

REPUBLIC OF NAMIBIA NATIONAL PLANNING COMMISSION

# Namibia Index of Multiple Deprivation





# February 2015



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February 2015



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## Preface

Namibia is faced with many developmental challenges which among others include limited access to services such as health, education, housing including access to employment opportunities and so forth. The lack of access to these services leads to poor standard of living for the communities. In order to measure such lack of access to services or opportunities countries such as United Kingdom and South Africa uses the concept of deprivation and therefore develops what is called Index of Multiple Deprivation.

Whereas Absolute Poverty Measures indicates the lack of financial resources to obtain services and products to satisfy a particular need; the Index of Multiple Deprivation indicates the lack of access to particular service or product which may be as a result of lack of financial resources but also may be as a result of various reasons such as distance, location, endowment of resources and so forth.

The history of using the Index of Multiple Deprivation in Namibia is not long, in 2010 an index was produced only for Khomas region and since then there was an overwhelming desire to produce a national index. The Namibia Index of Multiple Deprivation is based on the 2001 and 2011 Population and Housing Censuses using five main domains of deprivation with a total of eleven indicators. The main deprivation domains include: Material Deprivation, Employment Deprivation, Health Deprivation, Education Deprivation and Living Environment Deprivation.

This report read together with the Poverty Dynamics Report brings another perspective on general poverty and possible interventions in addressing poverty and general development across regions and constituencies. The report adds further analysis at a lower level than a constituency, i.e. data zone, meaning that even in the same constituency they may be segments of the population which are less privileged than others therefore requiring special attention. It is vividly clear from the findings that poverty measures using only income tend to under estimate the needs of communities and depending on particular domain regions/constituencies are affected differently.

It is my earnest plea that the analysis and findings of this report may find meaning in our policy formation, resource allocation and implementation of programmes and projects. I call upon all agents of development including the civil society and donors to use this report to inform their decision making processes and that together we turn Namibia into most desirable place to live in.

Lastly, I would like to express my gratitude to the United Nations Programme (UNDP) Namibia for the assistance in producing this report. Similarly, I thank the staff of the National Planning Commission, in particular the Department of Macroeconomic Planning for their tireless efforts in bring such an analysis to the public.

QGENERAL TOM K. ALWEENDO DIRECTOR-GENERAL IC OF PLANNING COMMISS

## **Section 1: Introduction**

The Namibian Index of Multiple Deprivation (NIMD) is a composite index reflecting five dimensions of deprivation: material deprivation, employment deprivation, health deprivation, education deprivation and living environment deprivation. The first such Index was created in January 2010 for the Khomas Region using data from the 2001 Population Census. The NIMD and its component domains of deprivation were then produced at regional, constituency and datazone levels using data from the 2001 and 2011 National Population and Housing Censuses.

It is important to state that, for accuracy and consistency in analysis of the data and information, this report adopts the region and constituency boundaries existing at the time the last Census was carried out in 2011. Thus the analysis has been carried out and results presented on the basis of the thirteen regions and 107 constituencies that existed in 2001 and 2011, and not the current fourteen regions and 121 constituencies demarcated during the 2013 boundary delimitation exercise.

Although 'poverty' and 'deprivation' have often been used interchangeably, there is a clear distinction between them. Poverty means not having enough financial resources to meet a need, whereas deprivation refers to an unmet need which is caused by a lack of resources of all kinds, not just financial resources.

The deprivation approach is underpinned by the idea that there exist separate dimensions of deprivation experienced by individuals living in a given area, which can be recognised and measured. 'Multiple deprivation' is conceptualised as a weighted combination of these distinct dimensions or domains of deprivation. An area level score for each domain is produced and these are then combined to form an overall Index of Multiple Deprivation (IMD). Although the geographic area itself may not be deprived, it can nonetheless be characterised as deprived *relative* to other areas, in a particular dimension of deprivation, on the basis of the proportion of people in the area experiencing the type of deprivation in question. This means that, the lived experiences of the people in an area give the area its deprivation characteristics.

Following this introductory section, in Section Two the methodological approach used in constructing the NIMD and its component domains is presented. In Section Three, regional, constituency and datazone level results, including an analysis of changes over time, are presented. The conclusions and policy recommendations are presented in Section Four.

## Section 2: Methodology

#### **2.1 Constructing the datazones**

The methodology adopted is based on a similar process undertaken in South Africa (Avenell et al., 2009) which, in turn, was adapted from techniques developed in the United Kingdom (see, for example, Martin et al., 2001). Datazones were built up from Census Enumeration Areas (EAs) to create a standard uniform geography across Namibia based on the existing EA nesting within 2001 and 2011 constituency boundaries, which, in turn, are found within regional boundaries. Though a datazone may be created from a single EA, it is usually created by merging one or more contiguous EAs that share common characteristics, in accordance with a set of pre-defined rules. The actual creation of datazones was undertaken using a variety of geographical programming techniques (see Avenell et al., 2009). A set of rules governing the merging process was drawn up to ensure that the datazones had, as nearly as possible, the following characteristics:

**Population size** Datazones are designed to have a similar resident population size, which allows comparability across the whole country. The target population size was 1 000 with a minimum of 500 and maximum of 1 500. Inevitably, the extent to which this target could be achieved was dependent on the variation in size and characteristics of the building block EAs. Using 2001 Census data, 1 871 datazones were created while using 2011 Census data 2 111 datazones were created.

**Population density** Datazones should comprise EAs of similar population density. This is important to ensure that urban areas become distinct from rural areas. The datazone algorithm incorporated thresholds to ensure that, wherever possible, urban areas became tightly bounded.

**Internal homogeneity** It is important that datazones comprise EAs with similar characteristics. This helps to ensure that the datazone geography created is 'meaningful' in that, for example, in urban areas housing of a similar type is grouped together within one datazone and that those living in EAs within a single datazone share similar socioeconomic characteristics. In order to achieve this, all EAs in Namibia were analysed using a technique known as 'cluster analysis'. This technique groups EAs across the country into a small number of 'families' based on a variety of relevant characteristics. In the cluster analysis adopted in the development of the datazones, all EAs in Namibia were grouped into the following five cluster types:

- Cluster type 1 comprises prosperous housing with high levels of brick construction, flush toilets, piped water and phones, and low levels of shacks or use of candles for lighting.
- Cluster type 2 and cluster type 3 are quite similar in that houses within them have low levels of flush toilets, piped water and brick construction, but are not shacks. They are likely to be traditional dwellings in rural areas with walls of mud or straw, and to have candles for lighting. They differ from each other only in terms of their access to telephones.
- Cluster type 4 is characterised by low levels of flush toilets and water supply but high levels of brick construction with few shacks.
- Cluster type 5 comprises mainly shacks in informal townships in peri-urban areas.

Rules were then developed which allowed for EAs with similar characteristics to be merged into datazones. A process of optimisation was undertaken in which EAs were iteratively swapped between adjacent datazones to check whether this improved the datazones in terms of population density and/or optimal size. However, some problems were however, insoluble due to the restrictions placed on datazone construction by the underlying EA geography. The datazones were checked and validated by obtaining aerial photography underlays for the mapping software and visually inspecting boundary positions.

### 2.2 Regional distribution of datazones

Table 1 gives the number of datazones in each region together with the percentage of the total Namibian datazones in that region. A total of 1 871 datazones was created on the basis of 2001 Census data and 2 111 on the basis of 2011 data.

|              | 20                     | 01                               | 2011                   |                                     |  |
|--------------|------------------------|----------------------------------|------------------------|-------------------------------------|--|
| Region       | Number of<br>datazones | Percentage of total<br>datazones | Number of<br>datazones | Percentage<br>of total<br>datazones |  |
| Zambezi      | 84                     | 4.49                             | 93                     | 4.41                                |  |
| Erongo       | 104                    | 5.56                             | 144                    | 6.82                                |  |
| Hardap       | 75                     | 4.01                             | 84                     | 3.98                                |  |
| Karas        | 68                     | 3.63                             | 80                     | 3.79                                |  |
| Kavango      | 202                    | 10.80                            | 243                    | 11.51                               |  |
| Khomas       | 252                    | 13.47                            | 345                    | 16.34                               |  |
| Kunene       | 74                     | 3.96                             | 84                     | 3.98                                |  |
| Ohangwena    | 233                    | 12.45                            | 237                    | 11.23                               |  |
| Omaheke      | 81                     | 4.33                             | 78                     | 3.69                                |  |
| Omusati      | 229                    | 12.24                            | 232                    | 11.0                                |  |
| Oshana       | 167                    | 8.93                             | 171                    | 8.10                                |  |
| Oshikoto     | 165                    | 8.82                             | 175                    | 8.31                                |  |
| Otjozondjupa | 137                    | 7.32                             | 145                    | 6.87                                |  |
| Namibia      | 1 871                  | 100.00                           | 2 111                  | 100.00                              |  |

Table 1: Distribution of Namibian datazones across regions, 2001 and 2011

#### 2.3 Introduction to the Domains and Indicators

The analysis was guided by the indicators collected during the 2001 and 2011 Censuses. The chosen domains need to allow different geographical areas to be distinguished from one another. As such, it was considered unhelpful to identify a domain of deprivation which is experienced by most people in most areas as this would not enable the areas to be distinguished from each other and ranked relative to each other in terms of deprivation.

#### 2.3.1 Domains

The NIMD contains five domains of deprivation:

- Material deprivation<sup>1</sup>
- Employment deprivation
- Health deprivation
- Education deprivation
- Living environment deprivation

Each domain is presented as a separate domain index reflecting a particular aspect of deprivation. Thus, only one dimension of deprivation is measured within each domain, which avoids overlaps between the domains and provides a direct measure of the deprivation in question. Individuals, however, can experience more than one type of deprivation at any given time and it is conceivable, and indeed likely, that the same person will be captured in more than one domain. For example, someone who was unemployed, was not literate and had no access to basic material goods would be captured in the employment deprivation, education deprivation and material deprivation domains.

#### 2.3.2 Indicators

Each domain index contains a number of indicators with a total of eleven indicators for the overall NIMD. The aim was to include the minimum set of indicators to comprehensively capture the deprivation for each domain, although within the constraints of the data available from the 2001 and 2011 Censuses. It was important to ensure that the indicators established were both direct measures of the domain of deprivation in question and specific to that domain.

#### 2.4 Material Deprivation Domain

#### Purpose of the domain

The domain measures the proportion of the population experiencing material deprivation in an area by reference to the percentage of the population that is deprived of access to basic material possessions.

