

REPUBLIC OF NAMIBIA  
NATIONAL PLANNING COMMISSION

## Namibia Poverty Mapping



Macroeconomic Planning Department



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## **Macroeconomic Planning Department**



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### **National Planning Commission**

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## PREFACE

Over the last 30 years, worldwide absolute poverty has fallen sharply (from about 40% to under 20%). But in African countries the percentage has barely fallen. Still today, over 40% of people living in sub-Saharan Africa live in absolute poverty. Despite an overall good picture of economic growth for the continent, some Africans are being left behind. Two-thirds of the United Nations 'least developed countries' (classified as those at risk of remaining poor) are in Africa according to the United Nations.

In Namibia the absolute poverty for the past 17 years or so has decreased by 40 per cent from unprecedented high levels of around 70 per cent to around 28 per cent according to statistics from Namibia Household Income and Expenditure Surveys. While the decrease in poverty levels is worth celebrating, the current levels and unevenness of these declines in regions and constituencies is something still to be worried about.

Understanding the magnitude, the severity and the spread of poverty is the first and important step in addressing this social evil that threatens the unity of families and communities in our country. Indeed poverty is a multidimensional phenomenon and therefore there is no single solution to address it; however, am convinced that it can be addressed through domestic policies and localized and targeted programmes and projects according to peculiarities of particular area of interest.

The Namibia Poverty Mapping Report adds value to the already available poverty and other poverty related information in the country by linking poverty to particular areas at lowest geographical level, in this case constituency level. At most poverty data and analysis has been limited to national and regional levels. The report corroborates findings from other studies that poverty levels in Namibia have been declining. Using two data points of the population censuses of 2001 and 2011, poverty has decline by 11 per cent over that period on the national level and in all regions except for Zambezi and Khomas regions. In addition, the report reveals that poverty levels in a particular region differ from one constituency to the other; and the designated poorest region does not necessarily have a poorest constituency in the country. The poorest region in Namibia is Kavango with a poverty headcount of 53.2 per cent while the poorest constituency is Epupa in Kunene with 69.2 percent.

This report is very important as we reach the end of the Millennium Development Goals (MDGs) and prepare for post 2015. Similarly, the implementation of NDP\_4 comes to an end in less than two years' time by 2016/2017, therefore there is a need to redefine our targets and strategies to achieve our long term goals. It is in this vein that I urge all policy makers, advisors, academia and practitioners to use the rich information and analysis in this report to inform our policy formulation and programmes development to make a change.

Finally, I would like to thank the staff of NPC, in particular the Department of Macroeconomic Planning for their efforts in bringing out this report. I would like, whole-heartedly to thank the United Nations Development Programme (UNDP) Namibia for their financial, material and technical support they have given to NPC in coming up with this report

  
**TOM ALWEENDO**  
**DIRECTOR-GENERAL**



# 1. INTRODUCTION

## 1.1 About Namibia and Overview of Development Challenges

Namibia has a population of 2 113 077 people, 57 percent of whom live in rural areas. Over the 2001 to 2011 period, the population growth rate declined from 2.6 percent per annum to 1.4 percent, while the fertility rate declined from 4.1 children per woman to 3.6 children per woman. Namibia is classified as an upper middle income country, with an estimated annual Gross National Income (GNI) per capita of US\$5 693. Sixty five percent of the total population falls within the age category 15 years and above. Of these, 71 percent comprise the labour force, with the unemployment rate estimated at 29.6 percent of the total labour force.

Since independence, the Government of the Republic of Namibia has consistently formulated policies and programmes to address developmental challenges. The current fourth National Development Plan (NDP4) outlines the development objectives and priority programmes to be implemented over the fiscal period 2012/13 to 2016/17. The three overarching goals of the NDP4 are to achieve high and sustained economic growth, employment creation, and increased income equality. The Government is also committed to achieving the Millennium Development Goals (MDGs) and other international development goals and objectives, such as the Sustainable Development Goals (SDGs) currently under discussions at the intergovernmental level.

A core objective of the national policy formulation and planning process, and consonance with the aspiration of achieving the MDGs, is eradication of poverty. In 1998, the Government adopted the Poverty Reduction Strategy and its Action Plan, while more recently in 2012, the National Rural Development Policy was also adopted. The aim of this policy is to promote systematic and coordinated development planning, and respond to the plethora of development challenges facing rural populations. The central objective of the Rural Development Policy, which was developed in furtherance of the Decentralisation Policy, is to promote service delivery within the decentralised levels of governance – regions and constituencies. To drive economic growth and, importantly, create jobs and thus address poverty, the Government has prioritised the agricultural, education, health and housing sectors for public investments since independence.

## 1.2 Understanding Poverty

Poverty is a multidimensional concept relating to a lack of resources with which to acquire a set of basic goods and services. Conceptually, poverty can be viewed as a state of deprivation and can be defined in both absolute and relative terms. Absolute poverty can be seen as the inability to afford certain basic goods and services. Delineation of those living in absolute poverty, therefore, aims to determine the number of people living below a certain income threshold or the number of households unable to afford basic goods and services. In every country, the poverty line is set to measure poverty in accordance with the expectation of the cost of meeting basic human needs.

Relative poverty, on the other hand, refers to a standard of living that is defined in terms of the expectations of the wider society in which an individual lives, and is a comparative measure of poverty. Thus an individual may be non-poor in absolute terms but may still be considered poor relative to other members of his or her society.

The poverty lines based on the sample survey were derived using the absolute poverty measure, based on the estimates of cost of basic needs as adopted by Namibia Statistics Agency (then Census Bureau of Statistics) in 2004. A two stage estimation process was adopted for deriving this poverty line. First, estimates of the cost of basic food needs, that is, the cost of a nutritional basket of food considered minimal for the healthy survival of a typical household, was used to define a lower bound or 'severe' poverty line. Second, an estimate of the value of a bundle of non-food items consistent with the spending of the poor was added to the lower bound or food poverty/severe poverty to determine the upper bound poverty line.

Thus, poverty is defined as the percentage of people in a specific area whose annual per adult equivalent consumption is below the poverty line. In 2003/2004 the poverty lines of annualised per adult equivalent expenditure were: lower bound - N\$2 217.72 and upper bound - N\$3 149.40. In 2010 the poverty line of annualised per adult equivalent expenditure, after adjusting for inflation, were: lower bound - N\$3 330.48 and upper bound - N\$4 535.52. When the annual per adult equivalent consumption is below the upper bound poverty line, an individual is considered to be poor, and when it is below the lower bound poverty line the individual is considered to be severely poor. The poverty headcount (incidence of poverty) is the proportion of the population whose consumption is below the poverty line.

### **1.3 Introduction to Poverty Mapping in Namibia**

The present report presents the results of poverty mapping in Namibia. Poverty mapping is considered important because it provides a detailed description of the spatial distribution of trends in poverty at regional and constituency levels. This report combines the 2003/04 and 2009/10 Namibia Household Income and Expenditure Survey (NHIES) data, and the 2001 and 2011 Namibia Population and Housing Census data, with the objective of estimating poverty levels for the thirteen regions and 107 constituencies of Namibia. In the past, poverty estimates have been done using the NHIES data alone.

However, due to the low statistical power resulting from the small sample size associated with such surveys (approximately 10 000 households only), it has not been possible to estimate poverty measures at constituency level in Namibia and earlier estimates have only been done at regional levels. Using econometric techniques that combine the NHIES and Census data, the study provides poverty measures at regional and constituency levels at two time points – 2001 and 2011 – the years in which Namibia Housing and Population Censuses were conducted. Thus the results are based on the entire population without a sample bias. The major limitation of the study, however, is that the estimation process is based on the generalised assumption that characteristics of poor individuals or households in the sample survey (NHIES) define the poor individuals and/or households in the entire population.



The study covers the thirteen regions and 107 constituents that were in existence before the recent boundary reviews by the Delimitation Commission. These are the geographic areas that formed the basis of both the surveys and censuses. For consistency in the application and interpretation of data, and especially in order to avoid any possible misapplication and misinterpretation of data, it was deemed necessary to analyse and present data on the basis of the boundaries that existed during the surveys and censuses.

The purpose of this exercise is to provide an additional body of data and information on poverty dynamics in Namibia. The added value of the present exercise is that the analysis has been undertaken and results presented for much smaller geographic units – constituencies. Although an attempt has been made to identify the possible causes of and explanations for observed poverty trends, this is by no means exhaustive and further analysis will be required to deepen the understanding of the causes of poverty in Namibia at national, regional and constituency levels. After this introduction, Section 2 describes the methodology applied in this study, Section 3 elaborates on the findings of the study, while Section 4 draws some conclusions and policy recommendations.

## 2 METHODOLOGY

This report presents the incidence of poverty in Namibia at the constituency level. Ideally this should be done using a single dataset. However, to do so would require a dataset that not only contains enough household information, but also has enough observations for each constituency to allow for the accurate measurement of poverty at a local level. No such dataset currently exists in Namibia. In fact, very few countries in the world have detailed household surveys with such large samples that accurate estimates of poverty can be determined for geographic areas with small populations.

Instead the report combines two sources of data: the Namibia Household Income and Expenditure Survey (NHIES) and the Namibia Population and Housing Census. The 2003/04 and 2009/10 NHIES datasets contain accurate income and expenditure data, but too few households are sampled in each constituency for poverty estimates at constituency level. The 2001 and 2011 Censuses contain no income or expenditure data, but have ample observations. Since the Census does not contain any expenditure information, the per adult expenditure level for each household was estimated using a poverty mapping model. A more technical explanation of the methodology followed is provided for specialist readers in the Annex 2, while the paragraph below provides a broad overview.

The model follows the imputation approach of Elbers et al. (2003). These authors suggest, first, choosing a set of household characteristics found in both datasets. Next, using the smaller dataset that has accurate expenditure data (the NHIES in this case), it is possible to derive the relationship between the chosen set of household characteristics and household expenditure. This relationship can be used to predict the expected level of expenditure for each household in the Census, since the same set of household characteristics is present in the Census.

Not every household with the same characteristics will have exactly the same expenditure level. For that reason, the model also generates a set of expected deviations from the average through a Monte Carlo process that also considers that households in the same survey cluster are somewhat more alike than other households. Average poverty rates are then estimated for each constituency.

### 3 POVERTY PATTERNS AND TRENDS

In this section, the results of the poverty mapping exercise are presented. For each region, the major defining characteristics in terms of geographic area, population size and density, major physical features, and resource endowments are outlined. This is followed by a discussion of the spatial distribution of poverty trends over the 2001 to 2011 period. Poor education lies at the root of much of the poverty, thus the report often refers to the education situation in different areas. People’s movements within and between regions are often driven by economic opportunities, therefore population growth is discussed. Furthermore, poverty is closely linked to other forms of deprivation, making service provision a major factor in addressing poverty.

#### 3.1 Regional Poverty Patterns and Trends

As can be seen from Table 1, Namibia registered a general decline in the incidence of poverty of 11 percentage points over the 2001 to 2011 period, with the national incidence of poverty declining from 37.9 percent to 26.9 percent over this period. Currently about 568 418 people are estimated to be poor. This indicates a total number of 125 277 fewer people living in poverty at the end of this period of ten years than would have been the case if the poverty rate had remained unchanged.

The greatest declines were registered in the northern regions of Ohangwena, Omusati, Kunene and Oshikoto, as well the eastern region of Omaheke. However, two regions (Zambezi and Khomas) registered increases of 7.2 percentage points and 1.2 percentage points, respectively. In 2011, out of the thirteen regions, seven regions (Otjozondjupa, Oshikoto, Omusati, Ohangwena, Kunene, Zambezi and Kavango) had poverty incidences that were above the national rate of 26.9 percent. These deviations from the general decline will be discussed in more detail later in this report.

**Table 1: Trends in Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**

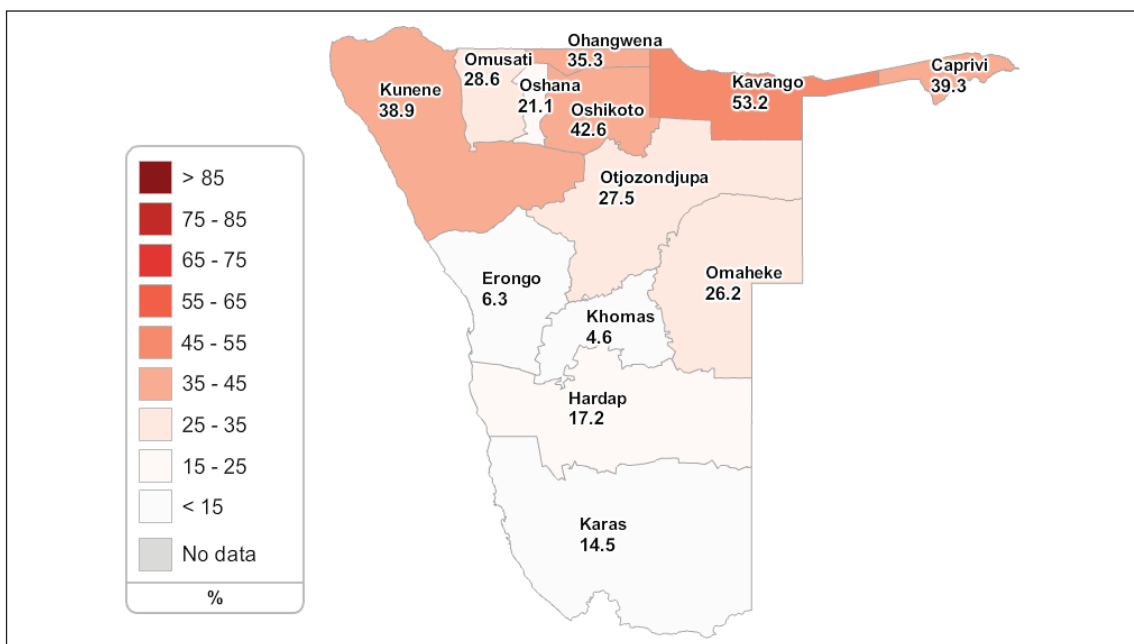
Region	Poverty Headcount Rate		
	2001	2011	Change
Zambezi	32.0	39.3	7.2
Erongo	9.3	6.3	-3.0
Hardap	20.4	17.2	-3.2
Karas	18.0	14.5	-3.4
Kavango	57.9	53.2	-4.8

Khomas	3.4	4.6	1.2
Kunene	53.7	38.9	-14.8
Ohangwena	62.8	35.3	-27.5
Omaheke	41.6	26.2	-15.5
Omusati	50.9	28.6	-22.2
Oshana	28.3	21.1	-7.1
Oshikoto	57.3	42.6	-14.7
Otjozondjupa	30.4	27.5	-2.9
Namibia	<b>37.9</b>	<b>26.9</b>	<b>-11.0</b>

Map 1, below, gives the spatial distribution of the incidence of poverty by region in 2011. It can be seen that in both 2011 and 2001, Ohangwena, Kunene, Zambezi, Oshikoto and Kavango had more than one third of their population classified as poor. Poverty in Namibia still bears a distinct rural face, with the poorest regions being those in which the majority of the population lives in rural areas. The regions with the lowest incidences of poverty (Khomas and Erongo) have largely urban populations and are the economic hubs of the country, with relatively more employment opportunities.

Although, as in Zambezi region, the poverty incidence in Khomas increased between 2001 and 2011, the region still has the lowest incidence of poverty with only 5 percent of its population living below the poverty line. Erongo, Karas, Hardap and Oshana also reported low levels of poverty. Khomas region is home to Windhoek, the political and economic capital of the country. Erongo region not only has most of the existing mines but also borders the Atlantic Ocean which produces fish, a major export commodity for Namibia. This region also has the Namib Desert, an important tourist destination. Indeed in 2011 the region recorded the second highest tourist arrivals in the country, with about 345 000 visitors.

**Map 1: Namibia Poverty Headcount Rate, 2011 (upper bound poverty line)**



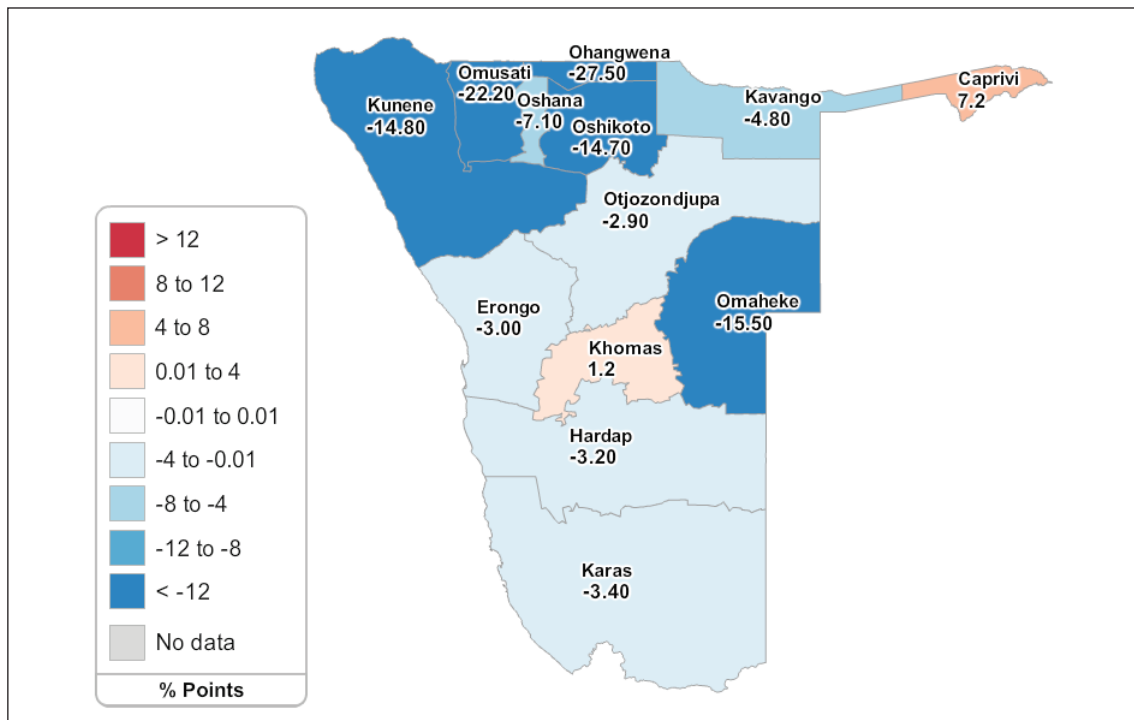
Although there was a general decline in the incidence of poverty at the national level, there were marked differences in the recorded changes in the incidence of poverty across the regions (see Map 2). As can be seen from Table 1 above, in 2001 the poorest region was Ohangwena followed by Kavango, Oshikoto, Kunene and Omusati, with more than half of the population being classified as poor in these regions. By 2011, however, the situation had changed with only Kavango (at 53 percent) having more than half of its population classified as poor. This widely-based decline in poverty is a reflection of important economic, social and policy progress that has been made, and is the most notable trend between the two census years.

