electricity, but when electricity is the basic source of energy it becomes a basic need, which motivates peoples' behavioural patterns.

The impact that electrification has had on the Frischgewaag community has been more subjectively tested by asking the respondents to rate electricity against other forms of energy. The value of this exercise to strategists in Eskom is in the arena of product positioning, customer education, and future promotion strategies.

When the respondents in Frischgewaag had to rate the performance of various energy forms on the issue of modernity there was no parallel to electricity. When questioned about smell, gas was labelled by more then 50% of the respondents as unacceptable, while 45% felt similarly about coal. Paraffin and wood, while fairing worse than electricity, were not of considerable concern to the respondents regarding their smell. (See figure 16).

Apart from wood (at 2%), electricity alone featured favourably in regard to lighting properties. Both wood and electricity also scored highly on availability, the propensity to give heat and in efficiency for cooking. Paraffin was however a nominal competitor in the last area among 5% of the respondents. Electricity was a clear favourite, with 85% rating it highly with regard to speed of use.

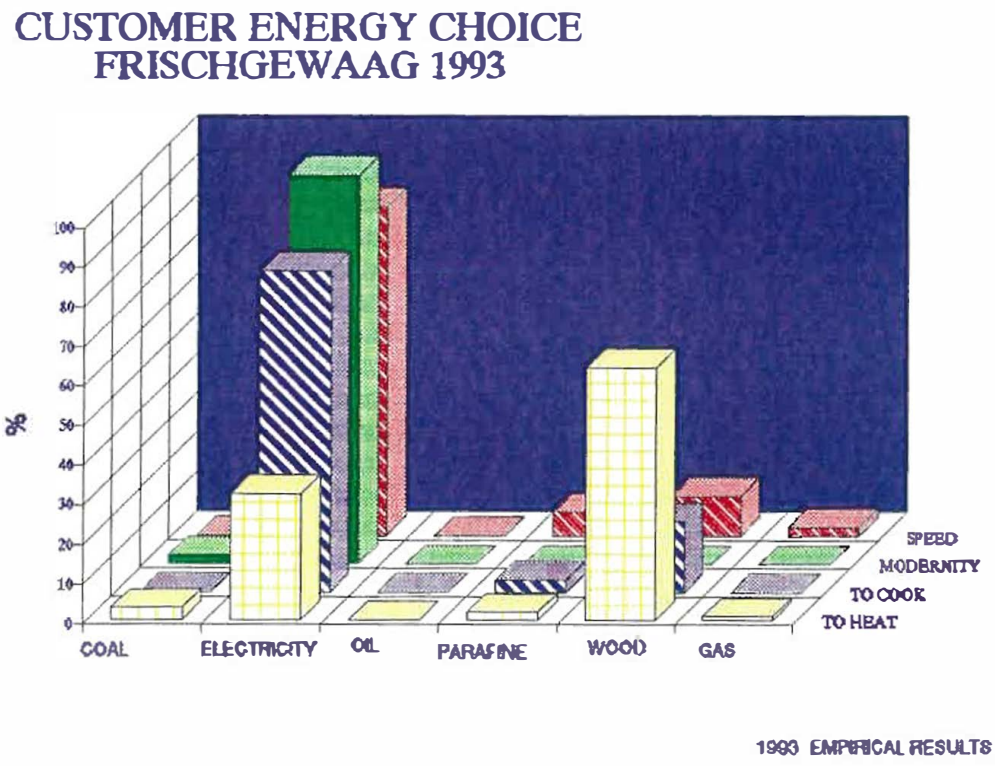


FIGURE 16: The above charts reflect Frischgewaag customer perceptions pertaining to electricity against other energy sources

60% of the respondents believed gas to be dangerous and 35% felt that electricity was also. In regard to cost, as could be expected in a coal mining belt, coal was regarded as the most economical, while wood and electricity (30% and 50% respectively), were regarded as expensive. When asked which was not safe for children, both gas and electricity were regarded as the greater evils (50% and 45% respectively).

Electricity was perceived to have the greatest number of uses and to be best suited to energy saving. Among the other energy forms wood scored significantly in this respect (although it was rated as 70% less appropriate than electricity).

As regards cleanliness, all respondents agreed that electricity was the optimum energy source. When the respondents were asked to identify themselves with an energy source 52% agreed that electricity was their first choice while 48% identified with wood. Interestingly, 35% said they would never use gas.

It is evident that electricity was the Frischgewaag respondents' first energy choice, followed by wood, notwithstanding the fact that cost and safety issues hamper the sale of both energy forms. The reliance on wood has alarmed researchers around the country as "wide spread use of fuel wood in rural areas incurs both an environmental and a social cost" (Dingley 1990). Dingley argues that a social cost is incurred as women spend hours collecting wood every day. Time, he argues, that could be spent on education, employment or broader social activities.

3.4.2 NEED STRUCTURE

A deeper look into the priorities and perceptions of this community yielded the following results. (See figure 17).

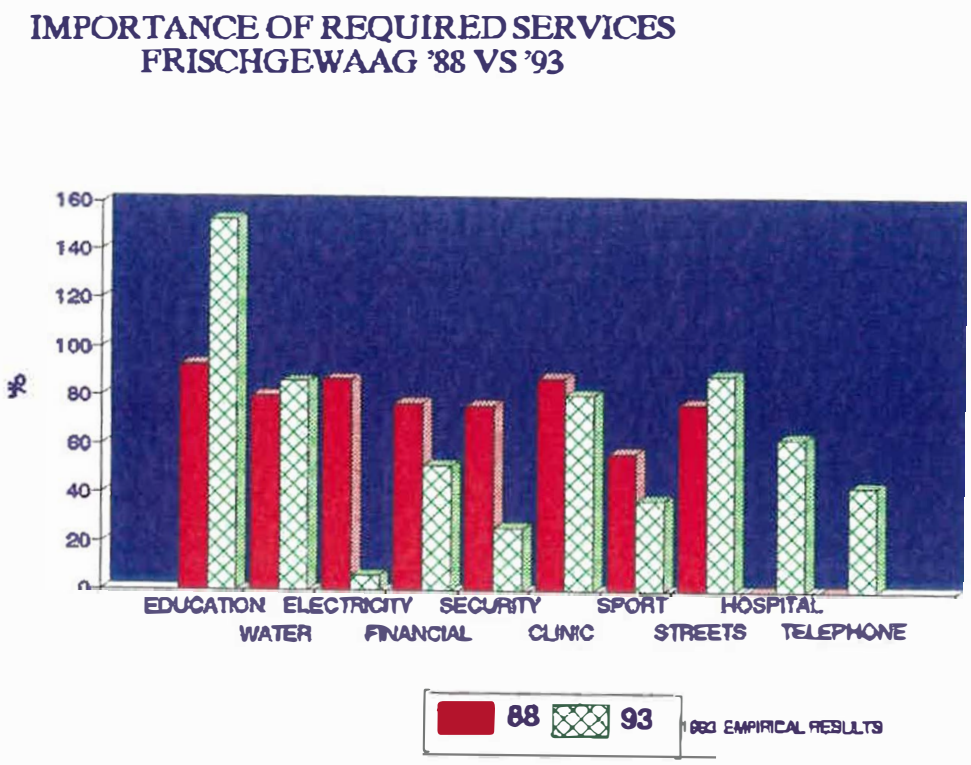


FIGURE 17: Attitude measurement of community services required

It is noticeable that the Frischgewaag communities attitudes were relatively less widely shared in 1993 when compared to 1989. It is apparent that their needs as a whole did not appear to be as urgent after electrification.

In Frischgewaag in 1989, education was the number one priority closely followed by a clinic service and electricity. Almost as important was water reticulation and street upgrading.

The variance in the trend in Frischgewaag in 1993 is significant. Education remains the priority, in fact the margin of need is almost double that of 1988 and 24% above the next highest need. These statistics emerged after a new high school had been built, the emergence of an adult education centre and the influx of television into the area. Hence it is apparent that although education has had a tremendous boost since the arrival of electricity the population still perceive a great need for it. Obviously electricity has dropped out of the need structure as it has already been supplied to the community. But water and street upgrading are still high on the community's agenda. The authorities have acted on the former need and according to Mr Gwala (interview 1993), two new reservoirs are in the process of being erected. Dingley (1993) says that an adequate and convenient supply of clean water is usually a higher priority in those areas which have neither electricity nor water. These findings were further substantiated by Nene (1993) who found water reticulation to be the first priority of residents in the Shozi area, South of Durban.

In 1993 in Frischgewaag the clinic was still cited as a principle need. It has dropped in importance as the Kwa-Zulu government has already commissioned the building of a new clinic. Notwithstanding this the community rated a hospital as insignificant in 1988 but 22% of the residents believed it relevant in 1993. This is an indicator of rising expectations brought about by recent developments in the community.

The need for physical security has dropped in Frischgewaag, which is an indicator of a more peaceful community. Another development has been the need for telephones. Mr Gwala (interview 1993) explained that Telkom stopped installing phones some years ago.

In conclusion the introduction of electricity, along with other socio-economic changes in the community, has brought about a change in the community's need structure, and given rise to increased expectations of themselves and the companies that service their town.

3.5 ENERGY CONSUMPTION PATTERNS

In an attempt to uncover the energy usage patterns of this community 3 principle issues were examined :

* The extent of wiring in the home.
* The amount that is spent on various energy forms.
* The cross correlation between energy used and appliance owned.

3.5.1 THE EXTENT OF ELECTRICAL WIRING IN THE HOME

The results give a clear indication as to how electricity is used in the Frischgewaag community. See figure 18.

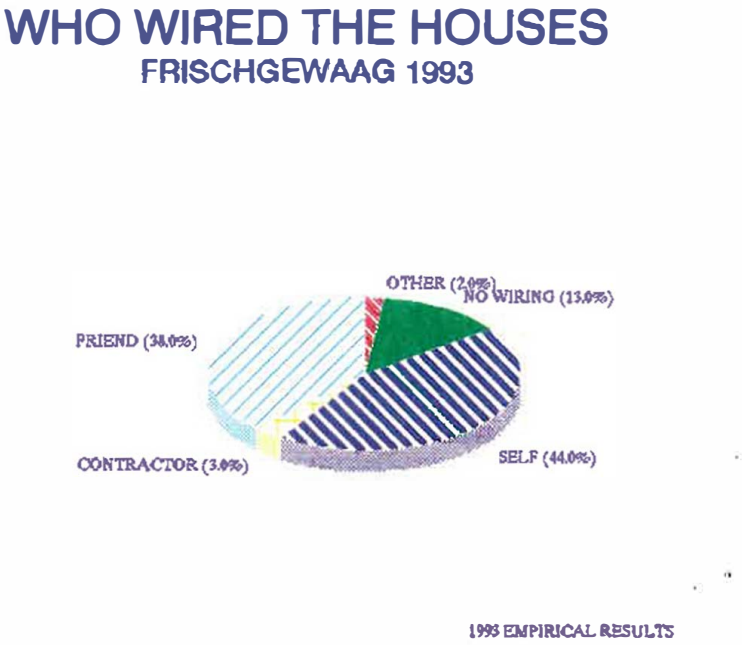


FIGURE 18: Who the houses in Frischgewaag were wired by

13% of the respondents had no wiring done in their homes. This segment of the population may be seen to lie just above the subsistence level, as the only light emitted by their electrical supply would be by the bulb attached to their meter.

44% have run extension cords and twin-flex wires themselves. This points to hazardous conditions as well as to an ignorance as to the dangers of electricity. Only 3% called in contractors, who installed conduit in the walls, their work being of first world standards. Significantly 38% asked a friend (presumably reasonably proficient with electrical connections) to wire their homes.

A synopsis of these findings would suggest that almost 50% of the connections in Frischgewaag could be dangerous, and that 87% of the households with electricity have made some attempt to utilise electricity beyond the plug points and light bulb attached at the meter.

A room by room analysis of the electrical wiring of the Frischgewaag homes revealed that the kitchen was by far the most extensively wired area in the home. 27% of the kitchens are wired with conduiting, 43% have twin-flex cords and 26% have extension cords. This result was borne out by the results on appliance ownership, suggesting that most the appliances were to be found in the kitchen.

3.5.2 INCOME SPENT ON ENERGY

The response to the question relating to the amount of income spent on energy gives an indication of electricity's market share. Furthermore, once reconciled to Eskom monthly revenue reports, these responses will be an indicator of revenue losses. Gander (1989)reports that income spent on energy in rural areas is very low, with abundant free firewood, but increases steadily to reach a peak in informal

settlements, then drops again in electrified townships. But Viljoen (1990) suggests that even in these areas the total energy expenditure of electrified houses is less then those of non-electrified households.

The Development Bank report (1993) suggests that cash incomes are limited, arising mainly out of remittances from migrant workers. Added to the decline in real incomes, expenditure on energy commodities may account for as much as 25% of total household expenditure.

As can be seen from figure 19, battery purchases in Frischgewaag have dropped 67,2% and candle purchases have declined by a similar amount per household.

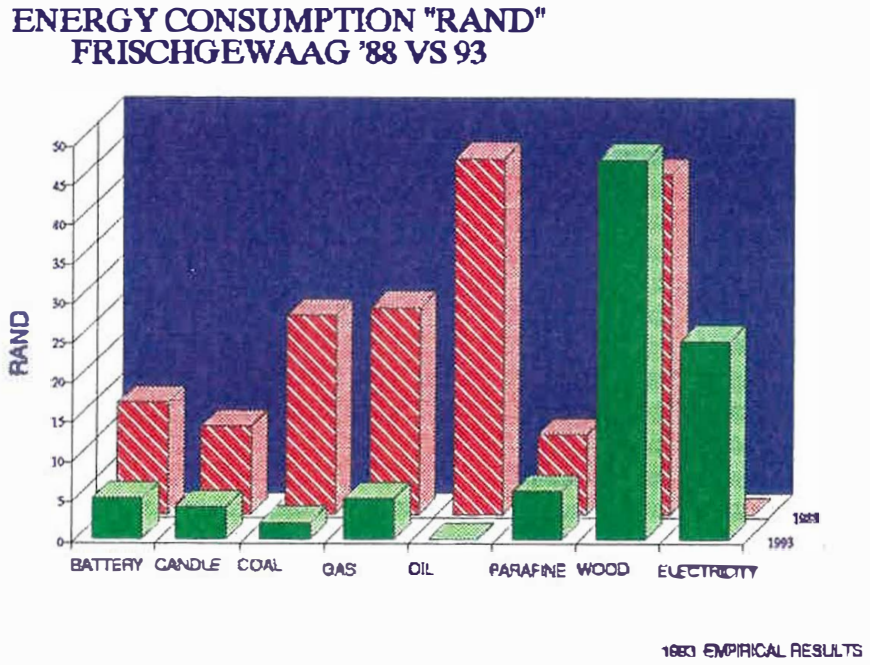


FIGURE 19: Energy expenditure per month

The figures of coal and diesel consumption were omitted in this analysis as an insignificantly small number of respondents in Frischgewaag used either energy form. Suffice to say that coal usage has declined markedly and that diesel is only used as a back-up facility to the businesses who formerly ran their electrical equipment off generators. The World Bank report (1992) has a more optimistic view regarding coal consumption, suggesting that electricity is only the least cost option if the rural settlement does not have easy access to coal.

The most significant decline in energy consumption in Frischgewaag between 1989 and 1993 was definitely that of gas. From an average of R25,76 p.m., per household being spent on gas to R4,66 p.m. (a drop of almost 82%).

In Frischgewaag, the average amount of electricity purchased per month was R24,45 in 1993. This was deemed to be a meagre amount and suggestions of possible theft of electricity or a series of faulty meters was investigated. A follow up analysis to verify these figures proved that 21% of the meters were faulty. Of these 10% had a broken seal, indicating foul play, and the remaining 11% proved to be authentically faulty meters. Should Eskom repair the broken meters and eradicate the theft of electricity, the monthly household expenditure on electricity should average R30,55 p.m.

