JAPAN INTERNATIONAL COOPERATION AGENCY(JICA)

MINISTRY OF MINES AND ENERGY
REPUBLIC OF NAMIBIA

STUDY
FOR
THE ELECTRICITY MASTER PLAN
IN
THE REPUBLIC OF NAMIBIA

REPORT

MAIN REPORT

SEPTEMBER 1998

EPDC INTERNATIONAL LTD.

YACHIYO ENGINEERING CO., LTD.

PREFACE

In response to the request of the Government of the Republic of Namibia, the Government of Japan decided to conduct the Study for the Electricity Master Plan in the Republic of Namibia and entrusted the Study to the Japan International Cooperation Agency (JICA).

JICA sent a study team led by Mr. Masaomi Matsui of EPDC International Ltd. and organized by EPDC International Ltd. and Yachiyo Engineering Co., Ltd. to the Republic of Namibia five times during January 1997 and July 1998.

In the process of formulating the Master Plan, the team had several times of site surveys and hold a number of discussions with officials concerned in Namibia. It is a pleasure to have got a final report here.

I hope this report will contribute to the development of the country and to the enhancement of friendly relations between the two counties.

I wish to express my sincere appreciation to all the parties concerned for their close cooperation extended during the study.

September 1998

Kimio Fujita
President
Japan International Cooperation Agency

September 1998

Mr. Kimio Fujita
President
Japan International Cooperation Agency
Tokyo, Japan

Dear Mr. Fujita,

Letter of Transmittal

We are pleased to submit to you the report on the Study for the Electricity Master Plan in the Republic of Namibia.

The study was conducted by a joint venture between EPDC International Ltd. and Yachiyo Engineering Co. Ltd., under the direction of JICA, during January 1997 and September 1998. In formation of the master plan, power development programs have been assessed from various viewpoints such as socio-economics, indigenous energy resources, technology, economics, organization and environment. Besides, technology transfer to the MME has been pursued in the course of the study.

The report contains several short, middle and long term power development alternatives, where care was taken to ensure that costs and risks of improved security of supply was carefully evaluated and that Namibia remains competitive in a regional perspective.

We recommend business as usual scenario adopting CCGT (Combined cycle gas turbine) as an optimal solution for power development and the solar cell systems (PV systems) introduction in the dispersed settlements. It is possible that CCGT scenario provide very low electricity prices by international standard and attain the energy policy goal to an acceptable level.

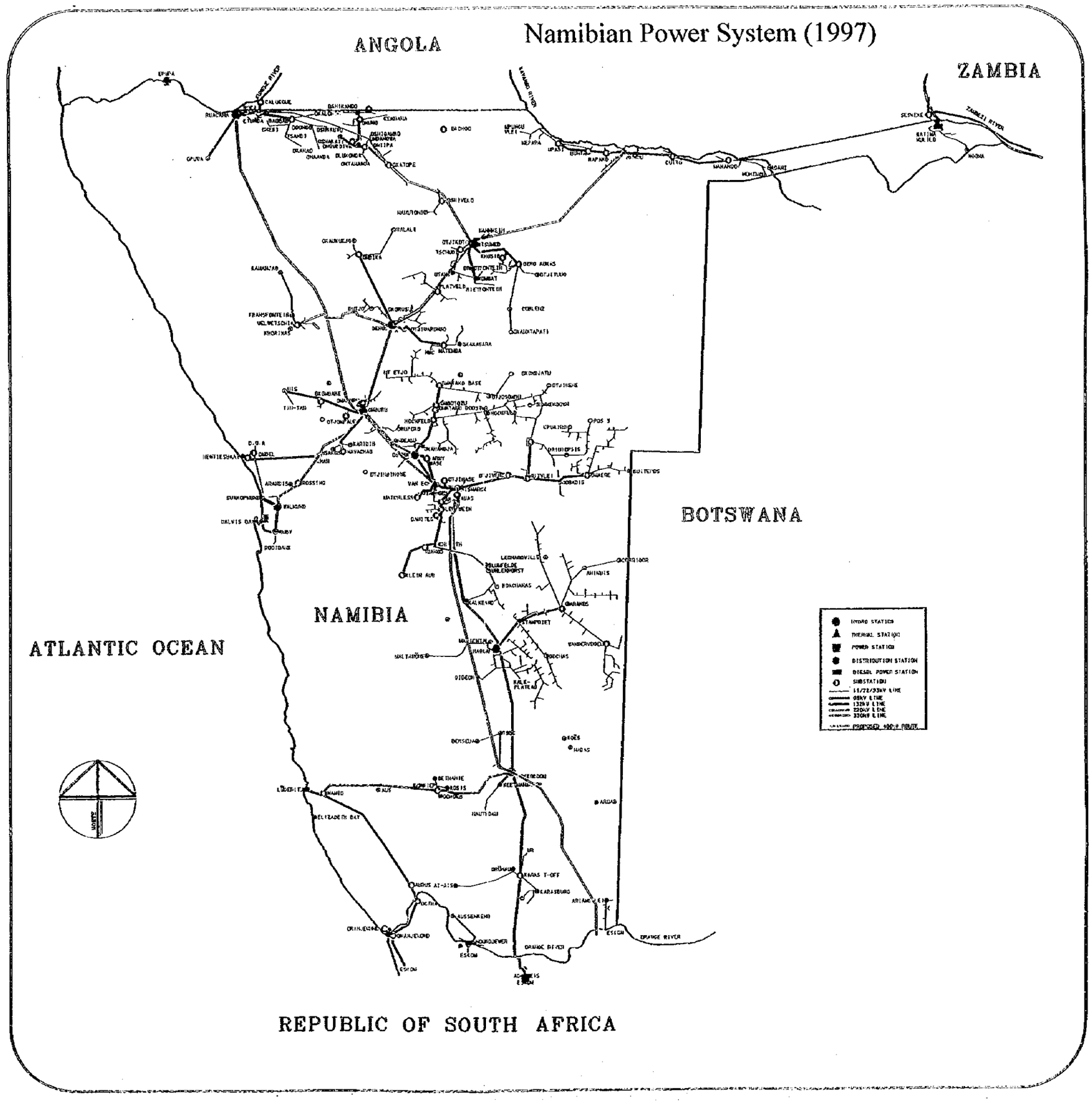
We wish to take this opportunity our sincere gratitude to your Agency, your South Africa Office and the Embassy of Japan in the Republic of South Africa. We also wish to express our deep gratitude to the Ministry of Mines and Energy and other authorities concerned of the Republic of Namibia for the close cooperation and assistance extended to us during our investigations and study.

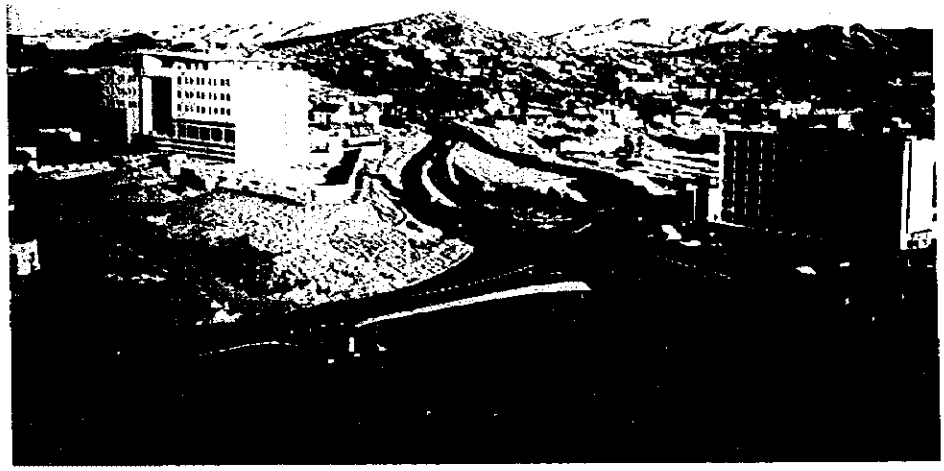
Very truly yours,

M. Matsui

Masaomi Matsui
Team Leader
Study for the Electricity Master Plan
in the Republic of Namibia

Namibian Power System (1997)





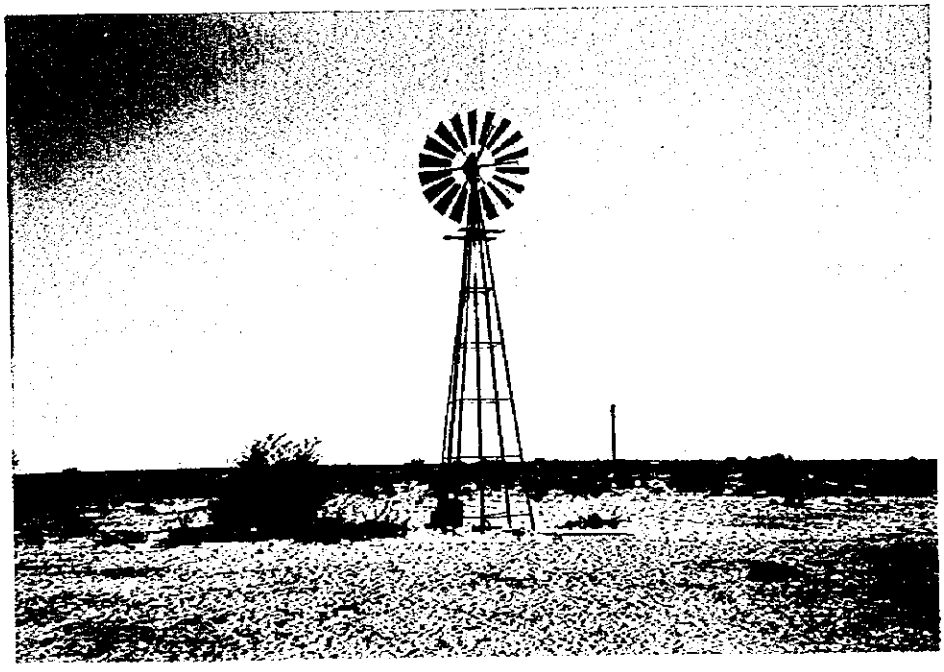
Windhoek(Capital)
Right: City office

Non-Electricity Village
(Oshakati)
- Conventional Residents -

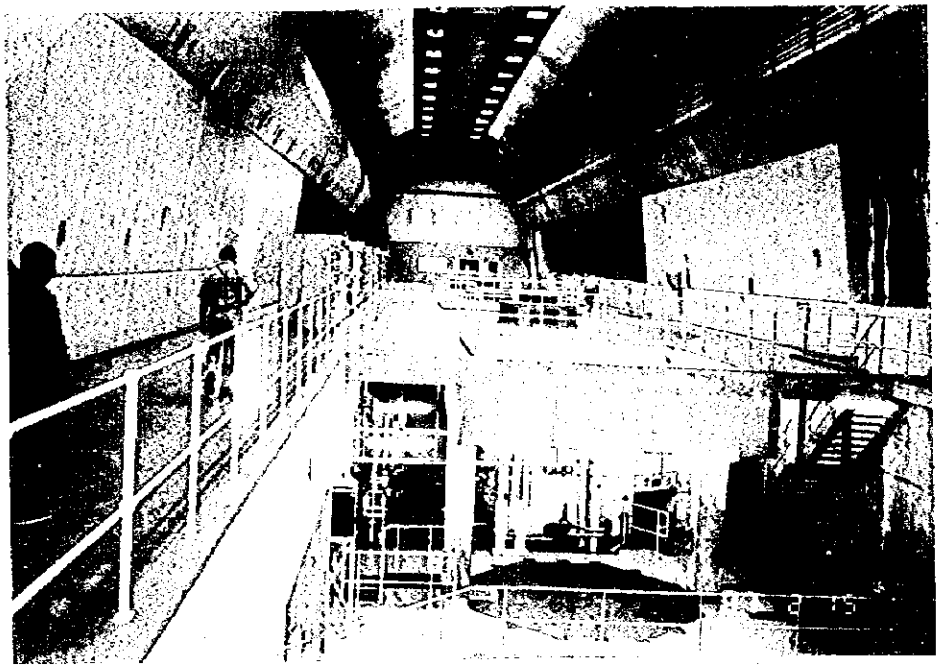
Non-Electricity Village
(Oshakati)
- Tranditional dwellings –

11kV Line
(Ondangwa)

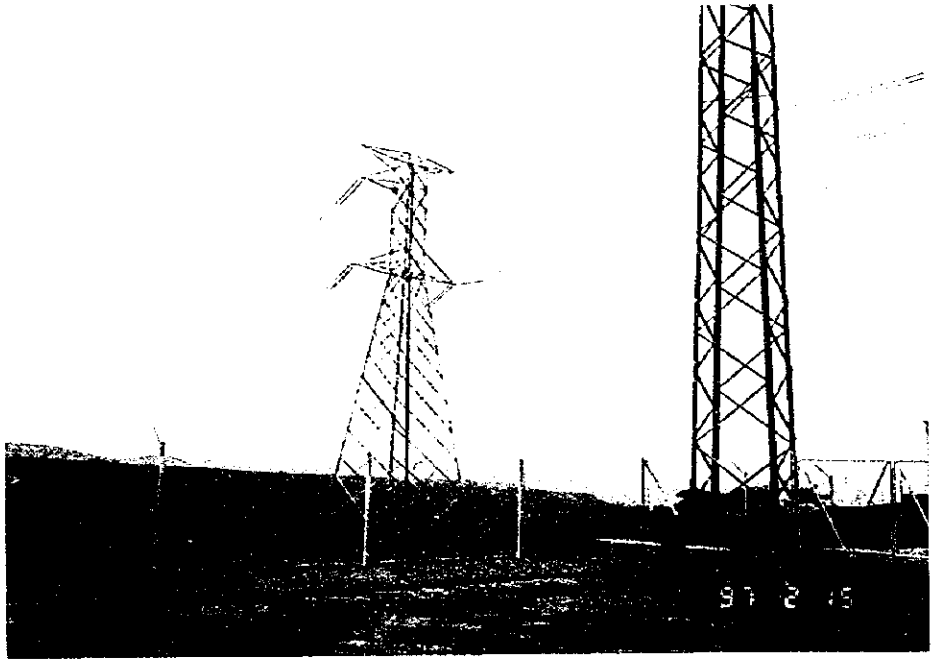
P.V System for Communications
(Mariental)