In terms of regional ranking, the situation has changed, with Kavango being the poorest region followed by Oshikoto, Zambezi, Kunene and Ohangwena. Importantly, Omusati region had fallen out of the five highest poverty headcount rate regions, while Zambezi had joined this group. Over the 2001 to 2011 period, Omusati region experienced a reduction of 22 percentage points in the incidence of poverty, from a high of 51 percent in 2001 to a low of 29 percent in 2011. According to the Town Council authorities, this remarkable progress can be attributed to increased private investment during the period, as exemplified by rapid growth of shopping complexes and other business activities in the town of Outapi after its proclamation as a town with an autonomous Town Council in 2002. The increase in business activities led to job creation and availability of critical services in the area.

The decline in the poverty headcount rate was not limited to Omusati region, however. The rate declined in nearly all regions, with Ohangwena, Kunene and Oshikoto and Omaheke regions registering the greatest declines. For instance, Ohangwena region, which was the poorest region in 2001, recorded a remarkable reduction in the poverty headcount rate of 28 percentage points during the period under consideration. According to the Ohangwena Regional Council, this is attributable to increased economic activity in that region, stimulated by public and private investments which boosted the regional economy.

In addition, the past decade has witnessed the successful completion of many infrastructure projects, including road networks, sanitation in rural areas and the construction of public infrastructure – schools, early childhood development centres, shopping complexes, small and medium enterprise (SME) parks and health facilities. The region has also benefitted from a successful roll-out of antiretroviral therapy (ART), as well as cross-border trade with neighbouring Angola, mainly carried out through the border town of Oshikango.

**Map 2: Namibia Change in Poverty Headcount Rate, 2011 - 2001 (upper bound poverty line, percentage points)**



Two regions (Zambezi and Khomas) recorded increases in the incidence of poverty over the 2001 to 2011 period, with the incidence of poverty in these regions increasing by 7.3 percent and 1.2 percent, respectively. Although Khomas was the least poor region at both the 2001 and 2011 time points, its poverty levels increased slightly between these two points. This could be attributed to the high rate of rural to urban migration, with most of the migrants being young people from other, often much poorer, regions. The population of Khomas increased by almost 92 000 or about 37 percent over the decade, more than twice the Namibian rate of population growth. For most young migrants, Khomas region, especially Windhoek, is their preferred destination. Many, however, are ill equipped for the job market and end up living in deplorable conditions without jobs.

While in 2001 the incidence of poverty in the Zambezi region was comparable to that in Otjzondjupa, by 2011 the situation in these two regions had changed drastically, with the incidence of poverty in Otjzondjupa having declined by about 3 percentage points while it had increased in Zambezi by 7 percentage points. Indeed by 2011, the incidence of poverty in Zambezi was comparable to the reported poverty incidence in Ohangwena and Oshikoto, while in 2001 poverty headcount in Zambezi had been just under half that in Ohangwena and Oshikoto regions.



While the northern regions and Omaheke region in the east registered significant reductions in the incidence of poverty, most of the regions in the central and southern parts of the country did not register similar declines in the poverty headcount over the 2001 to 2011 period. This could be because it is usually difficult to further reduce an already low level of poverty. These regions have huge economic potential in the agricultural and extractive sectors.

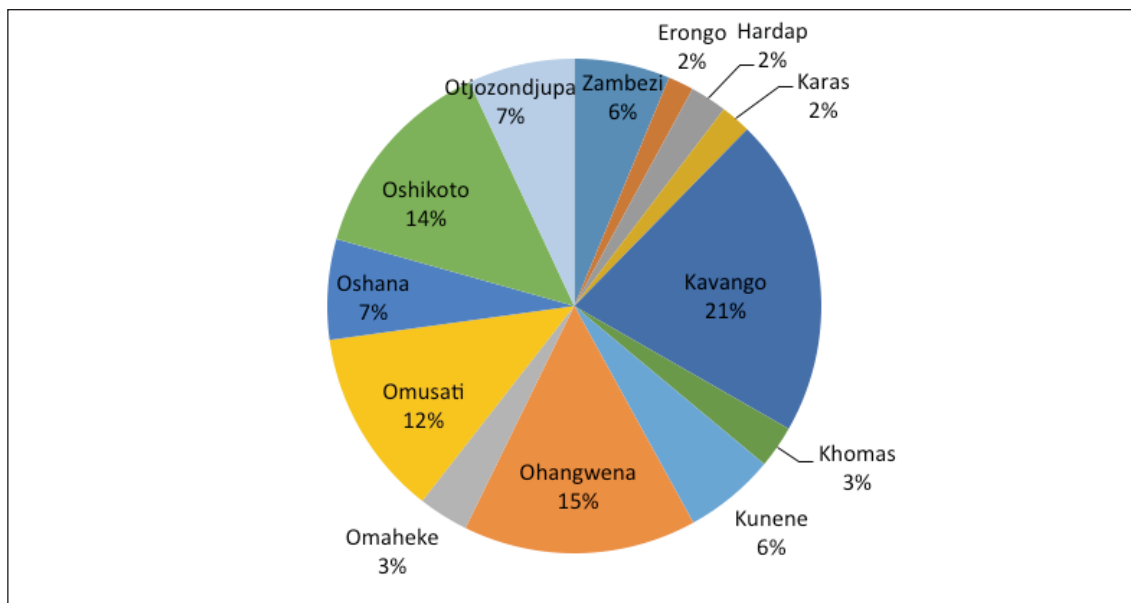
Most of the existing mines are located in Erongo and Karas, while Otjozondjupa, Hardap and Karas are characterised by large commercial farms, which form the basis of Namibia's agricultural exports to external markets such as the European Union. However, there is untapped potential in value addition, especially in diamond polishing and processing of agricultural products, to create jobs, spur economic growth and ultimately lead to poverty reduction.

**Table 2: Trends in Poverty Headcount Rate, 2001 - 2011 (lower bound poverty line)**

Region	Poverty Headcount Rate		
	2001	2011	Change
Zambezi	17.3	22.8	5.4
Erongo	4.4	2.4	-1.9
Hardap	10.5	7.8	-2.7
Karas	9.2	6.7	-2.6
Kavango	39.4	34.4	-5.0
Khomas	1.0	1.6	0.6
Kunene	37.5	24.8	-12.7
Ohangwena	40.7	18.6	-22.2
Omaheke	26.3	13.5	-12.8
Omusati	31.6	14.1	-17.5
Oshana	15.1	10.1	-5.0
Oshikoto	38.8	26.5	-12.1
Otjozondjupa	17.9	14.9	-3.0
<b>Namibia</b>	<b>23.8</b>	<b>15.0</b>	<b>-8.8</b>

Figure 1, illustrates the contribution of each region to the overall poverty of the country. Kavango region, with a population share of 11 percent and a poverty headcount rate of 53.2 percent accounts for 21 percent of total poverty in Namibia. The Figure indicates that 15 percent of all the poor live in Ohangwena, and 14 percent and 12 percent respectively in Oshikoto and Omusati regions. Only 2 percent of the total poor live in Erongo, Hardap and Karas regions each. Similarly, Khomas and Omaheke regions account for three percent of the total poor each.

**Figure 1: National poverty headcount shares, 2011 (upper-bound poverty line)**



## 3.2 Constituency Poverty Patterns and Trends

### 3.2.1 Overview of constituency poverty patterns and profiles

Regional poverty aggregates, as presented above, often mask wide intraregional variations. Beyond the regions, there exist wide variations in reported poverty incidence across the 107 constituencies of Namibia. While, at the regional level, the highest incidence of poverty was reported in Kavango region (53 percent), at constituency level, the highest incidence of poverty was reported in Epupa constituency in Kunene region, with 69 percent of the population classified as poor, while the lowest incidence was reported in Windhoek East constituency in Khomas region, with only 0.1 percent of the population being classified as poor.

There are also wide variations in the reduction in the poverty headcount rate over the 2001 to 2011 period across the 107 constituencies. The biggest reduction, in terms of percentage points, was registered in the northern regions of Ohangwena and Omasati, while the biggest increase was in the north-eastern Zambezi region. Eenhana, Endola, Engela, Okongo and Ongenga constituencies in Ohangwena region and Oshikuku constituency in Omasati region all registered a reduction in the poverty headcount rate of more than 30 percentage points, while Katima Mulilo Urban and Kongola constituencies in Zambezi region registered an increase of more than 10 percentage points over the 2001 to 2011 period.

In 2011, six of the thirteen regions had one or more of their constituencies where more than 50 percent of the population was classified as poor, while nine regions had one or more constituencies in which more than 30 percent of the population was classified as poor. Table 3 shows the proportion of constituencies with 30 or 50 percent of the population classified as poor.

**Table 3: Proportion of constituencies with more than 30% and 50% of the population classified as poor (upper bound poverty line), 2011<sup>1</sup>**

Regions	% of constituencies with at least 30% of population poor	% of constituencies with at least 50 % of population poor
Zambezi	83	33
Kavango	89	78
Kunene	50	17
Ohangwena	82	1
Omaheke	43	0
Omusati	33	0
Oshana	40	0
Oshikoto	90	30
Otjzondjupa	43	14

### 3.2.2 Zambezi region

Zambezi region (formerly Caprivi), with a land area of 14 528 km<sup>2</sup> and a total population of 90 596, lies in the north-eastern part of Namibia, bordering Botswana, Zimbabwe, Zambia and Angola. It also borders Kavango region in the east. Given its geographic location, the region is an important logistical centre and serves as the gateway to the Southern Africa Development Community (SADC) region. The population is 69 percent rural. The region receives an average annual rainfall of about 735mm. It is home to three perennial rivers – Kwando, Chobe and Zambezi. Given the nature of the terrain and soil types, however, these rivers often cause flooding in many parts of the region. Zambezi region also has many national parks with abundant wildlife. Thus it possesses huge potential in the agricultural, tourism, and transport and logistics sectors as key drivers of economic growth and development.

In 2001, poverty incidence in Zambezi was estimated at 32 percent, with no single constituency having more than half of its population living in poverty. By 2011, the regional poverty incidence had increased by 7.2 percentage points. This means that in 2011, 10 060 more people were living in poverty, while the number of non-poor had increased by just 710 people. Poverty is highest in Kongola and Sibbinda constituencies at 58 percent and 55 percent, respectively, and lowest in Katima Mulilo Urban at only 17 percent.

In terms of percentage change, however, the highest increase, of 11 percentage points, in the incidence of poverty over the 2001 to 2011 period was recorded in Katima Mulilo Urban and Kongola constituencies. Despite its low poverty rate, Katima Mulilo Urban contributed about one third (34 percent) of the increase in poverty, with an increase of 3 425 poor people, while Linyati accounts for 19 percent, Katima Mulilo Rural 15 percent and Sibbinda 14 percent of the increase.

<sup>1</sup> The regions not listed here (Erongo, Hardap, Karas and Khomas) had no constituencies with 30 percent or more of the population classified as poor.

**Table 4: Zambezi Region Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**

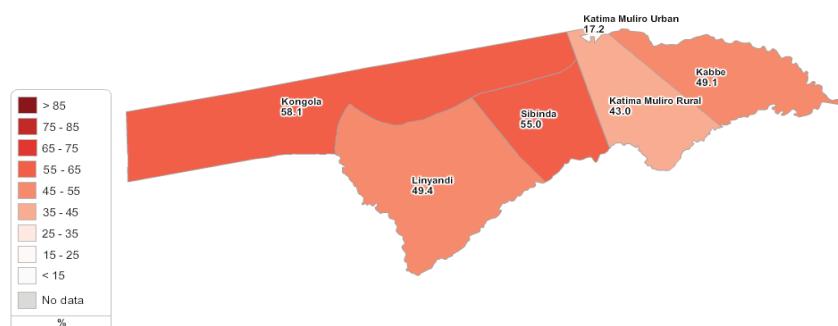
Zambezi Region	2001	Rank	2011	Rank	Change
Kabbe	42.2	3	49.1	4	7.0
Katima Mulilo Rural	38.3	5	43.0	5	4.7
Katima Mulilo Urban	6.4	6	17.2	6	10.8
Kongola	47.4	1	58.1	1	10.7
Linyanti	41.2	4	49.4	3	8.1
Sibbinda	45.8	2	55.0	2	9.2
Regional rate	<b>32.1</b>		<b>39.3</b>		<b>7.2</b>

Map 3 presents colour-coded poverty levels, with the darker colour indicating higher incidence of poverty. As is evident from the map, the two poorest constituencies are Kongola and Sibbinda. The populations in these constituencies are largely rural, eking a living from subsistence agriculture (livestock rearing and crop farming). They also rely heavily on social transfers, mainly in the form of old age pension. With only 1.1 percent of the people aged 15 years and above having never attended school, educational attainment in Zambezi region is relatively high.

The literacy rate for the population aged 15 years and above is estimated at 84 percent, while the youth literacy rate is estimated at 93 percent. Notwithstanding the good educational attainment, more than one third (38 percent) of the economically active population (labour force) is unemployed. With the exception of Sibbinda, with an estimated unemployment rate of 29 percent, more than half of the economically active population is unemployed in all constituencies. The agriculture sector is the main employer in the region, accounting for 42 percent of employment. It is followed closely by the public sector at 22 percent. The tourism sector contributes only about 3 percent of the employed population.

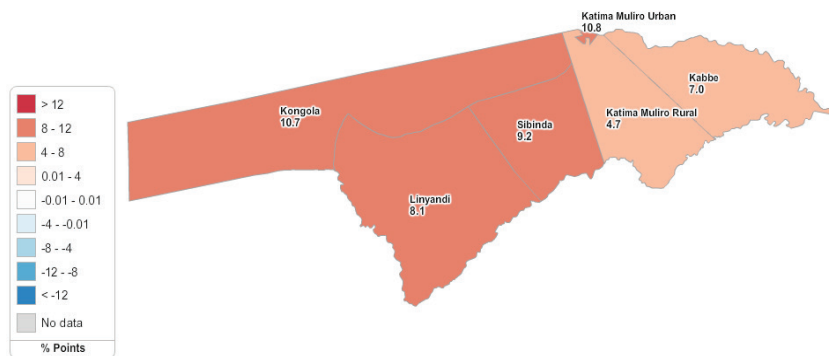
About 14 percent of households use electricity for cooking, while around one third (32 percent) use it for lighting. About 73 percent of the population has access to safe water. In Kabbe and Katima Mulilo Rural, only 25 and 55 percent, respectively, of households have access to safe drinking water but, in the rest of the constituencies, more than three quarters (75 percent) of the households have access to safe drinking water.

**Map 3: Zambezi Region Poverty Headcount Rate in 2011 (upper bound poverty line)**



Map 4, shows the changes in poverty incidence between 2001 and 2011. Although poverty increased in all constituencies during this period, the map indicates that Kongola and Katima Mulilo Urban registered increases of more than 10 percentage points in poverty headcount.

**Map 4: Zambezi Region Change in Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**



In 2011, the incidence of severe poverty was estimated at 23 percent, representing an increase of 5 percentage points from the 2001 figure of 17 percent and 8 percentage points above the national average of 15 percent. As with poverty levels, the incidence of severe poverty is highest in Kongola and Sibbinda, with more than one third of the population being severely poor in these constituencies. Katima Mulilo Urban has the lowest incidence of severe poverty at 7 percent.

The poverty literature (e.g. Cage, 2009) argues that security and political stability are fundamental to economic growth, employment creation and poverty reduction. Zambezi region experienced political instability in 1999 which had a negative impact on investment by both local and international investors. In 2001, about 83 percent of the labour force was employed compared to 62 percent in 2011. This indicates, that over this period, instability discouraged investment with negative impacts on employment creation and poverty reduction. Furthermore, political instability as one of the migration push factors, could have led to the higher out migration experienced between 1991 and 2011, a minimal population increase from 90 422 to 90 596 over a period of twenty years. This tends to increase poverty as it is mostly the economically active who migrate.

**Table 5: Zambezi Region Poverty Headcount Rate Scores and Values, 2001 - 2011 (lower bound poverty line)**

Zambezi Region	2001	Rank	2011	Rank	Change
Kabbe	23.6	3	29.3	4	5.7
Katima Mulilo Rural	20.9	5	24.7	5	3.8
Katima Mulilo Urban	2.0	6	7.2	6	5.3
Kongola	29.3	1	36.6	1	7.4
Linyanti	22.2	4	29.6	3	7.3
Sibbinda	25.1	2	35.6	2	10.5
Regional rate	<b>17.3</b>		<b>22.8</b>		<b>5.4</b>

### 3.3.3 Erongo region

Erongo is the second most urbanised region in Namibia after Khomas, with 87 percent of the inhabitants living in urban areas. The region has a total land area of 63 586 km<sup>2</sup> accounting for 7.7 percent of the country's land surface. The region, which borders the Atlantic Ocean, is a major tourist destination and is home to Walvis Bay harbour, the largest port in the country and an important gateway to many SADC countries such as Angola, Botswana, the Democratic Republic of Congo, Zambia and Zimbabwe. Thus Erongo has great potential to be an important transport and logistical hub for the SADC region. Other major economic activities in the region include tourism, mining, fishing and manufacturing.