The amount spent on wood has increased nominally, endorsing the findings of the 'perception analysis' which indicated that wood and electricity were this community's most popular energy forms. The Development Bank (1993)

contends that wood is the predominant household fuel in rural areas however, demand is outstripping sustainable supply and it is estimated that most natural woodland will be denuded before the middle of next century. Viljoen (1990) claims, using Aron's woodfuel gap model, the complete destruction of woodfuel resources within 40 years will eventuate should the current trend continue.

Dingley (1990) suggests that the case for electrification of urban areas is clear cut on economic grounds alone. Indicating that numerous studies have pointed to the fact that non-electrified homes spend more on energy than electrified homes, he suggests that provided the rural areas are densely populated the same would hold for rural areas. i.e. electricity would reduce their monthly energy bill. Frischgewaag results substantiate these claims.

3.5.3 CROSS CORRELATION BETWEEN ENERGY USED AND APPLIANCES

In Frischgewaag gas is used primarily for heaters and freezers, although it is also nominally used in stoves and fridges.

Paraffin is used in fridges and heaters as well as in the popular prima stoves. Only 1% of the television sets are still run off batteries, while 25% of the radio's are. 9% of the respondents still have a coal stove, although these have seldom been used since electricity has been supplied.

A significant number (48%) of the Frischgewaag households still cook on an open fire. These findings comply with the Development Bank results "A striking feature of South African households is the multiplicity of energy carriers used for cooking, space and water heating, lighting and entertainment" (Development Bank 1993).

Electricity has been widely used for all the above purposes. However, heaters, standard stoves and luxury "white goods" are not used by the majority of the consumers.

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SECTION 4

CONCLUSIONS

SECTION 4: CONCLUSIONS

4.1 A SUMMARY OF THE FRISCHGEWAAG FINDINGS

The empirical survey examined the socio-economic effects of electrification on Frischgewaag within five parameters, namely: Economic indicators; lifestyle changes; appliance ownership; perceptions and energy consumption patterns. While these indicators have been quantified for the purpose of this project, the deductions made from them should be seen as indicative and not conclusive. These results have emerged from the empirical study conducted in 1993. In order to establish changes in trends these results have been compared to the Research Surveys Report (1989).

Economic variables were assessed within the following categories: the emergence of small business; the number of dwellings built on a property; income levels; the type of houses; the condition of houses and the saving and investment trends of the community.

Since the introduction of electricity there has been a rapid emergence of small business in the area. 35% of households run a small business from home. 74% of these businesses are directly dependant on electrically driven technology (section 3.1.3).

The research results indicate that the role that electricity has played in the establishment of these businesses is not conclusive. However, results do show that electrical technology has facilitated entrepreneurial activities, often making them more efficient than the non-electrical equivalent (thereby giving the entrepreneur a competitive advantage). The net

result has been that a significant number of entrepreneurs have emerged in Frischgewaag since the introduction of electricity. This issue is discussed in the recommendations in section 5.5 of this dissertation. If the development of entrepreneurs can be fostered and markets outside of Frischgewaag can be penetrated by them, the Frischgewaag community will accelerate their wealth generation capacity.

Research results show that the number of dwellings on the average Frischgewaag property has increased by almost 10% since electrification (section 3.1.2). It has been argued that factors other than electricity, such as weather conditions, have prompted the accelerated building of houses in Frischgewaag (Mabizela, interview 1993). The empirical results suggest that there is a more definite link between electrification and the number of dwellings per homestead. This is substantiated by the influx of people from non-electrified regions to Frischgewaag since electrification.

The willingness of migrant workers to spend more money in Frischgewaag than in the centres in which they work, is also evident from the empirical results. In Section 5.5 of this report it is suggested that the additional houses should be electrified so as to assist Eskom in reaching economies of scale on the Frischgewaag project. The population influx into the township may also be seen as a catalyst to development as local market sizes increase and new expertise are introduced to the region.

Results show that household income levels have risen since the introduction of electricity (section 3.1.3). A significant trend is that the portion of the average Frischgewaag household income derived from salaries has dropped to 34% of total income. This statistic

needs to be viewed against the rise in the significance of the earnings of home-industries and small businesses (section 3.1.1). Also pertinent to the income equation is the size of the migrant labour force who live in Frischgewaag but work in other centres (section 3.2.4). The recommendations regarding the economic stimulation of Frischgewaag (Section 5.5) take the above variables into consideration.

The research trends regarding the types and conditions of houses in Frischgewaag (section 3.1.4) are not clearly linked to electricity, except through personal interviews (Gwala, interview 1993). The perception exists that homes with electricity have an elevated status when compared to those without.

Savings and investment trends reveal that prior to electrification, 18% of the households in Frischgewaag saved their money at home (Research Surveys 1989). Post-electrification figures show that no households adhere to this practice any longer (section 3.1.6). Results suggest that this may be linked to the effects of informal education, received through the medium of Television. The popularity of community saving schemes has increased by 30%. The trends listed above have ramifications for the marketing of appliances(section 5.5.3.8).

Lifestyle variables were assessed within the following categories: Education; Employment; the incidence of migrant workers; the size of household and the local day to day movement of the population.

40% of South Africans are functionally illiterate (World Bank 1991). Frischgewaag has similar illiteracy figures (section 3.2.3). The measure which was used to quantify the progress in education in Frischgewaag was the qualifications of the most educated person in each household. The results showed the incidence of households with no education had dropped by 3%, and the number of households which had a member with a secondary school education had risen by 10% during the period of electrification. The reasons behind these trends can be attributed to the introduction of an adult learning programme (held at night), and the building of a second high school.

Electricity plays a relevant role in the level of education in Frischgewaag. The use of lights, videos, overhead projectors and computers is facilitated by electricity.

Section 5.5 of this report discussed the role of electricity in education and development.

The 1993 empirical study suggests an increase in the number of pensioners in Frischgewaag by 16% since electrification (section 3.2.3). Results also show that the unemployment figure for the head of the household has increased by 9% since the introduction of electricity. These results need to be weighed against the 5% increase in blue collar workers and the aforementioned increase in household income.

The role that electrification has had on the aforementioned statistics is most definite in the influx of pensioners into Frischgewaag because of the relatively modern amenities offered in the town. The increased unemployment figures might be explained by the increased competition for jobs coming from an increasingly qualified youth. The latter will almost certainly explain the increase in the migrant labour force by 16% between 1989 and 1993

These issues have a direct bearing on the recommendations made to Eskom regarding demand side management in Section 5.5.

The size of the average Frischgewaag household has grown from 7,08 to 8,44 people since the introduction of electricity (section 3.2.5). These residents in most cases moved from non-electrified areas (Mayaba 1993).

Appliance ownership variables were assessed within the following categories: the appliances presently owned; the intention to purchase appliances and the location of appliances in the home.

Doppegieter (1993) claims that there is a direct correlation between the number of appliances in a home to the electricity consumption of that household. The following statistics therefore have a direct bearing on the return Eskom will get from its electrification investment. Stoves were found in only 13% of the homes. Due to the lack of running water, there were no washing machines or geysers discovered in Frischgewaag. The research indicated that at least 75% of the residents intended to purchase an iron, 68% a kettle, 40% a 2-plate stove and 32% a heater within the following 12 months (section 3.3.2).

It was found that the kitchen was the room in which most appliances were found, followed by the dining room (section 3.3.3). These statistics are relevant to section 5.5.3 of this report, where strategies to increase the use of electrical appliances are considered.

In analysing the perceptions of the residents in Frischgewaag, two fundamental issues were addressed. The first issue concerned the rating customers gave electricity when it was compared to other energy forms, and the second issue was based on an assessment of the needs of the community. Electricity was rated by 52% of the households as "their form of energy" while 48% still regarded wood as their preference (section 3.4.1). The reason for the latter being related to cost and heating issues.

With regard to the overall community needs in 1993, education and a hospital were listed as the most important issues (section 3.4.2). Telephones and street lighting also featured prominently. Electricity was the issue which raised the least concern to the community. The results would seem to suggest that electricity has largely met the expectations of the Frischgewaag community.

An assessment of the consumption patterns of electricity by Frischgewaag residents was conducted within three categories, namely: the extent of wiring in each house; the amount of money spent on fuels and a correlation between the energy consumed and the type of appliances in the home. 87% of the homes have been wired one way or the other (section 3.5.1). An average of R25,45 is spent on electricity per household and an average of R48 is spent on wood per month (section 3.5.2). Wood is often burnt in the kitchen and outside the home, while electricity is more evenly consumed throughout the homestead (section 3.5.3). From an Eskom view point, consumers would be able to afford more electricity simply by reducing wood purchases.

It is evident from the above synopsis that electricity has had a significant impact on the community of Frischgewaag. The extent of which, while quantified in terms of individual issues, remains subjective. This is due to the numerous variables associated with socio-economic development. The following chapter will explore the link between economic development and electrification, and section 4.3 will examine relevant issues in the South African context with regard to the energy market.

4.2 THE RELATIONSHIP BETWEEN ECONOMIC DEVELOPMENT AND ELECTRIFICATION

According to Spies (1990), economic development is the process of qualitative and quantitative improvement in the state of a nation's economy. Spies claims that the level of a country's development is a function of its ability to serve the needs and legitimate aspirations of its population over the long term. He argues that it is therefore possible for a country to experience rapid economic growth while simultaneously retrogressing in a development sense. He concludes by inferring that energy planners need to look at broader development issues other than economic growth. Levine (1991) claims that "Energy services enable improvements in labour productivity, added mobility and increased comfort and convenience, contributing to the development process itself".

The development pattern typical to industrialisation according to Spies (1990), is :

i. Increased socio-economic dichotomy between rural and urban class.

ii. Rapid urbanisation.

iii. Mobilisation of the urban class into the industrial process.

iv. Incorporation of this class into modern society socio-political reform.

South Africa saw rapid urbanisation in the 1980's. This trend has not abated, and all indications are that fiscal policy has been directed at trying to modernise this new urban class. Spies concludes that the greatest challenge facing strategists in South Africa today is to design systems that will help this country cope with the populations high propensity to urbanise. Energy management has a vital role to play in this regard.

Viljoen (1990) describes the domestic energy transition process as a change from a dependence on biomass fuels, through transitional fuels, before dependency on electricity is reached. According to Viljoen, this process is dynamic and varies both spatially and temporally and is driven by the search for greater amenity and economy within the family budget. Various factors, such as education and employment affect the transition, which can best be summarized in terms of 'modernisation'. See Diagram 2.

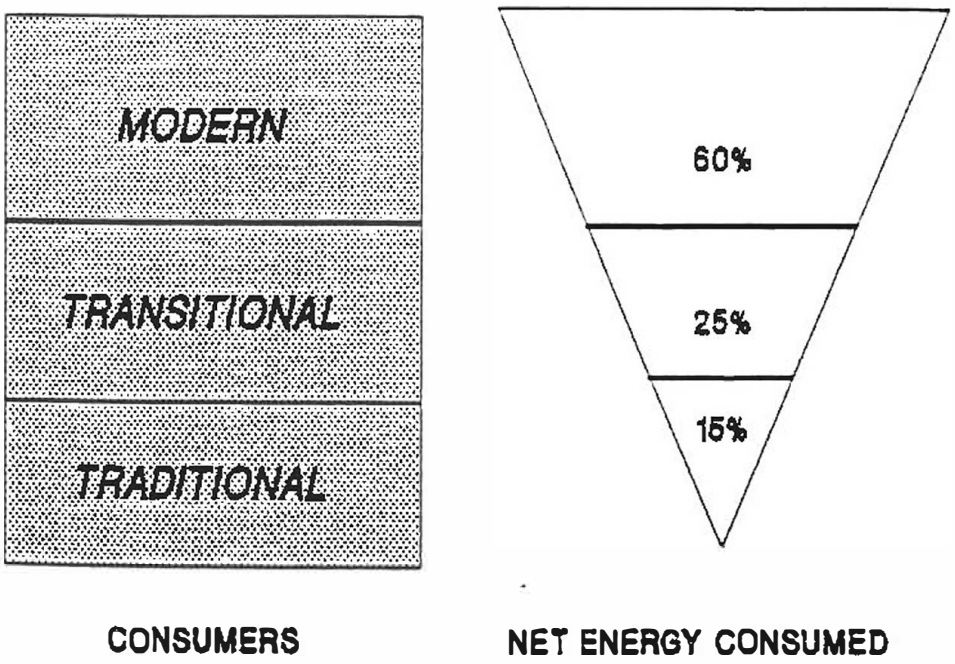

DIAGRAM 2: Modernization: The implications for South African Development

Viljoen (1990)

4.3 THE IMPLICATIONS FOR SOUTH AFRICAN DEVELOPMENT

Viljoen (1990) describes South Africa as a land with sharp contrasts. With its powerful western economy alongside a large subsistence economy in the rural areas. Urbanisation has not taken place evenly, in that a vast majority of densely settled rural areas have had their development stifled by political ideologies, while the "favoured" white settlement areas have had their development assisted.

Kok, quoted by Viljoen (1990), speaks of a process of "primary metropolitanization" having occurred in South Africa where migrants migrate directly to the cities without first moving into intermediate towns. The direct result has been an informal urbanised population growing at an alarming rate. The provision of energy is seen as a means to enhance the modernisation prospects of the informal settlements.

The impact of energy on development, according to W. Baum (1989), is one of the most neglected areas of research, because it was not regarded as a scarce resource until the 70's with the oil crises. Today it occupies a central theme in studies of development. In these studies however, the precedence is given to informal urban settlements over the rural settlements. This has resulted in a failure to evaluate the impact that electrification has had on rural development. This paper attempts to address some of these issues as they pertain to rural development.

4.4 RESULTS OF THE SURVEY AND IMPLICATIONS FOR MARKETING STRATEGY

A detailed review of the South African electricity industry in comparison to others around the globe highlighted the fact that Eskom's generating capacity ranked among the most impressive in the world. However even countries which are less economically advanced, who have less generating capacity and who have a far lower per capita income have significantly higher rates of electrification than South Africa (Dingley 1990). This is due to

the fact that a vast majority of rural South Africans have been denied access to basic infrastructural services.

Frischgewaag was chosen as the rural township to be studied as it was significantly representative of the vast majority of rural areas which have been affected by the inequalities of South Africa's past. A summary of the results suggests that electrification has had a positive economic impact on the town of Frischgewaag. While the quantification of this impact is difficult to ascertain, the indicators point to the township moving, according to Viljoen (1990) transitional model, towards modernization. Economic activity has accelerated, income levels have risen, literacy levels show an increase as do employment statistics. However, it is evident that an alarming number of residents are not paying for their power and that those who are, are not consuming significant amounts (150 kwh per month). There appears to be an economic cost to the electricity supplier which is only marginally being met by the consumers. Development Bank (1993) claims that it costs Eskom 3 000 rand to connect a rural domestic customer with electricity. It is evident that the return on investment (to initial capital costs) to Eskom would exceed 15 years, as the connection fee is only 30 rand (Vermaak 1993) and the average monthly expenditure on electricity is 24 rand forty five cents per household (Section 3.5.2).

On the basis of these findings it is evident that electrification has the propensity to initiate rural economic development of varying proportions according to specific environmental criteria. It is also evident that this impact has not been optimised in that rural electrification occurred independently of other infrastructure or development related services. This poses the question: "If electrification has had such an impact in a remarkably short time, and if this

impact was a spontaneous result of electrification, how much more could be achieved through an integrated development plan?" It is conceivable that such a programme might be able to shift a rural community from a subsistence mode into a growing, developing economic entity. It is acknowledged that infrastructural services alone would not sustain economic growth. Townships which exist only as a relic of the apartheid ideology of separate development, and have no local source of wealth generation (such as the exploitation of minerals, or agricultural products, the manufacture of products or the provision of services which may be exported to other centres) stand little chance of economic development.