#### Background

Following the definition of material deprivation as the outcome of lack of income, rather than the lack of income itself (which would be a measure of poverty), only the deprivation resulting from a low income, that is, lack of material possessions, is included in the calculation of deprivation. In fact, the 2001 and 2011 Censuses did not have an income question, and this heightened the need for a material deprivation domain to be produced. A lack of access to basic material goods can be understood as a proxy for low income.

<sup>1</sup> This refers to material goods, that is, assets or possessions.

The 2001 and 2011 Censuses did include questions about access to material goods (e.g. television, radio, newspaper, telephone and computer) which are internationally accepted and widely used as measures of variations in living standards. Of the possible material goods that could be included as indicators, access to a television/radio and telephone/cell phone were selected because they represent important modes of communication and a means of access to information crucial to life and livelihood. The type and quality of the services provided, however, were not taken into account as these are not captured in the census data.

#### Indicators

- Number of people living in a household with no access to a television or a radio; or
- Number of people living in a household with no access to a telephone/cell phone.

#### Combining the indicators

A simple proportion of people living in households experiencing either one or both of the deprivations was calculated i.e. the number of people living in a household with no access to a television/radio and/or with no access to a telephone/cell phone, as a percentage of the total population).

#### 2.5 Employment Deprivation Domain

#### Purpose of the domain

This domain measures employment deprivation conceptualised as involuntary exclusion of the working age population from the world of work, by reference to the percentage of the working age population that is unemployed.

#### Background

The 2001 and 2011 Censuses recorded employment status in line with the International Labour Organisation (ILO) 'labour force framework'. Under this framework, a person is considered to be employed if during the seven days prior to the Census night they worked for at least one hour for pay, profit or family gain. It follows that unemployment is defined as a situation of a total lack of work. The definition of unemployment adopted by the 13th International Conference of Labour Statistics (ICLS) stipulates three criteria which must be met simultaneously for a person to be considered unemployed. According to this official definition, an unemployed person is within the economically active population (aged 15 to 65 inclusive) who during the reference period (for the 2001 and 2011 Censuses this is the seven days prior to Census night) was:

- 1 Without work, i.e. in a situation of total lack of work; and
- 2 Currently available for work, i.e. not a student or homemaker or otherwise unavailable for work; and
- 3 Seeking work, i.e. taking steps to find employment or self-employment.

Although the 2011 Census question distinguished between the 'officially' unemployed and the 'discouraged' unemployed, these were combined to give overall unemployment figures that were comparable to the 2001 indicator. The age band was modified to 15 to 59 inclusive to reflect a concept of working age relevant to Namibia.

#### Indicator

• Number of people aged 15 to 59 inclusive who are unemployed.

#### **Combining the indicators**

The domain was calculated as those identified as unemployed and aged 15 to 59 inclusive, as a percentage of the total number of people in that age group.

#### 2.6 Health Deprivation Domain

#### Purpose of the domain

This domain identifies areas with relatively high rates of people who die prematurely. It measures premature mortality only, not aspects of behaviour or environment that may be predictive of forthcoming health deprivation.

#### Background

The analysis uses a form of standardised mortality ratio known as Years of Potential Life Lost (YPLL). An internationally recognised measure of poor health, the YPLL measure is the level of unexpected mortality weighted by the age of the individual who has died (for details about how this indicator was constructed see Blane and Drever, 1998). An area with a relatively high death rate in a young age group (including areas with high levels of infant mortality) will have a higher overall YPLL score than an area with a similarly relatively high death rate for an older age group.

The YPLL indicator is a directly age and gender standardised measure of premature death (i.e. death under the age of 75).<sup>2</sup> The YPLL measure is related to life expectancy in an area. Areas with low life expectancy will have high YPLL scores. Equally high levels of infant mortality and perinatal mortality as well as high levels of serious illness such as HIV related conditions and tuberculosis all contribute to reduced life expectancy in an area and, therefore, high YPLL scores. Thus, although the YPLL is a measure of mortality, it also reflects the extent of serious ill-health in an area. Although it would have been possible to use infant mortality, under-five mortality and life expectancy as indicators, the YPLL effectively combines all these into a single indicator, making it a broader and more useful overview of health deprivation in an area.

#### Indicator

Years of potential life lost.

<sup>2</sup> Because the direct method of standardisation makes use of individual age/gender death rates, it is often associated with small numbers. Therefore, an empirical Bayes or 'shrinkage' technique is used to smooth the individual age/gender death rates in order to reduce the impact of small number problems on the YPLL.

#### 2.7 Education Deprivation Domain

#### Purpose of the domain

This domain measures deprivation in educational attainment for people aged 15 to 59 inclusive.

#### Background

Elsewhere in the Southern Africa Development Community (SADC) region it has been shown that the level of educational attainment in the working age adult population is closely linked to an individual's employment status and future opportunities for those individuals and their dependants (Bhorat et al., 2004). The 2001 and 2011 Censuses included a record of the level of education completed and of illiteracy levels. These two questions provide the best available measures of educational attainment and make up the indicators for this domain.

#### Indicators

- Number of 15 to 59 year olds inclusive with no schooling completed at secondary level or above; or
- Number of 15 to 59 year olds inclusive who are illiterate.

#### Combining the indicators

A simple proportion of the working age population (aged 15 to 59 years old inclusive) who had not completed schooling at secondary level or who were illiterate was calculated as a percentage of the total population aged 15 to 59 inclusive.

#### 2.8 Living Environment Deprivation Domain

#### Purpose of the domain

This domain measures both inadequacy in housing conditions and a lack of basic services to the home.

#### Background

The 2001 and 2011 Census questionnaires provide indicators on households' access to basic amenities. These aspects of the immediate environment in which people live have an impact on the quality of their life and provide good measures of deprivation in terms of access to services.

Measuring access to electricity as a basic amenity is a useful indicator of living environment deprivation. Three Census indicators were considered, *viz* the main source of energy for cooking, lighting and heating. Cost, availability and effectiveness are factors in the consumption of all energy supplies.

However, it has been argued that the choice of fuel for cooking may be influenced by cultural preference rather than availability and cost alone, whereas the use of electricity for lighting, if available, would generally be the preferred choice. Therefore, access to energy for lighting provides the more valid measure of deprivation (Bhorat et al., 2004) and this was the measure used in the previous constituency level index.

However, at datazone level, all individuals in a high proportion of datazones were found to lack electricity for lighting, which would have resulted in the datazones all being given the same overall score for this domain, making it impossible to discriminate between datazones in terms of their level of deprivation. For this reason the indicator was altered slightly to include paraffin alongside electricity (and solar power) as a determinant of access to energy for lighting. The inclusion of paraffin does not imply any judgement about its suitability for lighting purposes, but is simply a means of enabling datazones to be properly ranked on this domain.

Access to clean drinking water and sanitation facilities is essential for the good health of the population and thus an important indicator to include in this domain. An indicator of no access to piped water within the home or within 200 metres of the home was included.

The crowding indicator is calculated by dividing the number of people in the household by the number of rooms, excluding bathrooms, toilets, kitchens, stoops and verandas. Different versions of the crowding indicator were considered. It was felt that the most appropriate measure of crowding was to classify three or more people per room as a deprivation. Setting the capacity cut-off at two or more people per room had been considered but it was felt that this lower capacity would capture too many non-deprived people, for example relatively well-off couples sharing a one room urban apartment.

It is important to note that most indicators in the 2011 Census were not directly comparable to the 2001 Census indicators and analogous indicators were reconstructed in 2011 using the relevant questions from the 2001 and 2011 Censuses.

#### Indicators

- Number of people living in a household without the use of electricity, paraffin or solar power for lighting; or
- Number of people living in a household without access to a flush toilet or pit latrine (ventilated or long drop); or
- Number of people living in a household without piped water/borehole/borehole with covered tank (but not open tank)/protected well inside their dwelling or yard or within 200 metres; or
- Number of people living in a household that is a shack; or
- Number of people living in a household with three or more people per room.

#### Combining the indicators

A simple proportion of people living in households experiencing one or more of the deprivations (i.e. the number of people living in a household without electricity, paraffin or solar power for lighting and/or without adequate toilet facilities and/or without adequate water provision and/ or living in a shack and/or in overcrowded conditions) was calculated as a percentage of the total population.

#### 2.9 Constructing the domain indices

In all domains apart from health deprivation, the overall score is a simple proportion of the relevant population, and so can be easily interpreted.

As censuses can be regarded as a sample from a super-population, it is important to consider and deal with large standard errors. A technique that takes standard errors into account but still enables the domains to be combined into an overall index of multiple deprivation is the Bayesian shrinkage estimation. Specifically, the scores for datazones can be unreliable when the deprived population is small and so the shrinkage technique was applied to each of the domains. The 'shrunk' estimate is the weighted average of the original geographic area estimate and an appropriate larger spatial unit. The weight is based on the standard error of the original geographic area estimate and the amount of variation within the larger area (a constituency). For further details on this technique see Annex 1 and also Noble et al. (2006b).

#### 2.10 Standardising and transforming the domain indices

Once a set of domain indices had been obtained, these were combined into an overall Namibia Index of Multiple Deprivation. In order to combine domain indices which are each based on different metrics there needed to be some way to standardise the scores. The form of standardisation and transformation needed to meet the four criteria. First, it must ensure that each domain has a common distribution; second, it must not be scale dependent (i.e. conflate size with level of deprivation); third, it must have an appropriate degree of cancellation built into it; and fourth, it must facilitate the identification of the most deprived datazones or geographic areas. The exponential transformation of the ranks best meets these criteria was applied in the NIMD 2001 and 2011. For further details see Annex 1 and Noble et al. (2006b).

#### 2.11 Weighting of the domain indices

Domains are conceived as independent dimensions of multiple deprivation, each with their own additive impact on multiple deprivation. The strength of this impact, though, may vary between domains depending on their relative importance. Equal weights for the domains were assigned with each domain assigned a weight of 1. The NIMD 2001 and NIMD 2011 were constructed, therefore, by adding the standardised and transformed domain indices with equal weights.

# Section 3: Findings

### 3.1 Multiple deprivation

In this section the findings of the study on multiple deprivation in Namibia at regional and constituency levels are presented. In the first part, the findings with respect to the composite index of multiple deprivation are presented while the findings with respect to individual domains of deprivation are presented in the second part.