Over the 2001 to 2011 period, there was a three percentage point reduction in poverty in Erongo region. Four out of the seven constituencies in Erongo recorded declines in the incidence of poverty over this period. The largest decline, of 18 percentage points, was recorded in Daures constituency. About 1 659 fewer people are poor than in 2011. This positive change could be attributed to small mining and conservancy activities in the constituency. Despite the decline in poverty in Daures constituency, it still has the highest incidence of poverty, at 20 percent of the population, although the number of people living in poverty only amounts to 2 281 people.

Three constituencies recorded increases in the incidence of poverty, the largest being 2 percentage points recorded in Omaruru constituency where 317 more people are poor than in 2001, while the number of non-poor people increased by 1 104. Erongo region has experienced rapid population growth over the past ten years, with the population growing at an average rate of 3.4 percent per annum, two percentage points above the national average of 1.4 percent. Indeed two of the constituencies, Swakopmund and Walvis Bay Rural, registered a population growth rate of 5 percent per annum over the 2001 to 2011 period. Educational levels in Erongo are high, with literacy rate for those aged 15 years and above estimated at 97 percent, as almost everyone in the region has attained some formal education.

**Table 6: Erongo Region Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**

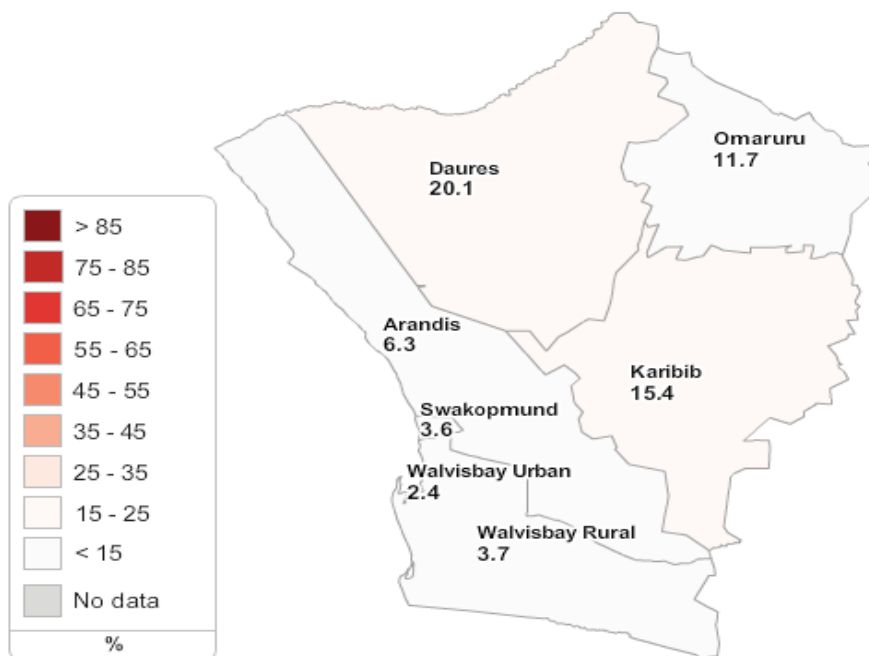
Erongo Region	2001	Rank	2011	Rank	Change
Arandis	5.4	4	6.3	4	0.9
Daures	38.3	1	20.1	1	-18.2
Karibib	16.9	2	15.4	2	-1.5
Omaruru	9.6	3	11.7	3	2.1
Swakopmund	4.4	5	3.6	6	-0.8
Walvis Bay Rural	3.4	6	3.7	5	0.2
Walvis Bay Urban	3.4	6	2.4	7	-1.0
Regional rate	<b>9.3</b>		<b>6.3</b>		<b>-3.0</b>

The main source of income for the region is salaries and wages, at 73 percent. Daures constituency is the only exception to this pattern, with 28 percent of households in this constituency citing salaries and wages as their main source of income while about a quarter (24 percent) indicated subsistence farming and the same proportion old age pensions as their main source of income.

About 79 percent of those 15 years and above are in the economically active category, with the unemployment rate within this group estimated to be 30 percent. The main employers are the fishing, mining and manufacturing sectors, each of which accounts for more than 10 percent of total employment. The tourism sector contributes only about 5 percent of total employment in the region.

Although Erongo has the second lowest poverty headcount in the country, Map 5, below, illustrates that the poverty headcount is still high in Daures, Karibib and Omaruru constituencies. Access to electricity in Erongo is high, with 76 percent of households using electricity for cooking, although in Daures constituency only 13 percent of households do so. Access to safe water is estimated at 96 percent. Here again Daures lags behind, with only 65 percent having access to safe water.

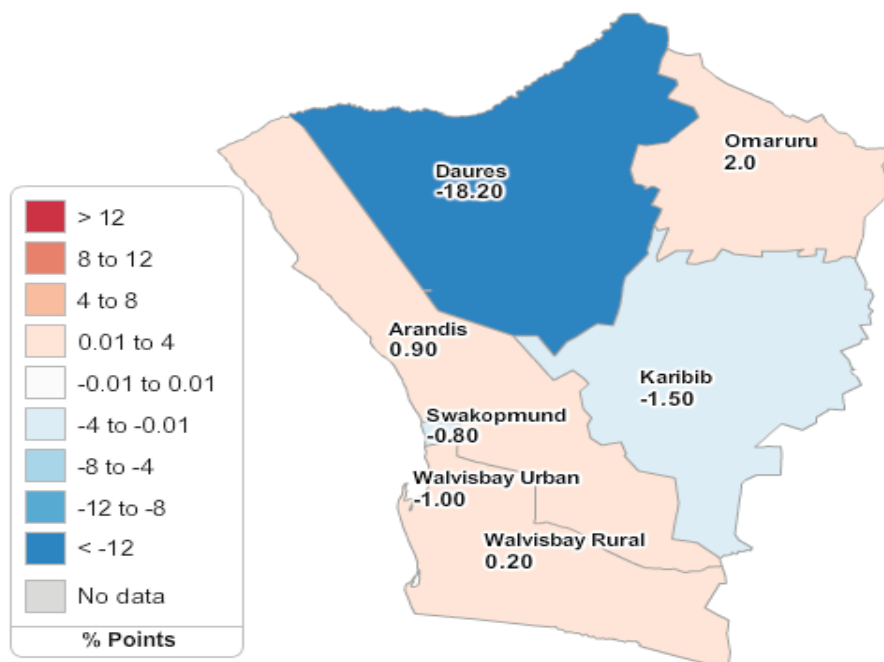
**Map 5: Erongo Region Poverty Headcount Rate in 2011 (upper bound poverty line)**



Map 6 shows changes in poverty levels over the 2001 to 2011 period. The map indicates that the greatest decline in the poverty headcount rate was registered in Daures constituency, while the incidence of poverty in Omaruru constituency increased by two percentage points.



**Map 6: Erongo Region Change in Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**



At 2 percent, the region registered a very low incidence of severe poverty. This is a two percentage point reduction in the incidence of severe poverty over the 2001 to 2011 period, i.e. the severe poverty rate, which was already extremely low in 2001, halved. As was the case with the incidence of poverty, although Daures constituency registered the greatest decline in the incidence of severe poverty of 13 percentage points, the constituency still has the highest incidence of severe poverty, at 9 percent. Again as with the poverty headcount rate, Daures is followed closely by Karibib constituency at 7 percent.

**Table 7: Erongo Region Poverty Headcount Rate, 2001 - 2011 (lower bound poverty line)**

Erongo Region	2001	Rank	2011	Rank	Change
Arandis	1.6	4	2.1	4	0.5
Daures	22.5	1	9.4	1	-13.1
Karibib	8.5	2	7.2	2	-1.3
Omaruru	4.1	3	4.5	3	0.4
Swakopmund	1.4	5	1.1	5	-0.3
Walvis Bay Rural	1.0	6	1.0	6	0.0
Walvis Bay Urban	1.0	7	0.7	7	-0.3
Regional rate	4.4		2.4		-1.9



### 3.3.4 Hardap region

Hardap is one of the southern regions of the country. It borders the Atlantic Ocean to the west and Botswana to the east, and covers a total land area of 109 659 km<sup>2</sup>. With a total population of 79 705, the region is one of the least densely populated areas of Namibia, with a population density of 0.7 people per square kilometre. Sixty percent of the population lives in urban areas. Hardap is one of the driest regions in Namibia, with an average rainfall ranging between 71 and 91mm, compared to the national average level of 800 mm. Naukluft Park and Fish River Grand Canyon (the second largest canyon in the world) are major tourist attractions in the region.

At the regional level, the incidence of poverty is estimated at 17 percent (13 675 people), having declined by 3 percentage points between 2001 and 2011. Poverty is highest in Gibeon, Rehoboth Rural and Mariental Rural constituencies, with nearly a quarter of the population in these constituencies classified as being poor, and lowest in Rehoboth Urban West, where the incidence of poverty is estimated at 4 percent.

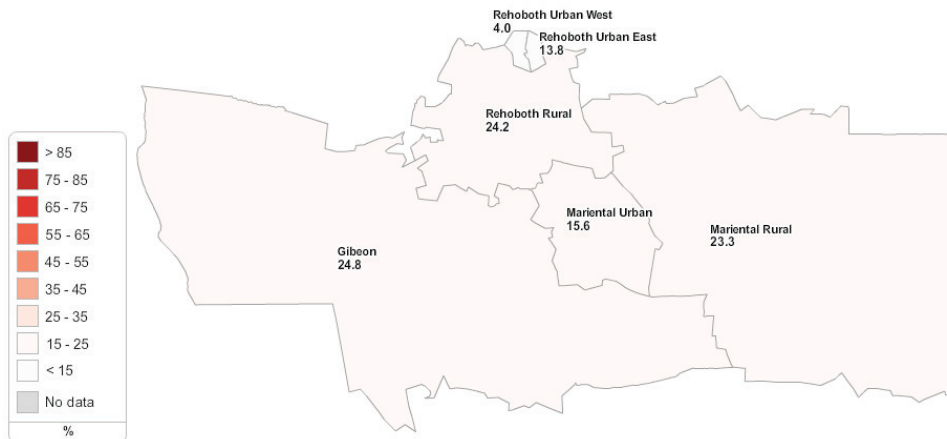
Over the 2001 to 2011 period the incidence of poverty declined in Gibeon, Mariental Rural, Rehoboth Urban West and Rehoboth Rural constituencies, while Mariental Urban and Rehoboth Urban East recorded marginal increases, with 408 more and 813 more people respectively living in poverty. Notwithstanding the marginal increase in the numbers of poor people, the number of non-poor people in these two constituencies increased by 2 040 and 4 331 respectively. Over the past ten years, the region experienced population growth of 1.5 percent, with the urban population growing by 4.3 percent, while the rural areas experienced a negative population growth of 1.5 percent.

**Table 8: Hardap Region Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**

Hardap Region	2001	Rank	2011	Rank	Change
Gibeon	30.2	1	24.8	1	-5.4
Mariental Rural	27.5	2	23.3	3	-4.3
Mariental Urban	15.4	4	15.6	4	0.2
Rehoboth Rural	27.1	3	24.2	2	-2.9
Rehoboth Urban East	13.0	5	13.8	5	0.8
Rehoboth Urban	9.0	6	4.0	6	-5.0
Regional rate	<b>20.4</b>		<b>17.2</b>		<b>-3.2</b>

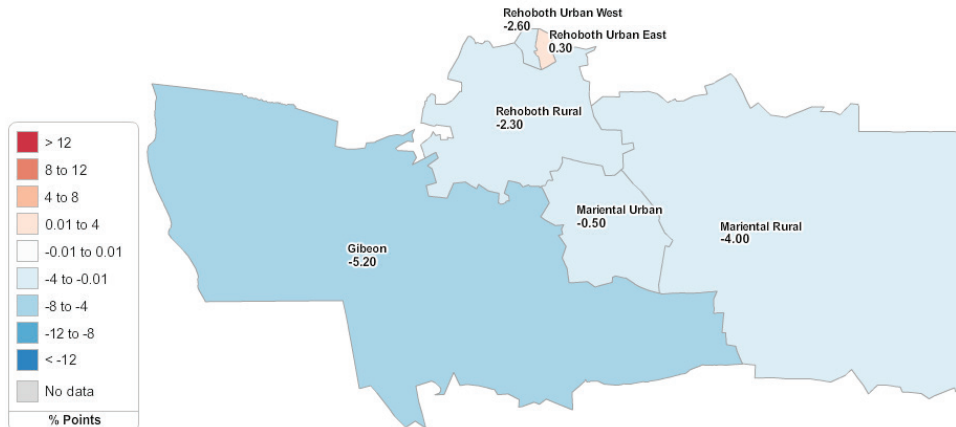
Map 7 shows the incidence of poverty in the constituencies of Hardap region. The incidence of poverty is highest in Gibeon, at 25 percent, and lowest in Rehoboth Urban, at 4 percent. Generally, the region has a high level of educational attainment, with a literacy rate of 96 percent and only 10 percent of the people aged 15 years and above having never attended school. The majority of those who have never attended school are concentrated in the poorer and rural constituencies of Mariental Rural and Gibeon. Agriculture, construction, and wholesale and retail trade are the main economic activities, employing about half of the economically active population. Mining accounts for only 2 percent, while manufacturing and tourism account for about 4 percent of employment in the region.

**Map 7: Hardap Region Poverty Headcount Rate in 2011 (upper bound poverty line)**



Map 8 illustrates changes in poverty levels over the last ten years. The map shows that the highest reduction was registered in Gibeon constituency followed by Mariental Rural constituency.

**Map 8: Hardap Region Change in Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**



From a high of 11 percent in 2001, an estimated eight 8 percent of the Hardap population is currently classified as being severely poor, a decline of 3 percentage points. Gibeon and Rehoboth Rural constituencies have more than 10 percent of their populations classified as severely poor.

**Table 9: Hardap Region Poverty Headcount Rate, 2001 - 2011 (lower bound poverty line)**

Hardap Region	2001	Rank	2011	Rank	Change
Gibeon	17.3	1	12.1	2	-5.2
Mariental Rural	15.0	2	11.0	3	-4.0
Mariental Urban	7.1	4	6.6	4	-0.5
Rehoboth Rural	14.9	3	12.6	1	-2.3
Rehoboth Urban East	5.1	5	5.4	5	0.3
Rehoboth Urban West	3.9	6	1.3	6	-2.6
Regional rate	<b>10.5</b>		<b>7.8</b>		<b>-2.7</b>

### 3.3.5 Karas region

Karas region is the driest and southernmost region of Namibia. It covers a total land area of 161 086 km<sup>2</sup>, which represents 19.6 percent of the country's land surface. With a population of 77 421, the region accounts for an estimated 3.8 percent of the national population. Karas is characterised by low rainfall, high evaporation rates and sparse vegetation. The region is, however, endowed with plentiful natural resources, such as alluvial gold, diamonds, iron and zinc, and is home to the country's largest mining activities. The region is also endowed with the perennial Oranje River along the border with South Africa and Naute Dam which offers potential for irrigated agriculture.

Poverty incidence in Karas region is estimated at 14 percent (11 226 people), having decreased by 3.4 percentage points over the past ten years. The greatest change was registered in Berseba constituency, where the incidence of poverty declined by 11 percentage points over the 2001 to 2011 period. Berseba is, however, still the constituency with the highest incidence of poverty in the region, with 27 percent of the population classified as being poor (2 880 people). Poverty has also declined in Oranjemund, Luderitz and Keetmanshoop Rural constituencies.

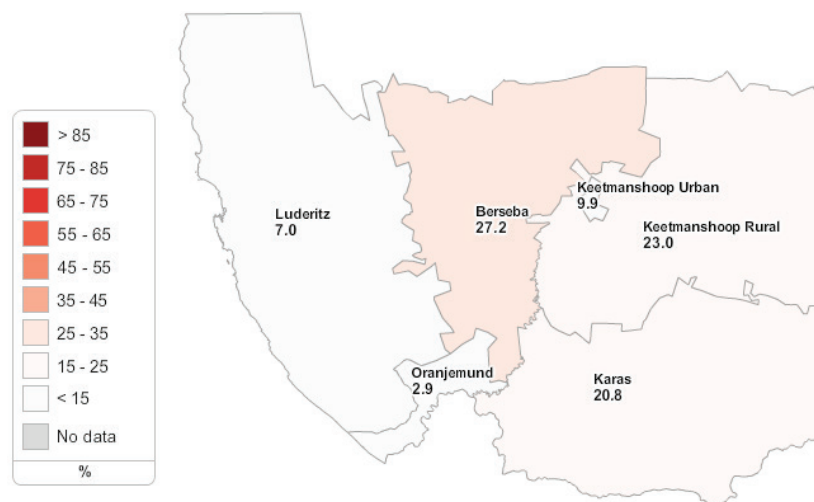
**Table 10: Karas Region Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**

Karas Region	2001	Rank	2011	Rank	Change
Berseba	38.5	1	27.2	1	-11.3
Karasburg	21.6	3	20.8	3	-0.8
Keetmanshoop Rural	25.8	2	23.0	2	-2.8
Keetmanshoop Urban	9.8	4	9.9	4	0.1
Luderitz	9.7	5	7.0	5	-2.7
Oranjemund	7.6	6	2.9	6	-4.7
Regional rate	18.0		14.5		-3.4

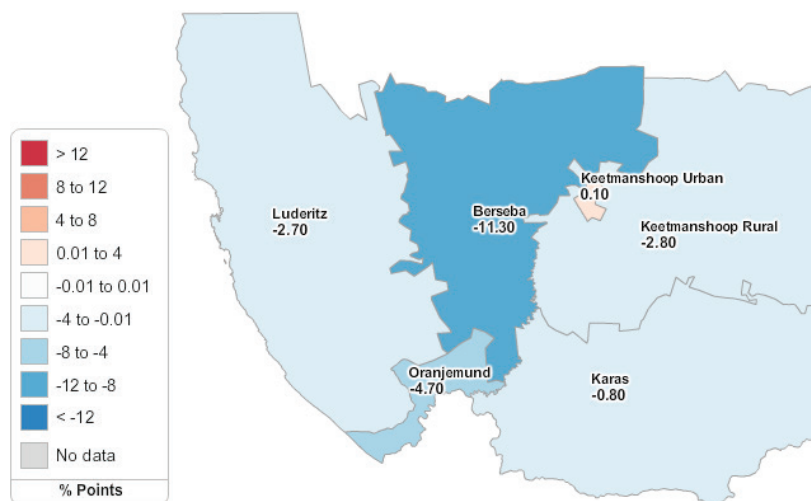
As shown in Map 9, Berseba, Keetmanshoop Rural and Karasburg constituencies have more than 20 percent of their population classified as poor. As education is known to have an ameliorating impact on poverty, it is not surprising that the first two of these constituencies, Berseba and Keetmanshoop Rural, have the highest percentage of people with no formal education at 9 percent and 8 percent, respectively. In contrast, the region as a whole has a literacy rate of 97 percent with only 5 percent of the population having never been to school. An estimated 68 percent of the population is economically active.