This in turn would indirectly make the rural electrification programme more cost effective by virtue of the fact that the population would have a higher propensity to consume electricity. This would afford the electricity supplier greater return on investment, and make rural electrification programmes more attractive to them.

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SECTION 5

IMPLICATIONS FOR THE MARKETING

OF INFRASTRUCTURAL SERVICES

SECTION 5: IMPLICATIONS FOR THE MARKETING OF INFRASTRUCTURAL SERVICES

5.1 INTRODUCTION

Based on the conclusions and findings of the empirical survey, an attempt has been made to offer some recommendations regarding the electrification of rural areas in Southern Africa. These suggestions embrace the opinions of authors both within South Africa and abroad and will also reflect the solutions derived through the research findings. The recommendations which are forwarded fall in the jurisdiction of the electricity distribution authorities modus operandi; however in most cases they are applicable to "utility -service marketing" in the South African context in general. Therefore they may also find relevance in the telephone, water and banking sectors, among others.

The World Bank's (1992) emphasis is one of poverty alleviation in rural communities. It proposes wide spread infrastructural development, with particular emphasis in meeting the basic needs of the community. These sentiments embrace the tide of socio-political thought that is motivating the development policies of South Africa today. The ANC in its Reconstruction and Development Programme (1994) suggests that electrification and housing are key developmental issues in Southern Africa. However the Development Bank (1994) cautions that electrification should not be considered an end in itself, but a means to reaching broader developmental goals and priorities. Less effort should thus be placed on accelerating electrification and more on ensuring that it effectively promotes development in its broadest sense.

Against this backdrop and given that NELF (the National Electrification Forum) has been established and is making significant steps toward streamlining the electricity distribution industry, this study addresses the rural scenario in particular. Most writers on this topic suggest that rural electrification cannot be justified on a cost basis, that broader developmental issues are at stake. It is hoped that these recommendations go some way (through both demand side and supply side management) toward optimising the national electrification drive in rural areas.

The fundamental issue which threatens the success of the electrification programme is addressed in Section 5.2. The factors which have given rise to the above issue are explained in Section 5.3. Section 5.4 examines the extent of the effects of the aforementioned issues. Against this backdrop, a marketing plan is submitted (Section 5.5). The plan commences with a realignment of corporate vision, objectives are set and strategies are recommended. It is acknowledged that the practical outworking of the proposal will require some attention (Section 5.6). The recommendations conclude with a brief synopsis of the control mechanism required to implement the plan (Section 5.6.4).

5.2 STATEMENT OF THE PROBLEM

RURAL DOMESTIC ELECTRIFICATION IS NOT COST EFFECTIVE

The title of this dissertation dictates that two broad issues are dealt with. The first being the quantification of the impact that electrification has had on the development of rural

settlements. This issue has been dealt with in the analysis of the empirical research results. The second issue is that of applying the aforementioned analysis in developing marketing strategies which will enhance the feasibility of rural electrification.

Based on the statistics already mentioned (section 1.5) most households in South Africa that are not electrified are either rural or informal peri-urban settlements. According to the Development Bank (1993) "the return on investment regarding the capital already invested in this arena does not justify itself on a financial basis". In other words it is not cost effective to electrify rural areas. This is the underlying problem towards which this paper attempts to make some contribution.

The Development Bank Report (1993) claims that few rural electrification programmes are financially self-sustaining within the first 5 to 10 years. The report suggests that the only substantial justification for the rural electrification programmes lie in social considerations. The short-term financing solution has been the cross-subsidisation of rural electrification projects by revenue collected from industrial consumers (Development Bank 1993). Eskom has also attempted to isolate the most densely settled rural areas first, so as to attempt to maximise economies of scale. With this in mind, and the knowledge that socio-political expectations dictate an irrevocable commitment to the electrification of all rural areas, the financial viability of the electricity industry is threatened. The contribution this paper attempts to make is toward increasing the financial viability of the rural electrification programmes, thereby alleviating the need to sustain these programmes with cross-subsidisation.

Steyn reports that electrification programmes expose utilities to significant financial risk. "A large electrification programme, implemented by a fragmented industry and based on hastily drafted policies, makes it impossible to estimate or manage the clearly increased, financial risk involved" (Steyn 1993). Steyn claims that the risk to the utility comes in the following ways:

i. Consumption risk : Should consumption by the rural settlement not meet or exceed expectations then the revenues will be lower than planned for. The cumulative net funding requirement will thus exceed budget.

ii. Revenue recovery risk. This refers to unpaid bills, but the advent of prepayment metering has gone a long way toward minimising this risk in the rural projects.

iii. Technological risk: Technology has long term implications. For example, Frischgewaag had a high incidence of meter failures due to the high incidence of lightning in the area. Faulty meters have an associated revenue cost (they often dispense electricity free of charge) and an associated labour cost, as the faulty meters need to be replaced.

According to the World Bank (1992), with the risks attached to electrification it is imperative that the most viable areas in the country are electrified first so as to build up a capital and consumption base to sustain the less profitable regions.

It is evident, from a business point of view, that the long term success of electrification will depend on the financial viability of each rural project. Hence solutions and strategies directed to this end are imperative.

Exacerbating the problem of a subminimal return on investment in rural electrification programmes, are social pressures. Public expectation and government demands dictate that Eskom's goal "Electricity for all" be irrevocable, regardless of the financial viability of each project. The ANC for example has called for a programme that would see 3 million new connections in 3 to 5 years (Development Bank 1993).

In conclusion, one could summarise the problem facing the electricity distribution industry in regard to rural settlements, as a paradox between a mandatory social obligation and an unlikely return on investment.

5.3 FACTORS GIVING RISE TO THE PROBLEM

The relative inefficiencies inherent in rural electrification are not problems indigenous to South Africa. Physical constraints such as terrain and the isolated dispersion of people are universal impediments to the economic viability of rural electrification. However, certain problems have been exacerbated in the South African context which compound the local problem. They include South Africa's political history, fragmented economy and the economic slump in the 1980's. They also include the electricity industry's pricing policies, decentralised structure and inexperience in low cost electrification. More recently, heightened expectations, preceded by political turmoil, contributed to the uncertainties surrounding the rural electrification programme.

5.3.1 POLITICAL HISTORY

The political history of separate development in South Africa carried with it the favoured allocation of critical resources in the predominantly "white areas". The rural "homelands" were deprived of infrastructural services and the net result has been an exaggerated disparity in development. Marais (1993) reports that the government tried to address these problems in the 1980's by creating black local authorities. Because of serious shortcomings in the system, this route failed, thus compounding the problems in these areas. With the abolition of the Influx Control Law and the abandonment of the Separate Development Policy, Black urbanisation has spiralled, and has resulted in overcrowding in the townships, with an explosion of informal settlements. The effect on rural areas has been the departure of potential income earners. The plight of the rural community was compounded as the national focus moved away from their development needs.

Viljoen (1990) used the "core-periphery" model (quoting Fair, 1982) as a tool to describe the South African context, and claims that the urban problems are increasingly dominating the economy, to the detriment of the rural sector.

A symptom of the economic development of South Africa, which compounds the development of rural areas, is the lack of education. The paucity of education in these areas exacerbates the unemployment problems which further compounds the obstacles to economic growth in the rural areas.

Du Toit (1991) describes black education as fast becoming a national catastrophe. Van Gas (1993), reports that only 18% of South African schools have electricity. This poses a serious impediment to the use of many technological aids and to the possibility of night classes or study times.

S. Van den Berg (1990) suggests that inequality and conflict are obvious features in the South African economy. "The historic legacy of 'apartheid' created an unurbanised black population" who have been disenfranchised to the extent of serious economic retardation. A further symptom of the recently abandoned apartheid system was the spate of sanctions which severely impaired the economic development of the region.

5.3.2 THE REAL COSTS WHICH INHIBIT RURAL ELECTRIFICATION

The Development Bank (1990) explains that with such low electricity demand levels it is difficult to justify the cost of grid extension. A deeper look into these costings reveals that the capital cost of electrifying a proposed 2,4 million dwellings would be R7 billion (1992 prices). Allowing for recurrent expenditure in the programme, this amount would be extended by R290 million. According to the Development Bank report (1990) the factors influencing the viability of electrification projects would include: the capital costs of appropriate technology, the cost of capital, the operating costs, the consumer mix, the consumer consumption levels and tariff revenue. More specifically Eskom has claimed that

they will require 277 million from 1992 to 1997 and about R1,2 billion in loan funding over the same period to make the programme viable.

It is not surprising, given these figures that the more densely settled regions, close to industrial development have been afforded higher priority over their rural counterparts (Thorn et al. 1992).

5.3.3 DECENTRALIZED ELECTRICITY DISTRIBUTION INDUSTRY

As has already been mentioned, there are over 400 municipal electricity distributers in South Africa as well as other sundry suppliers, such as the Department of Development Aid etc. Dingley (1990) believes that the low level of domestic electrification in South Africa can largely be attributed to the structure of the supply industry and to the fact that the majority has no franchise at either the national or local level. The "white town councils" have historically opted to utilize all their capital in electrifying the white areas and, except Durban and Cape Town, have made little attempt to electrify the townships on their periphery.

Eskom has seen their role, according to Dingley (1990), as that of supplier to regional authorities and have hence not been positioned to electrify the township communities.

Some black townships have electricity. However 80% of formal townships do not. This figure is high when compared to the 4 million farm workers living on white farms and the millions in the homeland areas who have no access to power. Transkei for example has only 2% of its households electrified. The decentralized nature of the electricity industry has relegated rural communities to dependency on fossil fuels.

5.3.4 PRICING STRUCTURE

Eskom's vision of electricity for all is coupled to a premise that electricity is "affordable even for the poorest people of this country" (McRae 1990). This has resulted in connection fees in the region of R30 per household compared to the cost of R3 000 per connection capital cost to Eskom (Development Bank, 1990). Rural costs can be significantly higher than these when terrain and geographical population concentration is not appropriate. A further complication is the high maintenance cost of a network in communities where there is little or no education. The temporary nature of some of these informal settlements, let alone the durability of the homesteads, poses a question over the long-term return on investment for these projects. A question has to be asked as to whether the pricing structure is appropriate, given the exceptionally high expectation on the part of the consumers as well as the low return on investment to the distributor.

These issues are coupled to the fact that the electrification drive is still in its infancy in South Africa. It has in no way come close to reaching economies of

scale which would make rural electrification a financially viable option. At this juncture, it remains a product of social conscience.

5.3.5 THE ELECTRIFICATION PROGRAM IS IN ITS INFANCY

Given the political history of this country and the recent emergence of the disenfranchised majority in the April 1994 elections, a new dynamic confronts the electrification drive. Formerly it was driven by an increasing awareness of a heightened social conscience. Now it promises to be driven by the very people who have been deprived for so long. NELF is strategically positioned to assist this transitional process, with interest groups from both the old and new dispensation being represented. The Reconstruction and Development Programme otherwise known as the "ANC's blue print" for rebuilding South Africa has some significant indicators regarding the course that the electrification drive might take.

i. The sovereignty of Eskom is likely to be maintained (particulary with former Foreign Affairs Minister Pik Botha being made Minister of Energy Affairs).

ii. The Eskom of today is undergoing a metamorphosis, with its accent on affirmative action.

iii. The structure of the distribution function of Eskom is destined to change dramatically in an attempt to reduce the decentralized nature of the electricity industry.

5.4 EFFECTS OF THE PROBLEM AND RELATED ISSUES

A multiplicity of factors are associated with and are caused by the problem of a lack of return on investment in rural electrification. These factors appear to relegate rural areas to a lower priority on the national electrification schedule. "It appears that electrification will mainly be an urban issue" (Development Bank 1993). These factors include :

i. Urbanisation.

ii. The energy transition process.

iii. The multiplier effect and forward and backward linkages in the economy.

iv. Balance of payment problems.

5.4.1 URBANISATION

The trend of urbanisation has a direct bearing on the electrification of rural areas. A sprawling informal metropolis is both more attractive (unit costs of supply are lower) and possibly more urgent than the electrification of rural areas. It could be argued that it is both a cause and an effect of the low capital returns on rural electrification. It is a cause, in that a reduction in the number of money-earning household members is occurring in rural areas. It is a symptom, in that the lack of rural electrification results in migrants leaving the rural area in search of the "bright-lights" or a higher standard of living in the cities.

Du Toit (1991) suggests that high urbanisation rates and the change in the racial composition of the population are the two significant trends in the changing

composition of the South African population. The urban foundation (1990) predict the black population in South Africa to be 48,5 million in the year 2010 as apposed to 24 million in 1985. They also predict an increase of over 170% in the black population in the metropolitan areas. According to Du Toit (1991) before the removal of influx control, concentrations of migrants converged on the homeland components of Durban, Bloemfontein and the PWV metropolitan areas. In the other major centres the proportions are smaller but the rate of growth in most these settlements could double within five years (Urban Foundation 1990).

Viljoen (1990) remarks that urbanisation has not taken place evenly. A process of "primary metropolitanisation" has occurred, in which rural/urban migrants migrate directly to urban areas rather than first to intermediate towns. This has resulted in a bulging informal sector. Viljoen estimates 20% of South Africa's population to be housed in these settlements. The questions to be asked are "what is the likely outcome of this trend of urbanisation?" and "what does it imply regarding energy consumption and economic development?". These questions may be addressed using the "transitional model" as a paradigm (Viljoen 1990).

5.4.2 TRANSITION OF STATE

Viljoen suggests there is a link between urbanisation and energy transition. He describes the energy transition process as one of "the complete substitution of

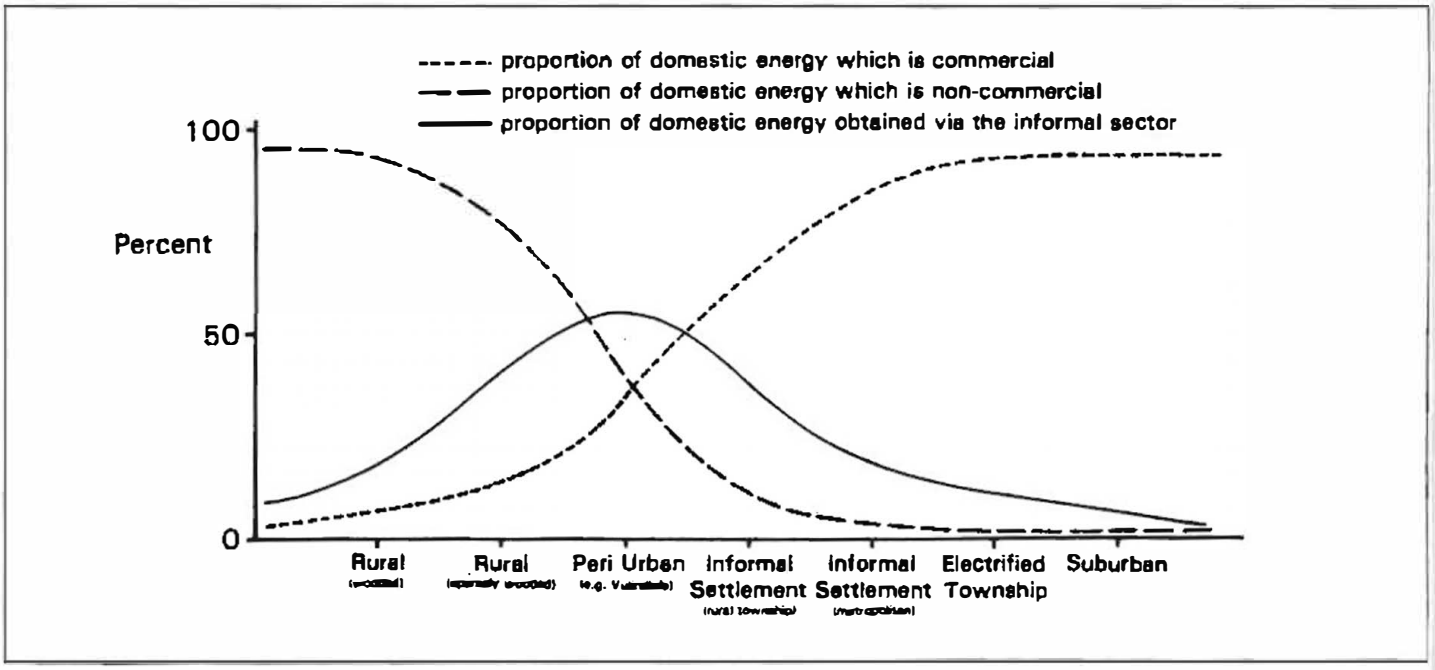
biomass fuels and the progressive adoption and abandonment of transitional fuels before the final stage of complete dependency on electricity is reached" (Viljoen 1989). The process is described as dynamic with a variance in both a spatial and temporal dimension. The process is driven by the search for greater amenity and economy within the framework of the household's financial constraints. Six distinct stages are identified by the model:

* Biomass dependency stage.
* Rural transition phase.
* First urban stage.
* Second urban stage.
* Third urban stage.
* Total dependency stage.

