RESOURCE ALLOCATION MODEL FOR THE

CONSTITUENCY DEVELOPMENT FUND

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Abstract

Detailed information on the location of those with the greatest need for publicly provided social services may be the most valuable information policy makers could use to allocate resources, plan and budget. More often than not, the emphasis has been on evaluating the distribution of poverty, as defined by income insufficiency, to inform resource allocation. Theoretically, measures of household wealth can be reflected by income, consumption or expenditure information. However, the collection of accurate income and consumption data requires extensive resources for household surveys. As regards, it may be more appropriate to focus on relative material and social deprivation than narrowly defined poverty. More importantly when one wants to evaluate the distribution of relative disadvantaged status between quite small geographic areas (e.g. Constituency), it is best to use data derived from the census, given that it is the most inclusive and representative of all household surveys. More overall, income from surveys are measures more reflective of short-run household's wealth or living standard, inadequate for estimating long-run poverty accurately whereas other socio-economic and demographic census variables are regarded as much more reliable to estimate long-run deprivation.

The research reported on in this paper has calculated a composite index of deprivation using 2010 Census data, drawing on the experience of similar initiatives in other countries and using internationally accepted statistical techniques. This index shows that the socio-demographic variables that have the greatest influence on deprivation in the Zambian Constituencies are: lack of access to piped water and toilets, traditional dwelling whose material for walls, roofs and floor are not solid, lack of access to electricity, solar power, gas or bio fuel, living in a female headed household, being a child under the age of 5 years, being illiterate, and being unemployed youth. The deprivation index was calculated at the constituency level. The highest levels of deprivation are experienced in the Sinkongo, Luapula, Lukulu-West, Sinjembela and Zambezi-West constituencies. To equalize development across the country there is need for policy intervention to re-allocate more resources in these need areas. The analysis shows that deprivation is skewed to rural dominated constituencies.

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1.   Background

The Constituency Development Fund, CDF, was established in Zambia in 1995. Under this arrangement, Government allocates funds on an annual basis to all constituencies through the Member of Parliament. The purpose of the fund is to empower local communities by providing a fund for health, education and other initiatives. The CDF is not unique to Zambia. It was probably pioneered by the Federal Government of India in 1993. In the Indian example, each MP, is given an equal amount of money from the Central Government to spend on eligible projects in Constituencies of their choice. This includes all MPs, both elected and nominated. A list of eligible and ineligible projects is given on which the MP may authorize expenditure to any part of the constituency or district of their choice. The MP may however, as case maybe, also authorize utilization of part of the fund elsewhere, outside the constituency, if necessary.

To date at least 23 countries have adopted or are considering adopting CDFs: In Africa CDFs are implemented in countries such as Ghana, Kenya, Malawi, Liberia, Rwanda and Zambia, among others. It has been argued that CDFs can address a number of development and governance challenges that many countries face. They purportedly:

- Ensure project delivery in the face of ineffective and corrupt local government structures;

- Bypass central bureaucracies and channel funding directly to community level, enable the participation of the local population in the choice of which local infrastructure is delivered;

- Empower the legislature by allowing them to allocate and spend money independently of the executive; and

- Allow MPs to respond directly to concrete demands from their constituents, something that they may not be powerful enough to make the executive do.

These arguments in favour of CDF are appealing, yet there are many critics of CDFs, as well. Though CDFs have made the headlines largely because of corruption and political manipulation associated with them, there are three more fundamental deficiencies built into the design of these schemes. CDFs may breach the key democratic principle of the separation of power by conferring the executive function of budget execution on the legislature. As a result of this breach, CDFs may compromise the ability of legislatures to represent the electorate and to oversee the work of the executive. By skewing resource allocation and project selection and oversight, CDFs also may have a negative impact on governments' capacity to contribute to service delivery and development, especially at the local government level.

CDFs are increasingly significant tools for politicized and decentralised resource allocation. Their popularity may stem from their performance of a function not otherwise supplied by the existing administrative-political system. As in the case of earmarks in the US, CDFs could fill the holes for things that fall between the cracks. But, the enormous potential for abuse in the operations of CDFs creates a significant challenge for policy makers and scholars to devise norms, rules and procedures for the effective operation of these increasingly important policy tools.

2.   Introduction

CDFs are distinguished from other decentralization initiatives or community-based development programmes by virtue of being raised by national government and disbursed at local level through the constituency and provides MPs some degree of control over the spending and earmarking of funds to development projects which reflect local needs and preferences.

However, other factors have a direct bearing on the performance of the CDF scheme. The disbursement of an equal quantum of funding per constituency has equity concerns because constituencies are not equal. This favours smaller, least populated constituencies against greatly populated and or the poorest – where needs are greatest. The blanket allocation of CDFs across the country, without recourse to policy targets underscores national failure to address pertinent policy concerns. This is unfortunately the case now.

According to a study commissioned by the Economics Association of Zambia (EAZ), the CDF was described as a 'one-size-fits-all' programme, which is less likely to effectively respond to differences in the nature and magnitude of desires and developmental problems in different localities. There are concerns, for example, that urban constituencies were better placed, in terms of developmental opportunities, because of the presence of lucrative economic activities, and that the CDF was more beneficial to smaller rather than larger constituencies. It is acknowledged that in some cases a larger constituency may not necessarily be densely populated compared to a smaller one, a situation which may support the allocation of more resources to the densely populated constituencies.

As postulated in the EAZ study, the CDF will need to be large enough to facilitate meaningful spatial distribution. Meaningful spatial allocation of the CDF will need to be supported by the availability of reliable data, on the communities of the given constituency, which could be used in a formula designed for the purpose. The emphasis on spatial allocation and the use of a formula, based on reliable data, will help respond to concerns raised of insufficient project financing. The proposed use of the formula is therefore essentially meant to take care of these spatial differences with a view to enhancing equity in the distribution of the public resources through CDF.

This report presents the findings of the study commissioned by Zambia Institute for Policy Analysis and Research (ZIPAR). The purpose of this study was to review the various social-economic conditions prevailing in different constituencies, including but not limited to: Housing conditions, water supply, sanitation conditions, poverty levels, school attendance, employment opportunities, and other material deprivation. The research developed a composite index of material and social deprivation using data from the Census 2010. Furthermore the study evaluates the distribution of deprivation in constituencies and considers ways in which deprivation index can contribute to public resource allocation of CDF deliberations.

The report outlines the conceptual frame upon which the material and social deprivation index and finally the resource allocation formula are based. It draws the distinction between poverty and material deprivation and some literature is reviewed. The methodology is outlined and finally the substantive results are presented.

### 3.	Key Concepts and Literature

Deprivation refers to the material and social Conditions that are experienced by individuals and households, where these conditions are inadequate relative to what is usually available or experienced in society. Key aspects of deprivation are:

- Material deprivation which includes: lack of or inadequate food, clothing, housing, sanitation, water, household assets; poor physical and/or mental health; living in a deprived environment where there may be air and noise pollution, no recreational facilities and no shops, etc.; and poor working environment.