#### **Overview of regional profiles**

Table 2, below, presents the regional scores and values (in the case of health deprivation) of individual domains of deprivation in 2001 and 2011, and the changes in regional scores and values (in the case of health deprivation) over the 2001 to 2011 period.

|              | Mat  | erial | Employment |      | Education |      | Living<br>environment |      | Change over 2001- 2011<br>period (percentage points) |            |           |                       |
|--------------|------|-------|------------|------|-----------|------|-----------------------|------|--|------------|-----------|-----------------------|
| Region       | 2011 | 2001  | 2011       | 2001 | 2011      | 2001 | 2011                  | 2001 | Materials  | Employment | Education | Living<br>environment |
| Zambezi      | 53.3 | 73.5  | 38.3       | 17.5 | 64.1      | 63.2 | 89.2                  | 90.2 | -20.2  | 20.8       | 0.9       | -0.9                  |
| Erongo       | 33.0 | 27.4  | 30.3       | 34.2 | 59.3      | 63.0 | 53.0                  | 56.2 | 5.6  | -3.8       | -3.7      | -3.2                  |
| Hardap       | 34.1 | 42.9  | 35.6       | 33.9 | 70.8      | 69.4 | 62.9                  | 65.5 | -8.8   | 1.7        | 1.4       | -2.6                  |
| Karas        | 33.0 | 37.2  | 33.2       | 28.6 | 66.5      | 67.8 | 59.5                  | 65.3 | -4.2   | 4.6        | -1.3      | -5.8                  |
| Kavango      | 64.4 | 75.1  | 50.8       | 20.4 | 73.3      | 72.4 | 90.4                  | 95.5 | -10.7  | 30.4       | 0.9       | -5.1                  |
| Khomas       | 30.5 | 38.0  | 30.4       | 29.4 | 48.8      | 51.4 | 52.7                  | 52.1 | -7.5   | 1.0        | -2.7      | 0.7                   |
| Kunene       | 63.4 | 79.4  | 36.2       | 23.5 | 81.6      | 75.2 | 84.4                  | 87.8 | -16.0  | 12.7       | 6.3       | -3.4                  |
| Ohangwena    | 54.3 | 86.0  | 43.7       | 37.3 | 69.9      | 65.4 | 94.2                  | 97.2 | -31.8  | 6.5        | 4.5       | -3.0                  |
| Omaheke      | 49.2 | 62.8  | 39.8       | 24.0 | 78.4      | 71.6 | 83.0                  | 86.3 | -13.6  | 15.7       | 6.8       | -3.2                  |
| Omusati      | 58.5 | 83.2  | 42.7       | 36.5 | 63.0      | 63.1 | 92.0                  | 95.1 | -24.6  | 6.2        | -0.1      | -3.1                  |
| Oshana       | 53.3 | 57.5  | 38.7       | 40.8 | 54.6      | 58.4 | 73.0                  | 81.4 | -4.2   | -2.2       | -3.8      | -8.4                  |
| Oshikoto     | 52.9 | 83.4  | 40.6       | 45.2 | 67.6      | 65.8 | 85.8                  | 88.8 | -30.5  | -4.7       | 1.8       | -2.9                  |
| Otjozondjupa | 41.7 | 57.0  | 38.3       | 31.7 | 73.0      | 68.2 | 69.2                  | 74.2 | -15.3  | 6.5        | 4.8       | -5.0                  |
| Namibia      | 48.1 | 64.7  | 37.5       | 31.4 | 63.5      | 63.5 | 76.4                  | 81.1 | -16.6  | 6.1        | -0.1      | -4.7                  |

| Table 2: Regional scores and values of individual domains of deprivation, and changes over t | the |
|--|-----|
| 2001-2011 period   |     |

At the national level, there was a 16.6 percentage point decline in the proportion of the population that is materially deprived over the 2001 to 2011 period. At the aggregate level, this indicates an improvement in access to important modes of communication which give one access to information crucial to one's livelihood. However, Erongo region registered an increase in material deprivation. The region has registered a steady population growth of 3.4 percent, with Swakopmund and Walvis Bay urban constituencies registering a growth of 5.0 percent or more. This suggests migration into the area which could explain the increase in material deprivation. In the 2011 figures, the region with the largest proportion of people classified as materially deprived was Kavango (64.4 percent), followed by Kunene (63.4 percent) and Omusati (58.5 percent) while the region with the smallest proportion of people classified as materially deprived was Erongo (33.0 percent) followed by Khomas (30.5 percent), Karas (33 percent) and Hardap (34.1 percent).

The proportion of people employed fell by 6.1 percentage points at the national level over the same period, indicating that more people are entering the labour force than the economy can absorb. However, in three of the regions – Erongo, Oshana and Oshikoto – there was actually a decrease in the proportion of people who are employment deprived, of 3.8 percentage points, 2.2 percentage points and 4.7 percentage points, respectively. Among the other regions which registered increases in employment deprivation over the 2001 to 2011 period, there were wide variations with major increases registered in Kavango (30.4 percent), Zambezi (20.8 percent), Omaheke region (15.7 percent) and Kunene region (12.7 percent). The region with the largest proportion of employment deprivation was Kavango (50.8 percent), followed by Ohangwena (43.7 percent) and Omusati (42.7 percent), while the region with lowest proportion of people who are employment deprived was Erongo 30.3 percent), followed by Khomas (30.4 percent) and Karas (33.2 percent).

Over the past ten years, education has received the highest share of the government budget, about 23 percent of the total budget allocation on average. Despite this investment in education, Table 2 indicates that there is no improvement. Although half of the regions registered a decline in the proportion of people who are education deprived over the 2001 to 2011 period, with reductions ranging from 0.1 to 3.8 percentage points, the other half registered increases in this domain. Among this group, the largest increase was registered in Omaheke region (6.8 percentage points), Kunene region (6.3 percentage points) and Ohangwena region (4.5 percentage points). The region with the largest proportion of education deprived people was Kunene (81.6), followed by Omaheke (78.4 percent) and Kavango (73.3 percent), while the region with the smallest proportion of deprived people was Khomas (48.8 percent), followed by Oshana (54.6 percent) and Erongo (59.3 percent).

The living environment domain measures improvements in the quality of life. All the regions, with the exception of Khomas, home to Windhoek, the capital city, registered declines in the proportion of people who are living environment deprived. The increase in the proportion of people who are living environment deprived in Khomas region can be understood in the context of rural to urban migration. The region with the largest proportion of deprived people was Ohangwena (94.2 percent), followed by Omusati (92 percent), Kavango (90.4 percent) and Zambezi (89.2 percent), while the region with the smallest proportion of deprived people was Khomas (52.7 percent), followed by Erongo (53 percent) and Karas (59.5 percent).

#### **Constituency profiles**

When deprivation in the various domain, is combined, an overall index of multiple deprivation is obtained. The results of this exercise, as well as results of analysis of individual domains of deprivation can be presented in the form of maps. The maps show the spatial profile of overall deprivation in Namibia across the 107 constituencies in 2001 and 2011 and illustrate changes that occurred over the intervening period.

#### How to interpret the maps

The maps in this report relate to the whole of Namibia and are presented at constituency and, in few instances, datazone levels. The constituencies are divided into five equal groups – quintiles – which make it possible to identify the 20 percent most deprived constituencies in the country (shaded deep blue) through to the 20 percent least deprived constituencies in the country (shaded yellow). As there are many more datazones than constituencies these are divided into ten equal groups for mapping (deciles). A similar colour scheme is adopted, with the most deprived ten percent shaded deep blue while the least deprived ten percent are shaded yellow.

From Maps 1A and 1B (on page 19) and Tables 3 and 4 (on pages 20 and 21) it can be seen that there have been changes in terms of the overall index and ranking of most of the constituencies between 2001 and 2011. By 2011, the most deprived constituency in Namibia was Kapako constituency in Kavango region, followed by Tsumkwe constituency in Otjzondjupa region, Mashare in Kavango region, Kongola constituency in Zambezi region and Kahenge constituency in Kavango region.

More than half (55 percent) of the twenty most deprived constituencies in 2011 were new entrants to this category, with Otjinene constituency (Omaheke region), ranked 17th most deprived constituency in 2011, having been ranked 87th out of 107 constituencies in 2001, a drop of 70 places in the NIMD ranking over the past decade. Similar declines in constituency NIMD ranking were registered in Onesi constituency in Omusati region, Tsunkwe constituency in Otjzondjupa region, Mashare and Kapako constituencies in Kavango region, Sesfontein in Kunene region and Katima Mulilo Rural constituency in Zambezi region.



| Constituency        | Region       | NIMD Rank 2011 | NIMD Rank 2001 |
|---------------------|--------------|----------------|----------------|
| Карако              | Kavango      | 1              | 24             |
| Tsumkwe             | Otjozondjupa | 2              | 26             |
| Mashare             | Kavango      | 3              | 27             |
| Kongola             | Zambezi      | 4              | 2              |
| Kahenge             | Kavango      | 5              | 23             |
| Ndiyona             | Kavango      | 6              | 1              |
| Omundaungilo        | Ohangwena    | 7              | 14             |
| Onesi               | Omusati      | 8              | 36             |
| Linyanti            | Zambezi      | 9              | 25             |
| Mukwe               | Kavango      | 10             | 18             |
| Rundu Rural East    | Kavango      | 11             | 22             |
| Sesfontein          | Kunene       | 12             | 29             |
| Ерира               | Kunene       | 13             | 13             |
| Sibinda             | Zambezi      | 14             | 10             |
| Epembe              | Ohangwena    | 15             | 11             |
| Mpungu              | Kavango      | 16             | 38             |
| Otjinene            | Omaheke      | 17             | 87             |
| Omulonga            | Ohangwena    | 18             | 4              |
| Katima Mulilo Rural | Zambezi      | 19             | 34             |
| Ondobe              | Ohangwena    | 20             | 16             |

Table 3: Namibia's twenty most deprived constituencies in terms of the overall NIMD, 2011,and changes in ranking over 2001-2011 period

As was the case in 2001, the least deprived constituency in Namibia at the 2011 time point was Windhoek East in Khomas region, followed by Windhoek West in the same region. Only two (10 percent) of the least deprived constituencies in 2001 were not in the twenty least deprived constituencies in 2011. These constituencies are Walvis Bay Rural in Erongo region and Katutura Central in Khomas region. Conversely two constituencies become relatively more deprived and are no longer in the least deprived twenty. These are Oshakati East in Oshana region and Otjiwarongo constituency in Otjzondjupa region.