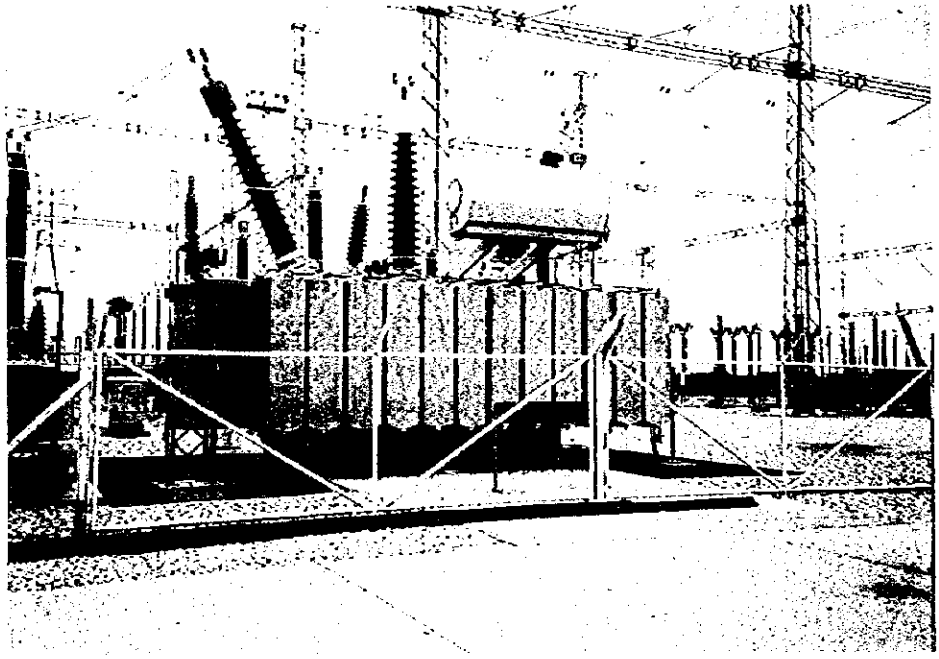
Water Pump with Wind Power
(Tses)



Ruacana Hydro Power Plant
Output: 240MW
(3×80MW)



330kV Line (Ruacan – Omburu)



Omburu 330/220kV Substation
Trans. 2×315MVA

CONTENTS

Abbreviations and Acronyms

ACSR	Aluminum Conductors Steel Reinforced
AFD	French Development Agency
AIDS	Acquired Immune Deficiency Syndrome
bar	1 bar = 100 kPa
bbl	barrel; 1 bbl = 158.99 liter
B/C	Benefit/Cost Ratio
CCGT	Combined Cycle Gas Turbine
CPI	Consumer Price Index
CSO	Central Statistics Office, NPC/ Central Sailing Organization (Diamond)
DOW	Department of Works
DSM	Demand Side Management
DWA	Department of Water Affair
EA	Environmental Assessment
EDRC	Energy and Development Research Center, RSA
EEZ	Exclusive Economic Zone
EIRR	Economic Internal Rate of Return
EMC	Evaluation Monitoring Committee
EPZ	Export Processing Zone
ESKOM	South African Power Company
FIRR	Financial Internal Rate of Return
F.S.	Feasibility Study
GFN	Gold Fields Namibia
GDP	Gross Domestic Product
GNP	Gross National Product
GT	Gas Turbine
GTZ	Deutsche Gesellshaft fur Technishe Zusammenarbiet: German Development Agency
GWh	gigawatt hour
ha	hectare (10,000 m^2)
HIV	Human Immune Deficiency Virus
HWL	High Water Level
IDC	Interest During Construction
IMF	International Monetary Fund
IMPS	Integrated Microcomputer Processing System

ISIC	International Standard Industrial Classification
JICA	Japan International Cooperation Agency, Japan
km	kilometer
km^2	squire kilometer
kV	kilovolt
kVA	kilovolt ampere
kW	kilowatt
kWh	kilowatt hour
LF	Load Factor
LOLP	Loss Of Load Probability
LPG	Liquefied Petroleum Gas
LPU	Large Power User
LWL	Low Water Level
m	meter
m^2	square meter
m^3/s	cubic meter per second
mm	millimeter
mm^2	square millimeter
m/s	meter per second
MBtu	mega Btu
Mct	mega carat
MD	Maximum Demand
MJ	mega joule
MME	Ministry of Mines and Energy
MN$	Million namibian dollar
MPLA	Moviment Popular de Libertacao de Angola
MRLGH	Ministry of Regional, Local Government and Housing
Mt	megaton
MUS$	Million United States Dollar
MVA	megavolt ampere
Mvar	mega-var ; megavolt ampere reactive
MW	megawatt
MWh	megawatt hour
Namco	Namibian Minerals Corporation
NAMDEB	Namdeb Diamond Corporation (Pty) Ltd.
NamPower	Namibian Power Company

Nc	Namibia cent
N$	Namibia dollar
NDC	Namibia Development Corporation
NDP1	First National Development Plan
NE	Northern Electricity
NGO	Non-governmental Organization
NHIES	National Household Income and Expenditure Survey
NORAD	Norwegian Development Agency
NPC	National Planning Commission
NPV	Net Present Value
NVE	Norwegian Water Resources and Energy Administration
ODM	Ocean Diamond Mining
OECD	Organization for Economic Co-operation and Development
OECF	Overseas Economic Cooperation Fund, Japan
O & M	Operation and Maintenance
OPGW	Composite Fiber-Optic Ground Wire
PERD	Primary Energy Resources Development
PF, Pf, p.f.	Power Factor/ Plant Factor
PLAN	People's Liberation Army of Namibia
PPI	Production Price Index
PPP	Provisional Population Projection
PV	Photovoltaic cell system
PVSC	Present Value of System Costs
Rc	South African cent
RE	Renewable Energy
REFAD	Renewable Energy for African Development
RSA	Republic of South Africa
SADC	Southern Africa Development Community
SADF	South African Defense Force
SAPP	Southern African Power Pool
SEPN	Shell Exploration and Production Namibia B.V.
SHS	Solar Home System
SIC	Standard Industrial Classification
SIDA	Swedish Development Agency
SPU	Small Power User
SWAWEK	Former name of NamPower (before 1996)

SWAPO	South West Africa People's Organization
SVC	Static Var Compensater
TAC	Total Allowable Catch
TCF	trillion cubic feet =tera cubic feet = CF x 10^{12}
TCL	Tsumeb Copper Limited
TJ	tera-joule = J x 10^{12}
UNDP	United Nations Development Programme
U_3O_8	Uranium Oxide
USc	United States cent
USD,US$	United States dollar

CHAPTER 1

INTRODUCTION

CHAPTER 1 INTRODUCTION

1.1 Background of Study

The Republic of Namibia is located in the south-west of Africa. It is bounded by two major deserts, the Namib, lying along the whole of the west coast, and the Karahari, on the southern and central eastern border with Botzwana. The central plateau, which extends from south to north has an average altitude of between 1000 and 2000 m. Namibia is the most arid country south of the Sahara Desert with low average and highly variable rainfall. Drought is always possibility and the lack of water is an ever-present constraint in most parts of the country.

Rain usually falls in the summer, from November to the end of March, and is the heaviest in the far north. Average of annual rainfall figures vary from less than 50 mm along the coast to 350 mm in the central and 700 mm in the far north-eastern regions. The Cunene river in the north-west of the country bordering Angola has potential for hydroelectric power generation which is already being exploited. Ruacana power station located on the Cunene river is only one hydroelectric plant in Namibia. Annual rainfall in the upper Cunene is 1300 mm and this figure is comparatively high. Although Gova regulation dam for the Ruacana was built in Angola south of Huambo, this has been destroyed in the Angola civil war. Actual storage now is only 30% of planned one, and furthermore regulation of the river flow is impossible. For this reason, at Ruacana power station its duration of full power generation is actually around 2,000 hours in a year and Ruacana is not operating at all during a certain time.

In spite of a high probability of energy resources such as natural gas, the exploitation has not been developed yet. Namibia is now importing coal and fuel for power generation from South Africa. Its costs are very high including the cost of transportation. The operation of thermal power plants is suppressed as much as possible.

Under the circumstances imported power from South Africa has been steadily increasing and reached over 50% of the national electricity consumption in order to meet the demand, mainly domestic use. The Government of Namibia is planning to meet the growing demand by means of increased power import from South Africa in the short term and to build a structure for power supply self sufficiency in the long term.

In the back ground, the Government of Namibia formally requested to conduct the electricity master plan consisting of development programs and projects in February 1995.

1.2 Objective of Study

The objective of the Study is to set up an electricity master plan which consists of development programs and projects for the whole Namibian electric power sector in short (less than 5 years), middle (less than 10 years) and long (not less than 10 years) terms. In formulation of the master plan, power development programs will be assessed from various viewpoints such as technology, economics, organization and environment. Besides, technology transfer to the MME, the counterpart personnel will be pursued in the course of the Study with regard to a study of power development programs.

1.3 Study Areas

Study areas are the national territory of the Republic of Namibia.

1.4 Organization of the Study Team

This Study includes not only power development plan but also various aspects such as Power demand forecasting by development of a computer data base and computer simulation models, technology transfer of formulation of these data base and models, assessment of import and export of electricity, review and assessment of rural electrification, assessment of utilization of photovoltaic system and wind power,

assessment of the supply potentials of hydropower and natural gas and policy recommendation for the power sector.

Accordingly two of competent consultants in the relevant fields, that is, EPDC International and Yachiyo Engineering have formed a consortium to join forces in an effort to successfully attain the objective of the Study.

EPDC International Ltd. (EPDCI) has a lot of experiences in overseas engineering services related to various investigations, detailed design and supervision of works in the field of hydro- and thermal power generation, transmission and substationing, distribution and overall power development plan.

Yachiyo Engineering Co., Ltd. (yec) has a wide range of experiences in roads, ports, rivers, buildings and electric power as a comprehensive overseas consultant.

Besides the above mentioned two consultants, the consortium has been reinforced for a prudent setup by adopting specialists from ESKOM and Japan NUS.

The study team consists of the following members :

Name, belonging to	In charge of	Expertise
Masaomi MATSUI, EPDCI	supervision/development planning	power system, generation
J. D. PRINSLOO, ESKOM	power demand (industry/large consumer)	energy forecasting
A. J. BERRISFORD, ESKOM	power demand (domestic/small consumer	load research
Noritsune CHIBA, yec	policy/institution	development plan, operation
Tadao SATO, EPDCI	facilities planning (generation/transmission/substation)	transmission
Yutaka MURAKI, yec	facilities planning (distribution)	electric facilities
Ryozo OHNO, JANUS	environmental consideration	environmental assessment
Masaaki UEDA, yec	financial/economic analysis	development plan, project evaluation
Makoto NAKAMURA, EPDCI	social analysis (including renewable energy)	economics

1.5 Scope and Study Term

The study was implemented in accordance with the Scope of Work and Minute of Meeting which were agreed upon between MME and JICA on October 18, 1996. The study was carried out spreading over for three consecutive fiscal years as follows.

a. First fiscal year (From January 1997 until March 1997)
   From preparatory home work in Japan to the first on-the-spot work in Namibia were conducted.

b. Second fiscal year (From April 1997 until March 1998)
   From the first home work to the third on-the-spot work were conducted.

c. Third fiscal year (From April 1998 until September 1998)
   From the third home work to the presentation of the final report were conducted.

1.6 Progress of the Study

The progress and results of the study during the term of the contract i.e. from January 1997 to September 1998 were as follows.

(1) Preparatory Home Work in Japan (January 1997)
Beforehand the first on-the-spot work in Namibia, questionnaire and inception report had prepared and sent to MME.

(2) First on-the-spot work in Namibia (From January to March 1997)
The first on-the-spot work in Namibia was took place during 30 January and 15 March. The work can be divided mainly into explanation of inception report, site survey, data collection and acquisition of survey equipment.

a) Explanation of inception report and consultation

The inception report was explained to the Namibian side and its content was discussed. MME suggested to modify some paragraphs and phrases but no major change of its course and scope were included. The final study target year, a study implementing set up (office space, other offered convenience and assigned counterpart personnel) were confirmed.

b) Site inspection

Three local trips were conducted during the stage. The first trip was made for the northern area where Tsumeb and Ruacna .had been focused. The second trip was for the eastern coast area where Swakopmund and Walvis Bay were focused and the third trip was for the southern area where Lüderitz and Keetmanshoop were focused. In those areas status of power supply and operation of utilities including municipalities, demand of mines and environmental aspects etc. were inspected.

c) Data collection

Reports, publications, statistics and various information those were relating to electric power, economy, environment and social analysis etc. were collected from the MME, NamPower, NPC, CSO and Ministry of Environment and Tourism and so on. A serial continued data covers 1980 to 1996 were collected.

However, procurement of information and study were done under the restriction that NamPower's generation mix, its costing and finance was confidential to the Study Team.

d) Purchase of personal computer

In order to promote computer assisted data base, one set of personal computer with necessary accessory and software was purchased. The specification of the computer was decided on the premise that it will be granted to Namibian side after the study is finished.

(3) First home work in Japan (From May to July 1997)

a) Analysis and examination of collected materials and investigation s at the first on-the-spot work

Collected materials and investigated results at the first on-the-spot work were analyzed and examined so as to prepare an overall draft plan.

b) Data arrangement for database and demand simulation models

Existing database was analyzed in terms of its quantity, quality and time factor etc. For preparation of new database, sector-wise i.e. industry, public use and regional-wise data were arranged.

c) Database system and programming for demand forecast models

Analyzing the characteristics (load curve, maximum demand, energy and load factor) and structure (large scale, small scale, industries) of the demand, construction of database system and programming for demand forecast models were started.

d) Preparation and sending of progress report

Content of the first on-the-spot work and the first home work in Japan were incorporated into the progress report, which were sent to the Namibian side.

e) Preparation for technical transfer seminar-1

Preparation was made for the seminar-1 which would be held during the second on-the-spot work. Abstract from the progress report for the first on-the-spot work was the main theme for the Seminar-1.