The primary stages in the modernisation process depict a community locked into the collection of local fuels, the by-products of which are often erosion and pollution. The pinnacle of modernisation reflects a community dependant on commercial fuels. These fuels facilitate the use of modern technology and minimise health and pollution hazards.

Viljoen (1989) believes that modernization governs both the economic and behavioral aspects of the energy transition process and the process may be measured in terms of a modernization index.

Gander, as quoted by Du Toit (1990), shows the income spent on energy, together with a rapidly increased amount of useful energy consumed during the energy transition process. (See Diagram 3).



• A qualitative representation of changes which occur in patterns of domestic energy acquisition and consumption across a spectrum from rural to urban settlements.

DIAGRAM 3: The energy transition model: Du Toit, 1991

This synopsis of the energy transition process explains to some degree why urban electrification is more attractive then rural. However it also serves to dispel the myths about rural electrification. In real terms rural people spend more on energy than their urban counterparts. This seems to indicate that the consumption of electricity in rural areas does have capacity for expansion. Furthermore it is possible to address the urban problems by creating a more attractive rural environment. This can to some extent be explained by the multiplier effect.

5.4.3 THE MULTIPLIER

The World Bank (1992) sees electrification as a "potential major employment creator, both directly, through demand for installation labour and materials, and indirectly, through demand for electrical appliances and by facilitating the establishment of small enterprises". It is estimated that one job could be created by every 4 to 20 electrical connections. Furthermore the World Bank estimated the electrification multiplier to be 1,5

The multiplier debate hinges around the ripple effect that an injection into the economy (be it fiscally, monopolistically or competitively initiated) may have on the broader economy. The argument hinges on the existence of forward and backward linkages from the point of activity. For example, were Eskom to stimulate the demand for television by their electrification drive to the extent that a Japanese television manufacturer erected a plant in South Africa, not only

would thousands of homes have access to cheap televisions, it would also provide numerous job opportunities which would further stimulate the economy. The intensity of the effect of the electrification multiplier is difficult to quantify, particularly its elasticity in the rural context as opposed to the urban. The extent to which the rural economic infrastructure can sustain a ripple effect of any significance is questionable. But what is certain is that the injection of economic activity will have a positive impact on a rural economy.

5.4.4 BALANCE OF PAYMENTS

Van Gas (1993) argues that the growth in the appliance market, as a result of the increased demand due to electrification, will have a significant effect on the balance of payments. Eskom finance division, 1991, anticipates more than R550 million to be subtracted from balance of payments as a result. Van Gas (1993) suggests that if South Africa's manufacturing volumes increase significantly, to the extent that economies of scale benefits are passed on to consumers, it would overcome the threat of a negative impact on a balance of payments and might even provide a platform for export. Furthermore Van Gas (1993) claims that electrification could facilitate competition which would reduce inflationary pressures. The causes behind South Africa's inflationary problem are cited as being: the limited domestic market, lack of competition, low productivity levels and an underdeveloped infrastructure and high labour costs. These issues may to some extent be addressed by electrification "Electrification is a pre-requisite for

economic growth provided that it is supportive of an integrated developmental approach" (Van Gas 1993).

5.5 RECOMMENDATIONS TOWARD A MARKETING STRATEGY FOR RURAL ELECTRIFICATION

The recommendations which follow are based largely on the findings of the Frischgewaag investigation. They embrace policies which are definitely applicable to the wider South African rural context, and might possibly lend insight into new strategies for urban areas. Many of these strategies are employed in one or other context in South Africa, it is hoped that this dissertation will serve to combine them into a homogenous marketing plan thereby contributing toward a return on investment in rural electrification programmes.

It is taken for granted that the electricity distribution industry is changing at an unprecedented rate. When reference is made to Eskom it is because Eskom supplies Frischgewaag with power. The term Eskom and the new EDI (Electricity Distribution Industry) may be used interchangeably when attempting to extrapolate these findings to other rural areas.

This marketing strategy, commences with a re-alignment of Eskom's corporate vision to embrace the plight of the rural population. Long and short term objectives are tabled, and these are followed by detailed marketing strategies. The recommendations conclude with an assessment of the implications for implementation.

5.5.1 ALIGNMENT OF CORPORATE VISION

According to Dr McRae (1990) Eskom's vision is three-fold:

i. To make Eskom a top utility internationally, ie: to produce electricity efficiently at the lowest cost and to be an organisation which cares for its people and customers.

ii. Provision of electricity for all, through a system of cross-subsidisation, even the poorest people in the land will afford electricity.

iii. To connect Southern Africa with an electricity grid which will contribute to the establishment of an economic union in the subcontinent.

This vision is destined to guide Eskom and South Africa through the uncertainties of the 90's. In response to the findings of this report it is recommended that added to this impetus is a focus on demand-side management. The current vision concentrates on service and supply. By expanding Eskom's ambit of influence into stimulating the economy by more than just the multiplier effect, through increased electrification, Eskom's electrification drive would be secured, socio-political expectations would be exceeded and the dream of becoming the world's top utility could be closer to a reality. This would necessitate a programme of integrated development, as spoken about by Dingley (1990), which would involve a greater co-operation between major utilities and service organisation in order to stimulate the South African economy.

According to the International Defence and Aid fund report (1991), manufacturing in South Africa is concentrated in certain areas of the country. In 1987 over 80% of South Africa's industrial output was produced in four major metropolitan regions.

The political ideology which guided South African policy making until 1993 imposed legislation which retarded this concentrated development. First the 1913 Native land act, then the 1936 Native Trust and land act designated 13,7% of the land in South Africa to Africans. This legislation was further enforced by the group areas act and the illegal squatting act (Meer 1982). To overcome the contradictory nature of the legislation of the day a policy known as 'Border Industry' or Decentralisation was developed in the 1960's (International Defence and Aid fund 1991). The government offered incentives to industrialists to relocate to areas close to Bantustans. The policy was designed to reduce the influx of Africans to the metropolitan areas and reduce the incidence of migrant labour. As a product of this legislation, townships such as Frischgewaag have emerged. This paper in no way condones the legislation of separate development or group area. However, the reality exists that millions of black South Africans have made homes and communities for themselves in rural areas such as Frischgewaag. These areas have been starved of the financial and technological resources afforded to the developed 'white sectors' of the economy. Policy makers are now faced with two options, given that integration and democracy is to be fostered in the New South Africa.

All discriminatory legislation may be dismantled and the free market economy could be left to eventually normalise society. The counter argument to such a policy would be that the underdeveloped sectors of society would continue to be exploited by their advantaged counterparts. It seems apparent that some level of fiscal intervention would be required to empower the disadvantaged communities so that they would have an equal chance of performing in a market driven economy. Considering the adoption of the Reconstruction and Development plan, it is evident that the current policy makers have adopted the latter viewpoint. The question then arises. What should be done with the bantustans and rural townships such as Frischigewaag.

It is argued in this dissertation that should a rural community have the potential to become a viable business centre, government assistance should be focussed to that region. This is not seen as an endorsement of 'Border Industry' policy. Numerous bantustans, due to their location and resource base, are not suitable for development. It is suggested that these areas receive secondary attention, as it is already apparent that the residents are moving away from these centres (section 3.2.6). Rural centres such as Frischgewaag, with an abundant raw material base (coal, fertile soil and water) as well as strategic geographic relevance (en route to Swaziland, Richards Bay and Gauteng), justify reconstruction and development assistance. To this end it is argued that both long term and short term strategies be employed to boost these regions' economic development.

The desired end-state being that these regions be net exporters of their goods and services to other centres within and beyond South Africa.

5.5.2 OBJECTIVES

The following objectives were tailored specifically to enhance the financial viability of rural electrification projects. In order to alleviate the immediate need of covering operating costs short term objectives were set. They were designed to increase electricity consumption and to safeguard against losses through tight control mechanisms. However, long term objectives also needed to be in place so as to ensure the economic welfare of the community and in so doing reduce the risk of a negative return on investment on each rural project.

5.5.2.1 SHORT TERM OBJECTIVES FOR THE ELECTRICITY SUPPLIER

i. To institute proper control measures so as to ensure remuneration for every unit of electricity consumed.

ii. To actively promote the sale of appliances.

iii. To provide an after sales service centre that ensures maximum utility of appliances, through optimising access to power and appliances.

iv. To actively promote the wiring of homesteads.

5.5.2.2 LONG TERM OBJECTIVES FOR THE ELECTRICITY SUPPLIER

i. To encourage the introduction of 'big business' into rural areas.

ii. To facilitate the growth of the informal sector.

iii. To contribute to an integrated economic development program including infrastructural and other services.

iv. To invest in education in the rural settlements.

v. To empower representative local authorities in order that they be a vehicle for change.

5.5.3 MARKETING STRATEGIES - SHORT TERM

Strategies have been proposed which address each of the aforementioned objectives. The short-term strategies focus on the execution of tight billing contracts and the stimulation of appliance sales.

5.5.3.1 TO ELIMINATE THE THEFT OF ELECTRICITY AND LOSS DUE TO FAULTY METERS

The 1993 research results proved that 10% of the meters in Frischgewaag had been tampered with and a further 11% were

faulty. The net result of these non-functional meters was a loss of at least 21% of potential revenue.

In the case of theft and faulty meters revenue losses are incurred because the consumption of units is not measured. In order to minimize faulty meters, each installation requires a routine check and Eskom needs to enforce guarantees by the suppliers of the meters. Overcoming theft is far more complicated. Two approaches may be adopted to resolve this problem:

i. The technology approach is one endorsed by Eskom at present. New theft-proof technologies are continuously being designed and tested. (See Appendix C, for Meter specifications).

In Japan, quality control circles have become fundamental to progress in research and development (Kotler 1986). Traditionally, design and quality control has been seen as a management function or the function of an isolated research division. In Japan, blue collar workers are integrated into quality control circles. Every employee is encouraged to contribute toward increased product quality. Reward systems and structured forums are in place to facilitate the quality control circles. The South African electrification

industry involves thousands of employees and suppliers, and the nature of the market is constantly changing. The effectiveness of quality control circles has been proven abroad. Quality circles in the electrification industry could reduce the theft of electricity through technological advancement.

ii. The International Defence and Aid fund report (1991) reports that production and finance in South Africa came to be dominated by a relatively small number of corporations, both private and state or parastatal. It also claims that management and supervisory positions are almost entirely occupied by whites, or else are under white control. Against this backdrop it is not surprising to discover low levels of community cooperation with regard to non-functional meters. However, a long term approach would be to get the community to take ownership of their electricity reticulation system. If the community understood that only cost efficient reticulation systems would survive in the long term then they would be more likely to do their own policing of non-functional meters.

In order to make rural electrification more cost effective every unit consumed needs to be accounted for. Faulty

meters and theft are two areas which should be controlled relentlessly.

5.5.3.2 THE ESTABLISHMENT OF AN ESKOM OFFICE IN THE TOWNSHIP

Frischegewaag can trace its origins to The Promotion of Self Government Act of 1959, where black South Africans were forced to live in predetermined areas. Despite its undemocratic beginnings, Frischgewaag has developed into a permanent rural settlement to which the residents feel a strong affiliation. The research results demonstrate that 30% of the residents in Frischgewaag save their money in community savings schemes. The inflow of earnings from migrant labour stands at 21,4% of the average household income. Furthermore, residents have expressed the intention to buy a significant number of appliances (See section 3.3.2). It is therefore feasible that institutions that render a service to Frischgewaag locate in the Township itself. This need surfaced in the Frischgewaag opinion leader survey. The interviewees termed its function as being that of an "electricity doctor". The value of having a service centre in the town is immeasurable: to maintain a ready supply of electricity coupons; to answer queries and attend to complaints; to minimize the down time of electricity; to promote an awareness of the benefits of electricity and to be a point of customer contact with Eskom. An office in the area will also allow

Eskom to the monitor the developments in the township first hand (eg : violence, new building developments, business activity etc).

Kotler (1991) attributes Nissan's success in the American car market to their PARTS AND SERVICE CENTRE NETWORKS. A support service located within the geographical parameters of the target market which contributes toward effective customer service.

Because electricity is an intangible product it is essential that the customer is able to identify with the product and service he is receiving. A local Eskom office will be beneficial in this regard.

5.5.3.3 PERSONAL SELLING

South African marketers have traditionally been victim of the political ideologies of their time. The end product of which was a neglected Black South African market. Verwoerd, in June 1954, is quoted as having said "The Bantu must be guided to serve his own community in all respects. There is no place for him in the European community above the level of certain forms of labour." (International Defence and Aid Fund 1991). The net result of this ideology has been a paucity of appliance outlets servicing markets such as Frischgewaag. This trend led to the myth that the Black South African market is unable to afford significant volumes of electrical appliances.

Woodfuel sales in Frischgewaag average R47 per household, per month. It is evident that should woodfuel be displaced as an energy form, households would have the necessary disposable income to operate electrical appliances. It is therefore deemed feasible to attempt to increase electricity consumption through the sale of electrical goods.

It is proposed that salesmen sell electricity-consuming appliances in the Townships. In the short term this is a labour intensive marketing technique, however it yields rapid, tangible results. Direct selling techniques have been employed throughout the country following the electrification drive, with success in most centres. The most popular methods are door to door selling, the "tupperware party" method and planned demonstrations (Vermaak, interview 1993).

Door to door selling is effective if the salesman is deemed credible in the mind of the consumer. He should carry identification, be driving a vehicle with the company logo clearly displayed and be available for after sale service. The above criteria have been hallmarks of the approach to date (Marais 1993). Another approach might be to promote the use of local residents as salesmen. They would need to be openly endorsed by Eskom or other credible suppliers. They already have a network of relationships, and might well be successful salesmen. Scott-Wilson (1990) writes about a comparable example of companies

in Johannesburg. The companies offer products at certain outlets at retail prices only to hawkers, thereby promoting the informal sector.

The "tupperware party" method is one that makes use of local housewives who host a salesman with the prospects of getting a commission on sales. This technique is largely untested in the rural setting. But, by blending the credibility of the salesman with the audience brought in by the host, it has the credentials of an effective sales strategy. Eskom has started work in this regard (McGibbon 1993) and it has proved effective.

Promotional demonstrations could be used to augment the activities of the salesmen. Planned demonstrations need not revolve only around the sale of appliances. They might also include basic wiring of plugs and appliances, the domestic servicing of more sophisticated appliances and safety hints for the household. They could also include cooking and sewing classes. These promotions are likely to work well as the effectiveness of electricity is demonstrated visibly.