The best performing constituencies, in terms of change in NIMD ranking over the 2001 to 2011 time period, reflecting decreasing relative deprivation, were Onayena and Oniipa constituencies in Oshikoto region, followed by Ongenga in Ohangwena and Okahao and Tsandi constituencies in Omusati region. Those which had become relatively more deprived by 2011, that is, the worst performing constituencies, included Otjinene and Aminius constituencies in Omaheke region and Onesi in Omusati region.

| Constituency        | Region       | NIMD Rank 2011 | NIMD Rank 2001 |
|---------------------|--------------|----------------|----------------|
| Okahandja           | Otjozondjupa | 88             | 90             |
| Omaruru             | Erongo       | 89             | 96             |
| Tsumeb              | Oshikoto     | 90             | 93             |
| Keetmanshoop Urban  | Karas        | 91             | 98             |
| Samora Machel       | Khomas       | 92             | 91             |
| Ongwediva           | Oshana       | 93             | 88             |
| Walvis Bay Rural    | Erongo       | 94             | 78             |
| Windhoek Rural      | Khomas       | 95             | 101            |
| Katutura Central    | Khomas       | 96             | 86             |
| Katutura East       | Khomas       | 97             | 95             |
| Luderitz            | Karas        | 98             | 94             |
| Arandis             | Erongo       | 99             | 99             |
| Rehoboth West Urban | Hardap       | 100            | 103            |
| Swakopmund          | Erongo       | 101            | 102            |
| Soweto              | Khomas       | 102            | 97             |
| Walvis Bay Urban    | Erongo       | 103            | 100            |
| Oranjemund          | Karas        | 104            | 105            |
| Khomasdal North     | Khomas       | 105            | 104            |
| Windhoek West       | Khomas       | 106            | 106            |
| Windhoek East       | Khomas       | 107            | 107            |

Table 4: Namibia's twenty most deprived constituencies in terms of the overall NIMD, 2011, and changes in ranking over 2001-2011 period

#### Small area level profiles

It is conceivable, however, that there are wide variations in overall deprivation within the constituencies, with some parts of a particular constituency being better or worse off than others. That is, it is possible that there are pockets of multiple deprivation even in constituencies (and regions) which are less deprived and *vice versa*. Therefore, it is thus important to present a spatial profile of the overall index of multiple deprivation at smaller (datazone) level across the country.

While the maps below present the situation with respect to multiple deprivation at small area level for 2001 and 2011, the value of comparisons between the 2001 and 2011 time points is limited by the fact that there were changes in the number and geographical coverage of datazones between 2001 and 2011 when the Censuses were conducted. Map 2 below presents a profile of the NIMD at datazone level in 2001 and 2011.





Map 2, above, shows that there have been changes in the score and consequently the ranking of datazones in terms of the overall Namibia Index of Multiple Deprivation over the 2001 to 2011 period. The 2011 datazone level map of multiple deprivation is nonetheless useful in depicting the variation in and concentration of small pockets of deprivation in Namibia. Chart 1 shows the minimum, maximum and median rank of datazones in each region, and the interquartile range for the overall NIMD in 2011 and in 2001.



How to interpret the interquartile range charts

The vertical green line for each region shows the range of the ranks of the datazones in a region. The most deprived datazone in Namibia is ranked 1, and the least deprived datazone is ranked 1 871 (2001). The 'T' at the top of the green line shows the rank of the least deprived datazone in the region. The 'upside-down T' at the bottom of the green line shows the rank of the most deprived datazone in the region. In some instances, small dots are shown on the chart at either end of the lines. These are data points that lie more than 1.5 times the interquartile range away from the nearer quartile value. In these cases, the dots closest to the edge of the chart indicate the rank of the most deprived datazone in the region.

The green box for each region shows the range of the NIMD or domain ranks of the middle 50 percent of datazones in the region (the interquartile range). The horizontal line within the box for each region represents the rank of the median datazone within that region. If the box is relatively short this indicates that datazones are ranked in a narrow range, with similar NIMD or domain ranks (and therefore similar levels of multiple deprivation). If this box sits towards the bottom of the chart it tells us that datazones in the region are concentrated in the most deprived part of the national distribution of the NIMD or domain. If the box sits towards the top of the chart it tells us that the ranks of the datazones in the region are concentrated in the least deprived part of the national distribution.

Chart 1: Interquartile range - Namibia Index of Multiple Deprivation, 2011 and 2001, at datazone level by region







#### 3.2 Individual domains of deprivation

#### 3.2.1 Material deprivation domain

This domain measures the proportion of the population experiencing material deprivation in an area by reference to the percentage of the population who are deprived of access to a television or radio and/or telephone or cell phone.

#### **Overview of regional profiles**

Overall there has been a decline in the proportion of people classified as material deprived across all the regions, with the exception of Erongo, over the 2001 to 2011 period. Erongo is one of the tourist destinations, well known for dunes and the desert. It is home to fish factories and a number of uranium mines. With a labour force participation rate of 78.8 percent, the increase in material deprivation could be attributed to rural to urban migration.

The greatest declines in material deprivation have been recorded in Ohangwena region (a 31.8 percentage point decline), Oshikoto region (30.5 percentage points) and Omusati region (24.6 percentage points) as shown below.





#### **Constituency profiles**

Map 3 below shows the spatial profile of material deprivation in Namibia across the 107 constituencies in 2011 and 2001.





As can be seen from the maps above and Tables 5 and 6 below, there have been changes in the absolute and relative scores in terms of material deprivation across the 107 constituencies over the 2001 to 2011 period with most constituencies registering a decline in the proportion of people classified as material deprived over this period. While in 2001 the most material deprived constituency was Epembe in Ohangwena region, by 2011 this constituency was ranked 11th most deprived, with the most deprived constituency being Epupa in Kunene region, which in 2001 was ranked 15th most deprived.

Among the twenty most deprived constituencies, Epembe constituency registered the greatest decline in proportion of people classified as material deprived, followed by Okankolo and Eengondi constituencies in Oshikoto region. Some constituencies however, registered increases in the proportion of material deprived people over this period, with the greatest increase being registered in Uukwivu constituency in Oshana region, followed by Kapako and Mpungu constituencies in Kavango region.

| Constituency | Region       | Rank | 2001 | Rank | 2011 | Change<br>2001-2011 |
|--------------|--------------|------|------|------|------|---------------------|
| Ерира        | Kunene       | 15   | 91.3 | 1    | 89.4 | -1.9                |
| Tsumkwe      | Otjozondjupa | 8    | 95.3 | 2    | 81.2 | -14.2               |
| Onesi        | Omusati      | 28   | 86.4 | 3    | 76.5 | -9.9                |
| Kongola      | Zambezi      | 10   | 93.4 | 4    | 76.3 | -17.1               |
| Kahenge      | Kavango      | 52   | 72.3 | 5    | 73.3 | 1.0                 |
| Sesfontein   | Kunene       | 6    | 96.7 | 6    | 73.2 | -23.5               |
| Mpungu       | Kavango      | 55   | 69.9 | 7    | 73.0 | 3.0                 |
| Omundaungilo | Ohangwena    | 2    | 98.6 | 8    | 72.8 | -25.8               |
| Kapako       | Kavango      | 59   | 64.8 | 9    | 72.8 | 8.0                 |
| Eengondi     | Oshikoto     | 5    | 98.3 | 10   | 71.9 | -26.4               |
| Epembe       | Ohangwena    | 1    | 98.9 | 11   | 70.8 | -28.1               |
| Mashare      | Kavango      | 12   | 93.0 | 12   | 70.7 | -22.3               |
| Okankolo     | Oshikoto     | 3    | 98.3 | 13   | 70.5 | -27.9               |
| Uukwiyu      | Oshana       | 64   | 62.0 | 14   | 70.4 | 8.4                 |
| Mukwe        | Kavango      | 27   | 86.4 | 15   | 69.8 | -16.6               |
| Sibinda      | Zambezi      | 11   | 93.3 | 16   | 69.5 | -23.7               |
| Otjombinde   | Omaheke      | 40   | 79.6 | 17   | 68.9 | -10.6               |
| Linyanti     | Zambezi      | 16   | 90.8 | 18   | 68.2 | -22.6               |
| Opuwo        | Kunene       | 20   | 89.7 | 19   | 65.8 | -23.9               |
| Okaku        | Oshana       | 49   | 74.7 | 20   | 65.5 | -9.2                |

 Table 5: Namibia's twenty most material deprived constituencies, 2011, and changes in NIMD

 score over 2001-2011 period

Among the twenty least material deprived constituencies in 2011 (see Table 6), the greatest decline in the proportion of people classified as material deprived was registered in Onayena constituency in Oshikoto region (a reduction of 56.1 percentage points) followed by Katutura Central in Khomas region (22.5 percentage points) and Okahandja constituency in Otjozondjupa region (18.8 percentage points). However, Walvis Bay Urban (Erongo region), Oranjemund (Karas region) and Katima Mulilo Urban (Zambezi region) recorded increases in the proportion of people classified as material poor over this period with percentage point increases of 12.6, 8.2 and 5.6, respectively. Windhoek East constituency maintained its position as the least material deprived constituency in the country over the 2001 to 2011 period.

| Constituency        | Region       | Rank | 2001 | Rank | 2011 | Change |
|---------------------|--------------|------|------|------|------|--------|
| Gobabis             | Omaheke      | 89   | 40.8 | 87   | 35.2 | -5.6   |
| Samora Machel       | Khomas       | 83   | 46.4 | 88   | 34.9 | -11.5  |
| Rehoboth East Urban | Hardap       | 91   | 39.5 | 89   | 34.7 | -4.9   |
| Katima Mulilo Urban | Zambezi      | 90   | 40.3 | 90   | 33.0 | -7.3   |
| Arandis             | Erongo       | 101  | 24.4 | 91   | 30.1 | 5.6    |
| Otjiwarongo         | Otjozondjupa | 84   | 46.4 | 92   | 30.0 | -16.4  |
| Okahandja           | Otjozondjupa | 79   | 48.7 | 93   | 30.0 | -18.8  |
| Onayena             | Oshikoto     | 30   | 85.6 | 94   | 29.4 | -56.1  |
| Katutura East       | Khomas       | 93   | 35.4 | 95   | 29.1 | -6.3   |
| Mariental Urban     | Hardap       | 94   | 34.9 | 96   | 28.9 | -6.0   |
| Luderitz            | Karas        | 92   | 36.6 | 97   | 28.6 | -8.0   |
| Swakopmund          | Erongo       | 98   | 28.5 | 98   | 28.2 | -0.3   |
| Katutura Central    | Khomas       | 76   | 49.6 | 99   | 27.2 | -22.5  |
| Oranjemund          | Karas        | 103  | 17.2 | 100  | 25.4 | 8.2    |
| Walvis Bay Urban    | Erongo       | 105  | 12.5 | 101  | 25.2 | 12.6   |
| Khomasdal North     | Khomas       | 99   | 26.5 | 102  | 23.3 | -3.2   |
| Soweto              | Khomas       | 96   | 31.5 | 103  | 22.2 | -9.3   |
| Keetmanshoop Urban  | Karas        | 102  | 18.2 | 104  | 19.8 | 1.6    |
| Windhoek West       | Khomas       | 106  | 11.0 | 105  | 11.5 | 0.5    |
| Rehoboth West Urban | Hardap       | 100  | 25.2 | 106  | 11.2 | -14.0  |