Unemployment is highest in Berseba and Karasburg, at 38 percent and 29 percent, respectively. Agriculture, mining and construction are the main employers, while manufacturing and tourism account for, respectively, 6 percent and 3 percent of total employment. The region has a potential for green scheme (irrigation) projects, which could have a poverty reducing impact, especially in Karasburg, Keetmanshoop Rural and Berseba constituencies.

**Map 9: Karas Region Poverty Headcount Rate in 2011 (upper bound poverty line)**



**Map 10: Karas Region Change in Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**



Map 10, above, illustrates the reduction in poverty levels over the past ten years. The map shows that over the 2001 to 2011 period, the largest decline in the poverty headcount rate was recorded in Berseba and Oranjemund constituencies. The decline in the poverty rate in Berseba is especially welcome given its high poverty incidence.

About 7 percent of the Karas population is estimated to be severely poor, having declined by 2.6 percentage points from 9.2 percent in 2001. Similar to the pattern for poverty levels, the incidence of severe poverty is highest in Berseba, at 14 percent, and lowest in Oranjemund, at less than 1 percent.

**Table 11: Karas Region Poverty Headcount Rate, 2001 - 2011 (lower bound poverty line)**

Karas Region	2001	Rank	2011	Rank	Change
Berseba	23.2	1	13.8	1	-9.4
Karasburg	11.0	3	9.9	3	-1.1
Keetmanshoop Rural	14.4	2	11.2	2	-3.2
Keetmanshoop Urban	3.6	5	3.8	4	0.1
Luderitz	4.0	4	2.6	5	-1.4
Oranjemund	3.4	6	0.9	6	-2.5
Regional rate	9.2		6.7		-2.6

### 3.3.6 Kavango region

Kavango is the fourth most populous region in the country with a population of 223 352, accounting for 11 percent of the total national population. Between 2001 and 2011, the regional population grew by 1 percent per annum, that is, more slowly than the national rate. The region has a population density of 4.6 people per km<sup>2</sup>. The main hydrological feature of the Kavango region is the Okavango River, which presents huge potential for irrigation and artisanal fishing. The past decade has witnessed an increase in investment in green scheme projects, mainly along the Okavango, leading to increased agricultural production and productivity in the region. An estimated 71 percent of the population lives in rural areas. The region recorded a net outflow of migrants both between 1996 and 2001 and between 2001 and 2011.

In 2011, Kavango region had the highest incidence of poverty of all regions at, 53 percent (118 823 people), representing a decline of 5 percentage points from the 2001 figure of 58 percent. With the exception of Rundu Urban constituency, all constituencies in Kavango region have poverty incidence above the national average of 27 percent. The highest poverty was reported in Kapako constituency (63 percent or 16 891 people), while the lowest incidence was reported in Rundu Urban (19 percent). Kahenge, Kapako, Mashare and Mpungu constituencies all have 60 percent or more of their population classified as poor.

In terms of changes in the incidence of poverty over time, the greatest decline was reported in Mashare, Ndiyona and Rundu Urban constituencies, which recorded reductions of 14.7, 12.8 and 11.8 percentage points, respectively between 2001 and 2011. Over the 2001 to 2011 period, the poverty headcount rate declined in all of the constituencies, with the exception of Kahenge and Kapako. Kapako recorded an increase of about 7 percentage points in poverty headcount.

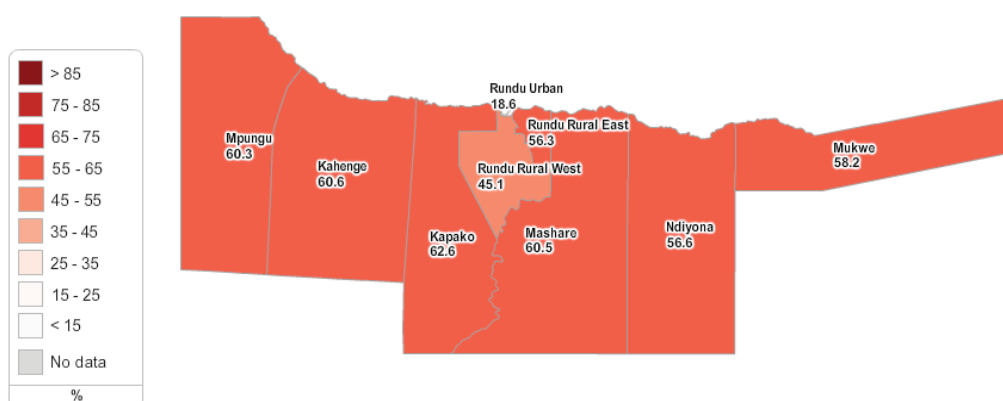
**Table 12: Kavango Region Poverty Headcount Rate, 2001 - 2011 (upperbound poverty line)**

Kavango Region	2001	Rank	2011	Rank	Change
Kahenge	60.3	6	60.6	2	0.3
Kapako	55.8	7	62.6	1	6.8
Mashare	75.3	1	60.5	3	-14.8
Mpungu	60.8	5	60.3	4	-0.6
Mukwe	65.2	3	58.2	5	-7.0
Ndiyona	69.3	2	56.6	6	-12.7
Rundu Rural West	46.8	8	45.1	8	-1.7
Rundu Urban	30.3	9	18.6	9	-11.8
Rundu Rural East	61.5	4	56.3	7	-5.2
Regional rate	57.9		53.2		-4.8

Map 11, below, shows that, with the exception of Rundu Urban and Rundu Rural West constituencies, in all the constituencies in Kavango region more than half of the population is poor. Although the literacy rate is high, at 79 percent, 18 percent of the population 6 years and above have never entered formal education while more than one third (35 percent) of those aged 15 years and above have not completed primary education. About 61 percent of those aged 15 years and above are in the economically active category. However, only half are employed, resulting in an unemployment rate of 50 percent.

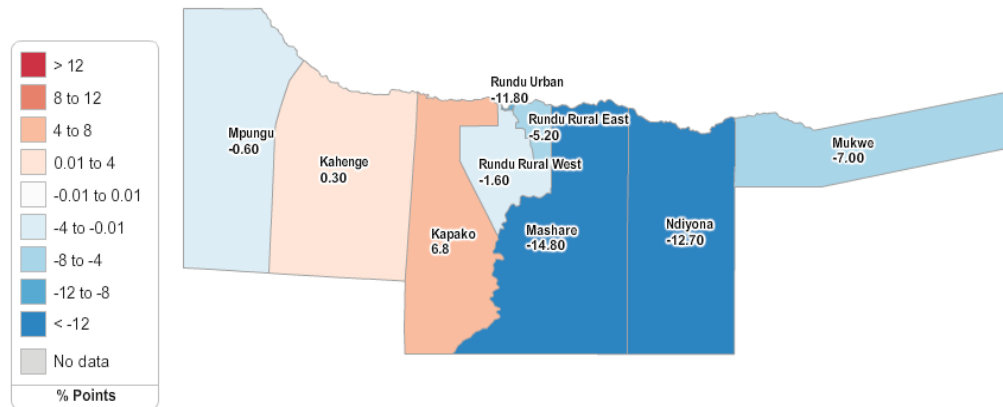
The agricultural sector is the main source of employment, accounting for 60 percent of the employment in the region. Unemployment is highest in Rundu Rural East, Kapako and Mashare constituencies. Subsistence farming is the main source of income, involving 43 percent of the households in the region. The only exception to this is Rundu Rural West and Rundu Urban constituencies where 39 percent and 55 percent, respectively, of the population cited salary and wages as the main source of income.

**Map 11: Kavango Region Poverty Headcount Rate in 2011 (upper bound poverty line)**



Map 12 indicates a reduction in poverty levels over the period of ten years (from 2001 to 2011). The map indicates that the greatest decline in poverty occurred in Mashare, Ndiyona and Mukwe constituencies.

**Map 12: Kavango Region Change in Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**



More than one third (34.4 percent) of the population in Kavango region is severely poor. The incidence of severe poverty reduced by five percentage points over a decade, with the greatest decline registered in Mashare and Ndiyona constituencies. The incidence of severe poverty increased in Kapako by 7 percentage points. Targeted poverty interventions are required to reduce poverty levels.

**Table 13: Kavango Region Poverty Headcount Rate, 2001 - 2011 (lower bound poverty line)**

Kavango Region	2001	Rank	2011	Rank	Change
Kahenge	41.7	5	39.7	4	-2.1
Kapako	36.0	7	42.5	1	6.5
Mashare	56.3	1	40.5	3	-15.8
Mpungu	42.5	4	40.6	2	-1.9
Mukwe	46.4	3	39.1	5	-7.3
Ndiyona	50.9	2	35.5	7	-15.4
Rundu Rural West	29.2	8	27.4	8	-1.7
Rundu Urban	15.9	9	8.5	9	-7.4
Rundu Rural East	40.1	6	36.6	6	-3.4
Regional rate	39.4		34.4		-5.0



### 3.3.7 Khomas region

Khomas Region is home to Windhoek, the commercial hub and capital of the country. The region has a population of 342 141 accounting for about 16.2 percent of the total population. The region is predominantly urban and six out of the seven constituencies are urban constituencies located in Windhoek. The region is a net recipient of migrants from other parts of the country due to its strong economic pull as well as the push factors (poverty and unemployment) present in some rural parts of the country.

Table 14 indicates mixed results with regard to reduction in the incidence of poverty, with four out of the ten constituencies having registered increases, while six constituencies registered declines in the poverty headcount rate over the 2001 to 2011 period. Windhoek Rural and Katutura Central registered the largest declines in poverty incidence. With poverty incidence of 5 percent (15 738 people), Khomas is the least poor region in Namibia. Notwithstanding this relatively low poverty level, there exist wide variations between the ten constituencies of the region, with those characterised by informal settlements recording higher levels of poverty. While there is virtually no poverty incidence in Windhoek East constituency (0.1 percent incidence), in Tobias Hainyeko the incidence of poverty stands at 10 percent, and in both Moses Garoeb and Windhoek Rural, poverty stands at 8 percent. Overall, there was a 1 percentage point increase in poverty in Khomas over the 2001 to 2011 period, meaning that 7 230 more people are living in poverty than in 2001.

**Table 14: Khomas Region Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**

Khomas Region	2001	Rank	2011	Rank	Change
Tobias Hainyeko	4.8	3	9.6	1	4.8
Katutura Central	6.2	2	4.0	6	-2.2
Katutura East	4.5	4	4.1	5	-0.4
Khomasdal North	1.6	7	2.4	7	0.7
Soweto	2.9	6	2.1	8	-0.8
Samora Machel	3.3	5	4.3	4	0.9
Windhoek East	0.2	10	0.1	10	-0.1
Windhoek Rural	11.3	1	7.7	3	-3.6
Windhoek West	0.5	9	0.4	9	-0.2
Moses Garoeb	1.4	8	8.4	2	7.0
Regional rate	3.4		4.6		1.2

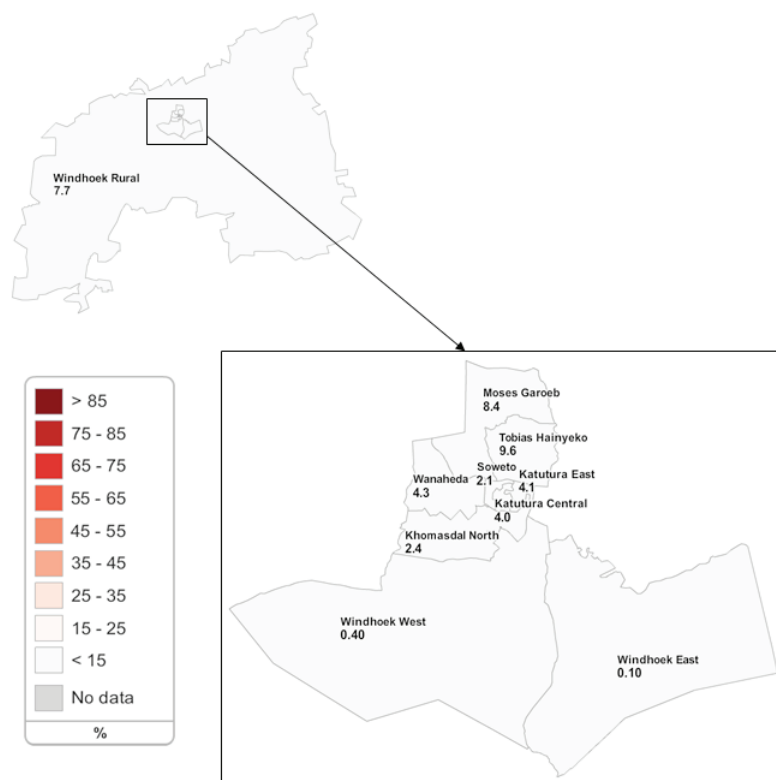
The relatively high incidence of poverty in Tobias Hainyeko and Moses Garoeb constituencies can be attributed to rapid population growth due to an inflow of migrants. While the region had a population growth of 3 percent per annum over the 2001 to 2011 period, Moses Garoeb, Samora Machel and Khomasdal North constituencies had population growth rates of 5 percent or higher. It is noteworthy that most of the migrants into these constituencies lack the necessary skills and education to be easily absorbed in the job market, leading to high rates of unemployment in these constituencies.



An estimated 74 percent of the population age 15 years and above is economically active, with unemployment estimated at 21 percent. Unemployment is highest in Moses Garoeb, at 30 percent of the labour force, followed by Tobias Hainyeko (29 percent), and Katutura Central, Katutura East and Samora Machel (all at 28 percent).

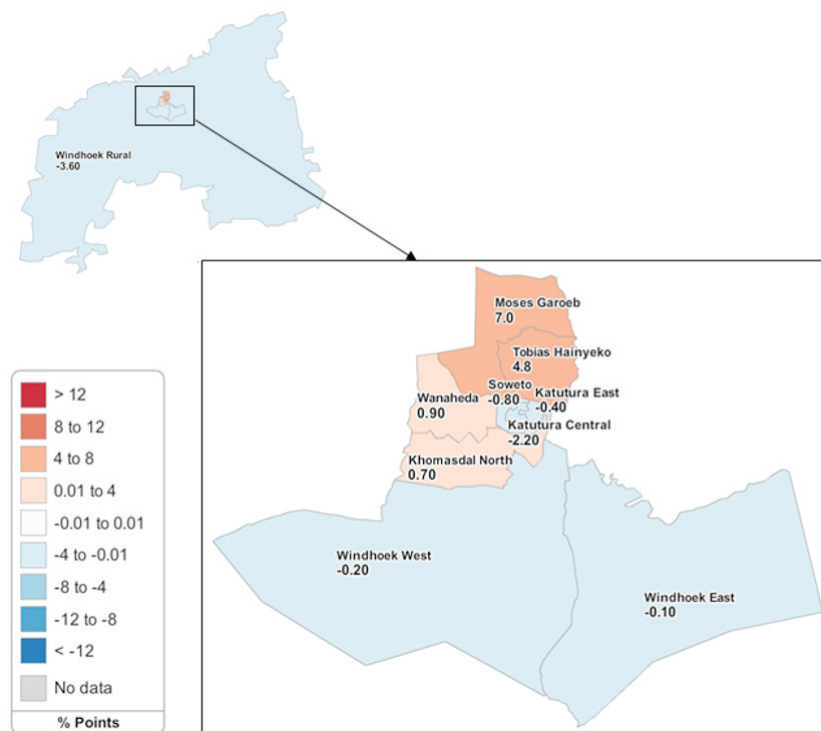
Map 13, below, depicts spatial patterns of poverty in Khomas at the 2011 time point. The education level in Khomas is very high, with the literacy rate estimated at 97 percent while an estimated 5 percent of the population has never attended school. Windhoek Rural, Tobias Hainyeko and Moses Garoeb constituencies have higher proportions of people who have never attended school, at 13 percent, 9 percent and 7 percent, respectively.

**Map 13: Khomas Region Poverty Headcount Rate in 2011 (upper bound poverty line)**



As stated above and shown in Map 14 below, the largest increase in the incidence of poverty was recorded in Moses Garoeb and Tobias Hainyeko constituencies.

**Map 14: Khomas Region Change in Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**



The incidence of severe poverty is estimated at an extremely low 1.6 per cent, indicating that in this urban setting even most of the unemployed are able to avoid poverty, and particularly severe poverty. Severe poverty is found in Tobias Hainyeko, Moses Garoeb and Windhoek Rural. It has actually increased in both Tobias Hainyeko and Moses Garoeb by 2 and 3 percentage points respectively, while it has declined in Windhoek rural by about 1.6 percentage points. Addressing the migration push factors and decentralisation could help reduce poverty in Khomas region.