According to Marais (1993), in all three direct selling techniques, three fundamental principles apply :

i. Appliances need to be available so as to facilitate the immediate purchase of an appliance at any of these functions.

ii. There must be a back up team should customers come back with problems, as the word-of-mouth communication network in rural areas is very efficient, and any bad publicity will soon be felt throughout the community.

iii. Rural communities tend to be suspicious of new technology and foreign concepts, Marais (1993) cited suspicion as the greatest hindrance to the growth of electricity consumption. It is therefore vital that whoever the salesman is, whether a popular local or a company agent, he needs to be deemed credible by the community. Marais (1993) has found lady representatives to be a great neutralizer of suspicion.

According to Blom (1985) an efficient sales force may also perform the following strategic functions: Market analysis, prospecting, intelligence gathering, servicing, defining problems, problem-solving and resource allocation. The allocation of a sales team to Frischgewaag has the potential to increase electricity sales and to contribute toward the technological advancement of the community.

5.5.3.4 NEWSLETTER AND OTHER WRITTEN COMMUNICATION

The 1980's saw the emergence of what is popularly known as an 'alternative press'. This includes community based local papers and

papers servicing other non-government organisation. The total circulation of the alternative weeklys was estimated at 120 000 in 1990. (International Defence and Aid Fund 1991). It is suggested that this medium be used to target specific messages to specific target markets, such as Frischgewaag. Furthermore, low budget pamphlets are also recommended as a means to correspond with the community.

Although literacy levels in many of the rural areas are below an acceptable standard, written correspondence does not go unnoticed, particulary when accompanied by vivid graphical displays. In Frischgewaag, literacy levels are increasing significantly. This trend will further increase the importance of written communication. The mailshot technique is possible if the pamphlets are delivered to the households or given to children at school to take home to their parents. Although the Grey report (1987) acknowledges the value of written correspondence, it was found that rural communities were often bombarded by mailshots, which reduced their readership potential. Morris (1992) suggests that the messages are therefore kept simple and well branded.

A service centre in the township, accompanied by a newsletter (which could act as a mini newspaper linking the developmental experiences of numerous rural towns), could foster a sense of pride and ownership of the electrical networks in the respective communities.

For each rural service centre to write its own newsletter would be logistically impossible, but it might be possible for articles to be collected from each centre and collated at a central Eskom office. Obtaining representation from a wide number of communities would be essential, as every township has unique issues which need to be addressed. The articles could include, electrification progress, hints on cooking, safety hints, specials on appliances, competitions, more general political and development news and sport. It could also contribute to adult education by encouraging consumers to read. Marais (1993) regards general ignorance about electricity as one of the greatest challenges to overcome when attempting to increase rural electricity consumption rates.

5.5.3.5 COMPETITIONS AND LUCKY DRAWS

Rural communities are responsive to live entertainment and organised competitions. Morris (1992) suggests that the implementation of competitions stimulates market interest in related products. Competitions and legitimate lucky draws (which have appliances as prizes) would serve a dual purpose. More appliances would find their way into the township homes and the profile of the appliance distributors would also be increased. Other benefits include an increase in Eskom's contact with the customers and the increased involvement of customers with the electrification team. The competitions may be run

from the service centres, from the retail outlets or at specially located stalls. What could be of particular interest in these competitions are high priced white appliances. Because as Marais (1993) reports, capital cost is often the barrier to entry when it comes to major appliances.

While unemployment figures have dropped significantly in Frischgewaag over the period of electrification, unemployment remains a problem. 6% of the households in the town do not receive remuneration of any kind. An associated issue is the low average household income, namely R1 200 p.m. It is therefore apparent that 'zero-risk' competitions will inject assets into the community in the short-term, while simultaneously increasing the township's capacity to consume electricity.

5.5.3.6 MEDIA PROMOTIONS

According to the Grey report (1987), First-world methods of promotion are just as applicable in the rural setting as they are in the urban areas if the population has access to the medium used to transmit the advertised message. Television, radio and first world magazines are included in this category. The more popular promotion mediums used in the developing world include 'moving media' (buses and taxis) and bill boards.

Television, as can be seen from the Frischgewaag results, is fast making inroads into every domestic home in the rural areas. In Frischgewaag, 38% of the homes with electricity has Television sets in 1993 (section 3.5.3). The value of television is that it overcomes illiteracy barriers, appeals to most of the senses, enjoys a high level of credibility from the audience and reaches the audience in the privacy of their own homes. The draw backs include the expenses of running advertisements and the fact that they are not region specific. It is useful in establishing brand identity and broad policy as well as being convincing in the promotion of appliances. The Grey report (1987) found Television advertising to be extremely successful. Morris (1992)) claims that two thirds of Television sets in the blackmarket are black and white. While this trend is destined to change through a natural technological progression, it is worthwhile ensuring that the messages which are broadcast are compatible with this medium.

Radio, as indicated by the Frischgewaag results, is in 43% of the electrified homes (section 3.5.3). Radio enjoys many of the benefits of television, but radios are also more transportable and they can address regional issues more cost effectively than television.

The International Defence and Aid fund report (1991) claims that the press and broadcasting institutions have traditionally been in the hands of the "apartheid state and large white corporations". The report also

claims that the media has been subject to extensive controls. The recent change of government in South Africa has seen a deregulation of the media. A direct consequence of which has been the introduction of numerous regional radio stations. These changes have allowed marketers to focus their attention on specific target markets.

Advertising in magazines and newspapers is a popular option to marketers. To maximise the efficiency of this method marketers will first need to survey the rural areas regarding the circulation of various publications.

A popular trend in the advertising of consumables is to use 'moving media'. This includes the placement of logo's on vehicles: such as buses and taxis as well as the vehicles of the service provider. A relatively new technique has been the distribution of pamphlets in taxis, accompanied by the use of tape cassettes in the taxis. Music is played on the tape in between the adverts of those who sponsor the tape. Because transport is a basic need among rural people, it is an appropriate and effective way of reaching the target market (Morris 1992).

Billboards have long been used in advertising circles. Innovative boards in the townships, might be used for street lighting and other practical purposes, as well as for promotions.

5.5.3.7 TRADE SHOWS

Morris (1992) claims that "Television Road Shows" have been operating in KwaZulu Natal since 1987, outside shops and community centres. The population is drawn to a central meeting point by loud music and the sound of a loud hailer. They are entertained and informed by the distributors of numerous appliances. According to P. Vermaak (interview 1993) the "travelling-show" is normally a great success, and this activity should continue.

The 1993 empirical research results reveal a significant demand for appliances in Frischgwaag (section 3.3.2). The results also indicate that the disposable income of households is increasing (section 3.5.2). Stimulation of that demand should result in increased appliance sales and a resultant increase in electricity consumption.

The relationships which have been developed between Eskom and the suppliers of appliances should continue and be fostered into wider areas. The establishment of permanent outlets or the subsidisation of schools and other community projects could be considered. The Grey report (1993) found that using community centres to screen promotional videos was also an effective technique.

5.5.3.8 FACILITATION OF RETAIL OUTLETS

The number of small businesses in Frischgewaag increased by 18% between 1989 and 1993. 27% of the households interviewed in 1993 intended to start their own small business (section 3.3.1). The facilitation of small business development becomes particularly significant when that small business is able to export its product or service out of the region (Van Gas 1991). Local retailers, both formal and informal should be assisted with effective product displays. This should be the function of the manufacturers of appliances (although it has been Eskom's policy to buy and resell these appliances to the consumers on behalf of the manufacturers). Every possible effort should be made to keep the store-owners in stock with appliances and promotion material.

Morris (1992) claims that branding is essential in the marketing of goods in townships. For local businesses to become competitive in other regions they require business expertise in areas such as branding, costing, distribution and quality control. According to Kotler (1986) Toyota management first entered the U.S. car market by focussing all their attention on Los Angeles, San Francisco and Seattle. These target markets were researched and thoroughly understood prior to the launch of the Toyota product line. Expertise such as these are lacking in areas such as Frischgewaag (section 3.2.2.). For rural townships to become

viable business centres, they require the introduction of this type of business expertise (see section 5.5.4.4).

5.5.3.9 COST CONTROL

A revision of the cost structure of the domestic tariff could make the rural electrification programme more cost effective. Indications from Viljoen (1989) show that as modernisation takes place consumers may spend more on electricity but their net energy-bill declines as they begin to use more efficient energy forms. This would suggest that rural consumers, although having low earning capacity, could possibly afford more than R30 for the connection fee. Alternatively, a higher cost per unit of electricity might also be possible.

Whatever the strategy employed to make rural electrification more cost effective, it will necessitate careful implementation and require a system of comprehensive controls.

5.5.4 MARKETING STRATEGIES - LONG TERM

Short-term strategies address the immediate need of increased electricity consumption. They embrace a host of sales techniques, focusing particularly on the sale of appliances and the awareness of the direct benefits afforded by

electricity, so as to increase the load factors of electricity consumers (that is the duration of time a consumer uses electricity as a percentage of each day).

Long term strategies are an investment into the economic development of a township beyond the immediate scope of electrification. They are designed to secure the long-term viability of the project through the economic empowerment of the community.

5.5.4.1 ENCOURAGE BIG BUSINESS INTO THE RURAL AREAS

It is common knowledge that South Africa's decentralisation policy of the 1960's did not enjoy much success. This policy encouraged white owned business to relocate to bantu areas in an attempt to maximise the use of exploited labour. This does not imply **ipso facto** that the introduction of big business into underdeveloped regions cannot be successful. Frischgewaag has an abundance of raw materials such as coal, fertile soil, water, and flat land. It is strategically situated (equidistant from Gauteng and Richards Bay) and is situated close to the gas pipeline and traction services between these centres. Frischgewaag is also situated in the heart of a rich forestry and agricultural region (Schikkerling, interview 1993).

Whether the initiative to encourage big business to relocate is the function of central government or a utility such as Eskom is debatable.

However Eskom has substantial bargaining power when it comes to electricity rebates Should Eskom align itself with the water and transport authorities, there is no reason why big business could not be encouraged to locate outlets, branches and particularly manufacturing sites close to rural settlements. The benefit of big business locating in close proximity to the rural townships can be explained by the multiplier effect, as described by Van Gas (1993). Employees will have greater purchasing power to purchase appliances and electricity, which will in turn create a demand for appliance retailers who will also generate higher buying power. The linkages are not only forward, but backward linkages are also possible, for example food outlets to feed the workers at meal times, the suppliers of uniforms and overalls and the taxi services will all receive an economic boost in servicing the new "big business" and its employees. It is also not inconceivable that smaller businesses would collect around the larger in order to supply component parts, which in itself will create jobs and initiate a multiplier effect.

It is understood that the stimulation of local business alone will not significantly contribute to the growth of the local economy, unless local services are exported to the broader economy. Kinsey (1988) claims that Malaysia is experiencing growth because their businesses have become export orientated. This principle is also true on a local scale. By servicing the wider community funds will be injected into Frischgewaag. This growth can be facilitated by the introduction of big

business into Frischgewaag. The local industries will improve their economies of scale by servicing these businesses, thereby becoming more competitive on a national scale. Kinsey (1988) claims that the production for the local market can only be maintained by exporting to the overseas market.

Kotler (1986) describes how Japan encourages the progress of Big Business. The government targets what it perceives to be a critical industry to the overall success of the economy. The government then makes an in-depth analysis of the industries strategic requirements. Funding is provided by the Japanese Development Bank, new technologies are purchased from abroad, tax incentives, infrastructural support, administrative guidance and trade barriers are offered to the respective businesses in the strategic industrial sector.

Kotler (1986) ascribes the success of the Japanese economy to the partnership between government and business. In South Africa it is suggested that government policy be directed at forming a similar partnership with South African industry in an attempt to develop the entire economy. The temptation exists to focus direct government spending on the underprivileged sectors of the community. Following the example of the government that rebuilt Japan, it is suggested that direct government spending in the underprivileged sectors should be balanced with spending on big business. An investment in the business /

government relationship, if it were strategically directed, would multiply the efforts of the rebuilding of the underdeveloped sectors of the economy. Using Frischgewaag as an example, industries that could be approached in this regard could be in the timber sector, eg: door manufacturers, furniture manufacturers or even leather industries that use bark extract for tanning. The prospect of big large industries moving to Paulpietersburg (the town closest to Frischgewaag) are not as remote as one might have thought, because Paulpietersburg is the centre of a thriving forestry industry. Furthermore, Frischgewaag is situated on the major coal line from the Reef which is equidistant from the export market of Richards Bay and the P.W.V market. The desired end-state would be an industrial sector, both within and without the metropolitan areas, which does not drain the public purse, but instead whose assistance builds the economy. Kinsey (1988) claims that this is what has eventuated in South Korea and Taiwan.

5.5.4.2 TO ENCOURAGE FOREIGN INVESTORS INTO THE REGION

The strategies for the relocation of local business and the introduction of international investors are based on the premise that the stimulation of the rural economy will alleviate the problems of urbanisation, as well as contribute to the economic development of the region. The net result will be the increased usage of infrastructural and community services.

This in turn will increase the likelihood of making these investments financially more viable.

The added advantage of the introduction of foreign business into rural areas is the positive effect this would have on the balance of payments, technology transfer and the exposure of local industries into international markets.

Kinsey (1988) claims that an essential element for the technology transfer and industrial development is the introduction of foreign business into the local economy.

If South Africa were to look at the Japanese model, the introduction of foreign investors would need to be balanced against selective protectional policies (Kotler 1986). While such policies have historically been employed in South Africa, they have centred around securing South Africa's primary and secondary product markets and have done little to promote the local production of highly technical goods.

Eskom already has the international publicity network in place to step up South Africa's involvement in securing foreign investment. The programme for Frischgewaag would necessitate a regional co-ordinator for the region to ensure the international exposure of the area. It is evident from the influx of Eastern manufactures in the Newcastle

vicinity (approximately 130 km from Frischgewaag), that this approach is a viable one. To support this initiative, pressure would need to be levied on the government in regard to its treatment of foreign investors. During the short time that the new government has been in power the international confidence index has lifted significantly. This augers well for investment from companies from abroad who were inhibited from investing in South Africa due to the pressure of sanctions.

5.5.4.3 THE STIMULATION OF THE INFORMAL SECTOR

The reason that local industry should be stimulated is obvious from the trends that were uncovered by the Frischgewaag survey. Small business boomed as a result of electrification (section 3.1.1.). The results showed that the boom was initiated by electrification and that the potential to start a small business was by no means saturated. Twenty seven percent of the households interviewed in Frischgewaag said that they intended to start a small business.

The reasons residents that Frischgewaag residents stated for not starting a business were recorded in section 3.1.1. Based on these results the strategies to promote the small business sector have been put forward. (The classification of small business encompasses the informal sector as well as organised business). The "Institute of Future Research" (1993) in Stellenbosch estimates that there are 12 million economically active

people in South Africa, that there are 7,7 million people currently working full-time, which leaves S.A. with 4,3 million jobless people, but a significant portion of these unemployed are currently running their own businesses.

The reason that the informal sector contributes to the long term success of electrification is not only due to the units of electricity that the small businesses consume. The income generated and the wages paid by the small business sector result in a greater disposable income for those employed in this sector. Furthermore, the establishment of small business lends itself to the stimulation of further business. A small block-making business does not normally have the financial capacity to vertically integrate deliveries on an informal scale. Instead a villager with a truck will deliver blocks at a fee, thereby creating another small business. The stimulation of informal business also has socio-political benefits. Crime diminishes and unemployment rates decline, as too do health problems, in proportion to the population's access to medicine which is made possible in a developing economy (section 3.2.3).

On a more practical level the following initiatives have been highlighted by the opinion leader survey in Frischgewaag. The community has asked Eskom to train an electrician in the town to wire houses. Currently, the wiring of a house is left to the resources of the home owner. By equipping a local entrepreneur as an electrician, more

extensive use of electricity will be encouraged in the home as it will be more readily available. There is a direct correlation between the extent of wiring in the home and the amount of power consumed (section 3.5.2). Further-more a team of wiremen could expand their business, based on the leverage this initiative would give them.