# Table 6: Namibia's twenty least material deprived constituencies, 2011, and changes in NIMD score over 2001-2011 period

Once again, it is noted that wide variations in material deprivation could exist even within the constituencies, with some areas or small pockets being either more deprived or less deprived in terms of material possessions than the rest of the constituency. Nonetheless an overall picture of the variation of material deprivation within a particular geographic area (regional level in this case) can be obtained from a chart presenting the interquartile ranges of the various scores. Chart 2 shows the minimum, maximum and median rank of datazones in each region, and the interquartile range material deprivation in 2011 and 2001.



#### 3.2.2 Employment deprivation domain

This domain measures employment deprivation conceptualised as involuntary exclusion of the working age population from the world of work, by reference to the percentage of the working age population that is unemployed and falling in the 15 to 59 years inclusive age group.

#### **Overview of regional profiles**

There was a general increase in employment deprivation across most of regions of Namibia between 2001 and 2011, reflected in an increase of 6.1 percentage points in employment deprivation at the national level. The largest increase was recorded in Kavango region (an increase of 30.4 percentage points) as shown in Figure 2 below. The only exceptions to this worrisome trend were Oshikoto, Erongo and Oshana regions, where employment deprivation declined by 4.7 percentage points, 3.8 percentage points and 2.2 percentage points, respectively over the period. Employment deprivation threatens the majority of the population and risks pushing the overall index upwards.



Figure 2: Changes in employment deprivation over 2001-2011 period by region

#### **Constituency profiles**

Map 4, below, shows the spatial profile of employment deprivation in Namibia across the 107 constituencies in 2011 and 2001.



There have been changes in the absolute and relative scores in terms of employment deprivation across the 107 constituencies over the 2001 to 2011 period, as is evident from the maps above and Table 7 and Table 8 below. Only 25 percent of the twenty most employment deprived constituencies in 2011 had retained their position among the top twenty most deprived since 2001, with the remaining 75 percent being new entrants to this unenviable category. In 2011, four of the five most employment deprived constituencies in Namibia were located in the Kavango region. These four constituencies are Rundu Rural East where 70.8 percent of the population was employment deprived, Kapako constituency (58 percent), Rundu Rural West (57.3 percent) and Mashare (55.5 percent). Onesi in Omusati region was the only constituency from outside Kavango to appear in the five most employment deprived, at 59.5 percent.

Among the twenty most employment deprived constituencies there has been a general increase in employment deprivation over the 2001 to 2011 period, with the greatest increase of 44.5 percentage points being recorded in Kapako constituency, followed by Rundu Rural East constituency (37.6 percentage points), Rundu Rural West constituency (33.7 percentage points) and Mashare constituency (32.4 percentage points). All of these constituencies are in Kavango region. Only two constituencies – Otamanzi in Omusati and Okakarara in Otjzondjupa –recorded declines in employment deprivation over the period 2001 to 2011, of 10.9 percentage point and 1.5 percentage points respectively. The remaining eighteen constituencies had recorded increases in employment deprivation over this period. It is noteworthy that most of the twenty most employment deprived areas in 2011 are rural constituencies, with Rundu Urban and Katima Mulilo Urban being the only exceptions.

| Constituency        | Region       | Rank | 2001 | Rank | 2011 | Change |
|---------------------|--------------|------|------|------|------|--------|
| Rundu Rural East    | Kavango      | 45   | 33.2 | 1    | 70.8 | 37.6   |
| Onesi               | Omusati      | 47   | 32.5 | 2    | 59.5 | 27.1   |
| Карако              | Kavango      | 95   | 13.5 | 3    | 58.0 | 44.5   |
| Rundu Rural West    | Kavango      | 78   | 23.5 | 4    | 57.3 | 33.7   |
| Mashare             | Kavango      | 80   | 23.1 | 5    | 55.5 | 32.4   |
| Omuthiyagwiipundi   | Oshikoto     | 19   | 43.1 | 6    | 54.7 | 11.6   |
| Rundu Urban         | Kavango      | 63   | 28.3 | 7    | 52.8 | 24.5   |
| Tsumkwe             | Otjozondjupa | 84   | 21.3 | 8    | 50.7 | 29.5   |
| Katima Mulilo Urban | Zambezi      | 57   | 30.1 | 9    | 50.1 | 20.0   |
| Otamanzi            | Omusati      | 11   | 60.5 | 10   | 49.6 | -10.9  |
| Otjinene            | Omaheke      | 90   | 17.7 | 11   | 49.2 | 31.6   |
| Oshikango           | Ohangwena    | 18   | 43.9 | 12   | 48.9 | 5.0    |
| Ohangwena           | Ohangwena    | 28   | 38.9 | 13   | 47.7 | 8.8    |
| Khorixas            | Kunene       | 17   | 44.2 | 14   | 47.5 | 3.3    |
| Okalongo            | Omusati      | 91   | 16.0 | 15   | 47.5 | 31.5   |
| Okatana             | Oshana       | 54   | 31.0 | 16   | 47.4 | 16.4   |
| Ondobe              | Ohangwena    | 26   | 39.5 | 17   | 47.3 | 7.9    |
| Sesfontein          | Kunene       | 67   | 27.3 | 18   | 47.0 | 19.8   |
| Aminuis             | Omaheke      | 70   | 26.1 | 19   | 47.0 | 20.9   |
| Okakarara           | Otjozondjupa | 15   | 48.5 | 20   | 47.0 | -1.5   |

Table 7: Namibia's twenty most employment deprived constituencies, 2011, and changes in employment deprivation score over 2001-2011 period

Among the twenty least employment deprived constituencies in 2011, the greatest decline in proportion of people classified as employment deprived was registered in Uukwiyu constituency in Oshana region (a reduction of 45.4 percentage points), followed by Arandis and Walvis Bay Urban constituencies in Erongo region with reductions of 7.5 percentage points and 6.9 percentage points respectively. Close to half (45 percent) of the twenty least deprived constituencies in 2011 had registered reductions in employment deprivation during the 2001 to 2011 period.

For those constituencies that had registered increases in employment deprivation over the 2001 to 2011 period, the greatest increase was registered in Mpungu constituency in Kavango region (a 26 percentage point increase), followed by Linyanti constituency in Zambezi (19.9 percentage points), Epupa constituency in Kunene region (12.5 percentage points) and Oranjemund constituency in Karas region (11.4 percentage points).

| Constituency        | Region       | Rank | 2001 | Rank | 2011 | Change |
|---------------------|--------------|------|------|------|------|--------|
| Mpungu              | Kavango      | 105  | 5.2  | 88   | 31.2 | 26.0   |
| Keetmanshoop Rural  | Karas        | 75   | 24.1 | 89   | 31.2 | 7.0    |
| Uukwiyu             | Oshana       | 2    | 75.7 | 90   | 30.4 | -45.4  |
| Linyanti            | Zambezi      | 99   | 10.2 | 91   | 30.2 | 19.9   |
| Rehoboth West Urban | Hardap       | 74   | 24.2 | 92   | 30.0 | 5.8    |
| Steinhausen         | Omaheke      | 81   | 22.8 | 93   | 29.8 | 7.1    |
| Uuvudhiya           | Oshana       | 85   | 21.1 | 94   | 29.5 | 8.4    |
| Arandis             | Erongo       | 40   | 35.8 | 95   | 28.4 | -7.5   |
| Luderitz            | Karas        | 66   | 27.6 | 96   | 28.3 | 0.7    |
| Walvis Bay Urban    | Erongo       | 44   | 34.0 | 97   | 27.1 | -6.9   |
| Oranjemund          | Karas        | 93   | 15.0 | 98   | 26.4 | 11.4   |
| Swakopmund          | Erongo       | 59   | 29.7 | 99   | 25.9 | -3.7   |
| Khomasdal North     | Khomas       | 76   | 24.0 | 100  | 24.6 | 0.6    |
| Kamanjab            | Kunene       | 79   | 23.3 | 101  | 24.2 | 0.9    |
| Omatako             | Otjozondjupa | 73   | 24.3 | 102  | 23.0 | -1.3   |
| Windhoek Rural      | Khomas       | 77   | 23.8 | 103  | 22.3 | -1.4   |
| Epupa               | Kunene       | 103  | 7.2  | 104  | 19.7 | 12.5   |
| Kabbe               | Zambezi      | 87   | 19.3 | 105  | 17.1 | -2.2   |
| Windhoek West       | Khomas       | 94   | 14.1 | 106  | 13.2 | -0.9   |
| Windhoek East       | Khomas       | 101  | 8.6  | 107  | 7.9  | -0.7   |

 Table 8: Namibia's twenty least employment deprived constituencies, 2011, and changes in employment deprivation score over 2001-2011 period

As with the other domains of deprivation, there could exist wide variations in employment deprivation within constituencies or regions. Thus a more complete overall picture of the variation of employment deprivation scores within a particular geographic area (regional level in this case) can be obtained from the chart below which presents the interquartile ranges of the various scores.







National Planning Commission | Namibia Index of Multiple Deprivation



#### 3.2.3 Health Deprivation Domain

This domain identifies areas with relatively high rates of premature deaths. This is the only measure applied as aspects of behaviour or environment that may be predictive of *forthcoming* health deprivation are not measured under this domain. For each area the domain measures years of potential life lost which is a directly age and gender standardised measure of premature death (i.e. death under the age of 75).