(4) Second on-the-spot work in Namibia (From July to November 1997)

a) Explanation and discussion of progress report

The progress report was explained to MME and discussed. Result of discussion was recorded in the minutes of meeting.

b) Holding a technical transfer seminar-1

The seminar-1 was held so that the contents of the progress report could be widely understood by the Namibian side.

c) Building of computer database

The database for electric power was established. The database is composed of following items.

a. Economic data (GDP, price index, population etc.)
b. Power consumption data (category, sector, sub-sector and major customers)
c. Energy data excluding electricity (liquid fuel and coal)
d. Water consumption (classify by category)

d) Development of power demand forecasting computer simulation models

Demand forecasting models were developed, those are designed enable to estimate large scale power, small scale power and the maximum power demand respectively.

e) Power demand forecasting

Short, medium and long term (up to 2020) demand forecast was produced by means of the developed models. Three growth rate scenarios were applied viz. moderate, high and low, to cover a deviation caused by economic and social uncertainty.

f) Preparation and holding the technical transfer seminar-2

Seminar-2 was held on the computer database system and power demand forecast simulation models built in the course of the second on-the-spot work so that its content is well understood by the Namibian side.

g) Evaluation of optimal generation mix and analysis of demand-supply balance

Optimal power supply scenario (the best generation mix) was formulated for short, medium and long term demand in Namibia.

h) Formulation of power development program and projects

An optimal investment plan on short, middle and long term basis were formulated after consultation with Namibian side. And identification of priority power development programs and projects were studied and analyzed. This analysis included technical, economic, financial and environmental assessment.

(5) Second Home Work in Japan (From December 1997 to January1998)

a) Preparation and sending of interim report

Content of the second on-the-spot work was filed up in an interim report, which was sent to Namibian side.

b) Preparations for technology transfer seminar-3

Preparations were made for the Seminar-3, which was held so that the content and analytic methodology studied in the second on-the-spot work was widely understood by the related Namibian personnel.

(6) Third on-the-spot Work in Namibia (February to March 1998)

a) Explanation of interim report

The interim report where the content of the second on-the-spot work was filed up was explained and discussed. The result was confirmed with minutes of meeting.

b) Holding the technical transfer seninar-3

Seminar-3 was held under the main theme of power development programs which were studied by the second on-the-spot work. Optimal generation mix, demand-supply balance, economic assessment and priority development etc. were discussed.

c) Formulation of electricity master plan

An electricity master plan was studied and formulated including power development programs which had been set up in the second on-the-spot work and its investment plan.

Examining demand-supply balance by 2020 in terms of self sufficient and import scenarios, generation construction and transmission system expansion programs in future were formulated

d) Recommendation on policy, system and organization

In order to implement the electricity master plan effectively, concrete measures were recommended on the following subjects.

a. Energy conservation and environment reservation

b. Electricity tariff system, power supply system and raising man power

c. Concrete measure for promotion of electricity master plan

e) Handing over a computer set

A complete computer system, database and demand forecast models were provisionally handed over to MME at their request for immediate and full utilization.

(7) Third Home Work in Japan (From May to June 1998)

The draft final report, where the preceded surveys' results were compiled, was prepared and sent to Namibian side for their examination.

(8) Forth on-the-spot work in Namibia (From June to July 1998)

a) Explanation of draft final report and discussion with MME

The draft final report was explained to Namibian side and discussed.

b) Holding the technical transfer seminar-4

The seminar-4 was held so that the content of the draft final report could be widely understood by the Namibian side. The result was confirmed with minutes of meeting.

c) Formal handing over of the computer set

JICA study team received from MME the formal receipt of the computer set which had temporarily been handed over to MME during the previous on-the-spot work in Namibia.

(9) Preparation of final report

On receipt of MME's comments on the draft final report, the final report was prepared taking the comments into consideration.

CHAPTER 2

GENERAL DESCRIPTION OF NAMIBIA

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2.1 A Brief History of Namibia

It is important to consider the history and politics of a country when doing a forecast economic growth and energy consumption. It is much easier to carry out a forecast for a country which had many years of political stability. A brief overview of the history of Namibia at the outset, is therefore essential.

From about 1900 Namibia, or South-West Africa (as it was called previously) was under the rule of Germany, after some bloody battles between the Germans and some of the indigenous people at that stage.

Following the first World War, the territory was put under the rule of South Africa by the League of Nations from about 1920.

After the dissolution of the League of Nations at the end of the second World War, South West Africa was still left under the governance of South Africa, virtually as a fifth province.

The rapid growth of industries in the post war period led to increasing demand for labour. The first trade union movement was established in the late 1940's. Strikes followed, and protests, against racial South African laws. At the end of 1959, further mass protests began in Windhoek.

Namibian political parties formed about the same time. Pressure gradually mounted against South Africa's rule. Calls went up for an end of its rule. A major country wide strike followed from December 1971 to March 1972.

The South African government held elections in 1973 in Ovambo for self-governing rule, but the elections were not recognised by most of the parties. Portuguese rule came to an end in Angola in 1975, which contributed to more pressure on South Africa. Namibians were now able to settle in Angola. As a result of this, South

African troops started occupying the north of Namibia. This led to the establishment of major military bases in the north.

Constitutional talks started in Windhoek towards the end of 1975, but were widely objected to, as not all leaders were permitted to take part freely.

South Africa's main invasion of Angola came in January 1976 to intervene in the civil war in Angola. In August 1976 South Africa agreed to a multi-racial provincial government to prepare for independence on 31 December 1978. An administrator-general from South Africa assumed duties in September 1977.

In the mean time there were various clashes between South African forces and forces from the "Movimento Popular de Libertacao de Angola" (MPLA) and the People's Liberation Army of Namibia (PLAN) across the northern border. Fighting became more and more intense and brutal during 1979. In 1980 the power line from the Ruacana hydroelectric power station to Windhoek was blown up a few times.

Talks on independence made slow progress, but there was no peace yet. Some progress was apparent by May 1984 with an Angolan-South African-US agreement on the withdrawal of South African troops from Angola, and a face-to-face meeting between the South West Africa People's Organisation (SWAPO) and South Africa in Lusaka. This was not entirely successful and further rounds of talks followed.

The breakthrough agreement, which finally paved the way for Namibian independence and a cease-fire in Angola was signed on 13 December 1988. Election preparations began in 1989 under the supervision of the United Nations. On November 1989 the results gave SWAPO a majority of 57%. Early in 1990 a constituion was adopted, and on 21 March 1990 the Republic of Namibia finally got its independence after 106 years of German, British and South African rule. The question of Walvis Bay still remained an issue, but the town eventually became part of the new Namibia on 1 March 1994.

2.2 The Namibian Economy

2.2.1 General

The economy of any country needs energy to exist and to grow. Therefore not only the growth rate of the economy, but also the type, characteristic and structure of the economy plays an important role in the energy market and its performance.

2.2.2 Size and Structure

Namibia is a democratic republic, is geographically part of Sub-Saharan Africa and has an area of 824 295 square kilometres. It is also a member of the Southern African Development Community (SADC). The country has a semi-arid climate with irregular rainfall. Its gross domestic product (GDP) was ranked about number twenty three out of forty three Sub-Saharan countries in 1993. It constituted about 1% of the total Sub-Saharan GDP in 1993.

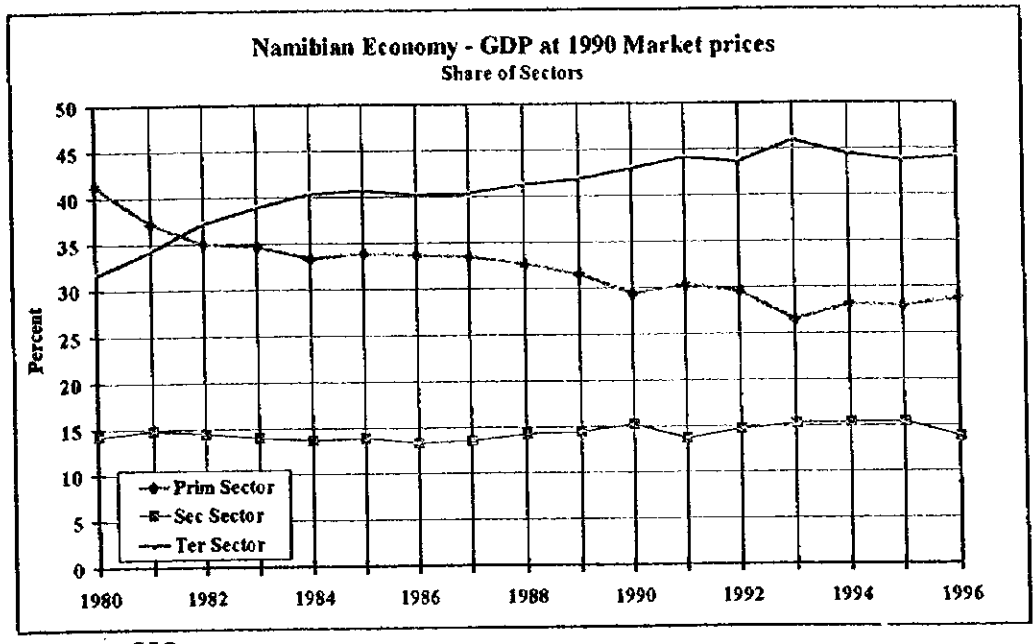
Namibia has a very open economy i.e. it is highly dependent on exports and imports. Its economy also depends very heavily on the South African economy. About 85% of its imports come from South Africa.

The population of the country is currently about 1.7 million people and increases at a rate of 3.1% per annum. An economic growth of greater than 3.1% per annum is therefore required in order to achieve a positive growth in GDP per capita. The size of the labour force was 492 000 in 1991 and is projected to be 660 000 by the year 2000, according to the First National Development Plan (NDP1). This is equivalent to an average annual growth of about 3.3% per annum. Unemployment is very high and is currently about 20%, while underemployment is estimated at 40%.

The share of the primary sector in the GDP decreased from 41% in 1980 to 29% in 1996. See figure 2.1 below. Its sub-sectors agriculture (commercialised) and mining show a significant decrease in share over the period, while subsistence agriculture and fishing show an increase over the period. Agriculture employs almost half of the labour force, but only contributes about 8% to the GDP. Mining is dominated by

large-scale foreign-owned companies employing capital intensive techniques. Namibia continues to be dependent on the export of its natural resources. The primary sector is the most energy intensive sector of the economy.

Figure 2.1 - The Namibian Economy - The share of the different sectors



Source: CSO

Massive overfishing in the seventies, largely by foreign factory ships, had seriously depleted this natural resource. Since independence the imposition of a 320 km Exclusive Economic Zone has been respected more by the international community. Fishing is further regulated through legislation and quotas.

Natural factors such as warming in the ocean temperature and a fall in the oxygen content have resulted in the allocation of very low quotas in 1996 and also in some previous years.

The share of the secondary sector stayed almost constant at only 14%. Manufacturing, as part of the secondary sector, plays a minor role in the economy. It had a share of only 8% in 1980 which increased to 10% in 1996. One of government's main aims is to correct this imbalance. Steps have already been taken through inter alia the establishment of the so-called Export Processing Zones (EPZ's), which includes

incentives for export producers. Manufactured exports currently are almost exclusively meat and fish processing.

Expanding the manufacturing sector will contribute much more to GDP than expanding the primary sector will. It creates more jobs and is not as energy intensive as the primary sector.

In the case of the tertiary sector, its share increased from 32% in 1980 to 44% in 1996. This increase is mainly due to the increasing share of the Government, which increased from 11% in 1980 to 21% in 1996. The role of government is seen as too big.

GDP per capita was about N$ 8 500 per annum in 1996 (current prices), which approximately US$ 1 800 per annum. Welfare is very unequally distributed. Around half of the population are poor with an income of less than N$ 500 per month. They are predominantly rural and principally in the north.

The rate of urbanisation had increased over the last few years and most of the urban areas has a population growth of between 5% to 6% per annum, which is well above the national population growth rate of 3.1%.

2.2.3 Historical Growth

Namibia received its independence on 21 March 1990. The history, as briefly summarised above, had a significant influence on the economy of Namibia. From an average annual growth of about 9%, for the period 1960 to 1973, the economy suffered a major slump in 1980 to 1985 when the rate of real GDP growth averaged minus 0.8% per annum (when measured at constant 1990 market prices). A major drought was also experienced in 1982 and 1983. Particularly hard hit were mining and agriculture. Fixed investment also dropped sharply during this period.

Modest annual growth in real GDP had been recorded since the recession namely 4.3% in 1986, 3.2% in 1987, 0.2% in 1988 and 1.9% in 1989. Namibia's GDP expanded by an average of 4.2% per year between 1990 and 1996. Growth in 1993

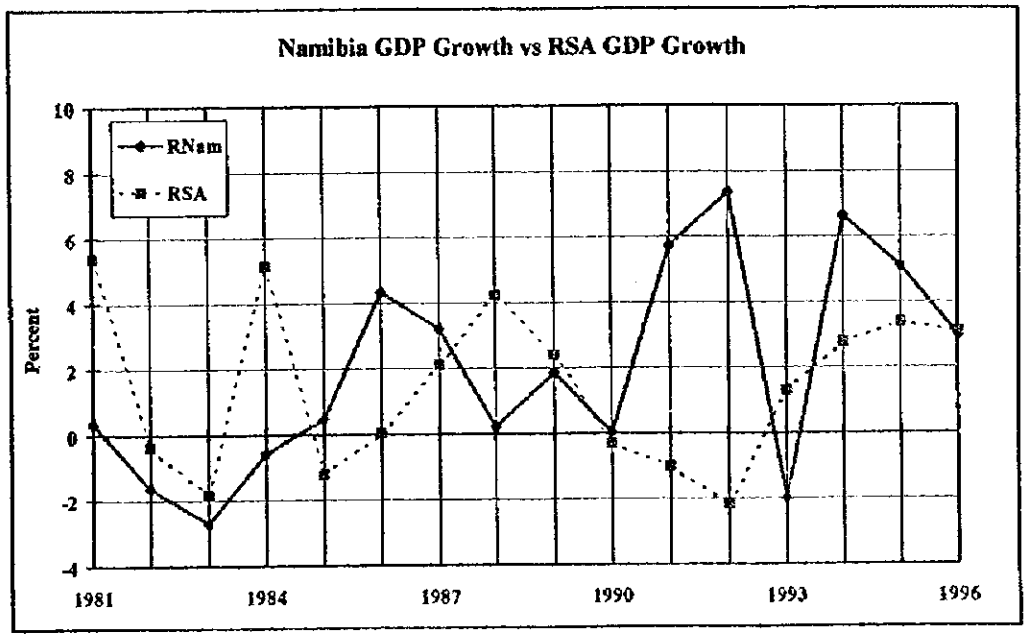
was adversely affected by the 1992/3 drought as well as the drop in uranium and diamond prices. Refer to figure 3.2 below.