- Social deprivation which includes: no or low level of education; few employment opportunities and lack of rights in employment; separated families; lack of recreation; lack of integration into the community, possibly as a result of racial and gender discrimination; and lack of participation in social institutions (Townsend 1987).

It is important to distinguish between the concept of deprivation and that of poverty, which traditionally focuses on insufficiency of income. Having an acceptable level of income does not automatically translate into adequate human capabilities. Instead, human development, or human capabilities, is influenced by a range of demographic, socio-economic and other factors. For this reason, it is important to focus more directly on these factors that ultimately influence whether or not individuals are able to achieve an adequate level of capabilities relative to others in society. This can be achieved by considering the multifaceted aspects of deprivation rather than only taking into account income inadequacy.

There are also practical reasons why a focus on deprivation may be preferable to that of traditional poverty measures. In particular, household survey measurement of individual and household income is most cases inaccurate. In contrast, indicators that are associated with the concept of deprivation (such as lack of access to water, sanitation, etc.) can be very accurately measured in household surveys and population censuses.

An important argument in favour of attempting to measure deprivation rather than poverty in the context of this study is that the appropriate allocation of public financial resources is more directly linked, through social service provision, with addressing the distribution of deprivation than income poverty in Zambia. In addition, focusing on deprivation as a multidimensional issue is valuable from a public policy perspective, as it lends itself to cross-sectoral policy and planning approaches.

### 3.1	Measures of Need - How is Deprivation Measured?

A large number of studies have attempted to measure deprivation, many of which have been conducted in the United Kingdom and other high-income countries. More recently, a number of studies have been undertaken in Middle-income countries (see McIntyre et al. 2000 for a comprehensive review of the literature). Although there is no single measure of deprivation, common to all these measures is the combination of a number of demographic and socio-economic (either individual or household level) variables into a composite index of deprivation. The key factors differentiating the indices from each other are the selection of their component variables, and whether the variables are weighted equally or differentially to form the composite deprivation index. Table 1 highlights the kinds of variables most frequently included in deprivation indices in different country contexts. While there are some similarities between the variables used in high- and middle-income country contexts, there is a much greater emphasis on lack of access to basic facilities (e.g. potable water, sanitation, safe energy sources) in low/middle-income countries.

Table 1: Variables frequently included in Deprivation Index in Different Countries

Variables frequently included in deprivation index in high income countries	Variables frequently included in deprivation index in low/middle income countries
Unskilled work/low social class	Illiteracy/low education attainment
Unemployment	Lack of access to running water
Overcrowding in housing units	Lack of access to electricity
Cannot afford a holiday	Lack of access to sanitation
Child under the age of 5	Low quality of housing
Pensioners living alone	Low income levels
Changed house/address in a past year (mobility)	Overcrowding in housing units
Don't own a car	Unemployment
Single parent	lack of assets/durables household goods
Living in rented accommodation/don't own a house	Age (children and the elderly may be more deprived)
Lack of amenities (toilet & shower inside the house)	Gender (women may be deprived)
Lack of education qualification	Lack of access to garbage disposal

There is growing consensus in the literature that a deprivation index should meet 2 criteria to ensure accuracy, namely that component variables should be additive and that differential weighting should be assigned to variables (Gordon 1995). Saunders (1998) explains 'additive' to mean that if an individual ranks poorly with regard to two or more variables of an index, that individual is more likely to be deprived than an individual belonging to only one of the categories. For example, if an index is constructed from 2 variables, which are 'low quality of housing, dwelling made of mud bricks' and 'illiterate', then low quality housing and illiterate dwellers are likely to be more deprived than dwellers who are just living in a low quality housing unit but are literate. The literature also stresses that component variables should be weighted instead of constructing a simple additive index. The lack of weighting for individual variables reflects an implicit, and often false, assumption that individuals displaying any one characteristic reflected in the index are just as likely to experience deprivation as individuals or households displaying any other characteristic. Weighted indices make explicit the relative importance of different variables in driving deprivation. The statistical technique most commonly used in recent deprivation studies, that ensures additivity and differential weighting of component variables, is that of principal components analysis (PCA), which is the approach used in this study.

3.2   Literature Review

Internationally, there has been a recent growth in the use of PCA to develop composite indices of deprivation or socio-economic status to assist in the analysis of household survey data. This has been spearheaded by the World Bank in their analyses of differences in health status across socio-economic groups (see for example Gwatkin et al. 2000). The World Bank's PCA based composite "asset index" includes very similar indicators to those considered in this study (such as access to water, sanitation and electricity; type of housing; etc.) as well as ownership of specific durable goods such as bicycles, radios etc. There are a number of examples of studies that have developed composite deprivation indices at a small area level and used the index values to guide resource allocation. The earliest such initiative was the inclusion of the "Jarman Under-Privileged Area (UPA)" score in the RAWP (Resource Allocation Working Party) formula, which was used to allocate resources between Regional Health Authorities in England (DHSS 1986). It was argued that this deprivation index would account for regional variations in the need for health services arising from differences in socio-economic conditions. Another prominent example of the deprivation index and small area analysis approach is the 1990s experience in New Zealand. The NZDep91 index of deprivation was constructed by performing a PCA on the 1991 census, and was updated using the 1996 census data to compile the NZDep96 index. The information is published in the form of a listing of areas, ranked according to the value of the deprivation index as well as maps which provide a visually appealing overview of the distribution of deprivation between geographic areas (Crampton, et al.2000). It has been extensively used to guide social service planning and resource allocation deliberations. Within the context of middle-income countries, the most widely known example is that of the Marginality Index in Mexico. This index was developed using PCA by the Mexican government for analysis of the distribution of marginality or deprivation across the country and to monitor trends in this distribution. It is used extensively by government departments in planning and for resource allocation purposes. A recent study has evaluated the relationship between marginality or deprivation and ill health at the county or municipality level, with the intention of informing the allocation of health care resources between municipalities (Lozano et al. 2001).

These international examples highlight that while estimating deprivation at small area level, and considering its relevance to resource allocation decision-making, may be not new in the Zambia context, Ministry health uses the allocation formula derived from deprivation index. The index was constructed from census 2000 and Living Conditions Monitoring Survey 1998 data (Kabaso et al. 2004). This index is being used and has been found to be relevant and useful.

4.0   Methodology

Principal components analysis (PCA) is used to combine different socio-economic and demographic variables together into a composite index of deprivation. PCA evaluates which variables (such as those listed in Table 2) are most highly correlated, i.e. have a strong relationship with each other, and also calculates the relative contribution of each of them to deprivation. A number of steps are required in undertaking a PCA, as outlined below (see Kline 1994 for an accessible exposition on PCA and other forms of factor analysis).