The results are not proportional and therefore not presented as percentages. Instead the figures represent actual number of years of potential life lost, calculated from unexpected mortality weighted by the age of the individual who has died. The YPLL is calculated across the period of one year, specifically 2001 and 2011 in the discussion below.

#### **Constituency profiles**

Map 5, on page 35, shows the spatial profile of health deprivation in Namibia across the 107 constituencies in 2011 and 2001.

Despite mixed results across the 107 constituencies, there has been a general reduction in health deprivation, that is, years of potential life lost, over the 2001 to 2011 period. At the 2011 time point, the most health deprived constituency was Khorixas in Kunene region, followed by Linyanti in Zambezi region, Mukwe in Kavango and Ohangwena in Ohangwena region.

Among the twenty most health deprived constituencies in 2011, the greatest reduction in health deprivation was reported in Kongola constituency in Zambezi region, followed by Ondobe constituency in Ohangwena region, Okaku in Oshana and Katima Mulilo Rural in Zambezi region, in that order. The lowest decline in health deprivation was registered in Outjo constituency in Kunene region. Increases in health deprivation however, were registered in 20 percent of the top twenty most deprived constituencies by 2011, with the largest increase being recorded in Khorixas constituency in Kunene region, followed by Tsumkwe constituency in Otjzondjupa region, Linyanti constituency in Zambezi region and Berseba constituency in Karas region.

| Constituency        | Region       | Rank | 2001    | Rank | 2011  | Change |
|---------------------|--------------|------|---------|------|-------|--------|
| Khorixas            | Kunene       | 61   | 404.9   | 1    | 793.1 | 388.2  |
| Linyanti            | Zambezi      | 49   | 551.7   | 2    | 778.8 | 227.1  |
| Mukwe               | Kavango      | 42   | 607.4   | 3    | 758.3 | 151.0  |
| Ohangwena           | Ohangwena    | 7    | 949.2   | 4    | 600.1 | -349.0 |
| Ndiyona             | Kavango      | 29   | 691.8   | 5    | 597.3 | -94.5  |
| Rundu Urban         | Kavango      | 36   | 653.6   | 6    | 596.8 | -56.7  |
| Katima Mulilo Rural | Zambezi      | 6    | 982.7   | 7    | 592.9 | -389.8 |
| Kongola             | Zambezi      | 1    | 1 374.9 | 8    | 584.8 | -790.1 |
| Карако              | Kavango      | 22   | 776.4   | 9    | 576.2 | -200.2 |
| Okaku               | Oshana       | 3    | 1 006.7 | 10   | 574.9 | -431.8 |
| Mashare             | Kavango      | 37   | 634.8   | 11   | 568.2 | -66.5  |
| Kahenge             | Kavango      | 25   | 736.7   | 12   | 566.4 | -170.3 |
| Endola              | Ohangwena    | 10   | 910.8   | 13   | 563.1 | -347.7 |
| Mpungu              | Kavango      | 35   | 654.1   | 14   | 555.6 | -98.5  |
| Omulonga            | Ohangwena    | 8    | 922.3   | 15   | 540.3 | -382.0 |
| Berseba             | Karas        | 80   | 322.3   | 16   | 533.4 | 211.1  |
| Tsumkwe             | Otjozondjupa | 91   | 259.4   | 17   | 521.8 | 262.3  |

| Table 9: Namibia's twenty most health depriv | ed constituencies, | . <b>2011,</b> and | d changes i | in health |
|--|--------------------|--------------------|-------------|-----------|
| deprivation index over 2001-2011 period      |                    |                    |             |           |

| Rundu Rural West | Kavango   | 38 | 634.4   | 18 | 520.1 | -114.2 |
|------------------|-----------|----|---------|----|-------|--------|
| Outjo            | Kunene    | 51 | 519.8   | 19 | 519.5 | -0.3   |
| Ondobe           | Ohangwena | 2  | 1 070.8 | 20 | 515.6 | -555.2 |

Among the least health deprived constituencies in 2011, there was an increase in health deprivation in 40 percent of these constituencies, with the largest increase being recorded in Oranjemund constituency (Karas region) followed by Grootfontein constituency (Otjozondjupa region), Windhoek East (Khomas region) and Omatako constituency (Otjozondjupa region) in that order. These increases in health deprivation among the twenty least health deprived constituencies were much lower than similar increases in health deprivation among the twenty most health deprived constituencies. As stated above, there was a decline in health deprivation in 60 percent of the constituencies in the most deprived category.

However, the declines were also far less than the declines recorded in some of the twenty most deprived constituencies, such as Kongola constituency in Zambezi region and Ondobe in Ohangwena region. Among the twenty least health deprived constituencies, the greatest decline was recorded in Soweto constituency in Khomas region, followed by Epupa constituency in Kunene region and Karibib constituency in Erongo region.

| Constituency     | Region       | Rank | 2001  | Rank | 2011  | Change |
|------------------|--------------|------|-------|------|-------|--------|
| Grootfontein     | Otjozondjupa | 101  | 203.3 | 87   | 317.1 | 113.8  |
| Eengondi         | Oshikoto     | 68   | 380.1 | 88   | 313.3 | -66.7  |
| Tsumeb           | Oshikoto     | 76   | 340.9 | 89   | 306.6 | -34.3  |
| Arandis          | Erongo       | 97   | 226.2 | 90   | 304.7 | 78.5   |
| Windhoek Rural   | Khomas       | 92   | 255.2 | 91   | 302.0 | 46.8   |
| Katutura East    | Khomas       | 75   | 355.4 | 92   | 294.9 | -60.5  |
| Karibib          | Erongo       | 69   | 379.7 | 93   | 294.4 | -85.3  |
| Omaruru          | Erongo       | 78   | 327.9 | 94   | 291.3 | -36.6  |
| Katutura Central | Khomas       | 74   | 356.2 | 95   | 279.0 | -77.2  |
| Samora Machel    | Khomas       | 82   | 312.5 | 96   | 275.6 | -36.9  |
| Ерира            | Kunene       | 72   | 360.8 | 97   | 269.4 | -91.4  |
| Omatako          | Otjozondjupa | 105  | 161.3 | 98   | 267.1 | 105.8  |
| Luderitz         | Karas        | 83   | 288.3 | 99   | 265.9 | -22.4  |
| Soweto           | Khomas       | 63   | 395.8 | 100  | 259.5 | -136.3 |
| Oranjemund       | Karas        | 107  | 25.8  | 101  | 254.5 | 228.7  |
| Walvis Bay Rural | Erongo       | 85   | 282.2 | 102  | 241.8 | -40.4  |
| Khomasdal North  | Khomas       | 98   | 216.7 | 103  | 220.9 | 4.2    |
| Swakopmund       | Erongo       | 84   | 283.1 | 104  | 219.6 | -63.6  |
| Windhoek East    | Khomas       | 106  | 90.3  | 105  | 199.8 | 109.6  |
| Walvis Bay Urban | Erongo       | 94   | 252.0 | 106  | 186.2 | -65.8  |

Table 10: Namibia's twenty least health deprived constituencies, 2011, and changes in health deprivation index over 2001-2011 period

As is the case with the other domains of deprivation, there is the possibility of existence of pockets of health deprivation even in constituencies (and regions) which are less deprived and vice versa, and generally there may be wide variations in health deprivation even within constituencies. A more complex overall picture of the variation of health deprivation score within a particular geographic area (regional level in this case) is illustrated in Chart 4, below, presenting the interquartile ranges of the various scores.







#### 3.2.4 Education Deprivation Domain

This domain measures deprivation in educational attainment by determining the proportion of the working age population (aged 15 to 59 years old inclusive) that has not completed schooling at secondary level or that is illiterate (i.e. the number of people with no schooling completed at secondary level or above, or who are illiterate).

#### **Overview of regional profiles**

Overall, there was a slight decline in education deprivation in Namibia over the 2001 to 2011 period. Five of the thirteen regions recorded declines in education deprivation, with the remaining eight recording increases in education deprivation. The largest decline in education deprivation was recorded in Oshana (a 3.8 percentage point decline), followed by Erongo (3.7 percentage points) and Khomas (2.7 percentage points). The largest increase on the other hand was recorded in Omaheke region (an increase of 6.8 percentage points), followed by Kenene region (6.3 percentage points) and Otjzondjupa region (4.8 percentage points), as shown in Figure 3, below.





#### Constituency profiles

Map 6, below, shows the spatial profile of education deprivation in Namibia across the 107 constituencies in 2011 and 2001.





As can be seen from the maps above and the Tables 11 and 12 below, there have been changes in the absolute and relative scores in terms of education deprivation across the 107 constituencies over the 2001 to 2011 period. There is however, a worrisome pattern in changes in education deprivation between the most deprived and the least deprived constituencies. While only 5 percent of the twenty least deprived constituencies have recorded an increase in education deprivation over the 2001 to 2011 period, all of the constituencies in the twenty most education deprived category have registered an increase in the education deprivation over this period.

Among the twenty most education deprived constituencies in 2011, the largest increase in education deprivation was recorded in Otjinene constituency in Omaheke region (a 16.4 percentage points increase), followed by Epukiro constituency (14.2 percentage points) in the same region, Omatako constituency in Otjozondjupa region (9.3 percentage points) and Daures constituency in Erongo region (8.3 percentage points).

| Table 11: Namibia's twenty most education deprived constituencies, 2011, and changes | in |
|--|----|
| education deprivation index over 2001-2011 period                                    |    |

| Constituency   | Region       | Rank | 2001 | Rank | 2011 | Change |
|----------------|--------------|------|------|------|------|--------|
| Ерира          | Kunene       | 1    | 83.4 | 1    | 91.1 | 7.7    |
| Tsumkwe        | Otjozondjupa | 4    | 78.9 | 2    | 85.8 | 6.9    |
| Rehoboth Rural | Hardap       | 6    | 77.1 | 3    | 85.2 | 8.1    |
| Steinhausen    | Omaheke      | 3    | 79.3 | 4    | 84.1 | 4.8    |
| Guinas         | Oshikoto     | 2    | 80.0 | 5    | 83.9 | 3.9    |
| Sesfontein     | Kunene       | 11   | 76.1 | 6    | 83.5 | 7.4    |
| Kamanjab       | Kunene       | 20   | 74.8 | 7    | 82.3 | 7.6    |
| Otavi          | Otjozondjupa | 13   | 75.8 | 8    | 82.1 | 6.2    |
| Omatako        | Otjozondjupa | 27   | 72.2 | 9    | 81.5 | 9.3    |
| Daures         | Erongo       | 25   | 72.8 | 10   | 81.1 | 8.3    |
| Otjinene       | Omaheke      | 66   | 64.6 | 11   | 81.0 | 16.4   |
| Otjombinde     | Omaheke      | 22   | 73.9 | 12   | 80.9 | 7.0    |
| Ориwo          | Kunene       | 24   | 73.3 | 13   | 80.6 | 7.2    |
| Eengondi       | Oshikoto     | 10   | 76.3 | 14   | 80.2 | 4.0    |
| Карако         | Kavango      | 12   | 76.0 | 15   | 80.2 | 4.2    |
| Epukiro        | Omaheke      | 62   | 65.5 | 16   | 79.7 | 14.2   |
| Kahenge        | Kavango      | 7    | 76.9 | 17   | 79.5 | 2.5    |
| Kalahari       | Omaheke      | 5    | 78.2 | 18   | 79.2 | 0.9    |
| Ndiyona        | Kavango      | 14   | 75.7 | 19   | 78.9 | 3.1    |
| Outjo          | Kunene       | 23   | 73.8 | 20   | 78.6 | 4.8    |