**Table 15: Khomas Region Poverty Headcount Rate Scores and Values, 2001 - 2011 (lower bound poverty line)**

Khomas Region	2001	Rank	2011	Rank	Change
Tobias Hainyeko	1.4	3	3.6	1	2.1
Katutura Central	1.6	2	1.1	6	-0.5
Katutura East	0.9	4	1.2	5	0.3
Khomasdal North	0.4	7	0.7	7	0.3
Soweto	0.9	4	0.5	8	-0.4
Samora Machel	0.7	6	1.3	4	0.6
Windhoek East	0.0	10	0.0	10	0.0
Windhoek Rural	4.5	1	2.9	3	-1.6
Windhoek West	0.1	8	0.1	9	0.0
Moses/Garoëb	0.2	8	3.0	2	2.9
Regional rate	1.0		1.6		0.6

### 3.3.8 Kunene region

Kunene region derives its name from the Kunene River, which forms Namibia's border with Angola and is the second largest river in the country. The region is characterised by rocky and bare mountains. Kunene receives low and unreliable rainfall and the climate is greatly influenced by the South Atlantic and Benguela currents. Nomadic pastoralism is the main economic activity as the potential for irrigated agriculture remains largely untapped. The region is home to one of Namibia's major international tourist attractions, the Epupa falls. It has a population of 86 856 people of whom 74 percent live in rural areas.

In 2011, Kunene region, with a headcount poverty rate of 39 percent (33 787 people), was the fourth poorest region in the country after Kavango, Oshikoto and Zambezi. Between 2001 and 2011, the region registered a 15 percentage point reduction in the incidence of poverty. Reductions were registered in all the constituencies, with the highest reductions being in Sesfontein (29 percentage points), followed by Opuwo (21 percentage points) and Kamanjab (17 percentage points).

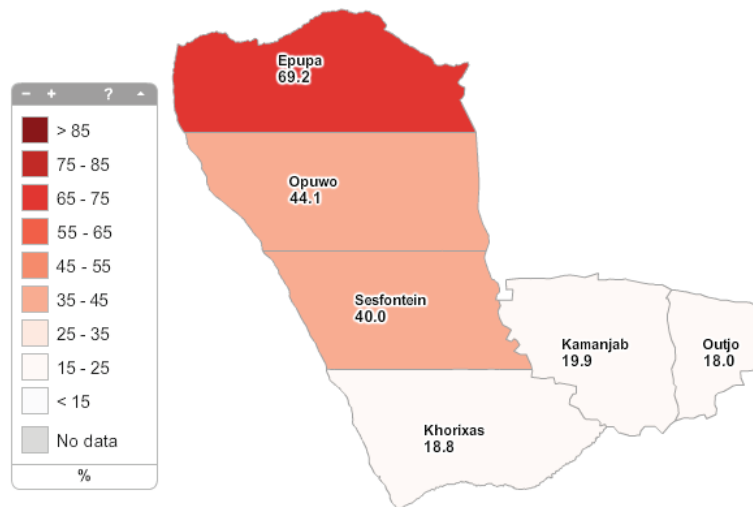
**Table 16: Kunene Region Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**

Kunene Region	2001	Rank	2011	Rank	Change
Epupa	76.8	1	69.2	1	-7.7
Kamanjab	37.0	4	19.9	4	-17.1
Khorixas	34.3	5	18.8	5	-15.5
Opuwo	65.2	3	44.1	2	-21.1
Outjo	22.7	6	18.0	6	-4.7
Sesfontein	69.0	2	40.0	3	-29.0
Regional rate	53.7		38.9		-14.8

Despite registering a reduction in the incidence of poverty of 8 percentage points, Epupa, with poverty headcount of 69 percent, is still the poorest constituency in Kunene. It is followed by Opuwo (44 percent) and Sesfontein (40 percent). This is shown in Map 15, below. The population of the region grew by 2.3 percent per annum, with Epupa and Outjo constituencies registering the highest growth rates at 3 percent and 3.1 percent, respectively. The region has a literacy rate of 65 percent, while more than one third (36 percent) of people aged 6 years and above have never attended school. Epupa (68 percent) and Opuwo (42 percent) have the highest rates of people who have never attended school.

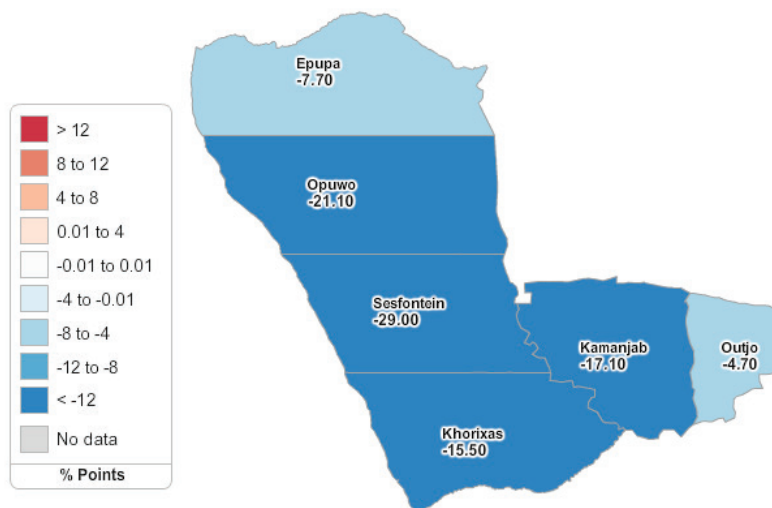
The economically active population is estimated at 67 percent of the population. Of these, 36 percent are unemployed. More than half (56 percent) of the employed population is in the agricultural sector, with tourism and manufacturing accounting for about 4.2 and 4.3 percent, respectively, of employment in the region. Apart from Outjo, Kamanjab and Sesfontein, all constituencies in Kunene region depend on subsistence farming as their main source of income.

**Map 15: Kunene Region Poverty Headcount Rate in 2011 (upper bound poverty line)**



Map 16 illustrates the changes in poverty incidence over the 2001 to 2011 period. As can be seen from the map, with the exception of Epupa (8 percentage points) and Outjo (5 percentage points), all constituencies registered a poverty reduction of more than 15 percentage points between 2001 and 2011.

**Map 16: Kunene Region Change in Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**



Despite a reduction of 13 percentage points between 2001 and 2011, an estimated one quarter of the Kunene population is still classified as severely poor. In Epupa constituency, more than half (51 percent) of the population is classified as severely poor, while almost a third (28 percent) of the population in Opuwo is severely poor. The region has the potential to reduce poverty through agriculture, tourism and logistics.

**Table 17: Kunene Region Poverty Headcount Rate, 2001 - 2011 (lower bound poverty line)**

Kunene Region	2001	Rank	2011	Rank	Change
Epupa	56.5	1	50.9	1	-5.6
Kamanjab	21.4	4	9.5	4	-12
Khorixas	20.6	5	8.8	5	-11.7
Opuwo	49.2	2	28.2	2	-21.1
Outjo	10.9	6	8.4	6	-2.5
Sesfontein	48.8	3	23.7	3	-25.1
Regional rate	37.5		24.8		-12.7

### 3.3.9 Ohangwena region

Ohangwena region borders Cunene Province in Angola to the north and Kavango, Oshikoto, Oshana and Omusati regions in Namibia. The region has a population of 245 446, which is 11.6 percent of the national population. At 23 people per square kilometre, the region has the highest population density in the country. An estimated 90 percent of the population lives in rural areas. Between 2001 and 2011, the region registered the greatest decline in the incidence of poverty, from 63 percent to 35 percent. As a result, 56 783 fewer people are living in poverty than was the case in 2001.

The decline in poverty incidence was observed in all the 11 constituencies. With the exception of Ondombe constituency where the incidence of poverty declined by 11 percentage points, all constituencies in Ohangwena experienced a poverty reduction of more than 20 percentage points, with the highest reduction of 34 percentage points (8 290 people), being registered in Endola constituency. This decline notwithstanding, Ohangwena remains among the five poorest regions in the country.

**Table 18: Ohangwena Region Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**

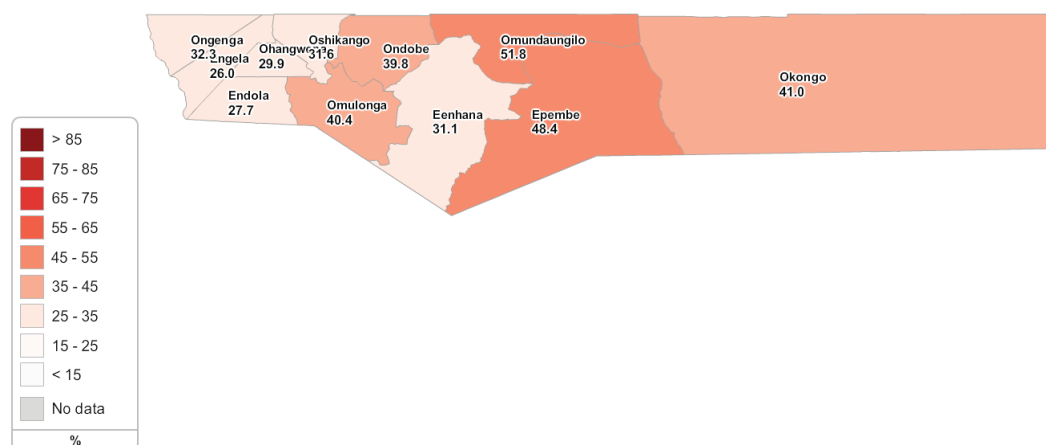
Ohangwena Region	2001	Rank	2011	Rank	Change
Eenhana	62.6	6	31.1	8	-31.4
Endola	62.0	7	27.7	10	-34.2
Engela	59.2	8	26.0	11	-33.2
Epembe	72.2	3	48.4	2	-23.8
Ohangwena	57.8	10	29.9	9	-27.9
Okongo	73.7	2	41.0	3	-32.7

Omundaungilo	76.1	1	51.8	1	-24.3
Ondobe	51.0	11	39.8	5	-11.2
Ongenga	65.3	4	32.3	6	-33.0
Oshikango	58.9	9	31.6	7	-27.2
Omulonga	63.1	5	40.4	4	-22.7
Regional rate	62.8		35.3		-27.5

From Table 18, above, and Map 17, below, it can be seen that the incidence of poverty is highest in Omundaungilo at 52 percent, followed by Epembe at 48 percent, Okongo at 41 percent, and Omulonga and Ondobe each at around 40 percent. Over the past decade, the region experienced a population growth of about 0.7 percent per annum. Ohangwena has a literacy rate of 86 percent, while 14 percent of those aged 6 years and above have never attended school. The poorer constituencies have high proportions of people who have never attended school – Omundaungilo (19.4 percent), Okongo (17.3 percent), Epembe (16.4 percent), and Omulonga and Ondobe (15.2 percent).

The economically active population is estimated at 49 percent of the regional population and 43 percent of these are unemployed. The agricultural sector is the main employer with more than half (51 percent) of the employed population engaged in this sector. It is followed by the public sector and wholesale and trade. Tourism and manufacturing sectors account for 4 percent and 3 percent of the employed, respectively, while construction accounts for 5 percent of employment. Access to safe water is estimated at 56 percent of the population. Again, the poorer constituencies have lower percentages of population with an estimated 22 percent of the population in Omundaungilo constituency has access to safe water, with the corresponding figures for Epembe, Omulonga and Ondobe being 23 percent, 44 percent and 43 percent, respectively.

**Map 17: Ohangwena Region Poverty Headcount Rate in 2011 (upper bound poverty line)**



Map 18, illustrates the reduction in poverty incidence for the period 2001 to 2011. With the exception of Ondobe, all the constituencies in Ohangwena region registered reductions in the incidence of poverty of more than 20 percentage points.

**Map 18: Ohangwena Region Change in Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**

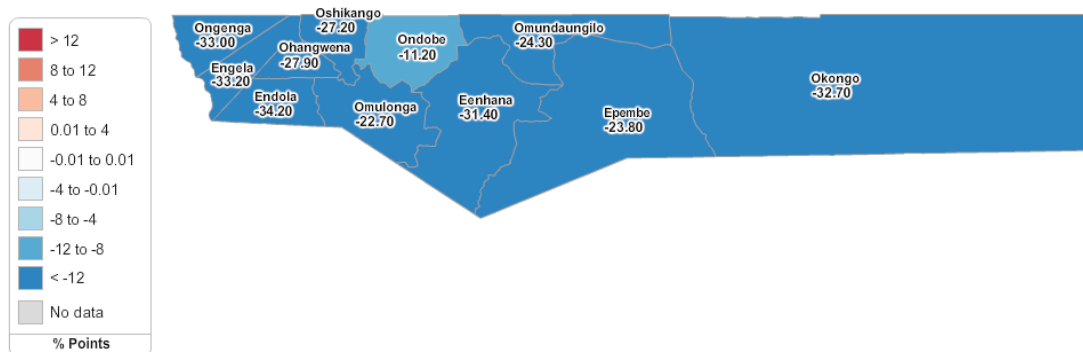


Table 19 presents the incidence of severe poor individuals in Ohangwena region. The table shows that the incidence of severe poverty reduced significantly by 22 percentage points over the 2001 to 2011 period. The incidence of severe poverty is highest in Omundaungilo, at 31 percent, and lowest in Engela, at 12 percent.

**Table 19: Ohangwena Region Poverty Headcount Rate, 2001 - 2011 (lower bound poverty line)**

Ohangwena Region	2001	Rank	2011	Rank	Change
Eenhana	38.3	9	15.7	8	-22.7
Endola	39.1	8	12.9	10	-26.2
Engela	39.6	6	12.1	11	-27.5
Epembe	48.3	3	28.4	2	-19.9
Ohangwena	37.0	10	15.1	9	-22.0
Okongo	51.8	1	22.5	3	-29.2
Omundaungilo	51.4	2	31.3	1	-20.2
Ondobe	33.5	11	21.3	5	-12.2
Ongenga	43.1	4	16.7	6	-26.4
Oshikango	36.7	5	15.9	7	-20.8
Omulonga	39.2	7	22.1	4	-17.2
Regional rate	40.7		18.6		-22.2

### 3.3.10 Omaheke region

Omaheke region, with a population of 71 233 people, lies in the central eastern part of Namibia. It borders Botswana to the east and the Hardap, Khomas and Otjozondjupa regions. The Trans-Kalahari highway, which links Namibia with Botswana, South Africa and Zimbabwe, traverses the region, thus presenting opportunities for transport and logistics, and related activities. The region is well known for its large commercial cattle ranches. An estimated 30 percent of the population lives in urban areas.

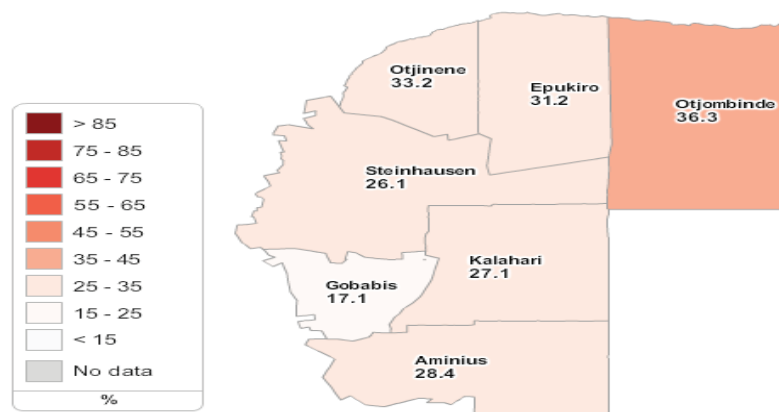
From a high of 42 percent in 2001, the incidence of poverty declined to 26 percent (18 663 people) in 2011, a 16 percentage point reduction. Over the 2001 to 2011 period, the incidence of poverty declined in all constituencies except Gobabis. The greatest decline was registered in Aminius (23 percentage points), followed by Otjinene (22 percentage points) and Epukiro and Otjombinde (21 percentage points each). Otjombinde constituency has the highest incidence of poverty, at 37 percent, while Gobabis has the lowest at 17 percent.

**Table 20: Omaheke Region Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**

Omaheke Region	2001	Rank	2011	Rank	Change
Aminius	50.9	4	28.4	4	-22.5
Gobabis	16.9	7	17.1	7	0.2
Kalahari	44.9	5	27.1	5	-17.8
Otjinene	55.1	2	33.2	2	-21.9
Otjombinde	57.0	1	36.3	1	-20.7
Steinhausen	35.5	6	26.1	6	-9.4
Epukiro	52.5	3	31.2	3	-21.2
Regional rate	41.6		26.2		-15.5

Map 19 shows the spatial distribution of poverty incidence in Omaheke. Poverty is highest in Otjombinde and lowest in Gobabis, the region's commercial and administrative capital. The region recorded a population growth rate of 0.5 percent per annum over the 2001 to 2011 period, with Gobabis constituency recording 3.3 percent per annum. Omaheke has a literacy rate of 73 percent, while 25 percent has never attained formal education. More than 30 percent of the population aged 6 years and above in Kalahari, Otjombinde and Steinhausen had never entered formal education. The economically active population is estimated at 65 percent, 40 percent of which is unemployed. About 45 percent of the employed population is in the agriculture sector. Tourism accounts for 5 percent of the employed population in the region, while manufacturing and logistics each account for 2 percent. Construction is a key sector, yielding about 7 percent of the region's employment.