4.1   Initial Identification of Variables for possible inclusion in the PCA

Table 2 summarises the demographic and socio-economic variables from the 2010 census that were considered for inclusion in the PCA. Selection of these variables was informed by the conceptual understanding of deprivation outlined above, i.e. variables were selected on the basis of the factors that

have been shown to be important in contributing to deprivation internationally, as well as consideration of deprivation issues within Zambia.

Many of the variables relate to environmental conditions generally associated with relatively disadvantaged households, such as housing made from materials that provide limited environmental protection to inhabitants, and using energy sources such as wood and paraffin that can create environmental hazards. There is also a focus on access to basic services such as water and sanitation. Many of the individual level variables, such as educational and employment status, are well recognised indicators of socio-economic status.

Table 2: Overview of Census Variables considered for inclusion in the PCA

Variable	Description
Water	Proportion of households without access to improved sources of water supply
Electricity	Proportion of households without access to improved sources of energy for lighting, heating and cooking
Garbage	Proportion of households without access to refuse collection
Radio	Proportion of households who don't own a radio
TV	Proportion of households who don't own a TV
Refridgerator	Proportion of households who don't own a Fridge
Telephone	Proportion of households who don't own a telephone
Bicycle	Proportion of households who don't own a Bicycle
Vehicle	Proportion of households who don't own a vehicle
Internet	Proportion of households who don't have access to the internet
Computer	Proportion of households who don't own a computer
Motorcycle	Proportion of households who don't own a motorcycle
Plough	Proportion of households who don't own a plough
Boat	Proportion of households who don't own a boat
Scotch_cart	Proportion of households who don't own a scotch cart
Donkey	Proportion of households who don't own a donkey
Mobile_phone	Proportion of households who don't own a mobile phone
Oxen	Proportion of households who don't own oxen
Wheelbarrow	Proportion of households who don't own a wheelbarrow
Roof	Proportion of households whose dwelling's roof is made poor quality material.
Walls	Proportion of households whose dwelling's walls is made poor quality material.
Floor	Proportion of households whose dwelling's floor is made poor quality material.
Kitchen	Proportion of households without a kitchen
Toilet	Proportion of households without a toilet
Illiteracy	Proportion of persons who are illiterate
No_education	proportion of persons without any formal of education
Youth_unemployed	Proportion of unemployed youths (aged 12-24 years)
Female_head	Proportion of female headed households
Child	proportion of persons who are 5 years and below
Elderly	Proportion of elderly persons 65years and older
Disability	Proportion of disabled persons

Young children, the elderly, women and the disabled are frequently regarded as potentially being particularly vulnerable, partly in relation to lower status in household decision-making over the use of limited resources. These groups may also experience deprivation from a social exclusion perspective. This may equally apply to households headed by a female or by a person of 60 years or older, and these households are also likely to have access to fewer economic resources.

The variables selected were expressed as the proportion of individuals or households within each constituency that had a particular characteristic (e.g. were children below the age of five or were an adult without any formal education) or did not have access to certain basic amenities. The use of proportions is necessary as each constituency has a different number of households and individuals. The value of the variables should reflect the extent to which individuals or households within each area have a particular characteristic rather than reflect the absolute number of households or individuals with that characteristic. Proportions are valid measures for variables when applying PCA, as they are continuous over the range of values between 0 and 1, just as percentages are continuous over the range of 0% to 100%.

4.2   Variables for inclusion in the PCA

A particular variable (e.g. access to water could be measured either as access to piped water or as having communal piped water), with the strongest correlation to the other demographic and socio-economic variables was considered for inclusion in the PCA. This was done by producing a bi-variate Pearson correlation matrix for all of the variables listed in Table 2 (see Appendix A for the full correlation matrix). A correlation matrix provides information on the extent of association between each pair of variables across the constituencies.

The variables included in the PCA analysis were restricted to those showing correlation coefficients significant at the 1% level, i.e. only those variables that were significantly associated with other socio-economic or demographic variables were included using a 1% level of significance. Statisticians normally use a 5% significance level, but the variable selection was further restricted to a 1% significance level to reduce the possible margin of error and to ensure our analysis was in line with generally accepted practice for PCAs. Given that the purpose of the PCA is to generate a composite index, the variables included must be closely associated with each other. The values of the variables should vary in a similar manner across all observations (constituencies). The correlation matrix assists in determining which variables are closely related to one another, thus highlighting those variables that reflect the underlying driving influence - deprivation. Through this selection process, we end up with a set of variables with similar patterns of variation across all constituencies.

Table 3 summarises the variables finally selected for inclusion in the PCA, and shows their correlation coefficients. All variables have more than one correlation coefficient of greater than 0.5 with other variables.

Table 3: Correlations of Variables

	water	radio	TV	electricity	wheelbarrow	roof	walls	floor	illiteracy	youth_unemployed	child	disability
Correlations												
water	1											
radio	.782**	1										
TV	.831**	.789**	1									
electricity	.793**	.714**	.975**	1								
wheelbarrow	.786**	.812**	.935**	.880**	1							
roof	.874**	.797**	.955**	.921**	.912**	1						
walls	.656**	.631**	.732**	.724**	.704**	.733**	1					
floor	.838**	.752**	.973**	.959**	.903**	.964**	.782**	1				
illiteracy	.644**	.709**	.779**	.716**	.798**	.740**	.609**	.765**	1			
youth_unemployed	-.766**	-.659**	-.900**	-.884**	-.805**	-.887**	-.614**	-.887**	-.674**	1		
child	.742**	.723**	.902**	.894**	.849**	.875**	.610**	.888**	.705**	-.872**	1	
disability	.735**	.755**	.737**	.693**	.722**	.772**	.667**	.730**	.585**	-.635**	.602**	1

**. Correlation is significant at the 0.01 level .

4.3 Identifying the Principal Component or Main Factor

As indicated previously, PCA generates a composite index from a group of closely related variables. PCA does this by creating a new variable that captures the variation of the group of variables across the observations in the sample. In this case, the index (deprivation index) is a variable that is derived from the combined variation of the 12 variables included. The PCA process produced a single factor or component (see Table 3), which explained 80.49% of the variance of the 12 remaining variables across all constituencies. The factor loadings reflected in Table 4 represent the relative influence of the individual variables on the generated factor. In other words, the factor loading is a measure of the level of association between the generated factor and each variable. The factor loadings are measured on a scale of zero to one (0 – 1). Values closer to one represent higher degrees of association or influence.

Table 4: PCA Factor

Variables	Factor loadings
Water	.879
Electricity	.949
Radio	.846
TV	.981
Wheelbarrow	.942
Roof	.973
Walls	.783
Floor	.974
Illiteracy	.810
Youth Unemployed	-.896
Child	.903
Disability	.799

4.4   Calculating the Composite Index

The index derived from this factor is presented in simplified terms below. Each of the variable labels represents the z-score of that variable and the number is the relative weighting for that variable. These issues can be described in more detail as follows:

- The z-score is the standardized deviation of each variable (for each constituency) from the overall mean value of the variable.