The slower growth of 3% in 1996, was caused mainly by substantial declines in the secondary industries, particularly the manufacturing sector. Real GDP per capita therefore declined marginally in 1996. Average annual GDP growth over the sixteen years from 1980 to 1996 was 1.9%.

The primary sector performed very well, especially in view of the fact that the total allowable catch (TAC) for pilchards was halved to allow for a faster recovery of the stock.

The secondary sector consisting of manufacturing, electricity and water performed poorly in 1996 due to poor performance of the fish processing sub-sector. Fish processing is directly dependent on the quota allocations for pilchards. Moderate growth was achieved by the services sector, which is dominated by government services.

Figure 2.2 - Namibian Economic Growth



Source: CSO

The above normal rainy season earlier this year brought relief after several years below long term average rainfall.

2.2.4 Prospects

According to the Kondratieff cycles, the world economy is currently in a period of expansion or upswing which started in 1995, and which will continue until the year 2020. This will be followed by a period of adjustment or contraction which is estimated to last until the year 2045.

World economic growth quickened during 1996 following widespread deceleration of activity in 1995, according to the World Economic Outlook, May 1997, of the International Monetary Fund (IMF). Economic and financial conditions are generally propitious for the global expansion to continue in 1997 and the medium term, at rates at least matching those seen in the past three years. The IMF expects a 2.6% growth rate, which is marginally better than the 2.3% of 1996 for the Industrial countries. In the case of the Developing countries, a growth rate marginally lower than the 6.5% of 1996 is projected for 1997.

Africa's growth performance in 1996 was particularly encouraging. Real GDP growth is estimated to have risen by about 5%, and reflected strong activity in the primary products sector of agriculture. Growth of just under 5% is projected up to the year 2000 by the IMF. Average annual growth of 4% is expected by World Bank between 1997 and 2006 for Sub-Saharan Africa

After a growth rate of 3.1% in 1996, about 2% is expected for the South African economy for 1997. The IMF predicted a growth of 2.1% in their latest World Economic Outlook for South Africa. An average annual growth of 3% to 4% is expected by the World Bank over the next decade for South Africa.

In 1995 the government of Namibia launched its First National Development Plan (NDP1) in which an average annual economic growth rate of 5% is envisaged for the period 1995 to 2000. Many economists in Namibia regard this objective as overoptimistic and unrealistic. After the year 2000 the NDP1 anticipates a growth

rate increasing to 10% until around 2030, when the growth slowly starts to decline to around 5% again.

Government is promoting small scale mining. This sector however lacks technical expertise, access to financing and managerial skills and it will take time before this sector will play a significant role.

AIDS has again been raised as an important factor which will have a negative impact on economic growth. About 14 million people in Sub-Saharan Africa are estimated to have AIDS. It was recently reported that economic growth in Sub-Saharan Africa could be cut by about 1.5%, largely due to the cost of diverting money into treating patients. The HIV and AIDS epidemic threatens Namibia in a manner which could have fundamental short- and long term consequences for sustainable development. AIDS has become the leading cause of death in Namibia. The impact on health care costs, productivity, training costs, etc. is expected to increase dramatically. Population growth rates could fall to less than 2% per annum by the year 2010 because of AIDS, compared to a figure of 2.9% when the impact of AIDS is not taken into account.

Namibia's growth also remains vulnerable to external factors such as recurring drought, volatile markets for minerals and highly variable output from the fisheries sector. Southern African weather and agricultural experts have voiced concern about the early build-up of the El Nino weather phenomenon, which could spark a devastating drought in the region in 1998.

The Namibian economy is showing signs that it might improve in 1998, but the growth in 1997 will once again fail to keep up with the population increase. A growth rate of about 2% is projected by Huyshamer Stals (Pty) Ltd for 1997 for Namibia's economy, while a figure of 4% is foreseen by the Economist Intelligence Unit in London.

Growth in 1998 is expected to increase as a result of continuing expansion in mining production and expansion in manufacturing due to the new EPZ enterprises.

Economists have predicted a growth of 5% for next year. This growth could be on the optimistic side in view of the possible impact of El Nino.

Forecasting long term economic growth for Namibia is very difficult, as the country only received its independence finally in 1990. The structure of the economy is expected to change, and historical growth rates have to be used with circumspection. Furthermore future growth in South Africa is also rather uncertain as the country only became independent in 1994.

As a result of these uncertainties, together with uncertainties with regard to major mining and industrial projects in the country, three electrical energy forecasts have been developed namely a high-, middle- and a low forecast. The real economic growth rates to support these three forecasts have been estimated at 5%, 3.5% and 2% per annum respectively on average over the long term.

The high forecast of 5% had been based on the economic growth rate which the government aims for in their NDP1 for the medium term. A growth rate higher than 5% is seen as a high road scenario.

Average annual growth since the cease-fire was signed in 1988 was 3.6% per annum for the seven years. This has been used as the base for the middle forecast of 3.5% per annum. This growth is also higher than the population growth rate, as well as the rate of new entrants into the Namibian labour market.

In the case of the low forecast of 2% growth per annum, a negative impact by AIDS of 1.5% has been assumed.

2.3 Financial Status

2.3.1 Revenue and Expenditure of State Budget

Fiscal policy is Namibia's key instrument for the successful implementation of the development objectives as outlined in the NDP1. The Namibian government has consistently sought to use fiscal policy to ensure that its development plan is

sustainable and will promote economic growth with a high degree of stability, and thus contribute to employment creation and poverty alleviation. Stimulating business development by promoting small and medium-sized enterprise is another objective.

(1) Revenue

The budget estimates for 1996/97 and 1997/98 provided for total revenue, including grants, are shown in Table 2.1, representing a remarkable increase of 17% and 9% compared with the previous year. The increased growth in revenue is a reflection of improved efficiency in tax administration, including the collection of taxes. Total revenue, including grants, for the past four years in relation to GDP has been, on average, 35%. Tax revenue is equal to 31% of nominal GDP and accounts for 88% of total revenue. The high growth in direct taxes was achieved despite a reduction in tax rates. Indirect taxes remained at 60% of total revenue, and accounted for 21% of nominal GDP. Grants account for 1.0~1.4% of total revenue.

Table 2.1 Government Revenue

(N$ million)

	95/96	% of total	96/97*	% of total	97/98*	% of total
Total revenue and grants	**4069.7**		**4770.6**		**5198.2**	
Tax revenue	3548.2	87.2	4206.1	88.2	4542.3	87.4
Direct Taxes	1080.7	26.6	1320.6	27.7	1365.6	26.3
Personal taxes	625.0	15.4	750.0	15.7	790.0	15.2
Company taxes	427.0	10.5	510.0	10.7	510.0	9.8
Other taxes	28.7	0.7	60.6	1.3	65.6	1.3
Indirect taxes	2467.5	60.63	2885.5	60.5	3176.7	61.1
Domestic tax on goods and services	1234.8	30.3	1448.5	30.4	1520.7	29.3
Tax on property	40.0	1.0	47.0	1.0	50.0	1.0
Tax on int. trade and transcriptions	1156.7	28.4	1348.0	28.3	1564.0	30.1
Others	36.0	0.9	42.0	0.9	42.0	0.8
Non-tax revenue	469.5	11.5	485.6	10.2	532.2	10.2
Entrepreneurial and property income	220.2	5.4	282.9	5.9	308.7	5.9
Fines and forfeitures	6.0	0.1	7.5	0.2	10.0	0.2
Administrative fees and charges	243.3	6.0	195.2	4.1	213.5	4.1
Return on capital	9.6	0.2	11.0	0.2	59.7	1.1
Grants	42.4	1.0	67.9	1.4	64.0	1.2

Source: Bank of Namibia Annual Report 1997

(2) Expenditure

Total government expenditures for 1995/96~1997/98 are shown in Table 2.2. Expenditure was about 40% of GDP. Current expenditure continued to be major of total expenditure, accounting for 85% in fiscal year 1996/97. The wage bill is the largest component of current expenditure Total interest payment on domestic and external debt in fiscal year 1996/97 amounted to N$215 million, almost double the amount in the previous year. Interest payments accounted for 4% of the total current expenditure, of which domestic interest payments were a dominant component and accounted for 83% on average for past three years. This reflects increased domestic borrowing to finance budget deficits and the higher interest rates prevailing in the country. Capital expenditure for fiscal year 1996/97 was N$746.9 million. Government development expenditure increased by 9% in real terms over fiscal year 1995/96, more than the 6% projected in the NDP1. The share of development expenditure in total capital expenditure was 87%.

Table 2.2 Government Expenditure

(N$ million)

	95/96	% of total	96/97	% of total	97/98**	% of total
Total expenditure and net lending	**4,339.8**		**5,857.1**		**5,754.0**	
Current expenditure	3,659.8	84.3	5,006.7	85.4	4,755.4	82.6
Personnel expenditure	2,027.2	46.7	2,763.1	44.7	2,633.9	45.8
Goods and other services	984.6	22.7	1,223.3	24.4	1,186.3	20.6
Subsidies and current transfers	527.5	12.2	805.2	11.8	725.4	12.6
Domestic interest payments	103.8	2.4	207.5	3.8	204.3	3.6
Foreign interest payments	15.9	0.4	7.4	0.4	3.3	0.1
Other	0.8	0.0	0.2	0.0	2.2	0.0
Capital expenditure	645.8	14.9	746.9	12.7	846.8	14.7
Lending and equity participation	34.2	0.8	103.5	1.8	151.8	2.6

Source: Bank of Namibia Annual Report 1997

(3) Budget for 1997/98

The Budget statement for 1997/98 reemphasized the government's basic policy objective of attaining growth and equity within a stable macro-economic framework. Highlighting unemployment, sluggish economic growth, and skewed income distribution as the major problems facing the economy, the budget seeks to achieve accelerated economic growth to bring about a meaningful improvement in the welfare of the Namibian people.

Total revenue in fiscal 1997/98 is expected to increase by nearly 15% over the previous year's original budget. Total expenditure is expected to rise by over 13%. The planned reduction in expenditure growth is a desirable shift from the previous fiscal year. The budgeted increase in both total revenue and expenditure was the same, at 17%, in fiscal 1996/97.

Capital and development expenditures are expected to record an increase of 21% over the original budget provision for the previous fiscal year. Their share in total expenditure is to go up from 16.2% in 1996/97 to 17.4% in 1997/98. This shift in Government expenditure should address concern about the sluggishness in fixed capital formation and contribute to economic growth. It is important to note that the budgeted-for overall deficit remains unchanged in nominal terms. In fact, it declines from 4.1% of projected nominal GDP for 1996/97 to 3.7%.

(4) Debt

At the end of 1996, total outstanding public debt stood at N$3.2 billion, representing a 26.7% growth, compared with 26.1% in the previous year. As a percentage of GDP, total public debt increased from 21.0% in 1995 to 23.3% in 1996. The share of public external debt in total public debt continued to decline. It decreased from 19.4% in 1995 to 15.0% in 1996. In 1990 it stood at 94.9% This clearly illustrates the Government's determination to increasingly meets its financing requirements on the domestic market.

Total public external debt was N$487.8 million at the end of 1996, in comparison with N$496.6 million in the previous year. This represented an annual decrease of 1.8% against the 4.5% rise in 1995. At the end of 1996, concessional debt accounted for 43% of total public external debt, compared with 25% in the previous year.

Domestic public debt, which accounted for 85% of total public debt, continued to grow. It grew by 34% to N$2.8 billion during 1996, compared with 33% in the previous year.

External private debt, which accounts for 6.6% of total external debt, decreased further by 5.9% to N$95.1 million, compared with the 1.6% decrease in 1995. At the end of 1996, the concessional portion accounted for 70% of total private external debt. The reason for this high degree of concessionality was that most private sector borrowers reverted to foreign shareholders.

2.3.2 Trade

Namibia's balance of payment recorded a surplus of N$98 million or 0.7% of GDP in 1996, a magnitude similar to that in 1995 (Refer to the Table 2.3). This followed the larger surpluses of 1993 and 1994, of N$298 million and N$266 million. These were mainly on account of the introduction of the Namibia dollar in September 1993. Despite the surplus recorded in 1996, the level of official foreign reserves of N$906 million could cover only 5.9 weeks of imports, a marginal increase from 5.7 weeks in 1995.

(1) Current Account

Namibia's trade balance reversed to a substantial deficit in 1995, after four years of consistent surpluses. The sharp deterioration was due to a 20% increase in imports, surpassing exports which grew by only 6%. In 1996, however, the growth in exports exceeded the growth in imports significantly, improving the net merchandise trade position from a deficit of N$405 million in 1995 to a deficit of N$107 million in 1996.

Namibia's merchandise exports registered another year of double digit growth in 1996. During the year , export value increased by 14% to reach N$5.8 billion on account of an increase of 15% in prices and a decrease of 2% in volume. A breakdown of exports according to products showed that almost all major categories had a strong performance in 1996, except manufactured goods which declined sharply. The most robust growth was in fish, lobster and crabs, followed strongly by diamonds and other mineral products. No electricity was exported to South Africa in 1996 (Refer to Table 2.4). Diamonds continued to be the mainstay of Namibia's exports.