With the execption of Oranjemund constituency in Karas region, all the constituencies in the category of twenty least education deprived registered a decline in education deprivation over the 2001 to 2011 period. Oshakati West constituency in Oshana region and Oshikuku constituency in Omusati region recorded the biggest decline in education deprivation over this period at 8.9 percentage point and 8.5 percentage points, respectively. They were followed by three constituencies in Windhoek (Khomas region) – Soweto, Katutura East and Windhoek West constituencies in that order. At the other end of the spectrum was Khomasdal North and Windhoek East constituencies in Khomas region and Swakopmund in Erongo region.

| Constituency        | Region  | Rank | 2001 | Rank | 2011 | Change |
|---------------------|---------|------|------|------|------|--------|
| Samora Machel       | Khomas  | 83   | 61.2 | 88   | 56.8 | -4.4   |
| Anamulenge          | Omusati | 89   | 59.7 | 89   | 56.4 | -3.3   |
| Ondangwa            | Oshana  | 90   | 59.1 | 90   | 55.8 | -3.3   |
| Katutura Central    | Khomas  | 82   | 61.3 | 91   | 54.8 | -6.5   |
| Okatana             | Oshana  | 93   | 58.1 | 92   | 54.7 | -3.4   |
| Swakopmund          | Erongo  | 96   | 56.9 | 93   | 54.3 | -2.6   |
| Oshakati East       | Oshana  | 94   | 57.5 | 94   | 53.6 | -3.9   |
| Rundu Urban         | Kavango | 99   | 56.2 | 95   | 53.1 | -3.1   |
| Oshikuku            | Omusati | 85   | 61.0 | 96   | 52.6 | -8.5   |
| Oshakati West       | Oshana  | 87   | 60.3 | 97   | 51.4 | -8.9   |
| Walvis Bay Urban    | Erongo  | 91   | 59.0 | 98   | 51.4 | -7.5   |
| Oranjemund          | Karas   | 105  | 43.8 | 99   | 50.3 | 6.5    |
| Rehoboth West Urban | Hardap  | 97   | 56.6 | 100  | 50.3 | -6.3   |
| Katutura East       | Khomas  | 95   | 57.3 | 101  | 49.0 | -8.3   |
| Katima Mulilo Urban | Zambezi | 103  | 46.9 | 102  | 45.6 | -1.3   |
| Ongwediva           | Oshana  | 102  | 48.2 | 103  | 43.9 | -4.3   |
| Khomasdal North     | Khomas  | 104  | 44.8 | 104  | 43.0 | -1.7   |
| Soweto              | Khomas  | 101  | 49.2 | 105  | 40.8 | -8.4   |
| Windhoek West       | Khomas  | 106  | 26.1 | 106  | 17.9 | -8.2   |
| Windhoek East       | Khomas  | 107  | 16.0 | 107  | 13.4 | -2.6   |

 Table 12: Namibia's twenty most education deprived constituencies, 2011, and changes in education deprivation index over 2001-2011 period

As was the case with the other domains of deprivation discussed earlier, it is conceivable that there would be wide variations in education deprivation even within the constituencies with some parts of a particular constituency being more or less education deprived than is the norm for that constituency. Chart 5 shows the minimum, maximum and median rank of datazones in each region, and the interquartile range for the overall NIMD in 2011 and 2001.



#### 3.2.5 Living Environment Deprivation Domain

This domain measures both inadequacy in housing conditions and a lack of basic services to the home by determining the proportion of people living in a household without electricity, paraffin or solar power for lighting and/or without adequate toilet facilities and/or without adequate water provision and/or living in a shack and/or in overcrowded conditions. It is important to reiterate that for the 2011 Census, most indicators (which are derived from the Census questions) were not directly comparable to the 2001 Census indicators. Therefore, analogous indicators had to be reconstructed in 2011 using the relevant questions from 2001 and 2011 Censuses.

#### **Overview of regional profiles**

Over the 2001 to 2011 period, there was a general decline in living environment deprivation across the 13 regions of Namibia, with the greatest decline having been recorded in Oshana, Karas and Kavango regions. The only exception to this declining trend was in Khomas region where there was a reported increase in the proportion of people who are classified as living environment deprived, as shown in Figure 4 below. Khomas region is home to Windhoek, the political and commercial capital which has witnessed a lot of in migration, especially of unskilled labour, and it is believed to be these people who end up living in shacks in the peri-urban areas.



Figure 4: Changes in living environment deprivation over 2001-2011 period by region

#### **Constituency profiles**

Map 7, below, shows the spatial profile of living environment deprivation in Namibia across the 107 constituencies in 2011 and 2001.



The maps above and Tables 13 and 14, below, show that there has been a general (although small) improvement in the living environment of the people of Namibia, albeit in varying degrees, over the 2001 to 2011 period. Compared to other domains of the Namibia Index of Multiple Deprivation, the living environment domain has registered the smallest changes over this period.

Among the twenty most living environment deprived constituencies in 2011, the largest declines in living environment deprivation were registered in rural constituencies in northern and north eastern Namibia, especially in Mpungu constituency in Kavango region (a 2.2 percentage point change) followed by Okongo constituency in Ohangwena region (2.1 percentage points), Ndiyona constituency in Kavango region (2 percentage points) and Sibinda constituency in Zambezi region (1.6 percentage points). No constituency in this most deprived category registered an increase in living environment deprivation during the period under consideration.

| Constituency        | Region    | Rank | 2001 | Rank | 2011 | Change |
|---------------------|-----------|------|------|------|------|--------|
| Epembe              | Ohangwena | 3    | 99.8 | 1    | 99.8 | 0.0    |
| Okankolo            | Oshikoto  | 6    | 99.6 | 2    | 99.0 | -0.6   |
| Kabe                | Zambezi   | 9    | 99.4 | 3    | 98.9 | -0.5   |
| Linyanti            | Zambezi   | 1    | 99.9 | 4    | 98.7 | -1.2   |
| Omundaungilo        | Ohangwena | 11   | 99.2 | 5    | 98.7 | -0.5   |
| Карако              | Kavango   | 5    | 99.6 | 6    | 98.6 | -1.0   |
| Ерира               | Kunene    | 4    | 99.7 | 7    | 98.6 | -1.1   |
| Kahenge             | Kavango   | 7    | 99.4 | 8    | 98.4 | -1.0   |
| Kongola             | Zambezi   | 16   | 98.6 | 9    | 98.3 | -0.2   |
| Sibinda             | Zambezi   | 2    | 99.9 | 10   | 98.3 | -1.6   |
| Eengondi            | Oshikoto  | 14   | 98.8 | 11   | 98.1 | -0.7   |
| Katima Mulilo Rural | Zambezi   | 20   | 98.2 | 12   | 98.0 | -0.2   |
| Omulonga            | Ohangwena | 15   | 98.8 | 13   | 98.0 | -0.8   |
| Mashare             | Kavango   | 12   | 99.2 | 14   | 97.9 | -1.2   |
| Ondobe              | Ohangwena | 13   | 99.0 | 15   | 97.9 | -1.1   |
| Mukwe               | Kavango   | 17   | 98.6 | 16   | 97.6 | -0.9   |
| Otamanzi            | Omusati   | 22   | 97.6 | 17   | 97.5 | 0.0    |
| Okongo              | Ohangwena | 8    | 99.4 | 18   | 97.3 | -2.1   |
| Ndiyona             | Kavango   | 10   | 99.2 | 19   | 97.2 | -2.0   |
| Mpungu              | Kavango   | 18   | 98.5 | 20   | 96.3 | -2.2   |

 Table 13: Namibia's twenty most environment deprived constituencies, 2011, and changes in

 environment deprivation index over 2001-2011 period

Among the twenty least living environment deprived constituencies 2011, the greatest decline in the living environment deprivation score was registered in the largely peri-urban constituencies of Rundu Urban constituency in Kavango region (a 24.3 percentage point decrease), followed by Walvis Bay Rural constituency in Erongo region (16.8 percentage points), Luderitz constituency in Karas region (16.1 percentage points) and Oshakati West constituency in Oshana region (16 percentage points).