- The relative weighting for each variable is the coefficient derived from regression-type estimation of the factor with the 12 variables. Effectively, it translates the relative influence / importance of each variable (as in the factor loadings) into calculable weights, to be applied to the characteristics of all constituencies. Variables with higher factor loadings have higher weights.

Deprivation Index = water*0.91+electricity*0.098+radio*0.088*TV*0.102+wheelbarrow*0.098+

Roof*0.101*walls*0.081+floor*0.101*illiteracy*0.084+youth_unemployment*-0.093
                 + child*0.094+disability*0.083.

Table 5 presents the weights, with variables listed in order of relative importance, beginning with the variable that has the greatest weight in the overall deprivation index.

Table 5: Weights

Variables	weights
TV	.102
floor	.101
roof	.101
electricity	.098
wheelbarrow	.098
child	.094
water	.091
radio	.088
illiteracy	.084
disability	.083
walls	.081
youth_unemployed	-.093

5.0   Results-Factors predicting Deprivation

The PCA conducted on the 2010 census data produced a deprivation index that indicates that key environmental factors; type of housing, access to water, sanitation and electricity, in addition to durable assets as a proxy for income, are particularly important in determining relative disadvantage or deprivation as can be seen in Table 5. Furthermore, certain demographic factors; young children, disabled persons, and individual socio-economic factors; youth unemployment and having low educational status are important.

6.0 Classifications of Constituencies into Quintiles

Constituencies can be ranked in order of the deprivation score. These scores can be used to identify areas that have relatively greater levels of deprivation. Table 6 shows deprivation index for each constituency in Zambia. The index values range from –2.53 for the least deprived constituency to 1.48 for the most deprived constituency. Table 6 also indicates which quintile each constituency falls within, with quintile 5 being the most deprived and quintile 1 the least deprived. Most of the constituencies within quintile 1 can be found in Lusaka and Copper belt, while most of those in quintile 5 are located in the Western, Luapula, North-Western, Muchinga and Northern provinces. The distribution of deprivation between constituencies is shown in Figure 1. This figure indicates that 25 percent of constituency's population falling into quintiles 1 through 2 are least deprived, while 60 percent quintile 4 through quintile 5 are representing the most deprived.

Table 6: Distribution of Constituencies into Quintiles

Distribution of constituencies from the richest 1st Quintile to the poorest 5th Quintile									
First Quintile		Second Quintile		Third Quintile		Fourth Quintile		Fifth Quintile	
Kabwata	-2.53	Bwacha	-1.07	Masaiti	0.14	Milanzi	0.49	Chama North	0.79
Lusaka Central	-2.39	Chipata Central	-1.02	Msanzala	0.15	Mbala	0.50	Mafinga	0.79
Nkana	-2.20	Chongwe	-0.94	Nangoma	0.17	Mkushi South	0.51	Mfuwe	0.81
Munali	-2.18	Solwezi Central	-0.82	Mambwe	0.19	Chinsali	0.52	Lupososhi	0.82
Kantanshi	-2.05	Mongu Central	-0.74	Kaoma central	0.24	Mapatizya	0.54	Lukulu east	0.82
Matero	-2.03	Choma	-0.68	Rufunsa	0.27	Petauke	0.54	Chifunabuli	0.84
Roan	-1.97	Monze Central	-0.59	Mpongwe	0.29	Lukashya	0.56	Malole	0.84
Kabushi	-1.97	Katuba	-0.48	Sesheke	0.29	Solwezi East	0.58	Mwinilunga	0.84
Wusakile	-1.96	Kasama Central	-0.41	Serenje	0.29	Chipangali	0.59	Ikelenge	0.88
Nchanga	-1.95	Chikankanta	-0.40	Chadiza	0.31	Mufumbwe	0.59	Chembe	0.91
Chifubu	-1.89	Mwembezhi	-0.24	Luangeni	0.31	Mwansabombwe	0.59	Kanchibiya	0.93
Mandevu	-1.86	Mpika	-0.22	Isoka	0.33	Mwandi	0.60	Mulobezi	0.95
Livingstone	-1.84	Chisamba	-0.16	Lundazi	0.34	Nchelenge	0.64	Kabompo East	0.95
Kanyama	-1.79	Magoye	-0.14	Itezhi Tezhi	0.34	Kapoche	0.65	Nalikwanda	0.96
Chawama	-1.74	Mumbwa	-0.13	Kasenengwa	0.38	Luena	0.65	Chama South	0.97
Kwacha	-1.73	Kalomo Central	-0.11	Mporokoso	0.40	Muchinga	0.65	Kaputa	1.00
Kabwe Central	-1.73	Siavonga	-0.06	Kafulafuta	0.40	Bangweulu	0.66	Nalolo	1.02
Bwana Mkubwa	-1.71	Kapiri Mposhi	-0.05	Dundumwezi	0.40	Senanga	0.66	Kalabo Central	1.04
Chililabombwe	-1.62	Mkushi North	-0.02	Namwala	0.40	Chitambo	0.66	Luampa	1.05
Kamfinsa	-1.58	Keembe	0.02	Gwembe	0.41	Shiwangandu	0.67	Chienge	1.06
Mazabuka Central	-1.52	Mansa	0.02	Lufwanyama	0.43	Kabompo West	0.68	Mangango	1.06
Chimwemwe	-1.51	Mkaika	0.05	Bahati	0.44	Pambashe	0.69	Chavuma	1.08
Kankoyo	-1.49	Nakonde	0.06	Nyimba	0.44	Mpulungu	0.70	Chilubi	1.09
Luanshya	-1.46	Bweengwa	0.06	Solwezi West	0.44	Chipili	0.72	Chimbamilonga	1.15
Chilanga	-1.45	Moomba	0.09	Mambilima	0.44	Chasefu	0.74	Liuwa	1.17
Chingola	-1.40	Mbabala	0.09	Mwense	0.45	Lumezi	0.75	Zambezi West	1.20
Ndola	-1.31	Pemba	0.09	Lubansenshi	0.45	Vubwi	0.76	Sinjembela	1.24
Kalulushi	-1.31	Sinazongwe	0.10	Kasempa	0.45	Lunte	0.76	lukulu west	1.31
Mufurila	-1.29	Feira	0.10	Sinda	0.46	Senga Hill	0.78	Luapula	1.33
Kafue	-1.20	Kawambwa	0.12	Katombola	0.47	Zambezi East	0.78	Sikongo	1.48