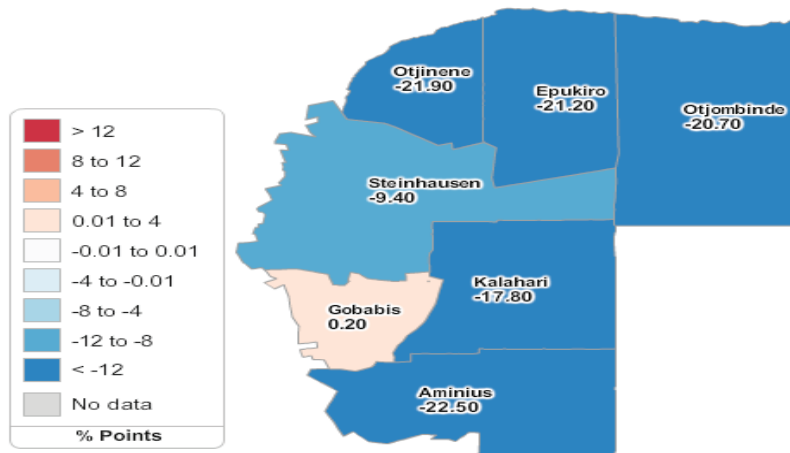
**Map 19: Omaheke Region Poverty Headcount Rate in 2011 (upper bound poverty line)**





Map 20 shows that, with the exception of Gobabis, all constituencies registered significant reductions in the incidence of poverty over the 2001 to 2011 period.

**Map 20: Omaheke Region Change in Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**



Between 2001 and 2011, the proportion of severely poor individuals in the region was reduced by almost half. From a high of 26 percent in 2001, the proportion of those classified as being severely poor stood at 14 percent in 2011. In 2011, Otjombinde constituency had the highest incidence of severe poverty, at 21 percent. It is followed by Otjinene and Epukiro constituencies.

**Table 21: Omaheke Region Poverty Headcount Rate, 2001 - 2011 (lower bound poverty line)**

Omaheke Region	2001	Rank	2011	Rank	Change
Aminius	35.2	3	14.7	4	-20.5
Gobabis	8.4	7	7.6	7	-0.8
Kalahari	28.6	5	13.6	5	-15.0
Otjinene	35.5	2	18.0	2	-17.5
Otjombinde	37.4	1	21.2	1	-16.2
Steinhausen	21.8	6	13.0	6	-8.8
Epukiro	31.1	4	17.3	3	-13.8
Regional rate	26.3		13.5		-12.8

### 3.3.11 Omusati region

Omusati region borders Angola in the north and also the Kunene, Ohangwena and Oshana regions of Namibia. It has a total area of 26 573 km<sup>2</sup>. With a population of 243 166, or 11.5 percent of the national population, the region has a population density of 9.2 persons per square kilometre, making it one of the most densely populated regions of Namibia. The region is well known for its *Mopani* trees and *mopani* worms. An estimated 95 percent of the population lives in rural areas and the people of the region are mainly engaged in mixed farming.

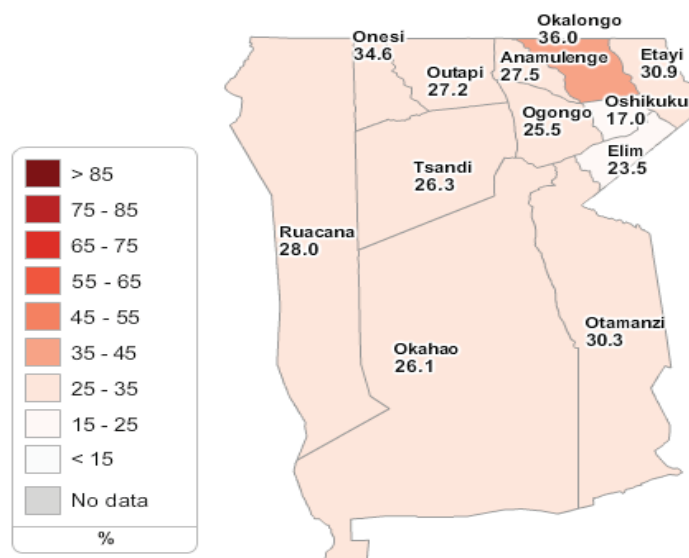
Over the 2001 to 2011 period, the region registered a 22 percentage point reduction in poverty incidence, with all constituencies showing significant poverty reductions. The current poverty headcount is estimated at 28.6 percent (69 545 people; 46 935 fewer than in 2001). Nine of the twelve constituencies registered poverty reductions of more than 20 percentage points and only Etayi had a reduction of less than 10 percentage points. The highest reduction was registered in Oshikuku constituency (32 percentage points), followed by Outapi and Tsandi (28 percentage points).

**Table 22: Omusati Region Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**

Omusati Region	2001	Rank	2011	Rank	Change
Oshikuku	49.3	8	17.0	12	-32.3
Elim	48.1	9	23.5	11	-24.5
Ogongo	47.2	10	25.5	10	-21.8
Okahao	52.3	5	26.1	9	-26.2
Tsandi	53.9	4	26.3	8	-27.6
Outapi	55.4	2	27.2	7	-28.2
Anamulenge	54.0	3	27.5	6	-26.5
Ruacana	51.6	6	28.0	5	-23.5
Otamanzi	46.7	11	30.3	4	-16.4
Etayi	40.7	12	30.9	3	-9.8
Onesi	51.0	7	34.6	2	-16.4
Okalongo	59.0	1	36.0	1	-22.9
Regional rate	50.9		28.6		-22.2

From Table 22, above, and as shown in Map 21, below, in 2011 the highest incidence of poverty was recorded in Okalongo (36 percent), while the lowest poverty incidence of poverty was in Oshikuku constituency (17 percent). Over the 2001 to 2011 period, the population of the region grew at a slow average of 0.6 percent per annum, with only Outapi (1.6 percent) and Ruacana (2.8 percent) constituencies registering population growth rates of more than 1 percent.

**Map 21: Omusati Region Poverty Headcount Rate in 2011 (upper bound poverty line)**



Omusati region’s literacy rate is estimated at 88 percent, while an estimated 10 percent of the population has never attained formal education. Ruacana (20 percent) and Onesi (15 percent) have the highest proportion of people with no formal education. The economically active population is estimated at 49 percent. Of these, 42 percent are unemployed. About 50 percent of the employed population is in the agricultural sector, while manufacturing, tourism and logistics employ 2 percent each. Construction, and wholesale and retail trade are also important sectors accounting for 4.4 and 3.6 percent of the region’s employment, respectively. The poorer constituencies of Okalongo, Etayi and Ontamazi have old age pensions as their main source of income, while in Onesi, subsistence farming is the main source of income. An estimated 52 percent of the households have access to safe drinking water but in Otamanzi, one of the poorest constituencies, only 25 percent of households have this access.

Map 22 shows that with the exception of Etayi (9.8 percent), Otamanzi (16 percent) and Onesi (16 percent), all constituencies recorded poverty reductions of more than 20 percentage points over the 2001 to 2011 period. The recent proclamation of former villages in Outapi, Oshikuku, Okahao and Ruacana constituencies as towns and the attendant investment in public services could partly explain the reduction in poverty noted in these constituencies.

**Map 22: Omusati Region Change in Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**

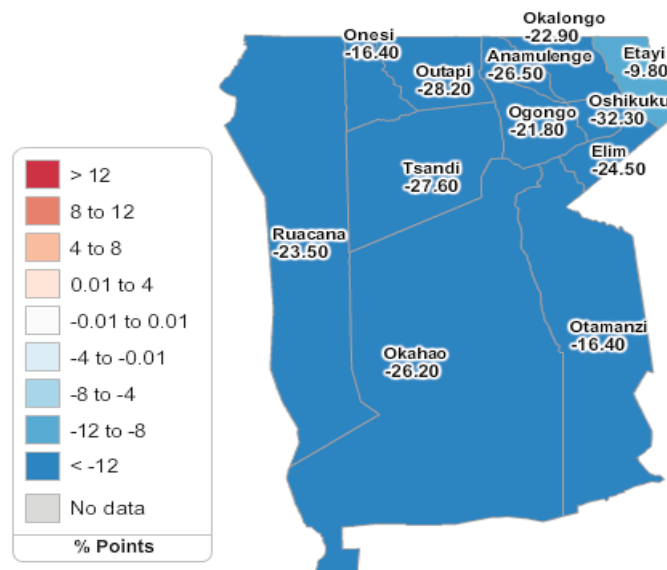


Table 23 shows that the incidence of severe poverty is estimated at 14 percent, having declined by a remarkable 18 percentage points between 2001 and 2011. Okalongo and Onesi are the two constituencies with the highest incidence of severe poverty, at 19 percent.

**Table 23: Omusati Region Poverty Headcount Rate, 2001 - 2011 (lower bound poverty line)**

Omusati Region	2001	Rank	2011	Rank	Change
Okalongo	39.8	1	18.7	1	-21.1
Outapi	36.1	2	13.2	7	-22.9
Onesi	33.9	3	18.6	2	-15.3
Elim	33.0	4	10.7	11	-22.4
Okahao	32.4	5	12.4	8	-20.0
Tsandi	32.3	6	12.2	9	-20.1
Anamulenge	32.3	7	13.6	6	-18.7
Ruacana	30.4	8	14.6	5	-15.8
Oshikuku	29.3	9	7.5	12	-21.8
Ogongo	27.0	10	11.7	10	-15.3
Otamanzi	26.5	11	14.7	4	-11.8
Etayi	23.9	12	15.3	3	-8.7
Regional rate	31.6		14.1		-17.5

**3.3.12 Oshana region**

Oshana is one of the three regions which does not have an international boundary. It is bordered by Omusati, Kunene, Oshikoto and Ohangwena regions. In 2011, Oshana had a population of 176 674, accounting for 8.4 percent of the national population. In terms of geographic size, this is the smallest of the thirteen regions, covering a total of 8 653 km<sup>2</sup>. Oshana region has a population density of 20.4 persons per square kilometre. Over the 2001 to 2011 period, the population of the region grew by 0.9 percent per annum. The mostly urban constituencies of Ongwediva, Ondangwa and Oshakati East registered growth rates of 2.4 percent, 1.5 percent and 1.2 percent per annum, respectively. The Oshakati-Ongwediva-Ondangwa complex has experienced a rapid rate of urbanisation and an influx of people from other parts of the country. Together these towns form an important commercial hub, providing employment opportunities for people in northern Namibia.

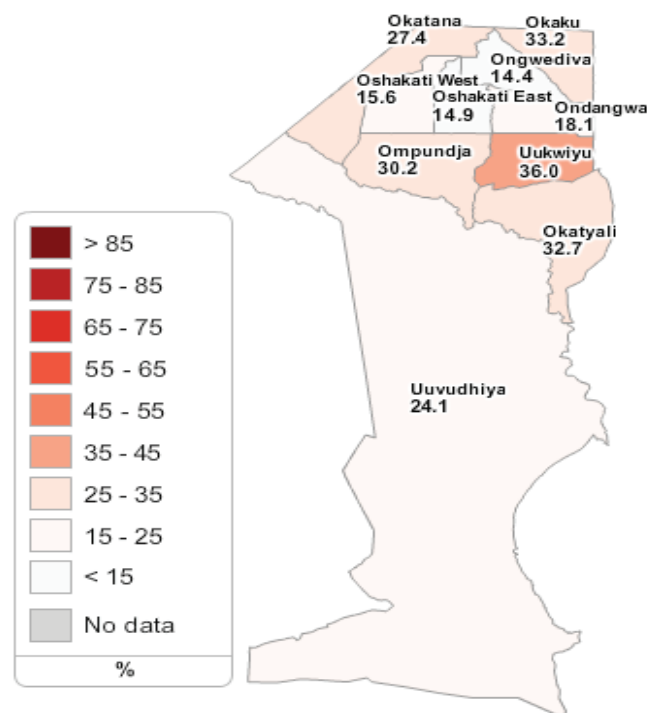
**Table 24: Oshana Region Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**

Oshana Region	2001	Rank	2011	Rank	Change
Ongwediva	22.8	8	14.4	10	-8.4
Oshakati East	19.0	9	14.9	9	-4.1
Oshakati West	13.5	10	15.6	8	2.1
Ondangwa	26.6	7	18.1	7	-8.5
Uuvudhiya	42.6	3	24.1	6	-18.5
Okatana	41.9	4	27.4	5	-14.5
Ompundja	42.7	2	30.2	4	-12.5
Okatyali	49.1	1	32.7	3	-16.3
Okaku	38.2	5	33.2	2	-5.0
Uukwiyu	36.0	6	36.0	1	0.1
Regional rate	28.3		21.1		-7.1

In 2011, the incidence of poverty in the region was estimated at 21 percent (37 278 people), having declined by 7 percentage points from the 2001 figure. Uukwiyu is the poorest constituency in Oshana, with an estimated 36 percent of the people classified as poor. It is followed closely by Okaku and Okatyali, where the incidence of poverty is 33 percent. Poverty incidence is lowest in Ongwendiva, at 14 percent. The greatest reduction in the incidence of poverty over the 2001 to 2011 period was recorded in Uuvudhiya (19 percentage points), Okatyali (16 percentage points), Okatana (15 percentage points) and Ompundja (13 percentage points), while Okaku (5 percentage points) recorded the least progress in reducing poverty. Poverty increased in Oshakati West by 2 percentage points over the same period.

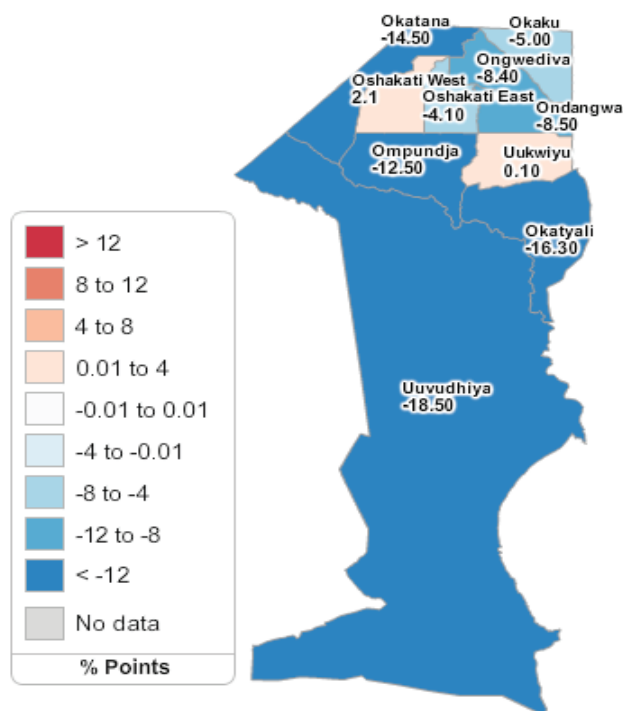
From Map 23 it can be seen that poverty is highest in Uukwiyu and lowest in the mainly urban constituencies of Ongwendiva, Oshakati West and Oshakati East.

**Map 23: Oshana Region Poverty Headcount Rate in 2011 (upper bound poverty line)**



Map 24 shows that the greatest decline in poverty occurred in Uuvudhiya, Okatyali and Okatana constituencies, as discussed above. The region has a literacy rate of 96 percent, while an estimated 6 percent of the population has never attended school. The economically active population is estimated at 61 percent of the population, of which 37 percent are unemployed. The agricultural sector employs 26 percent of the employed population, while manufacturing, tourism and logistics employ 3.9 percent, 3.5 percent and 3.9 percent of the workforce, respectively. The construction sector employs 6.3 percent of the region's labour force. Okatana, Okatyali and Okaku have unemployment rates of more than 30 percent. Salaries and wages (40 percent) and old age pensions (19 percent) are the main sources of income for the region generally, while old age pensions alone are the leading income source in Okaku (41 percent) and Ompundja (44 percent).

**Map 24: Oshana Region Change in Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**



In 2011, the incidence of severely poor individuals was estimated at 10 percent, a decline of 5 percentage points from 15 percent in 2001. Uukwiyu constituency has the highest incidence of severe poverty, at 19 percent, followed by Okaku, Ompundja and Okatyali constituencies.

**Table 25: Oshana Region Poverty Headcount Rate, 2001 - 2011 (lower bound poverty line)**

Oshana Region	2001	Rank	2011	Rank	Change
Oshakati West	6.2	10	6.8	8	0.6
Oshakati East	10.4	9	6.5	9	-3.9
Ongwediva	12.6	8	6.3	10	-6.3
Ondangwa	13.6	7	8.4	7	-5.2
Uukwiyu	18.2	6	18.8	1	0.6
Okaku	21.7	5	16.9	2	-4.8
Okatana	22.5	4	13.7	5	-8.9
Uuvudhiya	22.6	3	12.2	6	-10.4
Okatyali	26.2	2	15.9	4	-10.3
Ompundja	26.2	1	16.7	3	-9.4
Regional rate	15.1		10.1		-5.0



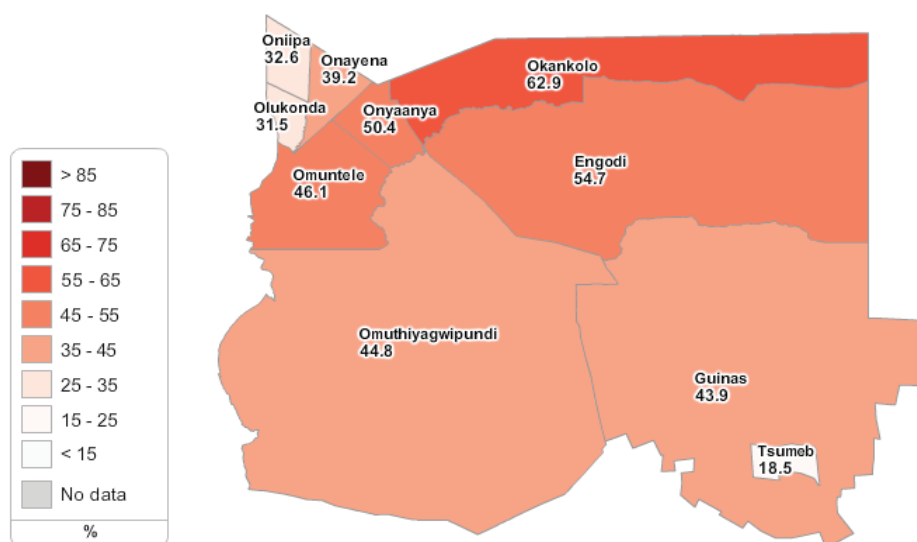
### 3.3.13 Oshikoto region

Oshikoto region is home to Etosha National Park, which is one of the major tourist attractions in Namibia and Southern Africa. The region has a population of 181 973, of which the vast majority (87 percent) lives in rural areas. In 2011, the incidence of poverty in the region was 43 percent (77 520 people), representing a 15 percentage point reduction from the 2001 figure of 57 percent. The poorest constituency in the region is Okankolo, with 63 percent of the population classified as poor. It is followed by Eengodi (55 percent) and Onyaanya (50 percent). The least poor constituency is Tsumeb where an estimated 19 percent of the population is classified as poor. Over the 2001 to 2011 period, the greatest decline in poverty, of 23 percentage points, was recorded in Onayena constituency. This was followed by a 21 percentage point reduction in Omuntele constituency and 20 percentage points in Oniipa constituency.