A further need which has been cited is the existence of an appliance repair shop in Frischgewaag. This would necessitate an electrician who could refurbish broken appliances. This would open new possibilities for retailers, auctioneers and component part suppliers, and ultimately might lead to the production of low cost appliances. The electrician and the appliance refurbisher could both receive inhouse training from Eskom at very little expense, as Eskom has extensive training facilities in place already. Kinsey (1988) suggests that training and technical development centres are needed to match the needs of the small firms to new technologies.

Morris (1992) claims that businesses interested in moving their product through townships should conduct retail seminars for all the retail dealers, on how to run their businesses more efficiently.

Scott-Wilson (1990) reports that Gilbey's have recently opened a depot near Soweto to cater for "call and collect" customers only. This is an example of a private enterprise developing black entrepreneurs while

simultaneously capitalising on a market opportunity. Businesses that do not consume electricity should not be dispelled from the equation either. This is because of the ripple effect of extended economic activity: for example a business using manual knitting machines could progress to the electric equivalent, then include sewing machines and ultimately become a fully automatd production line.

Similarly, the support of taxi drivers will increase the demand for panel beaters and petrol stations etc. Scott-Wilson (1990) refers to Eddison Spares Shop in Pretoria which completely dominates the trade to the taxis in that area.

The view of stimulating the informal sector needs to extend beyond a 'myopic' short term view, to the potential long term effects a developed economy may have for the electricity utility. Based on the transition model, it is evident that modernization is a key to electrification. The fastest way to modernisation is empowerment, and empowerment comes from an individuals capacity to control his own destiny, not only from his capacity to consume electricity in the short term.

How these initiatives are to be achieved is fundamental to the success of this strategy. Internally, Eskom needs to expand the function of the service centre depots which service each rural project. There are marketing orientated managers at these centres who need to be

empowered to initiate the changes discussed in this chapter. Mechanisms of financing for rural customers (be it through finance houses or internally) need to be in place. The facilitation of new small business activities (as done by SBDC) needs to be fostered in these areas. Training schemes could be provided and assistance with franchise-type marketing could be explored. In fact the goal for the region should be to make it a net exporter of consumable goods. The accent should be on empowerment of the people, on allowing them to drive the projects and to eliminate the barriers to communication, which stand in the way of economic progress in the region. These programmes should not be "hand-outs" they need to be autonomously viable ventures. The qualification for the aid given should be not so much the extent of electricity usage, but rather the Long-term financial viability of each project. The multiplier effect will ensure a further spin-off in the long-term and result in increase in electricity sales.

Whether the Eskom official takes responsibility for each project, or whether he is a facilitator in the process between other institutions (including government), would depend on the extent of the exercise. Scott-Wilson (1990) says that stimulating the informal sector often requires a peculiar approach, both in terms of product offered and means of distribution. It does not necessarily need to be seen as an alternative to the formal sector as both can grow organically alongside each other creating further opportunities.

5.5.4.4 EDUCATION AND TRAINING

Leaders in Japan regard education and training as a pillar behind the success of that country. Training is regarded as essential for development. Employees are encouraged to move from one division to another in Japanese firms. Training is used as a motivation tool (Kotler 1988).

The South African education system, consistent with other facets of the apartheid society, has historically been segregated. Dr H.F. Verwoerd, Minister of Native Affairs, on 7 June 1954 said "My department's policy is that education should stand with both feet in the reserves and have its roots in the spirit and being of Bantu society." (International Defence and Aid fund 1991). For the long term development of every sector in the South African economy, education is pivotal.

Eskom's investment in education and training thus far has been the partial electrification of some schools. Incentives for bursaries in each community, as well as the possibility of Eskom's human resource department's assisting with career guidance will do much to alleviate the much feared threat of unemployment. Morris (1992) suggests that factory site visits for children have the two-fold effect of creating brand loyalty and aspirations in the children to learn.

The investment in education might stimulate migration to the major centres, but it will also ensure the advancement of the local community, increase the development of the informal sector and contribute to the process of modernisation, which ultimately will lead to the energy transition from organic fuels to electricity (section 5.4.2).

The adult education programme at Frischgewaag is a step toward the enlightenment of the community. Eskom's involvement in such programmes could give added impetus to their success.

The investment in education has slow returns, but its effects are evident in the long run. Dingley (1990) believes that in the long run electrification brings higher literacy levels, lessens political tensions related to large disparities in wealth, and reduces the birth rate.

The case study of Orange Farm school (Transvaal) has received international attention. The community project, driven by a local entrepreneur, has turned the school at Orange Farm into a multimillion rand business. The school provides almost every service that the community is in need of: from cripple-care to taxi services, from dress design to building contracting. The school project has been a driving force behind the modernisation of that community.

The level of education in Orange Farm is exceptional when compared to other township equivalents, but more importantly the lessons in the classroom are being practised in the community. The progress at Orange Farm, if emulated elsewhere, could stimulate rural economies.

5.5.4.5 THE EMPOWERMENT OF TOWN COUNCILS

Frischgewaag has a spokesman, a Kwa-Zulu government official, a chief and a NPA official. Given the tribal customs of the local population and the continued Kwa-Zulu authority structure, the people still do not have the franchise to effect changes in their community. The chief's authority is limited mainly to judicial disputes that do not warrant formal litigation. The Kwa-Zulu spokesman represents the community on a regional basis, but there is no active body to whom the people can address complaints, ideas and look to for substantial assistance.

A council, compatible with the local culture, needs to be formed. This council needs the mandate of the people, the recognition of regional government and the assistance of support groups such as infrastructural utilities and "big business". The anticipated local government elections in 1995 should create such a body, provided that the elections are unilaterally accepted.

Eskom has traditionally played the role of placating the traditional authority structures, but has rarely become involved in extending their franchise. If a representative council of this nature existed in Frischgewaag it could be a means to effect significant change. Eskom would not need a large team to implement these strategies. A facilitator would be required to enlighten the council and maintain the process of initiation and development. A forum such as this could be a source of pooled ideas and a means to communicate to the public. Where these councils do exist in other communities, their franchise needs to be extended by assisting them in affecting meaningful change, which will enhance their credibility in the eyes of the community.

These strategies have an accent on facilitation; they should not implicate Eskom field managers in local government affairs. What is required is the whole-hearted support of Eskom through local authority structures, so that the change in the local context can be affected by the community itself.

5.5.4.6 TO COMPLETE ELECTRIFICATION PROJECTS

Once the electrification of an area is decided upon the maximum number of household units in that area need to be electrified. Marais (1993) reports that electrification is sensitive to economies of scale. It costs significantly less to connect every additional consumer (ie: the marginal

cost of connection decreases with every connecition. It might seem an obvious point, but the return on investment on every additional connection is significant. In other words, the extension of existing networks is a more cost effective allocation of resources than the electrification of a new township.

In areas where the cost of the extension of the National electricity grid would not be recoverable even under the most optimistic consumption scenarios, local power generation should be explored. These techniques are used extensively in India and China to great effect (Sinha 1991).

Eskom need not discount the possibility of electrifying remote areas. Fossil fuels, hydro power and other alternate energy sources could be employed to generate electricity prior to the arrival of the national grid. In this way the consumption rate and the electrical network would be significant when the national grid finally arrived in the area. This could conceivably make rural electrification in remote areas a more viable option.

5.5.4.7 RESEARCH AND DEVELOPMENT OF APPROPRIATE TECHNOLOGY

Eskom has already instituted the functioning of a test and demonstration centre in the MidRand for electro-technologies. Added impetus needs to be given to the research of new ideas in electrical appliances. A mechanism needs to be in place where the ideas from the communities themselves find their way to these facilities.

A product which is named and tailor designed by a community is more likely to be accepted by that community (Marais 1993). Further-more, it will lend itself to the possible manufacture of that product by that community.

The electricity card dispenser and the electricity meter constitute the visible component of the product offering to the Frischgewaag consumer. It is important that these components be continually updated to meet customer expectations and demands. In the future if modernisation takes its course the meters could be linked to ATM's which would vastly improve the billing systems in the areas and reduce administrative costs.

The continued investment into the research and development of technology in rural areas will help secure the long term viability of the rural electrification projects.

5.5.4.8 TO FACILITATE THE PROVISION OF INFRA-STRUCTURAL AND OTHER SERVICES IN AN INTEGRATED MANNER

This strategy aims at a restitution of the imbalances created by the political history of South Africa. Rural townships and informal settlements have been seriously neglected with regards to infrastructure and other services. Du Toit (1992) suggests that the technological infrastructure of a country is a key to its survival in the modern world, and access to electricity is a key requirement for a developed, technological infrastructure.

The provision of infrastructural services should not be seen as an end in themselves. Instead they should be seen as a contribution to the process of modernisation which will ultimately lead to increased electricity consumption. Furthermore, the provision of these services should also provide jobs in the short-term. In the building of roads, the provision of a telephone network or the building of hospitals the possibility exists for the creation of numerous jobs.

The way that infrastructural services are delivered will to a large extent be determined by the service-rendering organisations. Eskom might be able to operate joint ventures in billing systems and the building of community centres. Service rendering organisations (such as Telkom, Umgeni and Eskom) currently work independently,. If they focused their efforts through integrated strategies, they could make a significant socio-economic impact on the community.

Included in this category would be the extension of the service that Eskom already provides. Frischgewaag has no street lighting of any kind. The lighting of streets and bus shelters, if handled correctly could both assist in cost justifying the project as well as upgrading the area.

Kinsey (1988) suggests that special institutions should be established in townships which specialise in the financing of small businesses. Alternatively, commercial banks could be sustained in areas such as Frischgewaag, particularly if packages were structured to meet the needs of these types of communities. Section 3.1.6 covered the savings patterns of the Frischgewaag community and it is evident that commercial banks are not yet active in this township.

5.5.4.9 TO INITIATE HOUSING DEVELOPMENTS

Listed as top priority in the ANC's "Reconstruction and Development Programme" (1994), the provision of suitable housing is likely to receive

both regional and local government backing. Funding is likely to come from private developers, the state and from community members themselves. Whatever the financial arrangements, Eskom would do well to endorse such schemes. In fact in areas such as Frischgewaag, Eskom might need to actively initiate the building of houses through the required channels.

Once the projects are tabled it would be highly beneficial to Eskom to have reticulated water system to all the houses. It may be necessary to work through joint ventures with water supply authorities in order to achieve this. Water reticulation will facilitate the installation of geysers and other water heating systems. This will obviously increase electricity consumption as houses with water-heating systems consume up to 1,5 times that of homes without (Thorn et al. 1992).

By involving themselves from the inception stage of the projects, Eskom could counter the problem of the communities' lack of finance for the purchase of capital goods, as the cost of the geysers could be included in the cost of the houses. Furthermore, if the houses were more extensively wired than the elementary distribution board, wider use of electrical appliances would be encouraged.

Housing schemes are not common in rural areas, it might therefore be necessary to motivate these schemes from the highest levels. Again the misconception regarding the unchangeable fate of a subsistence rural person will need to be dispelled. Through the restitution of infrastructural services, through adequate funding and support, together with a concerted local effort to generate wealth, rural communities may progress economically.

5.6 PRACTICAL IMPLEMENTATION

5.6.1 THE STATUS QUO

As it stands the electrification of the township of Frischgewaag falls under the jurisdiction of the Eskom Depot at Paulpietersburg, some 15km away. The Eskom electrician (P. Mabizela) and a few assistants constitute the construction crew, under the guidance of the Paulpietersburg depot supervisor and an officer licensed to work on high voltage lines.

The applications for electricity connections are handled by the Paulpietersburg Depot as well as by a representative (S. Dlamini) from Eskom's Newcastle district office. The sale of appliances is also under the auspices of the district office. Their effort is heavily supported by the regional marketing team in

Durban. It is the Durban office which liaises with the suppliers of white appliances and organises trade shows etc. (See Diagram 4).

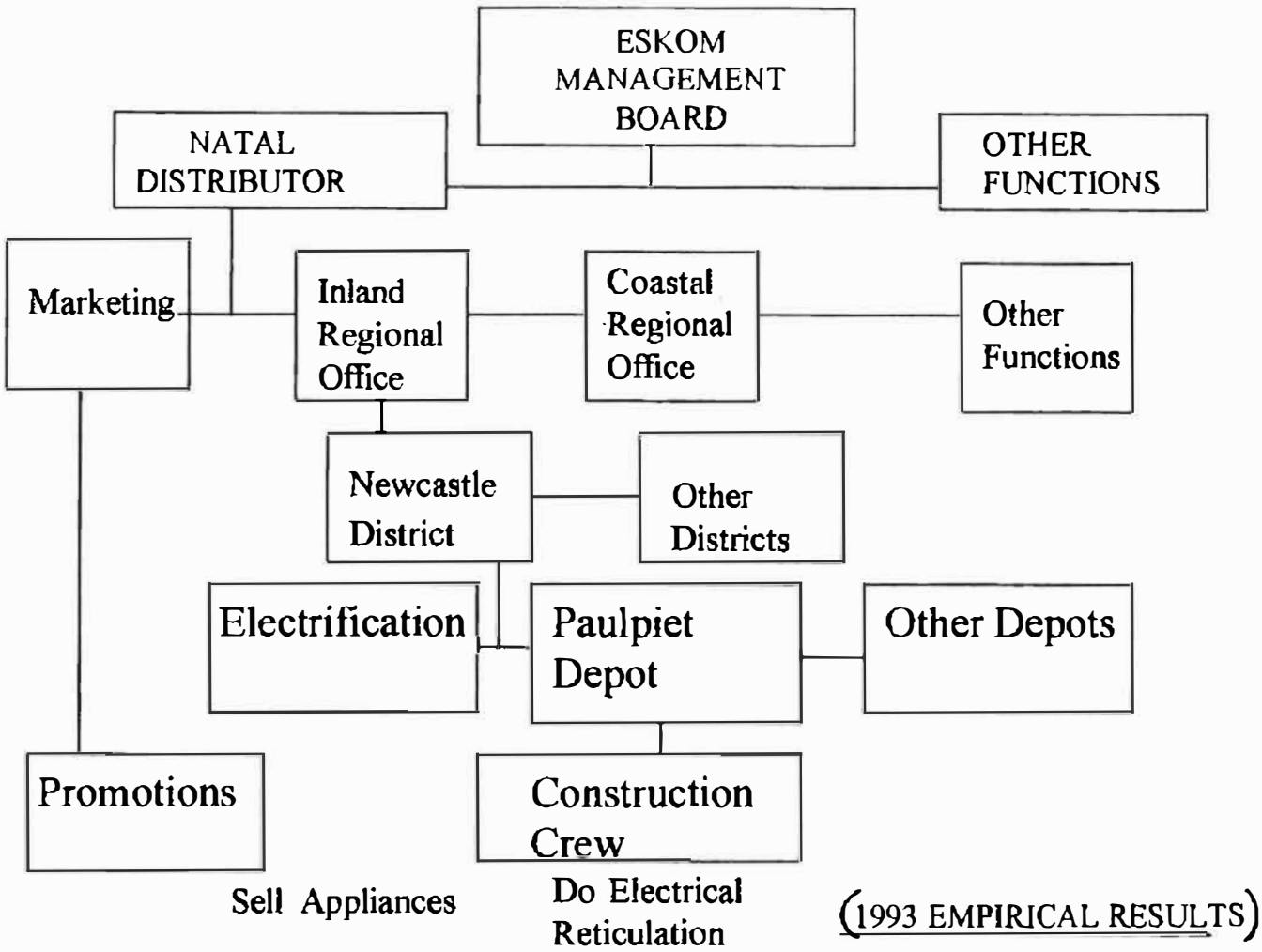


DIAGRAM 4: Eskom's Marketing Structure

5.6.2 POSSIBLE STRUCTURAL AMENDMENTS

In order to implement the short-term strategies (tabled in this report) the current system appears to be functional. However, the implementation of an integrated development plan which will ensure the execution of long term strategies will require a focused structure with clear lines of accountability.