Figure 1: Aggregate Distribution of Constituencies
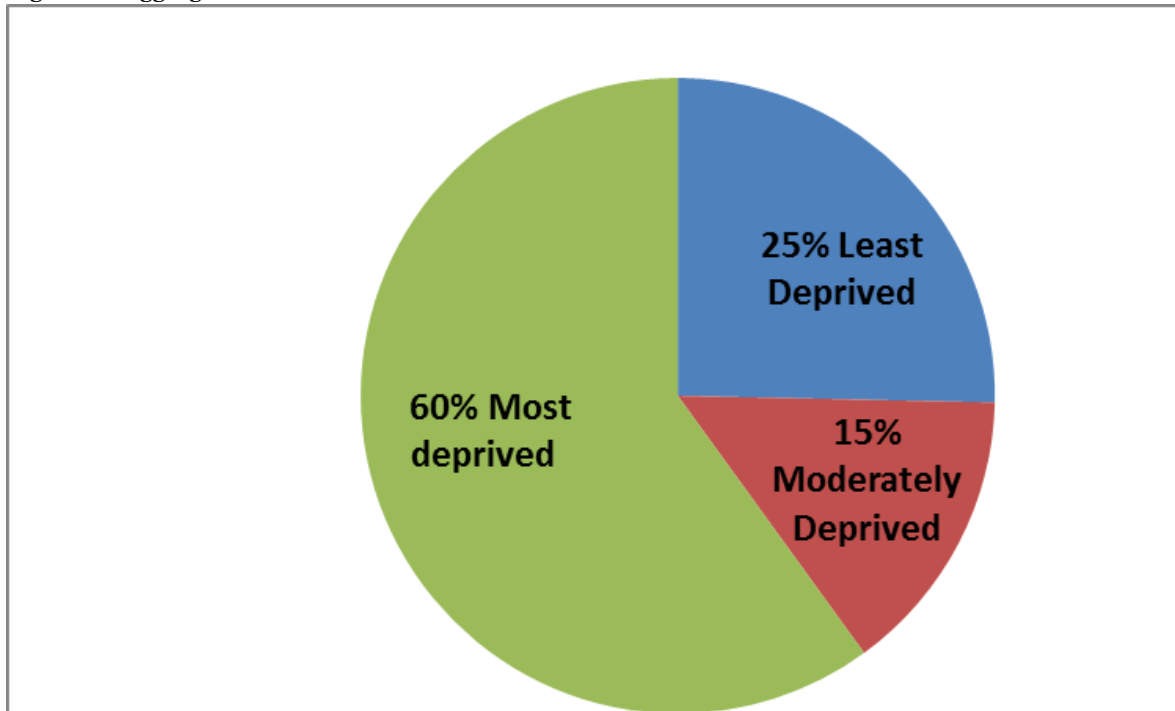
7.0   Deprivation and Resource Allocation

The deprivation index scores can be used in considering the allocation of public resources between constituencies. In a country such as Zambia where disparities in the distribution of income, in socio-economic status and in access to key social services are substantial, prioritising human development benefits for the most disadvantaged through the differential allocation of government resources could be argued to be an appropriate approach.

There are two key ways in which the deprivation index can be used to inform resource allocation patterns, the first one being inclusion of the index in a resource allocation formula. The second way in which the deprivation index can be used to inform resource allocation is to simply use it to guide marginal resource allocation, rather than incorporating it in a formula. For example, the results presented in table 6 could be used to guide allocation of any additional resources that become available, with priority being given to those constituencies with relatively greater levels of deprivation. This is the approach that has been adopted in New Zealand where, rather than using the actual index value for each area, priority in resource allocation and planning decisions is given on the basis of whether or not the area is in one of the most deprived deciles of areas (Crampton et al. 2000).

8.0   CDF Allocation Formula

The constituency weights from the deprivation index were derived by normalizing the index numbers. Normalizing involved basically adding a constant to each district index in order that the lowest value is equal to zero. In this case, the normalizing factor is 2.53. The normalized index scores were then used to weight the population. For each constituency, the weighted population was now expressed as a percentage

share of the total weighted population. The resulting shares are the weights for each Constituency. The proposed CDF resource allocation formula incorporating the deprivation index is:

$$\textbf{\textit{Constituency allocation = R*WCi}}$$

where,

Constituency allocation = Funds allocated to a constituency (i = 1, 2, 3,...150)
R = Total CDF resources allocation in the budget each year
WCi = material deprivation index weight for constituency (i = 1, 2, 3,...150)

Applying this formula to the total amount of CDF yields the computations in Table 7, with the richest constituency, Kabwata, allocated K2,779 while the most deprived constituency, Sikongo, allocated K947, 629. The highest amount is allocated to Kapiri Mposhi constituency although it is not the most deprived. This is so because the formula takes into account the deprivation status and the population of the constituency. In essence the ranking on the allocation scenarios is in terms of lowest to highest amount based on the population weighted deprivation and not on the deprivation scores alone.

However, two modes of reallocating resources are proposed. The CDF can be reallocated based on the formula (scenario 1) or re-allocated with each constituency getting a minimum amount of K1 million, and then the additional amount of K60 million provided in the 2014 National budget allocated using the model (Scenario 2).

Table 7: Re-allocation of CDF (Scenario 1)