Increases in living environment deprivation score were registered in the largely urban constituencies of Khomasdal North (Khomas region), Tsumeb (Oshikoto region), Swakopmund (Erongo region) and Oranjemund (Karas region), a trend which can be attributed to the mushrooming of informal settlements in the peri-urban areas.

| Constituency        | Region       | Rank | 2001 | Rank | 2011 | Change |
|---------------------|--------------|------|------|------|------|--------|
| Oshakati West       | Oshana       | 88   | 60.5 | 74   | 76.5 | -16.0  |
| Omaruru             | Erongo       | 89   | 60.3 | 92   | 61.8 | -1.5   |
| Okahandja           | Otjozondjupa | 90   | 59.5 | 90   | 63.7 | -4.2   |
| Otjiwarongo         | Otjozondjupa | 91   | 58.5 | 93   | 60.8 | -2.3   |
| Swakopmund          | Erongo       | 92   | 54.0 | 97   | 47.9 | 6.1    |
| Tsumeb              | Oshikoto     | 93   | 53.6 | 98   | 47.3 | 6.4    |
| Katutura Central    | Khomas       | 94   | 51.4 | 95   | 50.8 | 0.6    |
| Walvis Bay Rural    | Erongo       | 95   | 50.8 | 85   | 67.5 | -16.8  |
| Keetmanshoop Urban  | Karas        | 96   | 49.2 | 96   | 48.2 | 1.0    |
| Luderitz            | Karas        | 97   | 48.9 | 88   | 65.0 | -16.1  |
| Rundu Urban         | Kavango      | 98   | 46.8 | 79   | 71.1 | -24.3  |
| Khomasdal North     | Khomas       | 99   | 42.2 | 103  | 35.2 | 7.0    |
| Walvis Bay Urban    | Erongo       | 100  | 42.0 | 100  | 45.8 | -3.8   |
| Katutura East       | Khomas       | 101  | 41.6 | 99   | 46.1 | -4.5   |
| Soweto              | Khomas       | 102  | 38.6 | 101  | 38.4 | 0.2    |
| Arandis             | Erongo       | 103  | 34.0 | 102  | 35.9 | -1.9   |
| Oranjemund          | Karas        | 104  | 30.3 | 105  | 24.3 | 6.0    |
| Rehoboth West Urban | Hardap       | 105  | 26.8 | 104  | 32.0 | -5.2   |
| Windhoek West       | Khomas       | 106  | 13.6 | 106  | 16.1 | -2.5   |
| Windhoek East       | Khomas       | 107  | 8.4  | 107  | 12.1 | -3.6   |

 Table 14: Namibia's twenty least environment deprived constituencies, 2011, and changes in environment deprivation index over 2001-2011 period

As was the case with all the domains of deprivation discussed earlier, there are likely to be wide variations in living environment deprivation within the constituencies with pockets of living environment deprivation in constituencies (and regions) which are less deprived and areas of advantage within the more deprived constituencies. Chart 6, below, gives an overall picture of the variation of living environment deprivation score within a particular geographic area (regional level in this case), presented as the interquartile ranges of the various scores.

Chart 6: Inter-quartile range living environment deprivation, 2011 and 2001, by region





## **Section 4: Conclusions and Policy Recommendations**

#### 4.1 Conclusions

This report has detailed spatial patterns and recent trends in deprivation in multiple domains in Namibia. The report identifies and delineates the more deprived geographic areas – regions and constituencies – as at 2001 and 2011, when the two most recent national Censuses were conducted, as well as changes in absolute and relative measures of the material, employment, health, education and living environment domains. The report also presents similar patterns and trends in deprivation with respect to the combined Namibia Index of Multiple Deprivation.

There exist wide regional disparities with regard to multiple deprivations in Namibia. Three of the five most deprived constituencies in Namibia are located in Kavango region, while three of the five least deprived constituencies are located in Khomas region. The most deprived constituency in Namibia overall is Kapako in Kavango region, followed by Tsumkwe in Otzondjupa region, Mashare in Kavango region, Kongola constituency in Zambezi region and Kehenge constituency in Kavango region. The least deprived constituency in Namibia is Windhoek East, followed by Windhoek West and Khomasdal North constituencies, all of which are located in Khomas region. They are followed by Oranjemund constituency in Karas region and Walvis Bay Urban in Erongo region.

There have been changes in the level of relative deprivation over the 2001 to 2011 period. In 2011, more than half of the twenty most deprived constituencies were new entrants in this category, while among the twenty least deprived constituencies, only ten percent were new entrants. In other words, eleven constituencies moved out of the twenty most deprived category during the 2001 to 2011 period, while only two constituencies moved out of the category of the twenty least deprived constituencies.

Turning to individual domains of deprivation, there was a 16.6 percentage point decline in the proportion of the population that is materially deprived over the period 2001 to 2011, with the corresponding figures for those that are living environment deprived and education deprived being 4.7 and 0.1 respectively. There was, however, an increase in the proportion of people who are employment deprived by 6.1 percentage points over the same period. Wide regional variations exist with respect to individual domains of deprivation across the thirteen regions and 107 constituencies of Namibia.

In terms of material deprivation, over the 2001 to 2011 period, all but one region (Erongo) registered a decline in the proportion of the population that is deprived, with the largest decline being registered in the north and north eastern regions of Ohangwena, Oshikoto, Omusati and Zambezi. While at the national level, the proportion of the population that is employment deprived increased by 6.1 percentage points, in three of the regions – Erongo, Oshana and Oshikoto – there was actually a decrease in this domain during the period under consideration.

Half of the regions registered declines in education deprivation over the 2001 to 2011 period with reductions ranging from 0.1 to 3.8 percentage points, while the other half registered increases in the proportion of the population that is education deprived. Among this group, the largest increases were registered in Omaheke, Kunene and Ohangwena regions. All the regions, with the exception of Khomas, registered declines in the proportion of the population that is living environment deprived. The increase in living environment deprivation in Khomas region can be understood in the context of rural to urban migration, especially to Windhoek, and the consequent mushrooming of crowded informal settlements in peri-urban areas.

### 4.2 Policy Recommendations

There are many ways in which the regional and constituency profiles of individual domains of deprivation and the Index of Multiple Deprivation profiles presented in this report can support pro-poor policy formulation and planning processes at national, regional and constituency levels, as outlined below.

- The report provides policy and decision makers, and planners at all levels with the evidence on which to make decisions regarding resource allocation and the geographic areas and sectors to prioritise for public investment, government support and delivery of critical public services.
- The report presents a useful empirical basis for planning for, and targeting of, public investments aimed at addressing poverty, inequality and exclusion.
- As shown in the report, inequality exists across the thirteen regions and 107 constituencies
  of Namibia, in terms of not only income but also access to basic social services such as
  healthcare and education. Priority geographic areas, that is, regions and constituencies,
  and the domains in which they are deprived relative to other areas, can be identified
  and addressed through sector-specific interventions and/or integrated development
  programmes.
- Fiscal transfers from national and regional governments could be targeted to, and ringfenced for, those sectors/domains in which specific regions and constituencies are particularly deprived, or to the most deprived regions and/or constituencies.

It should be noted, however, that this report provides only a profile of *relative* deprivation across Namibia at the 2001 and 2011 time points, highlighting pockets of deprivation within the regions and constituencies. Such pockets of deprivation are to be found even within the least deprived geographic areas. As such, spatially targeted policy initiatives and programmatic interventions, if considered, should be regarded as a complement to, rather than a substitute for, mainstream pro-poor policies and strategies that the National Government and Regional Councils are already implementing.

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## Annex 1: Technical Notes on the Shrinkage Technique<sup>3</sup>

In some areas, particularly where populations at risk are small, data may be 'unreliable', that is, more likely to be affected by measurement error or sampling error, with particular datazones getting unrepresentatively low or high scores on certain indicators. The extent of a score's 'unreliability' can be measured by calculating its standard error. A technique known as 'shrinkage estimation' (i.e. empirical Bayesian estimation) has been used to deal with this problem.

Shrinkage involves moving unreliable datazone scores (i.e. those with a high standard error) towards another more robust score. This may be towards higher deprivation or lower deprivation. There are many possible candidates for the more robust score to which an unreliable score could move. The constituency mean has been selected for this purpose but others could, in theory, include the regional or national mean or the mean of areas with similar characteristics.

Arguably, the movement of unreliable scores towards the mean score for Namibia would be inappropriate because of the large variation across the country and because the point of this study to take into account local circumstances. Even within regions there is considerable variation, and it was, therefore, concluded that shrinkage to the constituency mean was the best and most reliable procedure. This is in essence the same as shrinking to the population weighted datazone mean for a constituency.

The actual mechanism of the procedure is to estimate deprivation in a particular datazone using a weighted combination of (a) data from that datazone and (b) data from the constituency. The weight attempts to increase the efficiency of the estimation, while not increasing its bias. If the datazone has a high standard error and a region appears to be an unbiased estimation of the datazone score then the datazone score moves towards the constituency score.

Although most scores move a small amount, only unreliable scores, that is those with a large standard error, move significantly. The amount of movement depends on both the size of the standard error and the amount of heterogeneity amongst the datazones in a constituency.

The 'shrunken' estimate of a datazone level proportion (or ratio) is a weighted average of the two 'raw' proportions for the datazone and for the corresponding constituency.<sup>4</sup>

The 'shrunken' datazone level estimate is the weighted average

$$z_{j}^{*} = w_{j}z_{j} + (1 - w_{j})z$$

[1]

where  $z_j$  is the datazone level proportion, z is the constituency level proportion,  $w_j$  is the weight given to the 'raw' datazone -*j* data and (1-w<sub>j</sub>) the weight given to the overall proportion for the constituency. The formula used to determine w<sub>i</sub> is

<sup>3</sup> This section is a modified version of that contained in the technical annex to Noble et al. (2006a).

<sup>4</sup> Where appropriate the weighted average is calculated on the logit scale, for technical reasons, principally because the logit of a proportion is more nearly normally distributed than the proportion itself.

$$w_j = \frac{1/s_j^2}{1/s_j^2 + 1/t^2}$$

where  $s_j$  is the standard error of the datazone level proportion, and  $t^2$  is the inter-datazone variance for the *k* datazones in the constituency, calculated as:

[2]

$$t^{2} = \frac{1}{k-1} \sum_{j=1}^{k} (z_{j} - z)^{j}$$
 [3]

#### Exponential transformation

In order to combine the domains into an overall NIMD, first, the domain scores are standardised by ranking, then the ranks are transformed to an exponential distribution. The exponential distribution has a number of properties, most importantly that it enables control over cancellation and it helps identify the most deprived constituencies.

The purpose of exponential transformation is to adjust the range of each transformed domain to make them comparable. This is important when the domains are combined because simply averaging the ranks could result in high deprivation in one domain being cancelled out by low deprivation in a different domain.

Applying the exponential transformation converts each domain to a distribution with a range of 0 to 100, and a score of 100 for the most deprived small area, with 25 percent of small areas having a score higher than 50. The skewedness in the transformed distribution reduces the extent to which deprivation in one domain can be masked by lack of deprivation in another. The exponential transformation formula selected enables the most deprived datazones to be identified. The formula distributes the scores to stretch out the 25 percent highest scoring (most deprived) datazones and compress the less deprived end of the distribution.

The transformation used is as follows. For any datazone, denote its rank on the domain, scaled to the range [0,1], by R (with R=1/N for the least deprived, and R=N/N, i.e. R=1, for the most deprived, where N=the number of small areas in Namibia).

The transformed domain, X say, is  $X = -45.5*\ln\{1 - R*[1 - exp(-100/45.5)]\}$ where In denotes natural logarithm and exp the exponential or antilog transformation.

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# NOTES







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