Table 2.3 Balance of Payments Main Aggregates

(N$ million)

	CALENDAR YEARS					
	1991	**1992**	**1993**	**1994**	**1995**	**1996(b)**
Balance on current account	**372**	**247**	**424**	**472**	**113**	**359**
Balance on merchandise trade	284	210	246	230	-405	-107
Merchandise exports fob	3,376	3,825	4,221	4,794	5,076	5,801
Merchandise imports fob	-3,092	-3,615	-3,975	-4,564	-5,481	-5,908
Net services	-938	-976	-823	-774	-922	-1,084
Net income	268	47	216	-237	432	419
Net current transfers	758	966	785	779	1,008	1131
Balance on capital and financial account, excluding reserves (c)	**-468**	**-169**	**-40**	**-282**	**-88**	**-238**
Net capital transfers	80	91	88	154	146	85
Direct investment, net	315	342	152	369	429	584
Portfolio investment, net	-70	45	255	157	393	108
Other long term investment, net	-712	-801	-774	-1224	-1267	-955
Pension funds	-404	-578	-659	-645	-904	-748
Life assurance	-433	-270	-105	-488	-479	-439
Other	125	47	-10	-91	116	232
Other short term investment, net	-81	154	239	262	211	-60
Balancing item (net errors & omissions) (d)	**62**	**-97**	**-86**	**76**	**62**	**-23**
Overall balance (e)	**-34**	**-19**	**298**	**266**	**87**	**98**
Change in reserves (f)	**34**	**19**	**-298**	**-266**	**-87**	**-98**
Current account balance	**5.2**	**2.9**	**4.7**	**4.3**	**0.9**	**2.6**
Overall balance	**-0.5**	**-0.2**	**3.3**	**2.4**	**0.7**	**0.7**

Source: Bank of Namibia Annual Report 1997

Table 2. 4 Merchandise Exports by Commodity Group

(N$ million)

	1991	1992	1993	1994	1995	1996(a)
Food And Live Animals	**964**	**1131**	**1139**	**1672**	**1753**	**2096**
Live animals	214	269	279	420	483	548
Meat and meat preparations	272	293	294	380	367	352
Fish, lobster, and crabs	450	539	536	842	873	1166
Other food products	28	30	30	30	30	30
Hides, Skins and Wool	**42**	**43**	**53**	**74**	**75**	**83**
Mineral Products	2014	2107	2374	2392	2655	3357
Diamonds	1222	1350	1515	1486	1765	2287
Other	792	757	859	906	890	1070
Manufactured Products	**352**	**538**	**655**	**655**	**589**	**265**
Canned fish, fish meal and fish oil	219	311	488	509	472	144
Other	133	227	167	146	117	121
Electricity	**4**	**6**	**0**	**1**	**4**	**0**
Total	**3376**	**3825**	**4221**	**4794**	**5076**	**5801**

0: indicate nil or less than N$500000
(a) provisional
Source: Bank of Namibia Annual Report 1997

(2) Capital and financial account

The capital and financial account registered a net outflow of N$238 million in 1996, equivalent to 1.7% of GDP, from a deficit of N$88 million in 1995. The imbalance on the capital and financial account has been a constant feature of Namibia's balance of payments since 1990. The deterioration in 1996 was due to smaller capital transfer receipts, redemptions of maturing debt instruments, and short term flows between the banking sector and its parent companies. The local asset requirement legislation affected net outflows on pension fund and life assurance businesses which declined from N$1.4 billion in 1995 to N$1.2 billion in 1996.

(3) International investment

Namibia's international investment position (IIP) changed dramatically in 1993, when it moved from a net liability to a net asset position of N$1.3 billion, due to

ownership changes in the mining sector. However, increases in the market value of direct investment in Namibia of around 10% per annum, and the effect of the local asset requirement on institutional investor's stock of assets in South Africa, combined to move the IIP to a net liability position of N$681 million by 31 December 1996.

2.3.3 Inflation and Exchange Rate

(1) Inflation

Consumer Price Index (CPI) has been fluctuated between 8% and 18% from 1990 to 1995. After stabilizing in 1997, consumer price inflation - as measured by the percentage change in the Interim Consumer Price Index of Windhoek - decreased to an average rate of 8.64% during the third quarter, from 9.81% in the first quarter (Table 2.5).

(2) Exchange rate

Since February 1996, the value of the Namibia dollar, which is pegged to the Rand, depreciated against major currencies. The Namibia dollar, which averaged N$3.65 against the United States dollar (USD) during the last quarter of 1995, depreciated to N$4.35 in June of 1996 and weakened further to N$4.64 at the end of the third quarter of 1997.

Foreign exchange rate of Namibia dollar per USD at the end of period is shown in Table 2.5.

Table 2.5 Annual Inflation Rate/ Exchange Rate against US$

Year	1990	1991	1992	1993	1994	1995	1996	1997		
								1st	2nd	3rd
(%)	12.0	11.9	17.7	8.6	10.8	10.0	8.01	9.81	9.88	8.64
N$	2.533	2.768	3.014	3.375	3.560	3.646	4.346	4.509	4.468	4.643

Source: Bank of Namibia, Quarterly Bulletin, December 1997

2.4 White Paper on Energy Policy

2.4.1 Energy Policy Formulation Process

The White Paper on the energy policy of Namibia is in its final phase and could be published by the end of 1998 by the Government of Namibia. This is the culmination of a two year effort by the Ministry of Mines and Energy, to create a framework for the future development of the Namibian energy sector.

The Government of Namibia has been committed to building the economy, and improving the quality of life of all of its citizens. Having formulated an initial energy programme within the context of the first National Development Plan (NDP1), MME had made an active decision to formulate a comprehensive and integrated energy policy for all energy sub-sectors. In 1996, MME established the Energy Policy Committee (EPC) to drive the policy making process, and the development of an Energy Policy White Paper.

In early 1997, EPC, with the assistance of consultants, launched a year long process of engaging both expert and public opinion. The draft White Paper was scrutinised and redrafted in the process of three workshops, a number of occasions, the parliament and public comment.

2.4.2 Energy Policy Goal

The White Paper embodies a new and comprehensive energy policy aimed at achieving the following six goals:

Security of supply

Namibia will achieve security of energy supply through an appropriate diversity of economically competitive and reliable sources, with emphasis on the development of Namibian resources.

Social upliftment

Households and communities will have access to appropriate, affordable energy supplies.

Effective governance

Effective governance system will be in place to provide stable policy, legislative and regulatory frameworks for the energy sector.

Investment and growth

The Namibian energy sector will expand through local and foreign fixed investment, resulting in economic benefits for the country.

Economic competitiveness and efficiency

The energy sector will be economically efficient and will contribute to Namibia's economic competitiveness.

Sustainability

The Namibian energy sector will move towards the sustainable use of natural resources for energy production and consumption.

Government recognises that in certain contexts some of these goals may be contradictory. The detailed policies which follow for the various supply, demand and cross cutting sectors represent government's current thinking on the best means to achieve these goals and overcome any contradictions.

2.4.3 Structure of the Policy

The document has been divided into four parts. Part 1 presents an economic and development context for the energy policy, and a brief profile of the energy sector. Policies for the energy demand sector are given in Part 2. The main focus of Part 2 is on the energy needs of urban and rural households. Part 3 presents policy choices related to the energy supply sector, including electricity, upstream oil and gas, downstream gas, and liquid fuels, and renewable energy. Policy for the cross-cutting sectors includes that which is applicable to the environment, health and safety, energy

efficiency and conservation, and regional energy trade and co-operation, and is presented in Part 4. Every effort has been made to ensure that the policy is concrete, attainable, justifiable, implementable, and realistic for the various energy sub-sectors.

The energy policy has been seriously considered in formulating the master plan. The policy has partly been stated in the related sections of the master plan report.

CHAPTER 3

SOCIAL ANALYSIS

CHAPTER 3 SOCIAL ANALYSIS

3 1 The Present Situation of Social Economy of Namibia

3.1.1 The Present Situation of Economy

Namibia faces the same legacy of apartheid as South Africa with an economy of extreme contrast. Some of its main characteristics are:

- A dualistic economy with a sophiscated modern sector that employs only a minority of the population
- The economy is depending on a few natural resource based sectors, to a large extent, capital intensive with little contribution towards increasing employment and reducing income inequality.
- Regarding the distribution of resources, there are vast disparities between a small, wealthy minority and a big majority of which many live below the poverty line.

The GDP per capita amounted to N$8,500 (US$ 1,800) with its 79th rank in 1996. This classifies Namibia as a middle income country. However, which is 116th in a ranking by the so-called Human Development Index (HDI), Namibia ranks much lower than by its GDP per capita and trails many countries with a lower GDP per capita.

Regarding the agriculture, though subsistence agriculture only contributes about 3 to 4 percent to the Gross Domestic Product (GDP), an estimated 35 to 40 percent of the employed population work there. Commercial agriculture, by comparison, contributes about 7 percent to the GDP and employs about 10 percent of all employed persons. It involves mainly livestock production, to a large extent exported to South Africa.

The fishing industry has been rapidly expanding since Independence. The fish catches are to an increasing extent further processed in Namibia. Thus, the combined contribution to the GDP by fishing and fishing processing has grown 4.5 percent in 1990 to percent in 1994.

Namibia is well endorsed with a variety of important minerals. The *mining* industry, although decreasing in relative importance, still contributes 10 to 15 percent to the GDP. However, the industry has had a minor effect on employment creation outside the mining itself.

Manufacturing, except meat and fish processing, contributes only about 3.5 percent to the GDP.

A striking feature of the structure of Namibia's economy is that the total expenditure by government amounts to almost 40 percent of the GDP. Among the reasons behind the relatively high percentages of government is the need to establish and organise government in accordance with the new and democratic contribution. This had to be achieved in context with the constitutional agreement to keep all public sector personnel from the previous administration.

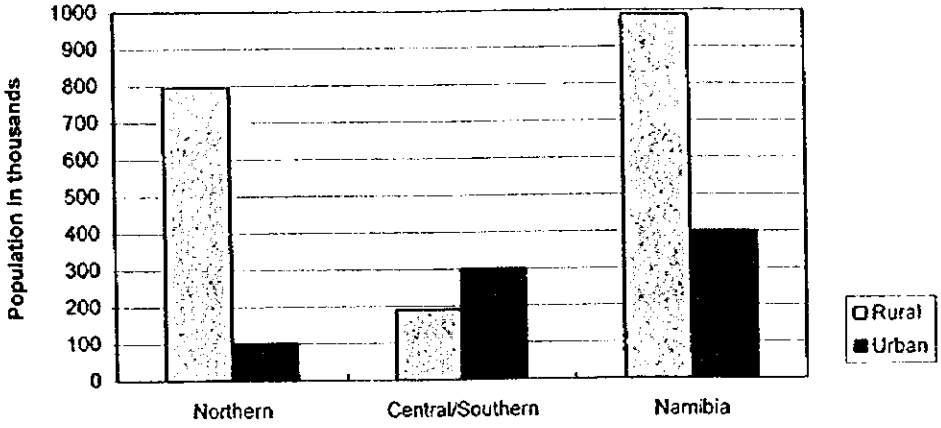
Namibia's economy has performed better since Independence than at any time since 1980. The average annual growth of the GDP since 1990 has been 4 percent.

3.1.2 Society of Namibia

(1) Population

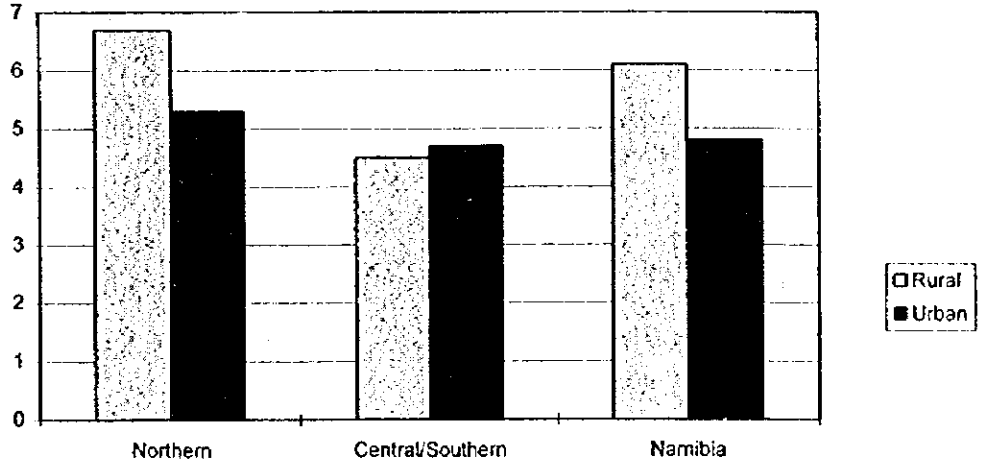
The number of private housefolds in Namibia is about 245,000 and the number of persons in these households is about 1.4 million. According to the 1991 Population and Housing Census, about 100,000 persons live in institutional households like hospitals, barracks and prisons. Thus the total population in Namibia is about 1.6 million. Most of the population live in the rural areas in the northern regions of the country (See Figure 3.1). The Khomas region where the capital Windhoek is situated has the largest population of the central/southern regions-about 35,000 private households and 160,000 persons in these households. The average household size is 6.1 persons in rural areas and 4.8 person in urban areas (Figure 3.2).

Figure 3.1 The household population by northern and central/southern regions and rural/urban areas



Source: CSO

Figure 3.2 The average household size by northern and central/southern regions and rural/urban areas



Source: CSO

(2) Age

The Namibian population is young. 43 percent of the household population are below 15 years of age. About 70 percent are below 30 years of age. About half of the Namibian population are in working ages i.e. in the age group from 15 to 64. The rate is somewhat lower in rural areas and evidently higher in urban areas. Only 5 percent of the Namibian population is 65 years or older.

(3) Main language

There are many languages spoken in Namibia and many Namibians are multilingual. The most common main language is Oshiwambo, which is the main language for half the Namibian population.

Afrikaans, Damara/Nama, Rukavango and Otjiherero are main languages for about 9 to 12 percent of the Namibian population respectively. The San language is the main language of somewhat more than 1 percent of the Namibian population. The official language - English - is the main language of only 1 percent of the Namibian population.

As a result of the language policy of the pre-independence regime in Namibia, Afrikaans has become the main language of households from different ethnic groups and also a main language for communication between different ethnic groups.