Constituency	Reallocation	Constituency	Reallocation	Constituency	Reallocation	Constituency	Reallocation	Constituency	Reallocation
Kabwata	2,779.44	Kwacha	550,742.86	Lubansenshi	817,905.04	Isoka	1,075,258.51	Sinazongwe	1,390,195.83
Lusaka Central	85,328.54	Mulobezi	551,694.56	Mongu Central	827,207.84	Kasempa	1,080,707.38	Kanyama	1,404,424.69
Kantanshi	140,181.63	Ikelenge	584,164.78	Kafue	834,770.00	Mangango	1,091,808.21	Bahati	1,420,745.68
Nkana	143,785.98	Solwezi East	589,639.03	Luena	839,305.12	Mumbwa	1,109,200.29	Chifunabuli	1,462,069.32
Roan	167,975.30	Chilanga	600,967.32	Masaiti	843,002.12	Luangeni	1,112,939.95	Kanchibiya	1,480,508.04
Kankoyo	245,288.24	Chimwemwe	619,913.23	Katuba	847,115.89	Mapatizya	1,114,561.00	Kasenengwa	1,484,592.69
Nchanga	267,620.50	Mporokoso	624,718.31	Kabompo East	871,812.42	Mpika	1,135,197.48	Bangweulu	1,517,619.27
Kabushi	275,728.48	Mwembezhi	630,254.30	Muchinga	884,914.01	Mafinga	1,140,941.90	Chilubi	1,528,457.68
Wusakile	290,203.48	Bwacha	633,975.42	Magoye	885,076.53	Lukashya	1,153,278.42	Namwala	1,569,244.68
Chifubu	328,996.37	Kalulushi	634,809.14	Ndola	887,249.14	Siavonga	1,159,172.21	Senga Hill	1,589,758.23
Feira	332,967.43	Sesheke	643,427.47	Pemba	917,275.06	Chongwe	1,169,866.78	Keembe	1,596,683.97
Mufurila	394,658.40	Kawambwa	653,809.05	Chama South	921,082.38	Senanga	1,177,994.64	Lumezi	1,600,676.46
Mambilima	399,488.08	Kafulafuta	656,485.71	Chama North	921,154.74	Solwezi Central	1,178,986.96	Nakonde	1,609,882.06
Mkushi South	404,353.51	Chavuma	657,944.73	Chadiza	925,605.23	Choma	1,180,149.67	Katombola	1,634,808.86
Mwandi	407,339.07	Chikankanta	664,597.60	Chimbamilonga	930,174.91	Nangoma	1,186,787.38	Mpulungu	1,649,931.46
Moomba	409,488.46	Pambashe	696,793.74	Mufumbwe	941,852.31	Lupososhi	1,207,578.72	Mkushi North	1,687,521.88
Zambezi West	425,896.92	Nalikwanda	727,392.06	Serenje	946,868.06	Lufwanyama	1,209,029.63	Msanzala	1,694,556.14
Kamfinsa	431,268.63	Matero	732,941.05	Sikongo	947,629.69	Dundumwezi	1,225,817.83	Chasefu	1,696,527.98
Chililabombwe	435,864.34	Mwansabombwe	735,648.84	Mwense	951,357.20	Mandevu	1,247,797.10	Mbala	1,742,921.59
Mfuwe	466,456.27	Kabompo West	736,688.85	Mambwe	976,366.72	Kaoma central	1,254,120.65	Kasama Central	1,766,156.91
Munali	481,805.63	Rufunsa	741,831.75	Lunte	990,809.12	Chipata Central	1,254,890.42	Mansa	1,811,749.48
Luapula	482,091.84	Chingola	751,591.07	Shiwangandu	996,246.19	Chisamba	1,283,711.62	Sinjembela	1,829,871.86
Kabwe Central	495,251.13	Vubwi	763,173.54	Zambezi East	1,004,798.88	Mkaika	1,287,028.99	Mwinilunga	1,831,349.03
Livingstone	500,297.79	Chawama	766,544.21	Lukulu east	1,020,001.94	Sinda	1,290,906.96	Lundazi	1,944,167.60
Bwana Mkubwa	507,448.05	Chembe	774,494.47	Milanzi	1,022,079.26	Kaputa	1,302,600.32	Kapoche	1,985,818.81
Liuwa	510,176.33	Mbabala	790,103.68	Itezhi Tezhi	1,024,233.13	Nyimba	1,312,467.00	Chipangali	1,992,744.29
Mazabuka Central	522,324.91	Chitambo	811,647.99	Monze Central	1,024,692.83	Solwezi West	1,321,946.52	Chienge	2,132,756.73
lukulu west	548,704.81	Gwembe	812,473.80	Nalolo	1,027,257.89	Kalomo Central	1,365,726.47	Nchelenge	2,522,541.20
Luanshya	548,971.08	Bweengwa	814,821.51	Kalabo Central	1,057,917.81	Mpongwe	1,367,515.98	Malole	2,651,406.43
Chipili	550,178.29	Luampa	816,961.63	Petauke	1,059,061.58	Chinsali	1,374,339.18	Kapiri Mposhi	3,279,989.32

Table 8: Re-allocation of CDF (Scenario 2)

Constituency	Re-allocated amount	Constituency	Re-allocated amount	Constituency	Re-allocated amount	Constituency	Re-allocated amount	Constituency	Re-allocated amount
Kabwata	1,012,156.57	Chipili	1,220,968.32	Luampa	1,328,402.33	Isoka	1,431,315.91	Chinsali	1,551,636.26
Lusaka Central	1,027,181.69	Mulobezi	1,221,714.77	Mongu Central	1,329,709.69	Kasempa	1,433,688.04	Sinazongwe	1,557,121.86
Nkana	1,053,031.86	Ikelenge	1,234,723.21	Kafue	1,330,776.72	Mangango	1,438,895.68	Bahati	1,570,111.92
Kantanshi	1,053,259.28	Solwezi East	1,236,720.01	Luena	1,337,023.22	Mumbwa	1,444,030.59	Chifunabuli	1,587,414.10
Roan	1,064,451.30	Chilanga	1,236,844.42	Masaiti	1,337,886.24	Luangeni	1,446,386.30	Kanchibiya	1,594,963.74
Kankoyo	1,096,570.42	Chimwemwe	1,243,873.61	Katuba	1,338,382.29	Mapatizya	1,447,394.44	Kasenengwa	1,595,609.43
Nchanga	1,102,839.23	Mporokoso	1,250,651.15	Kabompo East	1,350,365.36	Mpika	1,454,207.38	Bangweulu	1,609,411.86
Kabushi	1,105,831.56	Kalulushi	1,250,985.05	Ndola	1,350,790.75	Mafinga	1,458,335.84	Chilubi	1,614,458.46
Wusakile	1,111,495.14	Bwacha	1,251,701.11	Magoye	1,354,281.47	Lukashya	1,462,971.90	Namwala	1,629,624.79
Chifubu	1,127,123.95	Mwembezhi	1,252,145.14	Muchinga	1,355,340.67	Siavonga	1,464,192.11	Senga Hill	1,638,603.20
Feira	1,133,439.08	Sesheke	1,258,055.38	Pemba	1,367,589.81	Chongwe	1,465,295.24	Keembe	1,639,649.43
Mufurila	1,156,109.42	Kawambwa	1,262,032.07	Chama North	1,370,040.30	Solwezi Central	1,469,547.12	Lumezi	1,642,945.29
Mambilima	1,160,308.36	Kafulafuta	1,263,398.15	Chama South	1,370,183.81	Choma	1,470,638.22	Nakonde	1,645,032.63
Mkushi South	1,162,298.52	Chavuma	1,264,497.51	Chadiza	1,371,247.87	Senanga	1,473,041.80	Katombola	1,656,084.89
Mwandi	1,163,540.05	Chikankanta	1,265,621.09	Chimbamilonga	1,373,992.94	Nangoma	1,475,740.91	Mpulungu	1,662,636.45
Moomba	1,164,095.09	Matero	1,279,228.35	Mufumbwe	1,378,130.12	Mandevu	1,483,126.49	Mkushi North	1,675,918.90
Kamfinsa	1,169,331.86	Pambashe	1,279,830.40	Serenje	1,379,760.37	Lupososhi	1,485,134.41	Msanzala	1,679,248.52
Chililabombwe	1,170,878.57	Nalikwanda	1,292,334.92	Sikongo	1,381,269.29	Lufwanyama	1,485,143.93	Chasefu	1,681,414.48
Zambezi West	1,171,257.93	Mwansabombwe	1,295,348.15	Mwense	1,381,769.08	Dundumwezi	1,491,828.49	Mbala	1,699,531.06
Munali	1,178,737.65	Kabompo West	1,295,840.23	Mambwe	1,391,434.58	Chipata Central	1,498,621.39	Kasama Central	1,705,827.85
Mfuwe	1,187,393.53	Chingola	1,296,618.54	Lunte	1,397,990.11	Kaoma central	1,502,883.42	Mansa	1,725,811.65
Kabwe Central	1,193,256.57	Rufunsa	1,297,493.42	Shiwangandu	1,400,070.41	Chisamba	1,513,806.11	Mwinilunga	1,735,783.58
Luapula	1,193,909.33	Chawama	1,298,871.30	Zambezi East	1,403,629.89	Mkaika	1,515,661.90	Sinjembela	1,735,881.60
Livingstone	1,193,981.97	Vubwi	1,306,550.84	Monze Central	1,408,969.62	Sinda	1,518,059.06	Lundazi	1,779,871.98
Bwana Mkubwa	1,198,220.76	Chembe	1,311,219.02	Lukulu east	1,409,780.18	Kaputa	1,523,557.39	Kapoche	1,797,398.26
Liuwa	1,205,137.56	Mbabala	1,316,622.91	Milanzi	1,410,208.19	Nyimba	1,526,662.24	Chipangali	1,800,032.51
Mazabuka Central	1,205,421.47	Chitambo	1,325,930.65	Itezhi Tezhi	1,410,858.62	Solwezi West	1,530,474.64	Chienge	1,857,339.93
Kwacha	1,214,833.15	Gwembe	1,325,996.15	Nalolo	1,412,909.15	Kanyama	1,546,248.24	Nchelenge	2,012,907.91
Luanshya	1,216,307.56	Bweengwa	1,326,486.00	Petauke	1,425,123.86	Kalomo Central	1,546,781.16	Malole	2,065,257.33
lukulu west	1,220,693.48	Lubansenshi	1,328,219.22	Kalabo Central	1,425,249.73	Mpongwe	1,548,449.14	Kapiri Mposhi	2,313,569.92