One of two scenarios could be adopted. Firstly the regional marketing team could assume responsibility for both the long and short term strategies and have an office placed in every rural township (or cluster of rural townships) which would be co-ordinated by regional marketing staff. The function, (as opposed to the Depot staff's electrical, maintenance and connection function) would be to implement the aforementioned strategies.

Alternatively, the responsibility for strategy - implementation could belong to the district. With the regional marketing team co-ordinating the entire operation and lending the required negotiation skills and macro-planning when necessary.

5.6.3 IMPLEMENTATION POLICIES

The following policy statements are derived from the results of the empirical survey in 1993. If adhered to they could go a long way toward facilitating the successful implementation of the marketing strategy outlined in section 5.5.

5.6.3.1 COMMUNITY LEADER ENDORSEMENT

The community leaders need to buy into the goals, strategies and methodologies of the marketing plan.

5.6.3.2 COMMUNITY INVOLVEMENT

The actual formulation of the strategies needs to be done, as far as possible, by the community.

5.6.3.3 THE ESKOM OFFICER'S ROLE IS ONE OF "FACILITATOR"

The Eskom officers need to work within the framework of recognised and legitimate authority structures.

5.6.3.4 LOCATION OF THE SERVICE CENTRE

The Eskom office needs to be in the township which has been electrified, as there needs to be a ready and efficient service on hand. The service centre in the town also adds value to the product which is essentially an intangible one.

5.6.3.5 INTEGRATED STRATEGY

On a regional level other major players, eg water suppliers, Telkom and transport suppliers need to endorse the principles of integrated development. This will legitimize the efforts of the marketing staff on the ground.

5.6.3.6 THE FOCUS MUST BE COMMUNITY DEVELOPMENT

The long-term focus must be development, while the short-term focus needs to be on the increase of sales. But the latter must not be allowed to cloud the former.

5.6.4 CONTROLS

It is essential that the process of strategy implementation is monitored. Adequate and efficient software should characterise operations, and control systems need to be in place to monitor the effectiveness of each marketing strategy. To this end the capital costs and running costs of each rural electrification project need to be compared to the short term revenue generated from the township, and some value needs to be attributed to the long term effects of the initiatives directed at the broader economic development.

If the programme is truly an integrated one there should be a sharing of information which would assist in the monitoring of the success of the entire marketing plan.

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SECTION 6
CONCLUDING REMARKS

SECTION 6: CONCLUDING REMARKS

Eskom is caught between the need to operate a profitable business and the demands of a recently liberalised society. The SACOB report (1993) cites the electrification of all South African homes as an objective of the RDP. While the electrification of urban homes can be justified with a reasonable return on investment, this is not the case with rural electrification projects (Development Bank 1993).

Abratt (1987) acknowledges the responsibility that business has to society, but claims that this in no way denies the right of a business enterprise to ensure its long term survival and profitability. Holding this assumption, this paper attempts to make a contribution toward the profitability of the rural electrification programme in South Africa. First the impact that rural electrification has had on rural societies was assessed. The results gleaned from this assessment thus form the bases of a marketing plan which is designed to stimulate the demand for electricity.

The paper consists of five sections. Section one outlines the fundamental issues at stake. It provides an international, national and local township backdrop to the discussion. Section two describes how Frischgewaag was chosen to be the focus of an empirical research survey. Section two also details the methodology employed in this research exercise. Section three tables the results of the empirical survey. Section four draws conclusions from the results and highlights salient variables in the South African context which have a

direct bearing on the profitability of rural electrification programmes. Section five provides a marketing plan designed to increase the profitability of the rural electrification programmes. The proposals are aimed at the short-term stimulation of electricity demand as well as the long term development of the region. (Holding the assumption that long term economic growth will increase the base-load demand for electricity in rural areas).

Eskom is one of the many service providers who are caught in the dilemma between long-term corporate profitability and societal demands. It is possible that the recommendations in this paper might also be relevant to service providers other than Eskom.

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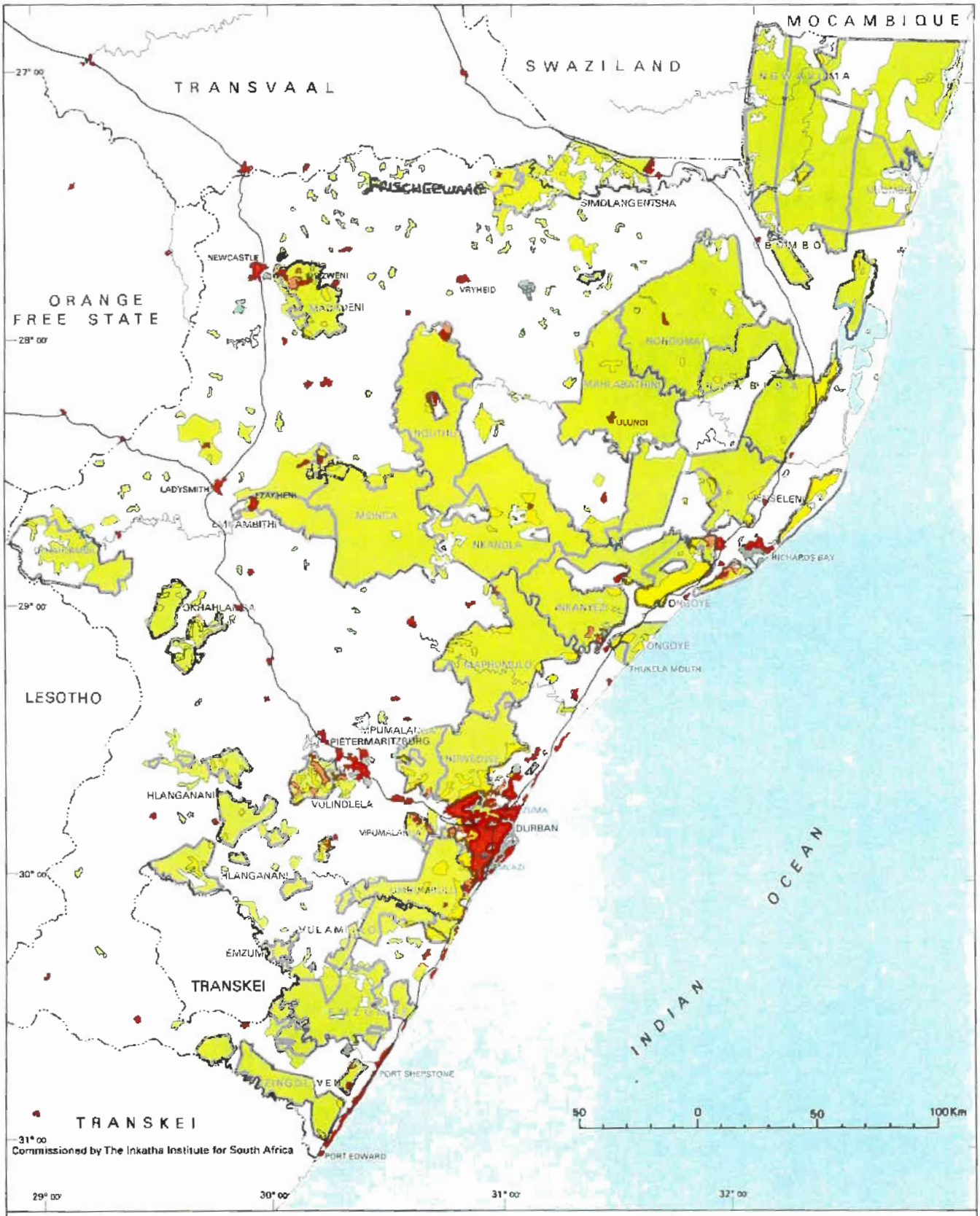
SECTION 7
APPENDICES

APPENDIX 'A'

MAP SHOWING LOCALITY OF FRISCHGEWAAG

GENERALISED MAP OF SETTLEMENT DISTRIBUTION IN KWAZULU / NATAL



Commissioned by The Inkatha Institute for South Africa

Compilation by the Air Survey Co. of Africa Ltd.: December 1987

Photography: Job Sur 100/86 April-July 1986 Survey and Mapping Division Department For Works Kwa Zulu Government

Information From Official Maps Reproduced Under Government Printer's Copyright Authority 8680 of 21 April 1987

Consultant: Professor D.A. Scogings

Source: 1 : 250000 Map Series "Preliminary Mapping Of Settlement Distribution Kwa Zulu /Natal"

SETTLEMENT TYPES

- Formal Urban
- Dense Informal
- Transitional Rural to Urban
- Rural
- Farmlands and scattered rural

To supplement information on this map, refer to explanatory notes obtainable from The Inkatha Institute For South Africa

APPENDIX 'B'

QUESTIONNAIRE USED IN INTERVIEW

DEBRIEFED BY: .....CODING CHECKED BY : .....

EDITED BY: .....CONSISTENCY CHECKED BY : .....

CODED BY: .....EDITING CHECKED BY: .....

NAME OF RESPONDENT .....

ADDRESS .....

.....

.....

TELEPHONE NUMBER (H) ..... (W) .....

INTERVIEWER'S NAME .....( ) (5)

INTRODUCTION AND FILTER QUESTIONS

1. Hello. My name is ..... I work for Eskom.
We are conducting a survey and I wonder if I might ask you a few questions.
It will take about 20 minutes.
Are you willing to participate?

1. Sawubona. Igama iami ngingu .....
Ngisebenzela iEskom. Senza uncwaningo ngezezimakethe. Manje bengithanda ukukubuza imibizo, mhlalwumbe izothatha imizuzu eyi 20. Ngabe kulungile?

IF NO OR IN DOUBT, CLOSE THE INTERVIEW

2.a Are you the head of the household?

YES	-1	GO TO Q.2d
NO	-2	ASK Q.2b

2.b Does the head of the household live at home?

YES	-1	MAKE ARRANGEMENTS FOR INTERVIEW
NO	-2	ASK Q.2c

2.c Who runs the household when the head of the household is not here?

SELF	-1	CONTINUE
OTHER	-2	MAKE ARRANGEMENTS FOR INTERVIEW

INTERVIEWER PLEASE CODE BELOW WHO YOU ARE INTERVIEWING: (6)

HEAD OF THE HOUSEHOLD	-1
SUBSTITUTE	-2

2.d How many people in your household live and work away from home?

NONE	-1	
ONE	-2	(7)
TWO	-3	
THREE+	-4	

3.a What types of income are there for this household?

3.b How much money do you get from each per month?

TYPE	Q3.a (8)	Q.3b AMOUNT	
WAGES	-1	.....	(9)
PENSION	-2	.....	(10)
DISABILITY	-3	.....	(11)
SALARY FROM ABSENTEES	-4	.....	(12)
PROFIT FROM OWN BUSINESS	-5	.....	(13)
OTHER (Specify)	-6	.....	(14)
.....		TOTAL	(15)

3.c Which of the following are most important to you? MULTIPLE MENTION ALLOWED

EDUCATION FOR THE CHILDREN	-1	
WATER TO THE HOUSE	-2	
ELECTRICITY TO THE HOUSE	-3	
FINANCIAL SECURITY	-4	(16)
PHYSICAL SECURITY	-5	
AVAILABILITY OF CLINIC	-6	
SPORTS FACILITIES	-7	
STREET LIGHTING	-8	

4.a What sources of energy are you currently using in your home?

ELECTRICITY	-0	
BATTERIES	-1	
CANDLES	-2	
COAL	-3	
GAS	-4	(17)
GENERATOR	-5	
PARAFFIN	-6	
SOLAR-ELECTRIC POWER	-7	
WOOD	-8	
OTHER (Specify)	-9	

4.d ASK FOR EACH SOURCE OF ENERGY USED

How much do you spend in an average month on each of the following: READ OUT EACH SOURCE OF ENERGY ONE BY ONE.

AMOUNT SPENT	BATTERIES (20)	CANDLES (21)	COAL (22)	GAS (23)	GENERATOR (PETROL) (24)	PARAFFIN (25)	WOOD (26)	ELECTRICITY (27)
R 1 - R 5 PER MONTH	-01	-01	-01	-01	-01	-01	-01	-01
R 6 - R10 PER MONTH	-02	-02	-02	-02	-02	-02	-02	-02
R11 - R 15 PER MONTH	-03	-03	-03	-03	-03	-03	-03	-03
R16 - R20 PER MONTH	-04	-04	-04	-04	-04	-04	-04	-04
R21 - R25 PER MONTH	-05	-05	-05	-05	-05	-05	-05	-05
R26 - R20 PER MONTH	-06	-06	-06	-06	-06	-06	-06	-06
R31 - R35 PER MONTH	-07	-07	-07	-07	-07	-07	-07	-07
R36 - R40 PER MONTH	-08	-08	-08	-08	-08	-08	-08	-08
R41 - R45 PER MONTH	-09	-09	-09	-09	-09	-09	-09	-09
R46 - R50 PER MONTH	-10	-10	-10	-10	-10	-10	-10	-10
R51 - R55 PER MONTH	-11	-11	-11	-11	-11	-11	-11	-11
R56 - R60 PER MONTH	-12	-12	-12	-12	-12	-12	-12	-12
R61 - R65 PER MONTH	-13	-13	-13	-13	-13	-13	-13	-13
R66 - R70 PER MONTH	-14	-14	-14	-14	-14	-14	-14	-14
R71 - R75 PER MONTH	-15	-15	-15	-15	-15	-15	-15	-15
R76 - R80 PER MONTH	-16	-16	-16	-16	-16	-16	-16	-16
R81 - R85 PER MONTH	-17	-17	-17	-17	-17	-17	-17	-17
R86 - R90 PER MONTH	-18	-18	-18	-18	-18	-18	-18	-18
R86 - R90 PER MONTH	-19	-19	-19	-19	-19	-19	-19	-19
R91 - R100 PER MONTH	-20	-20	-20	-20	-20	-20	-20	-20
R101 - R105 PER MONTH	-21	-21	-21	-21	-21	-21	-21	-21
R106 - R110 PER MONTH	-22	-22	-22	-22	-22	-22	-22	-22
R111 - R114 PER MONTH	-23	-23	-23	-23	-23	-23	-23	-23
R115 + PER MONTH	-24	-24	-24	-24	-24	-24	-24	-24
DON'T KNOW/NOT SURE	-25	-25	-25	-25	-25	-25	-25	-25
NONE/NOTHING	-26	-26	-26	-26	-26	-26	-26	-26

4.e I am going to read you a list of statements about different forms of fuel used for heating, lighting and cooking. Please would you tell me which of these forms of fuel, in your opinion, is the best described by each statement. You may mention as many or as few as you like as being suited to each statement. Which of these forms of fuel...?

27/28	COAL	ELECTRICITY MUNICIPAL/ESKOM	ELECTRICITY OWN GENERATOR	PARAFFIN	WOOD	GAS	NONE DON'T KNOW
1. Cooks quickly.	-1	-2	-3	-4	-5	-6	-7
2. Is clean.	-1	-2	-3	-4	-5	-6	-7
3. Has many uses.	-1	-2	-3	-4	-5	-6	-7
4. Is easy to use.	-1	-2	-3	-4	-5	-6	-7
5. Is safe.	-1	-2	-3	-4	-5	-6	-7
6. Saves time.	-1	-2	-3	-4	-5	-6	-7
7. Is economical.	-1	-2	-3	-4	-5	-6	-7
8. Is easily available.	-1	-2	-3	-4	-5	-6	-7
9. Is my kind of fuel.	-1	-2	-3	-4	-5	-6	-7
10. Lasts a long time.	-1	-2	-3	-4	-5	-6	-7
11. Has a bad smell.	-1	-2	-3	-4	-5	-6	-7
12. Is expensive.	-1	-2	-3	-4	-5	-6	-7
13. Is dangerous.	-1	-2	-3	-4	-5	-6	-7
14. Is not easily available	-1	-2	-3	-4	-5	-6	-7
15. Is modern.	-1	-2	-3	-4	-5	-6	-7
16. Is not healthy.	-1	-2	-3	-4	-5	-6	-7
17. Is best for cooking.	-1	-2	-3	-4	-5	-6	-7
18. Gives the best light.	-1	-2	-3	-4	-5	-6	-7
19. Is the best for heating the house.	-1	-2	-3	-4	-5	-6	-7
20. Is not safe for children.	-1	-2	-3	-4	-5	-6	-7
21. Makes life more comfortable.	-1	-2	-3	-4	-5	-6	-7
22. The one I would like but will never have	-1	-2	-3	-4	-5	-6	-7

4.f What appliances do you currently own? READ OUT IF NECESSARY FOR EACH MENTIONED IN 9.4f

4.g How does it work?