**Table 26: Oshikoto Region Poverty Headcount, 2001 - 2011 (upper bound poverty line)**

Oshikoto Region	2001	Rank	2011	Rank	Change
Tsumeb	18.8	10	18.5	10	-0.3
Olukonda	48.5	9	31.5	9	-17.0
Oniipa	52.4	8	32.6	8	-19.9
Onayena	62.1	5	39.2	7	-22.8
Guinas	54.1	7	43.9	6	-10.3
Omuthiyagwipundi	61.2	6	44.8	5	-16.5
Omuntele	66.9	3	46.1	4	-20.9
Onyaanya	62.2	4	50.4	3	-11.8
Eengodi	69.1	2	54.7	2	-14.5
Okankolo	71.7	1	62.9	1	-8.8
Regional rate	57.3		42.6		-14.7

**Map 25: Oshikoto Region Poverty Headcount Rate in 2011 (upper bound poverty line)**



As can be seen from Table 26 and Map 25, above, with the exception of Tsumeb, all constituencies have poverty levels higher than 30 percent and many are considerably higher. Between 2001 and 2011 the population of the region grew by 1.2 percent per annum although the urban areas recorded a higher growth rate of 4.6 percent per annum. Eengodi and Tsumeb constituencies grew by 3.6 and 2.9 percent per annum, respectively, while Okankolo, the poorest constituency, had a population growth rate of 1.9 percent. The region has a literacy rate of 88 percent, with about 12 percent of the population aged 6 years and above having never attended school. In Guinas constituency, with a poverty headcount of 44 percent, more than one third (37 percent) of people have never attained formal education. This is followed by Eengodi (20 percent) and Okankolo (18 percent).

The economically active portion of the population is estimated at 57 percent. Of these, 40 percent are unemployed. The agricultural sector employs 49 percent of the working population, while manufacturing, tourism and logistics account for 3 percent, 2.6 percent and 2.7 percent of employment, respectively. Other important sectors providing jobs are construction (4.7 percent), wholesale and retail trade (5 percent), and mining (2.5 percent). Unemployment is highest in Omuthiyagwipundi and Onayena constituencies, at 43 percent of the labour force. Access to safe drinking water is estimated to be 70 percent for the region but varies greatly across constituencies. Only an estimated one third (33.3 percent) of the households in Okankolo, the poorest constituency in the region, have access to safe drinking water, with the corresponding figure for Onayena being 39 percent. In the second poorest constituency, Eengodi, more than half (57 percent) of households have access to safe water. While about 11 and 20 percent of households in the region use electricity for cooking and lightning respectively, in Okankolo, only 2 and 3 percent of households, respectively, do so.

Map 26 confirms that, over the 2001 to 2011 period, all constituencies recorded declines in poverty headcount rate, albeit in varying degrees, with the greatest reductions being recorded in Onayena and the least in Tsumeb constituency.

**Map 26: Oshikoto Region Change in Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**

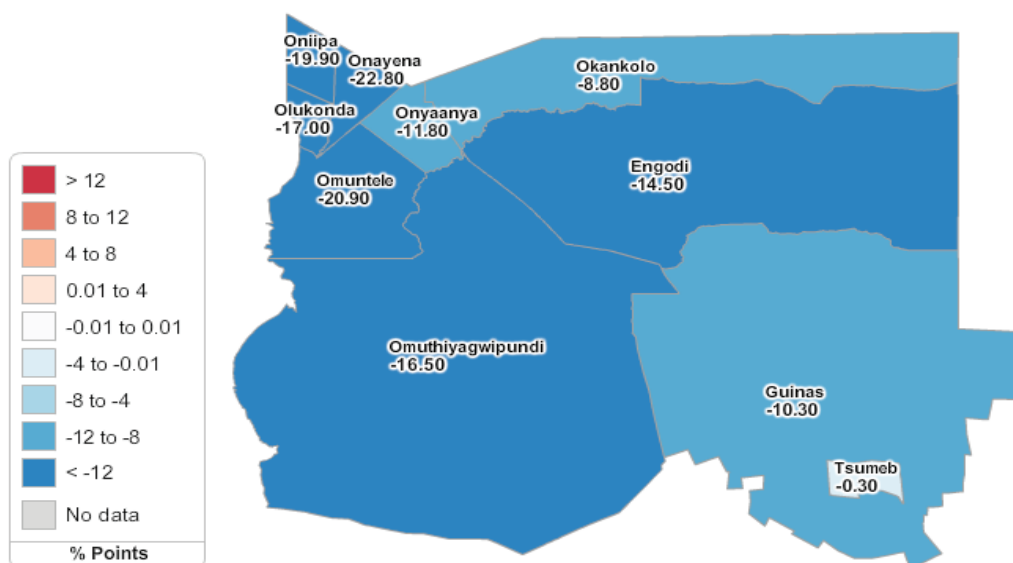


Table 27 presents the incidence of severe poverty in Oshikoto region, and changes between 2001 and 2011. An estimated 27 percent of the population is severely poor. With the exception of Tsumeb, all the constituencies in Oshikoto registered declines in the incidence of severe poverty, with Onayena and Oniipa registering the greatest declines. Despite a 10 percent reduction in the incidence of severe poverty between 2001 and 2011, Okankolo constituency still has more than 40 percent of its population living in extreme poverty.

**Table 27: Oshikoto Region Poverty Headcount Rate, 2001 - 2011 (lower bound poverty line)**

Oshikoto Region	2001	Rank	2011	Rank	Change
Tsumeb	8.9	10	9.0	10	0.1
Olukonda	28.6	9	17.3	9	-11.3
Oniipa	35.3	7	18.6	8	-16.7
Onayena	41.8	6	23.0	7	-18.8
Guinas	34.4	8	27.2	6	-7.3
Omuthiyagwiipundi	41.9	5	28.1	5	-13.8
Omuntele	43.7	3	28.6	4	-15.1
Onyaanya	43.2	4	32.3	3	-10.9
Eengodi	47.9	2	36.2	2	-11.7
Okankolo	54.0	1	43.8	1	-10.2
Regional rate	38.6		26.5		-12.1

### 3.3.14 Otjozondjupa region

Otjozondjupa region has a surface area of 105 185km<sup>2</sup>, accounting for 12.8 percent of the land area of Namibia, and is home to 6.8 percent of the population. The region is largely semi-arid with annual rainfall ranging from 300 to 600mm, and like Omaheke region, it is characterised by large commercial ranches. Otjozondjupa is divided into six constituencies - Grootfontein, Otavi, Otjiwarongo, Omatako, Okakarara, Okahandja and Tsumkwe. The central town of Otjiwarongo serves as the administrative headquarters of the region. The region is home to Ohorongo cement factory and B2 gold mine.

Between 2001 and 2011, the population grew at an average rate of 0.6 percent per annum. Over the past decade the region has experienced rapid urbanization, with 54 percent of the population currently living in urban areas, compared to 41 percent in 2001. The region has a relatively young population, with an estimated 36 percent of the population being under 15 years of age. An estimated 83 percent of the population is literate. Ninety five percent of households have access to safe drinking water and 56 percent use electricity for lighting.

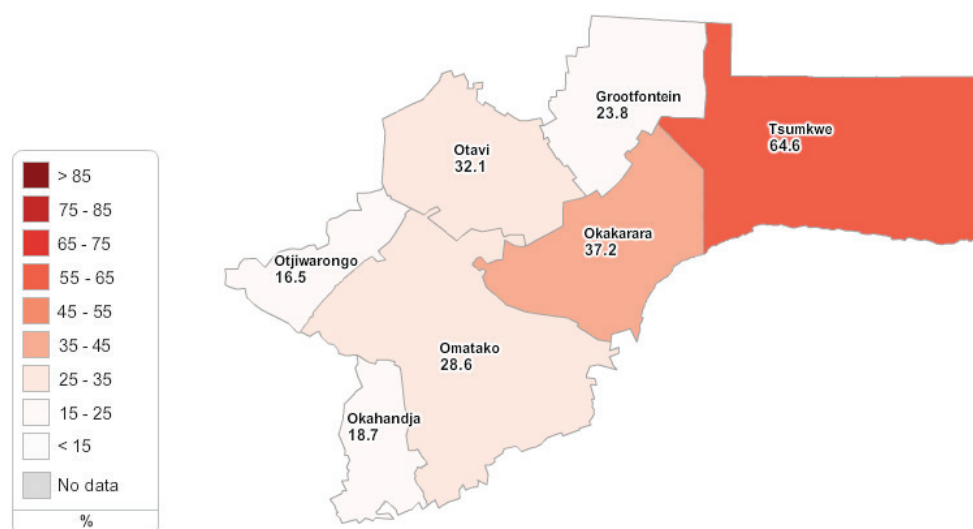
Although Otjozondjupa region is known for its potential for large scale commercial farms, the main source of income is salary and wages (60 percent), with agriculture, business and pensions jointly constituting the main source of income for 10 percent of the population. Seventy two percent of the population is economically active and of these, 37 percent is unemployed. At 27.5 percent (39 573), the poverty headcount rate is slightly above the national average, while the rate of severe poverty is estimated at 14.9 percent.

Poverty is highest in mostly rural constituencies characterised by subsistence farming. At the 2011 time point, Tsumkwe was the poorest constituency, with a poverty headcount rate of 65 percent, representing a marginal decrease of 1 percentage point from 2001, while the least poor constituency is Otjiwarongo with a poverty headcount rate of 17 percent. Tsumkwe constituency also has the lowest literacy rate, at 58 percent, with more than one third (36 percent) of people aged 15 years and above having never attended school. The labour force is estimated at 69 percent of the population and more than half (52 percent) of this group is unemployed.

**Table 28: Otjozondjupa Region Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**

Otjozondjupa Region	2001	Rank	2011	Rank	Change
Grootfontein	23.7	5	23.8	5	0.0
Okahandja	20.8	6	18.7	6	-2.1
Okakarara	49.7	1	37.2	2	-12.5
Omatako	27.4	3	28.6	4	1.2
Otavi	25.9	4	32.1	3	6.2
Otjiwarongo	16.8	7	16.5	7	-0.3
Tsumkwe	65.7	1	64.6	1	-1.2
Regional rate	30.4		27.5		-2.9

**Map 27: Otjozondjupa Region Poverty Headcount Rate in 2011 (upper bound poverty line)**



Between 2001 and 2011 the poverty headcount rate in the region declined by 3 percentage points, with Okakarara constituency experiencing the highest reduction of 13 percentage points. However, not all constituencies registered a reduction in poverty, as Otavi and Omatako had increases of 6 percent and 1 percent, respectively. Access to water is estimated at 92 percent of the population while an estimated 51 percent of the population uses electricity for lighting.

**Map 28: Otjozondjupa Region Change in Poverty Headcount Rate, 2001 - 2011 (upper bound poverty line)**



The changes in the incidence of severe poverty mirror closely those of poverty, with Tsumkwe constituency having the highest proportion of severe poverty (45 percent) and Okakarara constituency experiencing the highest reduction in severe poverty. The incidence of severely poor households in Otjozondjupa region is estimated at 15 percent, a reduction of 3 percentage points from the 2001 figure.

**Table 29: Otjozondjupa Region Poverty Headcount Rate, 2001 - 2011 (lower bound poverty line)**

Otjozondjupa Region	2001	Rank	2011	Rank	Change
Grootfontein	13.6	4	11.6	5	-2.0
Okahandja	9.4	6	8.4	6	-1.0
Okakarara	33.5	2	21.9	2	-11.7
Omatako	15.4	3	15.2	4	-0.3
Otavi	13.1	5	17.0	3	3.9
Otjiwarongo	7.5	7	7.1	7	-0.4
Tsumkwe	45.9	1	44.9	1	-1.0
Regional rate	17.9		14.9		-3.0

## 4 CONCLUSIONS AND RECOMMENDATIONS

### 4.1 Conclusions

Poverty in Namibia has declined over a decade on aggregate. At the national level, there was a decline of 11 percentage points in the poverty headcount over the 2001 to 2011 period, with the greatest declines being registered in the northern regions of Ohangwena, Omusati, Kunene and Oshikoto, as well as the eastern region of Omaheke. However, the decline in poverty headcount was not uniform across the thirteen regions of the country. While eleven out of the thirteen regions reported declines in the poverty headcount, two regions (Zambezi and Khomas) recorded increases in the incidence of poverty over the same period.

At the constituency level, the biggest percentage point reduction in the poverty headcount was registered in the northern regions of Ohangwena and Omusati, while the biggest increase occurred in the north-eastern Zambezi region. Eenhana, Endola, Engela, Okongo and Ongenga constituencies in Ohangwena region and Oshikuku constituency in Omusati region all registered a reduction in poverty headcount of more than 30 percentage points, while Katima Mulilo Urban and Kongola constituencies in Zambezi region had an increase in poverty headcount of more than 10 percentage points over this period.

The incidence of severe poverty in the country declined by 9 percentage points over the 2001 to 2011 period. However, while severe poverty declined in eleven out of the thirteen regions, two regions (Zambezi and Khomas) recorded increases in the severe poverty incidence. At the constituency level, the greatest decline, in terms of percentage points, in the incidence of severe poverty was recorded in Okongo constituency in Ohangwena region, followed by Engela, Ongenga and Endola constituencies in Ohangwena region, as well as Sesfontein constituency in Kunene. All of these registered reductions of more than 25 percentage points. On the other hand, the greatest increase in the incidence of severe poverty, of 7 percentage points or higher, was registered in Sibbinda, Linyanti and Kongola, all in Zambezi region, as well as in Kapako in Kavango region.

Over the past decade, poverty in Namibia continued to exhibit an urban-rural divide. The seven poorest regions – Kavango, Oshikoto, Zambezi, Kunene, Ohangwena, Omusati and Otjozondjupa – had poverty incidences above the national average of 26.9 percent. These are regions where the majority of their population lives in rural areas, while the less poor regions of Khomas and Erongo, the economic hubs of the country with relatively more employment opportunities, have largely urban populations.

In 2011, Kavango was the poorest region in the country and Khomas was the least poor region, while Epupa was the poorest constituency in the country, and Windhoek East the least poor constituency.

## 4.2 Policy Recommendations

The following policy recommendations are drawn from the findings of this study:

- Having located where the poor are, there is a need for targeted interventions in terms resource allocation, public/private investment and service delivery.
- The widely acknowledged negative relationship between education and poverty clearly exists in Namibia. Therefore, it is important that, as a long term strategy, investment in education is used to reduce poverty. However, short term service delivery is also crucial for poverty reduction. This will have the effect of also addressing migration which has been an increasing contributor to poverty in urban areas.
- National policies and a national agenda for poverty reduction need to be localised in order to make a notable impact.
- It is also important to gain a better understanding of the sectors, programmes and projects, as well as the institutional factors driving the reported reductions in the poverty headcount. Thus, further research to identify the factors driving poverty reduction is recommended.