9.0 Conclusions

The research reported on in this paper has calculated a composite index of deprivation using 2010 Census data, drawing on similar initiatives in other countries and using internationally accepted statistical techniques. The index highlights the socio-demographic variables that have the greatest influence on deprivation in constituencies and also indicates the relative importance of each variable in contributing to deprivation. It clearly demonstrates that the highest levels of deprivation are experienced in the Sikongo, Luapula, Lukulu West and Sinjembela Constituencies. The research results has potential usages, it informs decision-makers on resource allocation and planning and budgeting activities.

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Appendixes

Appendix 1

Overview of census variables considered for inclusion in the PCA			
Variable	**Description**	**Mean**	**Std**
water	Proportion of households without access to improved sources of water	0.46	0.25
electricity	Proportion of households without access to improved sources of energy for	0.81	0.20
garbage	Proportion of households without access to refuse collection	0.94	0.10
radio	Proportion of households who don't own a radio	0.45	0.13
TV	Proportion of households who don't own a TV	0.77	0.22
Refridge	Proportion of households who don't own a Fridge	0.89	0.16
telephone	Proportion of households who don't own a telephone	0.99	0.02
bicycle	Proportion of households who don't own a Bicycle	0.59	0.17
vehicle	Proportion of households who don't own a vehicle	0.97	0.05
internet	Proportion of households who don't have access to the internet	0.99	0.02
computer	Proportion of households who don't own a computer	0.98	0.05
motorcycle	Proportion of households who don't own a motorcycle	0.99	0.01
plough	Proportion of households who don't own a plough	0.89	0.14
boat	Proportion of households who don't own a boat	0.95	0.08
scotch_cart	Proportion of households who don't own a scotch cart	0.96	0.05
donkey	Proportion of households who don't own a donkey	1.00	0.01
mobile_phone	Proportion of households who don't own a mobile phone	0.56	0.23
oxen	Proportion of households who don't own oxen	0.91	0.12
wheelbarrow	Proportion of households who don't own a wheelbarrow	0.93	0.06
roof	Proportion of households whose dwelling's roof is made poor quality material.	0.61	0.31
walls	Proportion of households whose dwelling's walls is made poor quality	0.57	0.26
floor	Proportion of households whose dwelling's floor is made poor quality material.	0.66	0.28
kitchen	Proportion of households without a kitchen	0.45	0.15
toilet	Proportion of households without a toilet	0.26	0.25
illiteracy	Proportion of persons who are illiterate	0.22	0.12
no_education	proportion of persons without any formal of education	0.18	0.11
youth_unemployed	Proportion of unemployed youths (aged 12-24 years)	0.21	0.17
female_head	Proportion of female headed households	0.23	0.05
child	proportion of persons who are 5 years and below	0.21	0.02
elderly	Proportion of elderly persons 65years and older	0.03	0.01
disability	Proportion of disabled persons	0.02	0.01

Appendix 2

Constituency	Material Deprivation	Index	Population
Kabwata	First Quintile	-2.53306	174,338
Lusaka Central	First Quintile	-2.38993	117,097
Nkana	First Quintile	-2.19727	83,067
Munali	First Quintile	-2.17648	261,975
Kantanshi	First Quintile	-2.05205	56,378
Matero	First Quintile	-2.03170	282,734
Roan	First Quintile	-1.96906	57,561
Kabushi	First Quintile	-1.96567	93,918
Wusakile	First Quintile	-1.95578	97,146
Nchanga	First Quintile	-1.95371	89,264
Chifubu	First Quintile	-1.88912	98,677
Mandevu	First Quintile	-1.86149	358,788
Livingstone	First Quintile	-1.84067	139,509
Kanyama	First Quintile	-1.78968	364,655
Chawama	First Quintile	-1.74443	187,565
Kwacha	First Quintile	-1.73495	133,155
Kabwe Central	First Quintile	-1.72759	118,639
Bwana Mkubwa	First Quintile	-1.70564	118,325
Chililabombwe	First Quintile	-1.61767	91,833
Kamfinsa	First Quintile	-1.57532	86,834
Mazabuka Central	First Quintile	-1.52429	99,832
Chimwemwe	First Quintile	-1.51450	117,341
Kankoyo	First Quintile	-1.48821	45,258
Luanshya	First Quintile	-1.45867	98,498
Chilanga	First Quintile	-1.45090	107,051
Chingola	First Quintile	-1.39566	127,362
Ndola	First Quintile	-1.31463	140,326
Kalulushi	First Quintile	-1.31440	100,381
Mufurila	First Quintile	-1.29150	61,253
Kafue	First Quintile	-1.19744	120,415
Bwacha	Second Quintile	-1.07441	83,721
Chipata Central	Second Quintile	-1.01601	159,325
Chongwe	Second Quintile	-0.93855	141,301
Solwezi Central	Second Quintile	-0.82003	132,532
Mongu Central	Second Quintile	-0.73993	88,827
Choma	Second Quintile	-0.68173	122,736
Monze Central	Second Quintile	-0.58756	101,402
Katuba	Second Quintile	-0.47677	79,306
Kasama Central	Second Quintile	-0.40934	160,088
Chikankanta	Second Quintile	-0.39761	59,909
Mwembezhi	Second Quintile	-0.23813	52,860