APPLIANCE	Q4.f (33)	Q4.g GAS	BATTERY (34,35)	COAL	SOLAR	ELECTRICITY
FRIDGE	-1	-1	-2	-3	-4	-5
HEATER	-2	-1	-2	-3	-4	-5
HI-FI	-3	-1	-2	-3	-4	-5
IRON	-4	-1	-2	-3	-4	-5
KETTLE	-5	-1	-2	-3	-4	-5
STOVE	-6	-1	-2	-3	-4	-5
TV	-7	-1	-2	-3	-4	-5
AIRCONDITIONER	-8	-1	-2	-3	-4	-5
FAN	-9	-1	-2	-3	-4	-5
FREEZER	-10	-1	-2	-3	-4	-5
GEYSER	-11	-1	-2	-3	-4	-5
MICROWAVE OVEN	-12	-1	-2	-3	-4	-5
TOASTER	-13	-1	-2	-3	-4	-5
TUMBLE DRYER	-14	-1	-2	-3	-4	-5
VACUUM CLEANER	-15	-1	-2	-3	-4	-5
WASHING MACHINE	-16	-1	-2	-3	-4	-5

5.a Do you receive money from a home business?

YES -1

NO -2

5.b If yes, probe fully.

5.c Do you use electricity in the process?

5.d

BUSINESS		YES	NO
MEAT SALES	-1	-1	-2
LIQUOR SALES	-2	-1	-2
COOLDRINK SALES	-3	-1	-2
KNITTING	-4	-1	-2
SPAZA SHOP	-5	-1	-2
PANEL BEATER	-6	-1	-2
FURNITURE REPAIRS	-7	-1	-2
OTHER	-8	-1	-2
.....	-9	-1	-2
.....	-10	-1	-2
.....	-11	-1	-2
.....	-12	-1	-2
.....	-13	-1	-2
.....	-14	-1	-2
.....	-15	-1	-2

ONLY ASK THOSE WHO ARE SUBSTITUTE HEADS OF THE HOUSEHOLD (CHECK Q.2c)

6.a If you were told you could have electricity for an amount you could afford, would you make the decision, or would you have to speak to your husband and let him make the decision

DECIDE MYSELF -1
HUSBAND WILL DECIDE -2

6.b Does your husband send you money for the household?

YES -1
NO -2 ASK Q6.e

6.c How often does he send you money? READ OUT.

(42)

EVERY MONTH -1
EVERY SECOND MONTH -2
EVERY THIRD MONTH -3
EVERY FOUR TO SIX MONTHS -4
IRREGULARLY -5
WHEN I ASK/IF I NEED IT -6 ASK Q.6d

6.d IF ONLY "WHEN I ASK", SAY:

Under what circumstances does he send you money?

.....

.....

..... (43)

ASK Q6.e

ASK ALL EXCEPT PEOPLE WHO RECEIVE MONTHLY (Q.6c)

6.e You say that you don't receive money every month from your husband, how will you be able to pay for electricity? Where will you get the money from? PROBE FULLY

.....

.....

.....

..... (44)

GO TO Q.7

ASK PEOPLE WHO RECEIVE MONTHLY (Q.6c)

6.f How do you pay for electricity? Where do you get the money from? PROBE FULLY.

.....

.....

.....

..... (45)

8.a Of the following appliances, which ones do you own?

8.b Of the ones that you don't have, how long will it be until you get one?

MONTHS	FRIDGE	HEATER	IRON	KETTLE	STOVE	URN	2 PLATE
8A 8B	-1	-2	-3	-4	-5	-6	-7
1 - 3 MONTHS	-1	-2	-3	-4	-5	-6	-7
4 - 6 MONTHS	-1	-2	-3	-4	-5	-6	-7
7 - 9 MONTHS	-1	-2	-3	-4	-5	-6	-7
10 -12 MONTHS	-1	-2	-3	-4	-5	-6	-7
13 - 15 MONTHS	-1	-2	-3	-4	-5	-6	-7
16 - 18 MONTHS	-1	-2	-3	-4	-5	-6	-7
LONGER THAN 18	-1	-2	-3	-4	-5	-6	-7

8.c What room do you have the following appliances in?

APPLIANCE	BATHROOM	KITCHEN	BEDROOM	LOUNGE	DININROOM	OUTSIDE	OTHER
AIRCONDITIONER	-1	-2	-3	-4	-5	-6	-7
FAN	-1	-2	-3	-4	-5	-6	-7
FRIDGE	-1	-2	-3	-4	-5	-6	-7
FREEZER	-1	-2	-3	-4	-5	-6	-7
GEYSER	-1	-2	-3	-4	-5	-6	-7
HEATER	-1	-2	-3	-4	-5	-6	-7
HI-FI	-1	-2	-3	-4	-5	-6	-7
IRON	-1	-2	-3	-4	-5	-6	-7
KETTLE	-1	-2	-3	-4	-5	-6	-7
MICROWAVE OVEN	-1	-2	-3	-4	-5	-6	-7
STOVE	-1	-2	-3	-4	-5	-6	-7
TV	-1	-2	-3	-4	-5	-6	-7
TOASTER	-1	-2	-3	-4	-5	-6	-7
TUMBLE DRYER	-1	-2	-3	-4	-5	-6	-7
VACUUM CLEANER	-1	-2	-3	-4	-5	-6	-7
WASHING MACHINE	-1	-2	-3	-4	-5	-6	-7
LIGHTS	-1	-2	-3	-4	-5	-6	-7
OTHER	-1	-2	-3	-4	-5	-6	-7

10.a What other electrical appliances would you save money for in the future?
DO NOT PROMPT

	(63)
AIRCONDITIONER	-01
FAN	-02
FREEZER	-03
FRIDGE	-04
GEYSER	-05
HEATER	-06
HI-FI	-07
IRON	-08
KETTLE	-09
MICROWAVE OVEN	-10
STOVE	-11
TV	-12
TOASTER	-13
TUMBLE DRYER	-14
VACUUM CLEANER	-15
WASHING MACHINE	-16
OTHER	-17

10.b Where will you save this money?

	(64)	
BANK	-1	--- GO TO Q.12
AT HOME	-2	
COMMUNITY SAVINGS SCHEME	-3	ASK Q.10c
OTHER (Specify)	-4	GO TO Q12

.....

10.c Which community savings scheme? How does it work?

..... (65)

12.a Does any member of your family carry out any business activity at home?

YES	-1	ASK Q.12b (69)
NO	-2	GO TO Q.12d

12.b What sort of business?

.....

..... (70)

12.c Would electricity be useful in this business?

	YES	-1	
GO TO Q.12f	NO	-2	(71)

IF NO IN Q12a, ASK:

12.d Have you ever thought of starting a business from home?

	YES	-1	GO TO Q.12e
	NO	-2	GO TO Q.12f (72)

IF YES, ASK:

12.e Why haven't you started a business?

..... (73)

ASK ALL:

12.f Would anyone in your family start a business if electricity were available? (74)

YES	-1	ASK Q.12g
NO	-2	GO TO Q.13

12.g What sort of business would they start?

..... (75)

13.a Now that electricity has come to your area what questions do you have?

..... (76)

15. Where do you buy your groceries from that you need on a daily basis like milk, bread etc.? PROBE FOR NAME OF STORE.

.....

16. Who did the wiring of your house?

ESKOM	-1
SELF	-2
CONTRACTOR	-3
FRIEND	-4
OTHER (Specify)	-5

.....

17. How is your house wired?

ROOM	EXTENSION CORD	NO WIRING	SURFLEX	CONDUITING
KITCHEN	-1	-1	-1	-1
LOUNGE	-2	-2	-2	-2
BEDROOM	-3	-3	-3	-3
DINING ROOM	-4	-4	-4	-4
BATHROOM	-5	-5	-5	-5
OUTSIDE	-6	-6	-6	-6

DEMOGRAPHICS AND LIFESTYLE

18. SIZE OF HOUSEHOLD

2 OR LESS	-1	
3 - 4	-2	
5 - 6	-3	(84)
7 - 8	-4	
9 - 10	-5	
MORE THAN 10	-6	

18.a HIGHEST EDUCATION LEVEL OF HOUSEHOLD

NO SCHOOLING	-1	
PART-PRIMARY	-2	
PRIMARY COMPLETE	-3	(85)
PART SECONDARY	-4	
SECONDARY COMPLETED	-5	
POST-MATRIC EDUCATION	-6	

19. OCCUPATION OF HEAD OF HOUSEHOLD

..... (86)

20. NUMBER OF FAMILY MEMBERS EMPLOYED

NONE	-1	
ONE	-2	
TWO	-3	
THREE	-4	
FOUR	-5	(87)
FIVE	-6	
SIX	-7	
SEVEN	-8	
EIGHT	-9	
MORE THAN EIGHT	-10	

21. AGE

Please could you tell me into which of the following groups you fall? You need only tell me the letter of the alphabet corresponding to your age group.
HAND RESPONDENT AGE CARD.

		(88)
A	18 - 24 YEARS	-1
B	25 - 34 YEARS	-2
C	35 - 49 YEARS	-3
D	50 + YEARS	-4

22. MONTHLY HOUSEHOLD INCOME

Please can you tell me into which of the following groups your monthly household income falls. By monthly household income I mean all the salaries of salary earners in your household. You need only give me the letter of the group in which your household income falls. HAND RESPONDENT INCOME CARD.

		(89)
1	UP TO R 399 PER MONTH	-1
2	R 400 - R 699 PER MONTH	-2
3	R 700 - R1199 PER MONTH	-3
4	R1200 - R1999 PER MONTH	-4
5	R2000 - R2499 PER MONTH	-5
6	R2500 - R3999 PER MONTH	-6
7	R4000 - R5999 PER MONTH	-7
8	R6000 + PER MONTH	-8

23.b Which is your nearest town?

BOSTON	-1
BULWER	-2
LADYSMITH	-3
NEWCASTLE	-4
PAUL PIETERSBURG	-5
PIETERMARITZBURG	-6
UTRECHT	-7

24. How often do you visit .....
(nearest town)?

MORE OFTEN THAN FIVE TIMES A WEEK	-1
3 - 5 TIMES PER WEEK	-2
ONCE OR TWICE A WEEK	-3
EVERY SECOND WEEK (TWICE A MONTH)	-4
EVERY THIRD WEEK	-5
ONCE A MONTH	-6
EVERY SECOND MONTH	-7
LESS OFTEN THAN EVERY SECOND MONTH	-8

25. AREA

PEACE TOWN	-1
NKELEBANTWANA	-2
DICK'S HOLT	-3
FRISCHGEWAAG	-4

26. INTERVIEWER PLEASE CODE. 26.

TYPE OF HOUSE

MUD HUT	-1	
CONCRETE BLOCK HOUSE	-2	(94)
BRICK HOUSE	-3	
COMBINATION	-4	

CONDITION OF HOUSE

GOOD	-1	
FAIR	-2	(95)
POOR	-3	
VERY POOR	-4	

NUMBER OF ONE ROOMED DWELLINGS

ONE	-1	
TWO	-2	
THREE	-3	
FOUR	-4	(96)
FIVE	-5	
SIX	-6	
SEVEN	-7	
EIGHT OR MORE	-8	

NUMBER OF TWO OR MORE ROOMED DWELLINGS

ONE	-1	
TWO	-2	
THREE	-3	
FOUR	-4	(97)
FIVE OR MORE	-5	

27. I would like to test your meter to see that it is not broken.

RESEARCHER TO USE TESTING CARD.

RESEARCHER TO CODE

28. Type of Roof?

TIN	-1
TILE	-2
WOOD	-3
GRASS	-4

29. Painted house?

	YES	NO
INSIDE	-1	-2
OUTSIDE	-1	-2

30. Curtains on windows?

YES	NO
-1	-2

31. Lounge Suite?

YES	NO
-1	-2

32. Garden Walling?

WIRE FENCE	-1
HEDGE	-2
WOODEN	-3
CONCRETE	-4
TIN	-5
OTHER	-6

THANK RESPONDENT AND CLOSE INTERVIEW

SIGNED: ..... DATE: .....

I hereby certify that the questionnaire has been filled out according to instructions.

APPENDIX 'C'

METER SPECIFICATION

The Elfa Energy Management System

The Elfa System is primarily designed to dispense electricity and water units on a prepayment basis by means of inexpensive disposable magnetic cards.

In addition, comprehensive reports are generated per customer or for groups of customers. Reports include no purchase/low purchase report, statistical information, purchasing patterns, total sales etc. Data from remote Credit Dispensing Units is communicated to the System Master Station (main computer) and collated to produce a complete data base.

The Elfa range of Energy Dispensers therefore provides a product range specifically designed to operate under the harsh Southern African conditions, whilst meeting international quality standards.

THE MANAGEMENT SYSTEM

Magnetic card systems have been perfected over two decades and the Elfa energy systems are now in service throughout Southern Africa. All the essential customer information such as locality, units used, and financial records are stored on the System Master Station (SMS) PC. The cards are issued at central points and encoded with the necessary information at the time of payment. Thus no cash is handled in the field, and energy data is automatically logged onto the system at source.

The hardware for the energy dispensing system consists of a standard IBM-compatible PC as a System Master Station (SMS) with a report printer and credit dispensing units located at central Points of Sale.

The Credit Dispenser Units (CDUs) may be sited in the same building as the SMS or remotely for customer convenience and afterhours purchasing. CDUs can be connected by telephone modems for a totally integrated management system. Security is maintained through privileged access.

A Checker unit is available at each CDU to ensure the validity of each customer's Mincard after programming. Very little training is required to operate the SMS and CDU equipment, other than the normal tuition required to input data from a standard keyboard.

THE MINCARD

Two types of coding are offered with the Elfa System. Area-coded cards are pre-programmed at our factory for a fixed amount of kWh units in 20, 50 or 100 units. These low-cost cards can only be used once, but used cards can be returned to the factory for reprogramming. Each installation has independently coded area cards to prevent neighbouring installations from using them. This type of coding is suitable for up to 300 - 500 consumers.

Unique cards are required for installations where high security is warranted. The cards are individually coded to operate on a specific Elfa meter. They may be programmed to any value, eg rand and units. These cards, which may not be reprogrammed, are produced by a CDU at the Point of Sale.

Cards are provided for electricity and water units. Separate cards are provided for each function. Each card represents a given number of electrical or water units.

A non-card type meter is under development for use with installations where cardless inputs are preferred. The same Mincerds will carry the encryption number.

THE CHECKER UNIT

A checker unit at each CDU confirms that the data on the Mincard is correct by providing a direct readout on an LCD on the front of the unit, immediately the Mincard is inserted into the slot, and without erasing the information.

The onus is thus on the consumer to ensure that he has just purchased a valid Mincard from the CDU. The Elfa Checker Unit is identical to the Elfa LCD model hardware but uses different software as the card's monetary values are displayed instead of units.

A Checker also has the added advantage of enabling the customer to practice inserting and removing the card, and so instilling confidence in the system.

1 Alternate technology
2 Digital electricity dispenser
3 Digital water and electricity dispenser
4 Customer checker unit