(4) Education

There are about 1,125,000 inhabitants in Namibia who are 6 years or above. 16 percent or about 175,000 have never attended school. About 135,000 or 75 percent of this group are 20 years or older. In the age group 65 and above,55 percent have never attended school.

About 55 percent of the Namibian population, 20 years and above have no secondary education. In the rural areas the corresponding percentage is about 65 percent.

In several of the northern regions the percentage of the population, 20 years and above having no secondary education is still higher. For example, in the Ohangwena region, about 75 percent of the population 20 years and above have no secondary education.

Educational attainment on tertiary level is rare in Namibia. 4 percent of the population 20 years and above or 25,000 persons have some kind of tertiary education. 80 percent of these persons are males.

3.2 The Labour Situation in Namibia

3.2.1 The Labour Force

57 percent or about 800,000 of the Namibian population are 15 years and above. Among this part of the population, 55 percent or about 435,000 are economically active i.e. belong to the Namibian labour force. In the age group 10 to 14 years, to which 13 percent of the Namibian population belong, about 7 percent are economically active and the majority of them are unpaid family workers.

The labour force participation rate is lower for females than for males. The labour force participation in the rural areas is low compared to the urban areas. The labour force participation is highest in the Khomas region while Ohangwena has the lowest labour force participation rate of the 13 regions in Namibia.

3.2.2 The Employed

Out of the economically active population, 81 percent or 360,280 persons are employed i.e. have some work.

Income earners constitute about three fourths of the employed population while unpaid family workers constitute somewhat less than one fourth.

About three fourths of the income earners are paid employees and one forth are own-account workers or employers.

3.2.3 The Unemployed

19 percent of the economically active population or about 85,000 persons are unemployed i.e. have no work in spite of the fact that they are available for work and looking for work.

Females have somewhat higher unemployment rate than males. Generally, the unemployment rate is higher in the younger age groups. The unemployment rate in the rural areas (16%) is low compared to the urban areas (25%). The reason for this

difference might be lack of jobs in the rural areas which discourage people from looking for work.

3.2.4 The Underemployed

A person is underemployed if he/she has some employment but is available for more work. About half of the employed population is underemployed in Namibia.

The underemployment in the rural areas is higher than in the urban areas. The under employment of females is slightly higher than for males.

3.3 Households in Namibia

3. 3.1 The Economic Activity of the Household

As an indicator of the household economic activity of a household, the concept of full-time employment equivalent is used. One full-time employment equivalent corresponds to one full-time employed person but this employment does not necessary fall on one household member but might be distributed on two or more part-time employed household members (One full-time employment equivalent corresponds to 40 hours of employment by one or more than one of the household members during a period of one week).

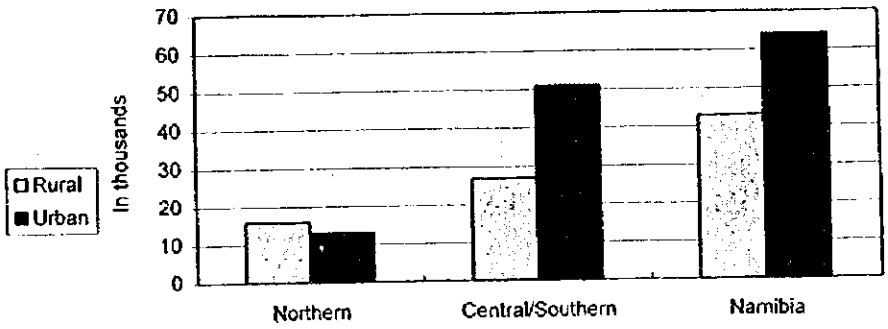
In 24 percent of the Namibian households, no economic activity at all took place during the week some several years in Namibia. Presently, in 55 percent of the households, the economic activity corresponded to one or more than one full-time employment equivalent. In 22 percent of the households the economic activity even corresponded to two or more than two full-time employment equivalent.

The economic activity in the households is significantly higher in the urban areas than in the rural areas. The economic activity in the households is also significantly higher in the central/southern regions of Namibia than in the northern regions.

3.3.2 Main Source of Income

'Wages in cash' is the most common main source of income for the Namibian households. 44 percent of the households report this main source of income. The second most common main source of income is 'subsistence farming'.35 percent of the households report 'subsistence farming' as the main source of income. Among the remaining 21 percent of the households, 11 percent have 'pensions',6 percent have 'business' and 4 percent have 'cash remittances' as the main source of income. Figure 3.3 shows the households with wages in cash by northern and central/southern regions.

Figure 3.3 Households with wages in cash as the main source of income by northern and central/southern regions and rural/urban areas



Source: CSO

About 14,000 households have 'business' as main source of income and about 4,000 of these households are commercial farmers.

In urban areas,' wages in cash' is the predominant main source of income. Almost 80 percent of the households report 'wages in cash' as the main source of income in urban areas. On the other hand, subsistence farming is the predominant main source of income in rural areas.

But 'wages in cash' is also common as the main source of income in rural areas. 'Subsistence farming' is the most common main source of income for female headed households while 'wages in cash' is the most common main source of income for male headed households. More female headed households than male

headed households report 'pensions' and 'cash remittances' as the main source of income in rural areas as well as in urban areas.

With the exception of the Kunene region, 'subsistence farming' is the predominant main source of income in the northern regions, while 'wages in cash' is predominant in the central/southern regions.

3.4 Distribution of Economic Resources

3.4.1 Background

An attempt to illustrate the skewed distribution of economic resources among the population in Namibia was conducted by a UN mission in1989. In this study the population was divided into three groups: 'Whites', 'Non-whites supported by modern economy' and 'Non-whites supported by traditional economy'. By means of rough statistical judgements based on available population figures, the number of the Namibian population belonging to the three groups was estimated. In the same way, the Namibian Gross Domestic Product (GDP) was also distributed among the three groups. Based on these calculations shown in Table 3.1 were presented for 1988.

Table 3.1 Population and GDP disaggregated by three population

	Whites	Non-whites supported by modern economy	Non-whites supported by traditional economy	All groups
Percentage of population (%)	5.1	40.0	54.9	100
Distribution of GDP (%)	71.2	25.4	3.4	100
Per Capita GDP (Rand)	32919	1500	145	2360

Source: UN Mission

As to the above Table, the UN Mission reported as follows:
'Though the estimate of per capita GDP are provisional, they show the general trend of income distribution among the population groups'.

'The overall per capita GDP in a developing country like Namibia is greatly affected by the dualistic nature of the economy. This dualistic nature is very apparent in the economy of Namibia and it is the most distinguishing characteristics of that country.

In Namibia, two separate economics exist. On one hand, there is a modern sector which employs highly advanced technologies techniques and methods in the production process and ways of life. On the other hand, there is a traditional sector which depends on subsistence production and has not reached a level of sophistication and development. Therefore, the overall per capita GDP combining the economies of these two sectors is misleading and conceals great differences in the income accruing to groups of population associated to or supported by these sectors.'

3.4.2 Basic Indicator

As experienced internationally, the consumption is better recorded than income in house-hold income and expenditure survey. This means that the most reliable way to estimate (total available) household income and expenditure survey is to add household savings and investments and some other non-consumption disbursements (e.g. income tax) to the total private consumption of the household. The private household consumption is defined as the cash expenditures and the consumption in kind (own produce, bartering, payments/gifts in kind). Household income and private household consumption defined in this way are the main indicators of economic standard in this report.

3.4.3 Household Consumption

The 10 percent of the households (5.3 percent of the population) having the highest economic standard i.e. the highest per capita income are consuming about 44 percent of the total private consumption in households. The other90 percent of the households (94.7 percent of the population) are consuming about 56 percent of the total private consumption in households. The annual per capita consumption is about N$18,700 in the better off group while it is about N$ 1,300 in the rest of the population.

The 5 percent of the households who have the highest economic standard have a total consumption which is almost twice the consumption of the 50percent of the households who have the lowest economic standard. The smaller group of 5 percent

of the households includes only 2.5 percent of the population but has a total annual consumption of about Million N$ 900. The larger group of 50 percent of the households includes about 60 percent of the population and the total annual consumption in this group is about Million N$ 490.

3.4.4 Household Income

The skewness of the income distribution is still more pronounced than the skewness of the distribution of private consumption. The 10 percent of the households or 5.3 percent of the population who have the highest per capita income have more than 50 percent of the total income of the private households. The other 90 percent of the households or 94.7 percent of the population have only about 48 percent of the total income of the private households.
The average per capita income is about N$ 29,500 in the better off group while it is about N$ 1,500 in the rest of the population.

The 5 percent of the households who have the highest economic standard have a total household income which is about three times the household income of the 50 percent of the households which have the lowest economic standard.

The smaller group of 5 percent of the households includes only 2.5 percent of the population but has a total annual household income of about Million N$1,500. The larger group of 50 percent of the households includes about 60 percent of the population and the total annual household income in this group is about Million N$ 520.

3.5 Differences Between Population Groups

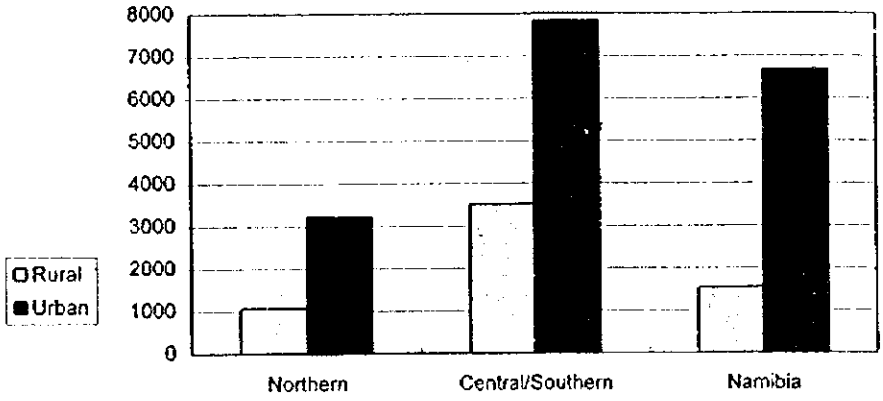
The skewed distribution of economic resources illustrated above is reflected in often dramatic differences in living conditions between population groups in Namibia. In this report such differences in living conditions are systematically described for population groups defined from the following variables.

- region and rural/urban areas
- highest formal education of head of household

3.5.1 Region and Rural/Urban Areas

The Khomas region has the highest level of private income in Namibia. The average annual per capita income in Khomas region is about N$ 10,000. A general Observation is that rural areas and the northern regions of Namibia are worse off concerning economic standard (See Figure 3.4).

Figure 3.4 The average per capita income (N$) by northern and central/southern regions and rural/urban areas



Source: CSO

The differences in economic standard are reflected when studying indicators on housing conditions and possession of household durable/capital goods.

In the rural areas almost three quarters of the households live in traditional houses and only about 15 percent in modern housing i.e. in a detached or semi-detached house or in a flat. In urban areas the frequencies are the opposite - about 80 percent of the households live in modern housing and only 3 percent in traditional houses. The frequency of improvised housing is about the same in rural and urban areas - about 10 percent.

The majority of the households live in traditional houses in the Caprivi, Kunene(49%), Ohangwena Okavango, Omusati, Oshana and Oshikoto regions i.e. in

the northern regions of Namibia. In Caprivi, Ohangwena, Okavano and Omusati the frequencies are 85 percent or higher.

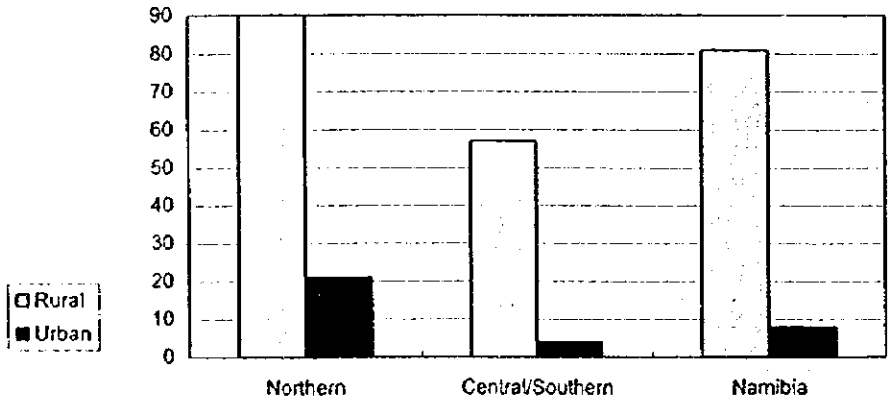
In the central/southern regions - with the exception of the Omaheke region-the majority of the households live in modern housing. In the Karas, Omaheke and Otjiozondjupa regions more than 20 percent of the households live in improvised housing.

There is no straightforward relation between the type of house of a household and the housing standard. Also households living in modern housing might have a low housing standard.

About three quarters of the Namibian households have no electricity or gas for cooking. The same frequency of households have no electricity for lighting. Almost 60 percent of the households use the bush or a bucket as toilet. About 45 percent have no pipe or well for drinking water within 5 minutes' one-way distance from the house.

There are great differences in housing standard between rural and urban areas. The housing standard is much worse in rural areas. As an example, about 80 percent of the households are using bush or bucket as toilet in rural areas while less than 10 percent in urban areas (See Figure 3.5).

Figure 3.5 Percent of households using bush or bucket as toilet by northern and central/southern regions and rural/urban areas



Source: CSO

There are also great differences in housing standard between the regions of Namibia. The Khomas region where the capital Windhoek is situated has, on the average, a significantly better housing standard than the rest of the regions. And among the rest of the regions the housing standard is clearly worst in seven northern regions of Namibia.