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**Annex 1: Detailed Poverty Headcount using the Upper Poverty Line 2001 and 2011**

Region and Constituency	2001			2011			Change			
	Poverty Rate	Population	Poor	Poverty Rate	Population	Poor	Poverty Rate	Population	Poor	Non-poor
<b>Zambezi</b>	32.0	79 826	25 544	39.3	90 596	35 604	7.3	10 770	10 060	710
Kabbe	42.2	14 962	6 314	49.1	14 518	7 128	6.9	-444	814	-1 258
Katima Mulilo Rural	38.3	14 566	5 579	43.0	16 399	7 052	4.7	13	1 473	-1 460
Katima Mulilo Urban	6.4	22 704	1 453	17.2	28 362	4 878	10.8	5 658	3 425	2 233
Kongola	47.4	4 419	2 095	58.1	5 658	3 287	10.7	-	1 193	-1 193
Linyanti	41.2	13 985	5 762	49.4	15 477	7 646	8.2	1 492	1 884	-392
Sibbinda	45.8	9 190	4 209	55.0	10 182	5 600	9.2	992	1 391	-399
<b>Erongo</b>	9.3	107 663	10 013	6.3	150 809	9 501	-3.0	43 146	-512	43 658
Arandis	5.4	7 590	410	6.3	10 093	636	0.9	2 503	226	2 277
Daures	38.3	10 289	3 941	20.1	11 350	2 281	-18.2	1 061	-1 659	2 720
Karibib	16.9	12 084	2 042	15.4	13 320	2 051	-1.5	1 236	9	1 227
Omaruru	9.6	7 156	687	11.7	8 577	1 004	2.1	1 421	317	1 104
Swakopmund	4.4	26 310	1 158	3.6	44 725	1 610	-0.8	18 415	452	17 963
Walvis Bay Rural	3.4	16 293	554	3.7	26 916	996	0.3	10 623	442	10 181
Walvis Bay Urban	3.4	27 941	950	2.4	35 828	860	-1.0	7 887	-90	7 977
<b>Hardap</b>	20.4	68 249	13 923	17.2	79 507	13 675	-3.2	11 258	-248	11 506
Gibeon	30.2	11 541	3 485	24.8	12 122	3 006	-5.4	581	-479	1 060
Mariental Rural	27.5	13 946	3 835	23.3	15 308	3 567	-4.2	1 362	-268	1 630
Mariental Urban	15.4	13 109	2 019	15.6	15 557	2 427	0.2	2 448	408	2 040
Rehoboth Rural	27.1	7 524	2 039	24.2	7 288	1 764	-2.9	-236	-275	39
Rehoboth Urban East	13.0	12 891	1 676	13.8	18 035	2 489	0.8	5 144	813	4 331
Rehoboth Urban West	9.0	9 238	831	4.0	11 197	448	-5.0	1 959	-384	2 343

<b>Karas</b>	18.0	69 329	12 479	14.5	77 421	11 226	-3.5	8 092	-1 253	9 345
Berseba	38.5	9 064	3 490	27.2	10 589	2 880	-11.3	1 525	-609	2 134
Karasburg	21.6	15 758	3 404	20.8	16 470	3 426	-0.8	712	22	690
Keetmanshoop Rural	25.8	6 399	1 651	23.0	7 219	1 660	-2.8	820	9	811
Keetmanshoop Urban	9.8	15 777	1 546	9.9	19 447	1 925	0.1	3 670	379	3 291
Luderitz	9.7	14 542	1 411	7.0	13 859	970	-2.7	-683	-440	-243
Oranjemund	7.6	7 789	592	2.9	9 837	285	-4.7	2 048	-307	2 355
<b>Kavango</b>	57.9	202 694	117 360	53.2	223 352	118 823	-4.7	20 658	1 463	19 195
Kahenge	60.3	30 903	18 635	60.6	29 799	18 058	0.3	-1 104	-576	-528
Kapako	55.8	26 263	14 655	62.6	26 983	16 891	6.8	720	2 237	-1 517
Mashare	75.3	16 007	12 053	60.5	15 688	9 491	-14.8	-319	-2 562	2 243
Mpungu	60.8	18 660	11 345	60.3	20 787	12 535	-0.5	2 127	1 189	938
Mukwe	65.2	27 250	17 767	58.2	27 690	16 116	-7.0	440	-1 651	2 091
Ndiyona	69.3	19 565	13 559	56.6	20 633	11 678	-12.7	1 068	-1 880	2 948
Rundu Rural West	46.8	26 623	12 460	45.1	38 281	17 265	-1.7	11 658	4 805	6 853
Rundu Urban	30.3	19 173	5 809	18.6	20 953	3 897	-11.7	1 780	-1 912	3 692
Rundu Rural East	61.5	18 250	11 224	56.3	22 538	12 689	-5.2	4 288	1 465	2 823
<b>Khomas</b>	3.4	250 262	8 509	4.6	342 141	15 738	1.2	91 879	7 230	84 649
Tobias Hainyeko	4.8	34 348	1 649	9.6	45 912	4 408	4.8	11 564	2 759	8 805
Katutura Central	6.2	21 243	1 317	4.0	24 608	984	-2.2	3 365	-333	3 698
Katutura East	4.5	17 745	799	4.1	18 501	759	-0.4	756	-40	796
Khomasdal North	1.6	27 950	447	2.4	43 921	1 054	0.8	15 971	607	15 364
Soweto	2.9	13 865	402	2.1	15 121	318	-0.8	1 256	-85	1 341
Samora Machel	3.3	29 382	970	4.3	50 110	2 155	1.0	20 728	1 185	19 543
Windhoek East	0.2	17 674	35	0.1	22 712	23	-0.1	5 038	-13	5 051
Windhoek Rural	11.3	20 212	2 284	7.7	22 254	1 714	-3.6	2 042	-570	2 612
Windhoek West	0.5	42 201	211	0.4	53 438	214	-0.1	11 237	3	11 234
Moses/Garoëb	1.4	25 642	359	8.4	45 564	3 827	7.0	19 922	3 468	16 454

<b>Kunene</b>	53.7	68 735	36 911	38.9	86 856	33 787	-14.8	18 121	-3 124	21 245
Epupa	76.8	13 129	10 083	69.2	17 696	12 246	-7.6	4 567	2 163	2 404
Kamanjab	37.0	6 454	2 388	19.9	8 441	1 680	-17.1	1 987	-708	2 695
Khorixas	34.3	11 501	3 945	18.8	12 566	2 362	-15.5	1 065	-1 582	2 647
Opuwo	65.2	20 892	13 622	44.1	27 272	12 027	-21.1	6 380	-1 595	7 975
Outjo	22.7	9 154	2 078	18.0	12 447	2 240	-4.7	3 293	163	3 130
Sesfontein	69.0	7 605	5 247	40.0	8 434	3 374	-29	829	-1 874	2 703
<b>Ohangwena</b>	62.8	228 384	143 425	35.3	245 446	86 642	-27.5	17 062	-56 783	73 845
Eenhana	62.6	18 690	11 700	31.1	21 089	6 559	-31.5	2 399	-5 141	7 540
Endola	62.0	24 804	15 378	27.7	25 591	7 089	-34.3	787	-8 290	9 077
Engela	59.2	21 832	12 925	26.0	24 271	6 310	-33.2	2 439	-6 614	9 053
Epembe	72.2	14 860	10 729	48.4	16 229	7 855	-23.8	1 369	-2 874	4 243
Ohangwena	57.8	17 887	10 339	29.9	17 468	5 223	-27.9	-419	-5 116	4 697
Okongo	73.7	21 551	15 883	41.0	25 698	10 536	-32.7	4 147	-5 347	9 494
Omundaungilo	76.1	8 115	6 176	51.8	7 855	4 069	-24.3	-260	-2 107	1 847
Ondobe	51.0	22 253	11 349	39.8	23 954	9 534	-11.2	1 701	-1 815	3 516
Ongenga	65.3	21 706	14 174	32.3	22 075	7 130	-33.0	369	-7 044	7 413
Oshikango	58.9	25 221	14 855	31.6	28 635	9 049	-27.3	3 414	-5 807	9 221
Omulonga	63.1	31 465	19 854	40.4	32 581	13 163	-22.7	1 116	-6 692	7 808
<b>Omaheke</b>	41.6	68 039	28 304	26.2	71 233	18 663	-15.4	3 194	-9 641	12 835
Aminius	50.9	12 392	6 308	28.4	12 306	3 495	-22.5	-86	-2 813	2 727
Gobabis	16.9	15 119	2 555	17.1	20 993	3 590	0.2	5 874	1 035	4 839
Kalahari	44.9	9 443	4 240	27.1	7 611	2 063	-17.8	-1 832	-2 177	345
Oijinene	55.1	7 790	4 292	33.2	7 306	2 426	-21.9	-484	-1 867	1 383
Ojombinde	57.0	6 560	3 739	36.3	6 851	2 487	-20.7	291	-1 252	1 543
Steinhausen	35.5	9 600	3 408	26.1	10 060	2 626	-9.4	460	-782	1 242
Epukiro	52.5	7 135	3 746	31.2	6 106	1 905	-21.3	-1 029	-1 841	812

<b>Omusati</b>	50.9	228 842	116 481	28.6	243 166	69 545	-22.3	14 324	-46 935	61 259
Anamulenge	54.0	12 617	6 813	27.5	13 410	3 688	-26.5	793	-3 125	3 918
Elim	48.1	10 850	5 219	23.5	11 406	2 680	-24.6	556	-2 538	3 094
Etyayi	40.7	35 130	14 298	30.9	35 101	10 846	-9.8	-29	-3 452	3 423
Ogongo	47.2	19 611	9 256	25.5	19 546	4 984	-21.7	-65	-4 272	4 207
Okahao	52.3	17 751	9 284	26.1	17 548	4 580	-26.2	-203	-4 704	4 501
Okalongo	59.0	28 719	16 944	36.0	30 609	11 019	-23.0	1 890	-5 925	7 815
Onesi	51.0	12 995	6 627	34.6	13 149	4 550	-16.4	154	-2 078	2 232
Oshikuku	49.3	8 299	4 091	17.0	9 093	1 546	-32.3	794	-2 546	3 340
Outapi	55.4	31 496	17 449	27.2	36 934	10 046	-28.2	5 438	-7 403	12 841
Ruacana	51.6	11 204	5 781	28.0	14 857	4 160	-23.6	3 653	-1 621	5 274
Tsandi	53.9	27 049	14 579	26.3	28 018	7 369	-27.6	969	-7 211	8 180
Otamanzi	46.7	13 121	6 128	30.3	13 495	4 089	-16.4	374	-2 039	2 413
<b>Oshana</b>	28.3	161 916	45 822	21.1	176 674	37 278	-7.2	14 758	-8 544	23 302
Okaku	38.2	20 354	7 775	33.2	19 007	6 310	-5.0	-1 347	-1 465	118
Okatana	41.9	15 352	6 432	27.4	14 801	4 055	-14.5	-551	-2 377	1 826
Okatyali	49.1	2 812	1 381	32.7	3 187	1 042	-16.4	375	-339	714
Ompundja	42.7	4 448	1 899	30.2	4 659	1 407	-12.5	211	-492	703
Ondangwa	26.6	31 694	8 431	18.1	36 846	6 669	-8.5	5 152	-1 761	6 913
Ongwediva	22.8	26 700	6 088	14.4	34 065	4 905	-8.4	7 365	-1 182	8 547
Oshakati East	19.0	24 269	4 611	14.9	27 227	4 057	-4.1	2 958	-554	3 512
Oshakati West	13.5	19 862	2 681	15.6	20 676	3 225	2.1	814	544	270
Uukwiyu	36.0	12 047	4 337	36.0	12 092	4 353	0	45	16	29
Uuvudhiya	42.6	4 378	1 865	24.1	4 114	991	-18.5	-264	-874	610

<b>Oshikoto</b>	57.3	161 007	92 257	42.6	181 973	77 520	-14.7	20 966	-14 737	35 703
Eengodi	69.1	15 217	10 515	54.7	21 732	11 887	-14.4	6 515	1 372	5 143
Guinas	54.1	9 033	4 887	43.9	10 730	4 710	-10.2	1 697	-176	1 873
Okankolo	71.7	13 065	9 368	62.9	15 831	9 958	-8.8	2 766	590	2 176
Oluukonda	48.5	9 226	4 475	31.5	9 559	3 011	-17.0	333	-1 464	1 797
Omuntele	66.9	15 160	10 142	46.1	16 865	7 775	-20.8	1 705	-2 367	4 072
Omuthiyagwiipundi	61.2	23 674	14 488	44.8	26 183	11 730	-16.4	2 509	-2 759	5 268
Onayena	62.1	15 459	9 600	39.2	15 392	6 034	-22.9	-67	-3 566	3 499
Oniipa	52.4	24 730	12 959	32.6	24 939	8 130	-19.8	209	-4 828	5 037
Onyaanya	62.2	20 536	12 773	50.4	20 902	10 535	-11.8	366	-2 239	2 605
Tsumeb	18.8	14 907	2 803	18.5	19 840	3 670	-0.3	4 933	868	4 065
<b>Ojozondjupa</b>	<b>30.4</b>	<b>135 384</b>	<b>41 157</b>	<b>27.5</b>	<b>143 903</b>	<b>39 573</b>	<b>-2.9</b>	<b>8 519</b>	<b>-1 583</b>	<b>10 102</b>
Grooifontein	23.7	23 793	5 639	23.8	24 878	5 921	0.1	1 085	282	803
Okahandja	20.8	18 071	3 759	18.7	24 451	4 572	-2.1	6 380	814	5 566
Okakarara	49.7	21 820	10 845	37.2	22 747	8 462	-12.5	927	-2 383	3 310
Omatako	27.4	26 908	7 373	28.6	17 619	5 039	1.2	-9 289	-2 334	-6 955
Otavi	25.9	12 378	3 206	32.1	12 488	4 009	6.2	110	803	-693
Ojijwarongo	16.8	23 412	3 933	16.5	31 813	5 249	-0.3	8 401	1 316	7 085
Tsumkwe	65.7	9 002	5 914	64.6	9 907	6 400	-1.1	905	486	419
<b>Namibia</b>	<b>37.9</b>	<b>1 830 330</b>	<b>693 695</b>	<b>26.9</b>	<b>2 113 077</b>	<b>568 418</b>	<b>-11.0</b>	<b>282 747</b>	<b>-125 277</b>	<b>408 024</b>

## Annex 2: Technical Notes

For each period, there was one dataset available, the NHIES, with quite accurate income and expenditure data, but with a limited (stratified and clustered) sample. Conversely, there is another dataset, the Census, with no income or expenditure data, but with a much larger and more representative sample.

Following the approach of Elbers et al. (2003), the analysis reported here used the NHIES to predict the relationship between a set of observables and income, and then used this relationship to impute the likely per adult equivalent income for each household in the Census using the same set of observables. Once these values were imputed, the poverty levels for each household in each constituency were aggregated. (Note that the term income is used throughout but, as it is regarded as better measured in a developing country context, it was expenditure that was modeled and estimated.)

Throughout it was assumed that logged household income can be modeled as the estimated logged household income plus an error component.

$$\ln Y_{ch} = E[\ln Y_{ch}|X_{ch}] + u_{ch}$$

$$y_{ch} = E[y_{ch}|X_{ch}] + u_{ch}$$

where  $c$  is the subscript for *cluster*,  $h$  is the subscript for the *household* within the cluster  
 $Y_{ch}$  is the *per capita expenditure* of household  $h$  in cluster  $c$ ,  
 $X_{ch}$  is the *household characteristics* for household  $h$  in cluster  $c$  and  $u_{ch}$  is the *error*.

If it is assumed that this relationship holds for the entire population and that the questions of interest are comparable between surveys, then this model can be used to predict the logged consumption in the Census. Suppose it was believed that it would be possible to adequately predict consumption using only three predictors, the education level of household head, whether the house has a car, and household size. Then the relationship between these three variables and household consumption (shown in the regression below) can be used to predict the expected level of consumption for each household in the Census, since information on all three of these attributes is available in the Census as well.

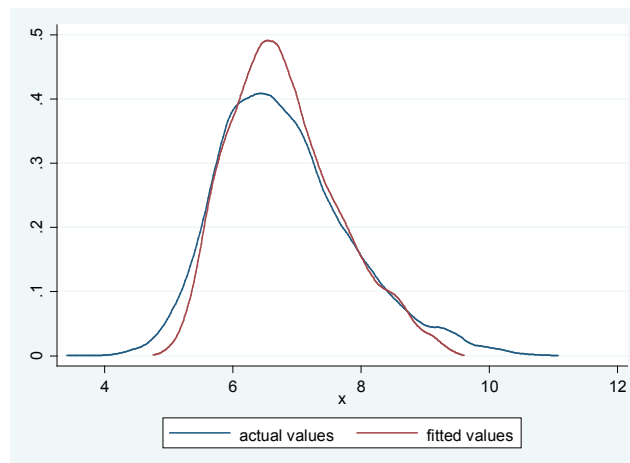
	Coef	se
Education	0.069***	43.286
Household Size	-0.130***	-55.001
Car	1.133***	59.650
Constant	6.724***	371.311
Adjusted R2	0.553	
note: *** p<0.01, ** p<0.05, * p<0.1		

This example ignores two important issues, which will now be discussed briefly.



### 1. *Not every household will earn exactly what they are predicted to earn*

While the regression model might do well in predicting the underlying relationship between observables and expected income, it might not do well in predicting the expected income for each household individually. Using the predicted values of this regression unchanged assumes that everyone who has the same set of observables will all have exactly the same income, which is obviously not the case. This is apparent when the distribution of actual income in the NHIES is compared to the distribution of the fitted values in the same dataset (see below). The fitted values follow a narrower distribution than the actual income values.



To address this concern, the model incorporated Monte Carlo simulations. In the second part of the modeling, one thousand iterations were run, each time drawing a stochastic error term for every household. The average poverty rate is then estimated over all the iterations, for each region, constituency and for the population as a whole. This method helps to account for the stochastic term that would otherwise have been ignored.

### 2. *Households within clusters are somewhat alike*

Usually the outcomes of are considered to be independent of one another. This is unlikely to be true when measurements are taken from related subjects. In the case of the NHIES, for instance, the primary sampling units (or clusters) represent households that are from the same neighborhood. One usually finds that these households are fairly similar, not only with regard to observables, but also with regard to attributes that may not have been recorded in the survey. Ignoring this within-area correlation would produce misleading results.

According to Dobson (2002), the standard deviation of the mean differences in incomes between two areas will be underestimated if the observations which are correlated are assumed to be independent. For instance, suppose it was desired to compare the height of women from two different countries, but women from specific cities only were selected in both countries. While the mean difference would still be unbiased, the standard deviation of the mean difference between two countries would be overestimated if the observations that are correlated are assumed to be independent, since the data would have recorded too little of the actual variation in each country.

Unlike conventional models, it was not assumed that the errors are independent of one another. Allowance was made for the errors to be correlated within clusters. The error will consist of two components: the location effect (or cluster component)  $\eta_c$  which will capture the intra-cluster correlation, and the idiosyncratic effect  $\varepsilon_{ch}$ .

#### Decomposing the Error

$$u_{ch} = \eta_c + \varepsilon_{ch}$$

where  $\eta_c$  is the cluster component/location effect and  $\varepsilon_{ch}$  is the household component.

The GLS-variance covariance matrix,  $\Omega$ , will look as follows:

$$\Omega = \begin{bmatrix} \sigma_{\eta_1}^2 + \sigma_{\varepsilon}^2 & \sigma_{\eta_1}^2 & 0 & 0 \\ \sigma_{\eta_1}^2 & \sigma_{\eta_1}^2 + \sigma_{\varepsilon}^2 & 0 & 0 \\ 0 & 0 & \sigma_{\eta_2}^2 + \sigma_{\varepsilon}^2 & \sigma_{\eta_1}^2 \\ 0 & 0 & \sigma_{\eta_2}^2 & \sigma_{\eta_1}^2 + \sigma_{\varepsilon}^2 \end{bmatrix}$$

The GLS models make it possible to control for this within-area correlation. This added flexibility comes at a cost though since the GLS method is much more complex and time-consuming than the conventional OLS model. Unfortunately,  $\Omega$  has to be estimated from the data by an iterative process since it is not known - FGLS.







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