Constituency	Material Deprivation	Index	Population
Mpika	Second Quintile	-0.21888	94,417
Chisamba	Second Quintile	-0.15696	103,983
Magoye	Second Quintile	-0.14157	71,231
Mumbwa	Second Quintile	-0.12621	88,698
Kalomo Central	Second Quintile	-0.10549	108,278
Siavonga	Second Quintile	-0.06010	90,213
Kapiri Mposhi	Second Quintile	-0.04569	253,786
Mkushi North	Second Quintile	-0.01518	128,986
Keembe	Second Quintile	0.02274	120,230
Mansa	Second Quintile	0.02410	136,352
Mkaika	Second Quintile	0.04955	95,906
Nakonde	Second Quintile	0.05507	119,708
Bweengwa	Second Quintile	0.06241	60,417
Moomba	Second Quintile	0.08912	30,053
Mbabala	Second Quintile	0.09137	57,937
Pemba	Second Quintile	0.09431	67,187
Sinazongwe	Second Quintile	0.09973	101,617
Feira	Second Quintile	0.10345	24,304
Kawambwa	Second Quintile	0.11519	47,511
Masaiti	Third Quintile	0.13570	60,788
Msanzala	Third Quintile	0.15247	121,429
Nangoma	Third Quintile	0.16610	84,613
Mambwe	Third Quintile	0.19321	68,918
Kaoma central	Third Quintile	0.24004	87,027
Rufunsa	Third Quintile	0.26588	51,002
Mpongwe	Third Quintile	0.28501	93,380
Sesheke	Third Quintile	0.29066	43,848
Serenje	Third Quintile	0.29481	64,432
Chadiza	Third Quintile	0.30575	62,742
Luangeni	Third Quintile	0.30633	75,425
Isoka	Third Quintile	0.33314	72,189
Lundazi	Third Quintile	0.33752	130,325
Itezhi Tezhi	Third Quintile	0.34000	68,599
Kasenengwa	Third Quintile	0.37846	98,117
Mporokoso	Third Quintile	0.39866	41,003
Kafulafuta	Third Quintile	0.39996	43,069
Dundumwezi	Third Quintile	0.40015	80,415
Namwala	Third Quintile	0.40238	102,866
Gwembe	Third Quintile	0.41020	53,117
Lufwanyama	Third Quintile	0.43041	78,503
Bahati	Third Quintile	0.43716	92,040
Nyimba	Third Quintile	0.43717	85,025

Constituency	Material Deprivation	Index	Population
Solwezi West	Third Quintile	0.44182	85,505
Mambilima	Third Quintile	0.44290	25,830
Mwense	Third Quintile	0.44612	61,446
Lubansenshi	Third Quintile	0.44881	52,779
Kasempa	Third Quintile	0.45435	69,608
Sinda	Third Quintile	0.46454	82,864
Katombola	Third Quintile	0.47049	104,731
Milanzi	Fourth Quintile	0.48887	65,079
Mbala	Fourth Quintile	0.49539	110,738
Mkushi South	Fourth Quintile	0.51232	25,548
Chinsali	Fourth Quintile	0.51621	86,723
Mapatizya	Fourth Quintile	0.53599	69,877
Petauke	Fourth Quintile	0.54138	66,281
Lukashya	Fourth Quintile	0.56028	71,736
Solwezi East	Fourth Quintile	0.58094	36,433
Chipangali	Fourth Quintile	0.58633	122,916
Mufumbwe	Fourth Quintile	0.58811	58,062
Mwansabombwe	Fourth Quintile	0.59198	45,294
Mwandi	Fourth Quintile	0.59521	25,054
Nchelenge	Fourth Quintile	0.64319	152,807
Kapoche	Fourth Quintile	0.64623	120,179
Luena	Fourth Quintile	0.64952	50,741
Muchinga	Fourth Quintile	0.65251	53,448
Bangweulu	Fourth Quintile	0.65578	91,569
Senanga	Fourth Quintile	0.66206	70,937
Chitambo	Fourth Quintile	0.66305	48,861
Shiwangandu	Fourth Quintile	0.67260	59,795
Kabompo West	Fourth Quintile	0.67523	44,180
Pambashe	Fourth Quintile	0.68898	41,609
Mpulungu	Fourth Quintile	0.70383	98,073
Chipili	Fourth Quintile	0.71753	32,565
Chasefu	Fourth Quintile	0.73670	99,828
Lumezi	Fourth Quintile	0.75311	93,717
Vubwi	Fourth Quintile	0.76030	44,585
Lunte	Fourth Quintile	0.76284	57,839
Senga Hill	Fourth Quintile	0.77752	92,391
Zambezi East	Fourth Quintile	0.78099	58,334
Chama North	Fifth Quintile	0.79124	53,313
Mafinga	Fifth Quintile	0.79449	65,969
Mfuwe	Fifth Quintile	0.81425	26,811
Lupososhi	Fifth Quintile	0.81677	69,357
Lukulu east	Fifth Quintile	0.81960	58,534

Constituency	Material Deprivation	Index	Population
Chifunabuli	Fifth Quintile	0.84234	83,337
Malole	Fifth Quintile	0.84391	151,058
Mwinilunga	Fifth Quintile	0.84456	104,317
Ikelenge	Fifth Quintile	0.88106	32,919
Chembe	Fifth Quintile	0.90526	43,337
Kanchibiya	Fifth Quintile	0.93417	82,151
Mulobezi	Fifth Quintile	0.94901	30,482
Kabompo East	Fifth Quintile	0.95104	48,141
Nalikwanda	Fifth Quintile	0.96402	40,017
Chama South	Fifth Quintile	0.97035	50,581
Kaputa	Fifth Quintile	1.00250	70,881
Nalolo	Fifth Quintile	1.02343	55,569
Kalabo Central	Fifth Quintile	1.03993	56,963
Luampa	Fifth Quintile	1.05205	43,840
Chienge	Fifth Quintile	1.05906	114,225
Mangango	Fifth Quintile	1.06222	58,423
Chavuma	Fifth Quintile	1.07922	35,041
Chilubi	Fifth Quintile	1.08611	81,248
Chimbamilonga	Fifth Quintile	1.14650	48,633
Liuwa	Fifth Quintile	1.17356	26,479
Zambezi West	Fifth Quintile	1.19594	21,972
Sinjembela	Fifth Quintile	1.23987	93,303
lukulu west	Fifth Quintile	1.30983	27,468
Luapula	Fifth Quintile	1.33037	24,005
Sikongo	Fifth Quintile	1.47674	45,462

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