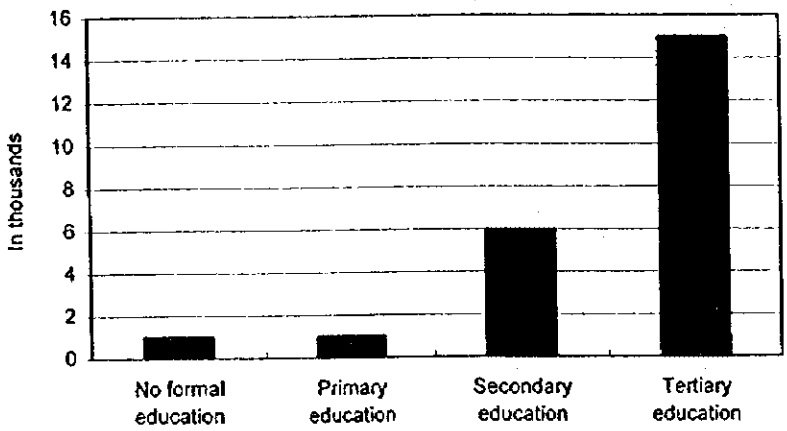
3.5.2 Education of Head of Household

There is a strong relationship between the level of educational attainment of the head of household and the economic standard of the household. The average per capita consumption is about 12 times higher in households where the head has finished some tertiary education compared to households where the head has no formal education (See Figure 3.6).

The differences in average income level are still more pronounced. The average per capita is about 15 times higher in households where the head has finished some tertiary education compared to households where the head has no formal education.

There is a clear correlation between the level of education of the head of household and the type of house of the household. The higher the education, the more frequent the households live in modern housing i.e. in detached or semi-detached houses or in flats. The lower the education, the more frequent the households live in transitional houses or in improvised housing.

Figure 3.6 The average per capita income(N$)by educational attainment of the head of household



Source: CSO

There is a clear correlation between the level of education of the head of household and the housing standard of the household. For example, in households where the head of household has no formal education about 95 percent of the households have no electricity for cooking or for lighting. The same percentage in households where the head of household has a tertiary education is about 20 percent.

3.6 Rural and Peri-urban Household Energy Consumption

Based on the survey report "Study on Energy Consumption Patterns of Rural and Peri-urban Households in Namibia, June 1997" that describes the status on energy consumption in rural and peri-urban areas in Namibia, present issues concerning fuels for lighting and cooking, entertainment and gender problem are discussed below. Note that the survey for this report was conducted by MME in conjunction with UNDP and GTZ.

The survey collected data on and at villages Omutati, Oshana, Oshikoto, Okavango, Omaheke, Erongo (2 sites) and Karas (appearing in the order of location from north to south). Tables 3.2 through 3.4 show the summaries of the survey. Table 3.5 shows detailed descriptions on the actual status at each of the survey points.

This survey used three household groups according to their income.

Group	Monthly income (N$)
Low income	50 ~ 750
Middle income	751 ~ 1,500
High income	1,501 ~

3.6.1 Types of Energy and Their Use

(1) Fuel for Cooking

They use firewood, gas, electricity, cow dung and kerosene for cooking. Table 3.2 shows a relationship between the use of these fuels and household income.

Table 3.2 Cooking fuels by Income groups (% Households)

Fuel	Low Income	Middle Income	High Income
Wood	93.8	85.7	90.9
Gas	27.1	35.7	50.0
Electricity	4.2	7.1	22.7
Cow dung	22.7	0.0	9.1
Kerosene	10.4	14.3	9.1

Note: Because some of the family samples are using multiple types of fuel, the sum of percentage numbers exceeds 100%.

Consumption of firewood for cooking is far and away the largest irrespective of income level. They are consuming firewood of 3.8 kg/day/household that corresponds to 0.587 kg/day/person. Higher income households are consuming a larger proportion of gas and electricity. Table 3.3 shows statistics on the amount of expenditure for firewood. As can be seen in this table, 81% of the household samples are procuring firewood free of charge.

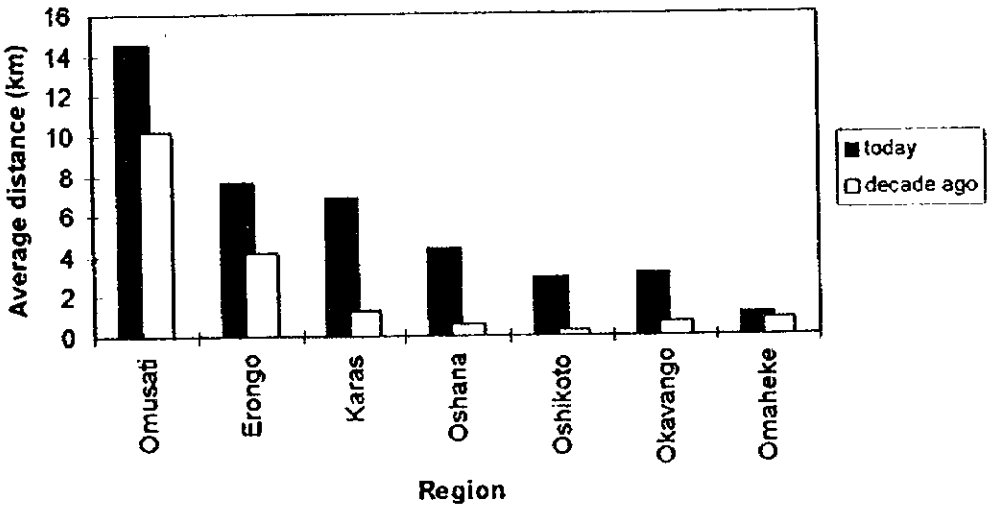
Table 3.3 Proportion of households by expenditure on fuel wood

Expenditure (N$)	% households
0	81
1-50	11
51-100	7
101+	1

Collecting firewood is normally a job of women and children. For this job, they must move about in an area of 5.6 km long (and 0.25 to 30 km wide) on average. They transport firewood on foot (66%) or using a donkey cart (22%) or vehicle (1%).

The distance they must move is becoming longer year by year, now about twice longer than 10 years ago (see Fig. 3.7).

Fig. 3.7 Average distances travelled for firewood: today and a decade ago



Source: MME

(2) Fuels for lighting

They use candles, kerosene, electricity and gas in the order from the largest consumption. Table 3.4 shows a relationship between the use of these fuels and income household level. The low income group is using mainly candles, while the middle and high income groups are using mainly kerosene and electricity. The monthly expenditure for lighting ranges from N$1.9 to N$93.6 with the average of N$21.5. The light-on time is 3.3 hours per day on average (ranging from 0.4 to 7 hours).

Table 3.4 Lighting fuel by income group (% households)

	Low income	Middle income	High income
Candles	70.8	50	50
Kerosene	50	71.4	72.7
Gas	2.1	7.1	4.5
Electricity	6.3	28.6	36.4

Note: Because some of the family samples are using multiple types of fuel, the sum of percentage numbers exceeds 100%.

Source: MME

(3) Entertainment and Others

There are almost no entertainment apparatuses other than radios and TVs in these villages. Radios are dry-cell or lead-storage-battery operated. TVs are external-power or lead-storage-battery operated. The present status on the use of radios and TVs is as shown below.

Spread rate	Power source
Radio (69.3%)	Dry cell (98%)
	Lead-acid battery (2%)
TV (8%)	External power (87.5%)
	Lead-acid battery (12.5%)

In addition, daily conversations within families or with neighbors are consuming 80 minutes per day on average. These conversations in the night are using firewood-lighting. The expenditures for lighting for entertainment purposes are estimated N$9.55 per month on average, though this figure may include errors due to the difficulty in sorting the lighting energy by its purpose.

The present status on the use of irons and refrigerators is as shown below.

Spread rate	Energy source
Iron (48%)	Hot wood coal (70%)
	Charcoal (7.1%)
Refrigerator (5%)	Electricity (50%)
	Kerosene (50%)

Note: About half of the electrified households have an electric refrigerator.

(4) Sunstove Solar Cooker

Sunstove solar cookers using the solar energy are an alternative to fire wood. According to willingness to purchase and use solar cookers, 82% of the total household samples would want to use the solar cooker. The market price of the solar cooker is N$120. 83% of the household samples who are would want to use the cooker may afford to pay N$50 to N$120. The remainder (17%) are negative, because they would not pay anything for the cookers.

Factors for obstructing the spread of solar cookers include a general feeling of uneasiness in using such a new apparatus that may be strange to the people who have never used cooking apparatuses other than firewood-burning cookers, and poverty. Table 3.5 shows detailed data on energy consumption at the eight villages in the seven regions. This table clarifies the actual status of energy consumption in the rural areas.

Table 3.5 Energy Consumption in Rural and Peri-urban Households

(1/2)

Characteristics \ Region	(1) Tsandi-Omusati		(2) Ekamba-Oshana		(3) Omuthiya-Oshikoto		(4) Mashare-Okavango	
1. No. of hsld. members & Rooms								
Av.: (Range: ~)	8.7	(6 ~ 12)	10	(6 ~ 12)	10	(4 ~ 24)	16	(9 ~ 28)
Room:	11		12					
2. Household Income (N$/month)								
Income Av. (range)	1,038	(150 ~ 3,000)	1,183	(150 ~ 4,800)	745	(185 ~ 1,700)	2,450	(1,069 ~ 4,550)
Remittances	114 (30% hslds.)	(42 ~ 200)	37 (33% hslds.)	(10 ~ 50)	200 (40% hsld.)		109 (58.3% hslds.)	(50 ~ 500)
3. Cooking fuel (N$/month)								
Av. (range)	(Propo. of hsld.)	(Expenditure)						
Wood	100%	0	100%	0 (40% hsld.)	100%	0	100%	72.2 (22.4 ~ 160)
Kerosene	30%	32.1 (10.8 ~ 45.5)	11%		20%	7 (6 ~ 58)	16.7%	
Gas	40%	110 (45 ~ 199)	22%	57.5 (45 ~ 70)	20%	45 (20 ~ 70)	58.3%	10 (4.4 ~ 18)
Electricity	0		0		0		0	
Charcoal	0		0		0		0	
Cow dung	0		77	0	0		0	
Total expenditure		71 (10 ~ 199)		40.8 (7.5 ~ 70)		10.4 (0 ~ 70)		80 (28.4 ~ 166.25))
4. Collection of fuel								
Travel Av. (Range)	14.5 km	(8 ~ 19 km)	4.3 km	(1 ~ 7 km)	2.9 km	(0.25 ~ 8 km)	1.2 km	(0.4 ~ 3 km)
Times/month	9		n.a.	8 times than decade ago	4	(1 ~ 8)	buy at the market sites	
Responsibility	Women & Children		Woman & Children		Women & Children		-	
Transport (share %)	Vehicle (40), Foot & donkey (40)		Walk		Walk		Walk, donkey cart	
Tree (live or dead)	Fell trees		Fell 1 tree/trip		Fell 1 tree/trip	(30% hsld.)	Not chop down any tree	
5. Lighting (N$/month)								
Av. (range)	(Propo. of hslds.)	(Expediture)						
Kerosene	100%	23 (10 ~ 52)	55.5%		90%		90%	
Candle	60%	18 (-)	77.8%		70%	17.8 (3.6 ~ 44.1)	50%	
Gas	0		0		10%		8.3%	
Electricity	0		0		10%	-	33.3%	
Torch	-	(inc. in total)	11%	10 (-)	30%	15 (-)	-	5.4
Rooms to light up	4		2 (1 ~ 6)		2 (1 ~ 5)		3	
Mean duration hours	3		3 (1 ~ 6)		2.4 (1 ~ 4), Business: 20%		3	
Total expediter		47.4 (14.4 ~ 97)		41.9 (2.8 ~ 102.6)		37.0 (8.4 ~ 75.1)		25.2 (12.1 ~ 42.6)
6. Entertainment (N$/month)								
Av. (range)	(Prop. of hsld.)	(Expenditure)						
TV	0		0		0		0	
Radio with dry-cell batt.	100%		55.6%	36 (32 ~ 40)	50%	32 (15.6 ~ 48)	58.3	
Fringe with kerosene	25%		22.2%		30%			
Iron with wood fired	-		0		0			
Firing hrs. after cooking	70% hslds. put out the fire		44.4% hslds. put out the fire Remaining: 2 hrs.		90% hslds. put out the fire		41.7 hslds. put off the fire soon Remaining: 1.5 hrs.	

Note) hslds: households

Source: MME

Table 3.5 Energy Consumption in Rural and Peri-urban Households

Characteristics \ Region	(5) Epukiro-Omaheke		(6) Henties bay-Erongo		(7) Okombahe-Erongo		(8) Kutenhoas-Karas	
1. No. of hsld. members & Rooms Av.: (Range: ~) Room:	16 -	(9 ~ 24)	5 -	(2 ~ 9)	6 4		14 3	(NHIES: 4.7)
2. Household Income (N$/month) Income Av. (range) Remittances	2,450 109 (58% hslds.)	(1,069 ~ 4,550) (50 ~ 500)	395 50 (5.9% hslds.)	(200 ~ 900)	1,256 78 (15% hsld.)	(160 ~ 4,450) (60 ~ 100)	1,015 115 (50% hslds.)	(150 ~ 5,000) (20 ~ 350)
3. Cooking fuel (N$/month) Av. (range)	(Propo. of hsld.)	(Expenditure)						
Wood	100%	72.2 (22.4 ~ 160)	70.6%	44.5 (10 ~ 96)	90%	26.9 (2 ~ 60)	100%	
Kerosene	16.7%	7.5 (5 ~ 10)	0%		0%		45%	
Gas	58.3%	10.0 (4.4 ~ 18)	75%	57.5 (45 ~ 70)	20%		8.3%	
Electricity	0		11.8%		30		0	
Charcoal	0		0		0		0	
Cow dung	Used in winter		0		0		0	
Total expenditure	Total	80 (28.4 ~ 166.25)	Total	41.7 (12 ~ 103.6)	Total	43.6 (30 ~ 65)	Total	18 (Max. 48)
4. Collection of fuel Travel Av. (Range) Times/month Responsibility Transport (share %) Tree (live or dead)	1.2 km (0.4 ~ 3 km) 92% hslds. buy at market sites - Foot (66.7), donkey (8.3) Not chop down any tree		3.8 km (0.5 ~ 6 km) 5 times further than 10 years ago Woman & children Foot -		8 km (1 ~ 30 km) Foot (30), donkey (45) Chop 3 trees/2 trips		6.5 km (2 ~ 10 km) 5 times further than 10 years ago Women & children Foot (33.3), donkey (66.7) -	
5. Lighting (N$/month) Av. (range)	(Propo. of hsld.)	(Expenditure)						
Kerosene	90%	23 (10 ~ 52)	23.3%		60% }		69.2%	
Candle	50%	18 (-)	82.3%		30% }		70%	
Gas	8.3%		5.9%		-		0	
Electricity	33.3%		17.6%	8.3 (-)	40%		0	
Torch	-	(inc. in total)	-		45%	9.10 (-)	58%	4.6 (3.15 ~ 6.60)
Rooms to light up	3		3		3		2	
Mean duration hours	3		4		4		4	
Total expediter		25.2 (12.1 ~ 42.6)		- (9.6 ~ 62.4)		24 (2.4 ~ 68.4)		27.2 (1.9 ~ 79.4)
6. Entertainment (N$/month) Av. (range)	(Prop. of hsld.)	(Expenditure)						
TV	0		12%		30		0	
Radio with dry-cell batt.	58.3%	5.4	50%		85%		80%	13.3 (-)
Fringe with kerosene	-		17.6%		40% (elect.)		8.3%	
Iron with wood fired	-		35		50% (Wood fired 25%, elect. 25%)		83.3%	
Firing hrs. after cooking	42% hslds. put off the fire soon. Remaining: 1.5 hrs.		- -		-		-	

Note) hslds: households

Source: MME

3.6.2 Problems Relating to Household Energies

Problems relating to the supply of household energies include:

a. Family members', especially women's and children's overwork required for gathering firewood
b. Social development being impeded for lack of living necessaries
c. Natural environment being deteriorated due to the increasing consumption of wood
d. Accessibility to alternative energies being impeded due to poverty and insufficient governmental supports

3.6.3 Gender Related Problems

According to "National Gender Policy, Department of Women's Affairs, Nov. 1997" prepared by the Namibian Government, various gender related problems including the following have been recognized.

a. Gender, poverty and rural development
b. Gender balance in education and training
c. Gender and reproductive health
d. Violence against women and children
e. Gender and economic empowerment

Gender problems existing in developing countries including Namibia has a common background that women living in rural areas are forced to overwork for housekeeping and farming using primitive tools and methods.

Collecting firewood requires walking for five hours or more per week on average that corresponds to a move of 3.9 km distant. The value of this work has been estimated as low as N$38 per month (per annum N$456). Compare this with the farm employees' average wage of N$300 per month. Lighting is necessary for all family members, especially for school children whose job is reading. Housewives

need lighting for preparing dinner. Some families require lighting for in-house businesses such as commercial baking and basket weaving.

The most urgent problem among others is women's overwork that is attributable to poverty and is relating to the method for procuring household energies. It seems that this is a matter to be discussed widely, not just as a family matter. Disparity in wealth will lead to abuse of human rights.

3.7 Disparity in Wage

Macroscopic statistics cannot show the actual status of wage disparity. Economic inequalities, wage disparity in a narrower sense, can be expressed with the Gini coefficient. The Namibia's Gini coefficient in 1993/94 was 0.70. The present number of this coefficient may be much about the same, since the factor is unlikely subject to sudden improvement.

The Gini coefficient of zero (0) means no inequalities existing. The Gini factor of one (1) means perfect inequalities: only one person has an income while others have no incomes. In reality, either of the number 0 or 1 does not occur (values above 0.55 indicate 'very skewed income distribution'). For information, the Japan's Gini coefficient in the years from 1960 to 1996 was 0.25 to 0.31 (0.28 in 1996). A larger Gini coefficient will lead to larger disparities in education, employment and income levels, and resultantly invite a further raise of the Gini coefficient.

3.8 Living Environment in Rural Areas

The 1996 per annum GDP was N$8,500 (US$1,800), though about half of the population earned less than NS$500 that is slightly larger than the annual income by firewood collecting by a woman (NS$38/month x 13 months approximates NS$500) (see 3.6.3). The GDP figure does not reflect the actual status of living of the low income population due to the great disparity between the rich and the poor. These disparities likely root in the specific national history of Namibia, monopoly of capital by limited groups, and the specific industrial structure. The Government

should make efforts to remove such disparities by introducing the philosophy of the welfare economics.

(1) Discussions for Eliminating the Disparities

Energies are a matter of governmental concern in any of developing or developed countries. Energies are prerequisite to human living and their sources are limited. It is therefore reasonable that all governments are using regulatory instruments in order to control the driving force from the market and ensure the fair sharing of energies.

A generally acceptable theory that interprets the idealism in resource distribution is that achieving an equilibrium in a market can give rise to an efficient distribution of resources (Pareto's optimum distribution). However, this theory is not always desirable: an equilibrium can be obtained even with the mixture of the very rich and the very poor. This is the case occurring in Namibia. Even if an equilibrium has been achieved through a free competition, it is unknown whether fair sharing of resources can be assured or not.

On the contrary, the welfare economics is to achieve both efficient distribution and fair sharing of resources by transferring a certain amount of assets from the rich to the poverty at an early stage. One of the methods for realizing this theory is taxation and aid. This instrument (poor-aiding programs using tax revenues as the funds) enables the poor to access to resources.

(2) Assistance for the Low-income Population

The following instruments for aiding the poverty are effective and considerable.

a. Supplying solar cookers free of charge or at a lower price
b. Supplying electricity free of charge or at a lower price

a.: This should apply to areas where electric grids will unlikely be expanded for the time being or where firewood is in short supply. The market price of the solar cooker is NS$120. Families with a monthly income of NS$50 to 200 may not afford to buy the solar cooker, so that they must continue using firewood. Another reason for obstructing the propagation of solar cookers is a general feeling of uneasiness in using such new apparatuses. However, these obstructions can be removed by

financial aids: supplying solar cookers free of charge or at a lowest price.

b.: This instrument will allow low-income families to reduce the payment for electricity. For example, using two electric lamps of 30W for six hours a day will consume electricity of 10.8 kWh per month. Based on the electric rate of 34 Nc/kWh (MRLGH's prepayment system energy charge), the electric charge for this consumption is N$3.7 per month. This accounts for 7.4 to 3.7% of the average monthly income (N$50 to 100) of the low-income family category. This electric charge is unreasonably high. This should normally be less than 2%.

For information, the Brazilian poor-aiding program (1996) exempts families whose monthly income is not greater than US$120 from payment for monthly electric consumption up to 30 kWh.

The above mentioned two instruments will effect:

a. relieving women and children from overwork for collecting firewood - the first step of gender policies, and
b. reducing the consumption of firewood, and suppressing the ongoing destruction of natural environment.

These instruments may be associated with some gender policies and/or financial supports for environmental protections that may need funds. This implies that even the low-income group may be imposed a energy-related tax , and resultantly the disparities between the rich and the poor may further enlarge.

3.9 The Future Prospect of Namibia's Society

Based on the analyses discussed so far in the previous sections of this Chapter, an analysis is made here on the future prospect of Namibia's societies on a long term basis. In conducting the analysis, thorough attention has naturally been focused onto the precise identification of the factors which function to hinder the balanced economic and social development of the country. Among others, the difference of gap of the living standard between the people living in urban areas, mainly

comprised of the 'white' and the people in rural areas, mainly 'black', still exist distinctly in Namibia as the legacy of 'apartheid'. In other words, the gap of living standard derivied historically between the two different races underlines the basis of any other kinds of gap and inequalities among the people in Namibia.

However, it is not easy or rather sometimes incorrect for a social economist to make comment on the social and economic gap caused by the racial difference in Namibia since the issue is which in the category of politics.

(1) Namibia as a Multi-racial Nation

Though a lot of discussions have been made on the difference between regions or between races in Namibia, it is felt that a socio-economic development on a national level has not clearly indicated in the sense that two major different races in Namibia are jointly combined the sychronized to attain the same goal of the prosperity of the country.

For instance, in Malaysia, which is also a multi-racial nation, the New Economic Plan(NEP) was officially launched as the National Policy to enhance the living standard of the indigenous Malay people who had been in lower economic situation in comparison with the Malaysian -Chinese.

The NEP, covering 20 years up to 1990, has implemented various policies to raise the living standard as well as the educational level of Malaly people. Malay people, who occupy around 60% of the total population of Malaysia, has been lagging behind the Malaysian-Chinese, whose population in Malaysia is about 35%, in their economic and social activities. As the result of implementing the New Economic Plan, the living standard of the indigenous Malay people are enhanced remarkably in the course of 20 years and today Malaysia is one of eminent economic powers in the South East Asia. Thus, the difference or gap of livelihood between the two different races in Malaysia has significantly been reduced.

(2) Importance of Human Resources Development

As was discussed in the section of 3.1.1, GDP per capita of Namibia in 1996 was N$8,500-(US$1,800-) and Namibia was ranked 79th in the entire countries of the

world. However, in the ranking of 'Human Development Index=HID), Namibia was ranked 116th in the world which is far lower than those developing countries where GDP per capita is much lower than Namibia. This is due to the reason that the absolute total amount GDP itself of Namibia is high owing to the earning of the export of diamond and other mining resources. Wealth thus earned is owned and monopolized by a small group of rich people in Namibia and its economic and social benefits do not reach or even trickle down to the majority of the Namibian citizens.

Further, the mining industry does not contribute much to the significant the increase of the creation of the employment opportunities of the Namibians. Further, the mining industry does not contribute much to the significant increase of the job creation of the Namibians. On the other hand, there are two types of agricultural activities in Namibia which is considered to offer the maximum volume of employment opportunities for Namibians.

One is 'commercial farming' mainly engaged and operated by the 'white' agricultural people where the advanced farming technology is introduced together with modern farming machines and equipment. The commercial farmings attain high agricultural productivity whereby the white farmers are possible to earn high income by marketing their agricultural products. The other is 'subsistence agriculture' mainly engaged by the 'black' farmers where the farmers can hardly sustain their own living. Thus, it is indeed unique to find two extreme dualism in a nation like Namibia where mutual close collaboration has not been maintained satisfactorily between the two main different races in a country.

(3) Necessity of Enhancing the Agricultural Productivity

As described earlier, there are two types of agriculture in Namibia; 'commercial agriculture' and 'subsistence agriculture'. White people who are engaged in commercial agriculture earn high income while black people who are engaged in subsistence agriculture can hardly support their own subsistence by farming due to the low agricultural productivity. Approximately 60% of the total population of Namibia reside in the rural areas and the living standard of nearly half of the total population of the nation is below the 'poverty line'. It is vital in the country, where significant industry is not anticipated to be arisen in the near future, to exert utmost

nation-wide efforts geared for heightening the agricultural productivity. Many programmes have already been launched to cope with the issue as the poverty reduction programmes.

Further, a number of programmes by the central as well as by the provincial governments have been planned and implemented for institutional strengthening of the peoples organizations and agricultural cooperatives and so on. However, the results of the implementation of these programmes have not yet reached the practical level.

By observing the agricultural development in Namibia, what occurs in mind of the consultant is why the transfer of technology is not done satisfactorily between the white farmers and black farmers in the agricultural sector. It is strongly advised that the technological collaboration be promoted between the different races and among the regions of Namibia.

(4) Improvement of Agricultural Infrastructure

Among various natural disasters in Namibia, drought is feared most seriously by all Namibians. Drought brings about the immediate damages to the farmers who are engaged in the subsistence agriculture. Even for the white farmers who run the commercial agriculture, drought causes serious damages to their farming land and facilities.

In Namibia where rainfall is very limited, it is extremely difficult to preserve the water resources. Still, the white people have some measures to preserve the water resources whereby they can minimize damages caused by drought. But, for black people, there is no means to protect their farmland and other facilities from drought. It is urgently required to implement the policy so as to convert from the subsistence agriculture to livestock or to develop agriculture in some confined areas intensively where the water resources are relatively easy to make available.

(5) Enhancement of the Primary Health Care and Measures Against the HIV Infection

Primary Health Care(PHC) has been programmed and implemented in many developing countries nowadays for the sake of decreasing the mortality ratio of

infant children(below the age of five) as well as for maintaining good health of the pregnant women and so on.

In Namibia, however, in rural areas in particular, the basic medical services are yet rendered to the rural inhabitants in a satisfactory manner mainly due to the absolute shortage of the number of doctors, nurses and midwives.

Though a variety of health programmes have been planned and implemented at the administrative guidance of the Ministry of Health, heath problems still remain unsolved especially in rural areas.

Further, infection cases of HIV cases are increasingly year after year and prevailing throughout the country. Due to inadequate health education, HIV infections are particularly increasing in rural areas of Namibia.

(6) Future Prospect of Northern Regions of Namibia

In comparison with central/ southern regions, the northern regions are lagging behind from central/southern regions in their socio-economic development.

The problematic points indicated above from section 1) to 5) are all significantly observed in the northern regions and the worst cases of the above problems are always found in the northern regions. Though the central government as well as provincial governments of the respective regions in the North have alloted substantial amount of budget and subsidies to the northern regions to cope with the socio-economic issues, significant results are yet obtained due to the absolute shortage of professional staff and absolute financial constraints.

The population density in the North is higher than the central/southern regions, people inhabit in dispersed manner in the vast land of the North. Though agriculture is the main industry of the North, a variety of constraints have limited agricultural production in the area. These are given below:

a. Limited rainfall, plus high variability from year-to-year, both in rain and the flow of floodwaters

b. Limited access to improved technology on sandy and low fertility soils, both to increase yields of existing crops and for new varieties.

c. Severe labour shortages during the peak periods of the cultivation cycle, owing to the short rainy season, a dispersed population and associated limited access to hired labour, and high level of migration from rural to urban areas.

d. Limits in the area which can be cultivated, both because of labour shortages, and because increasing population density and a recent tendency towards indiscriminate fencing of large areas of communal land have further restricted the land available for agricultural production.

e. Weakly developed agricultural markets which reduce the incentives to increase the production.

However, there are some options for easing these contains. First, it explores how rain-fed production of mahangu (a kind of crop) might be increased. Then it turns to ways in which the water available in the region might be harnessed more effectively in service of agriculture.

Third, it presents some options for fostering some currently underdeveloped agricultural markets. Finally, it highlights some implications of the analysis for the financing and operation of agricultural research and extension.