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# **Zambia Poverty Assessment**

**Stagnant Poverty and Inequality in a Natural Resource-Based  
Economy**

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# Abbreviations and Acronyms

ARVs	Antiretroviral Drugs
BIA	Benefit Incidence Analysis
CCT	Conditional Cash Transfer
CSO	Central Statistical Office, Government of the Republic of Zambia
CSP	Community, Social and Personal Services
FISP	Farmer Input Support Program
FSP	Fertilizer Support Program
FSPF	Food Security Pack Program
GCE	General Certificate of Education
HDI	United Nations Human Development Index
ILO	International Labor Organization
IOB	Policy and Operations Evaluation Department, Netherlands Ministry of Foreign Affairs
ISIC	International Standard Industrial Classification
LCMS	Living Conditions Monitoring Survey
LFPR	Labor Force Participation Rate
LFS	Labor Force Survey
MACO	Zambian Ministry of Agriculture and Cooperatives
MoFNP	Zambian Ministry of Finance and National Planning
MDG	Millennium Development Goal
MoH	Zambian Ministry of Health
NGO	Nongovernmental Organization
SSA	Sub-Saharan Africa
WDI	World Bank World Development indicators
WHO	World Health Organization
ZMK	Zambian Kwacha

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# EXECUTIVE SUMMARY

## *Poverty in Zambia*

i. As in many countries throughout Sub-Saharan Africa and around the developing world, poverty in Zambia is overwhelmingly a rural phenomenon. In 2010 the moderate poverty rate in rural areas was 74 percent, more than double the urban poverty rate of 35 percent. Because roughly two-thirds of the population lives in rural areas, the countryside is home to 80 percent of Zambia's poor. Rural poverty is also far more severe: almost 90 percent of Zambians living below the extreme poverty line are concentrated in rural areas, and the poverty gap index (a measure of how far average incomes fall below the poverty line) is far higher for the rural population than for their urban counterparts (20 percent and 3.7 percent, respectively).

ii. Between the mid-1990s and mid-2000s Zambia achieved substantial progress in reducing poverty nationwide. However, more recent changes in poverty rates have become increasingly slight and uneven, with much of the returns to growth accruing to a relatively small segment of skilled workers the urban formal sector. Since 2006, changes in the rural, urban and national poverty rates have all been statistically insignificant despite the rapid growth of the Zambian economy during the period. From 2000-2010, Zambia's GDP increased by an annual average of 5.7 percent, driven primarily by the mining, construction, financial services and tourism industries, all of which are strongly associated with the urban economy. Job creation, however, has been relatively weak; the fastest-growing sectors account for only a small fraction of the national labor force, and high unemployment across the urban economy has sharply limited the poverty-reducing impact of growth. According to data from Zambia's most recent Living Conditions Monitoring Survey (LCMS) the urban unemployment rate in 2010 was over 25 percent, even after jobs in the large urban informal sector had been accounted for. Increases in income have been heavily concentrated among the most skilled urban workers, with modest secondary impacts on income growth and poverty reduction in the urban sector as a whole.

iii. The rural workforce, meanwhile, has been largely unaffected by the growth of the national economy. Agricultural production has risen in recent years due to a combination of cyclical and structural factors, including the government's efforts to support corn (maize) producers, though abundant rainfall has been the single biggest contributor. Yet despite the very low rate of rural unemployment, which was less than 2 percent in 2010, rural incomes have remained essentially stagnant over much of the past decade, and changes in the rural poverty rate have been limited and uneven. The rural poverty rate registered a statistically insignificant drop of 1 percent between 2006 and 2010, and while more substantial progress has been observed in social indicators, especially school enrollment and completion rates, rural poverty in Zambia remains both pervasive and severe.

iv. Income inequality has also increased considerably since 1996, and despite declining slightly from 2006 the Gini index remained at over 50 percent in 2010. This pattern provides a further indication of the relative concentration of growth in the urban economy and its increasing disparity

with the rural sector. This divide is also evident in the analysis of poverty dynamics by province. Lusaka Province, which is dominated by the capital city, registered the lowest rates nationwide for both moderate poverty (34 percent) and extreme poverty (14 percent). The country's highest poverty rates were observed in Luapula Province, located in Zambia's remote northeast, which recorded an 80 percent rate of moderate poverty and a remarkable 62 percent rate of extreme poverty. Lusaka Province has been strongly impacted by rapid growth in the construction, transportation and service sectors and by the large presence of the public sector with its relatively well-paid workforce. In the overwhelmingly rural Luapula Province growth has been hampered by its relative geographic and economic isolation and by the low productivity of its mostly subsistence-agriculture-based economy.

v. Zambia's rural poor face problems common to other poor countries and . Asset ownership is limited, property rights are frequently insecure, and returns to assets are constrained by a variety of factors, both individual and social. While ownership of basic household goods (such as mattresses, bicycles and especially cellular phones) has become somewhat more common in recent years, more expensive assets like motor vehicles, televisions and household appliances (such as gas or electric stoves, refrigerators or private water pumps) are almost negligible among rural households, and housing conditions remain very basic in rural areas. As previous analytical work on poverty in Zambia has recognized, limited access to investment and working capital stifles the growth of small enterprises and constrains productivity, particularly in rural areas. Uncertainty is endemic in economic relationships, and the poor are most likely to be excluded from the informal systems of mutual support that characterize much of Zambian society.<sup>1</sup> Without the backing of a strong social network or reliable public assistance programs, household-level shocks (such as the death of a primary wage-earner) can have devastating consequences for poor families.

vi. While all of these factors, and many others, contribute to the perpetuation of poverty nationwide, high rates of rural poverty are both a cause and consequence of the way the rural economy is structured. A large majority of the Zambian labor force (over 65 percent in 2010) is engaged in agriculture or closely related activities in the rural economy; most of these workers are employed on smallholder farms or in family-run microenterprises. Because of the abundant labor supply production in nearly all segments of the rural economy is extremely labor-intensive. Farmers, and especially the poorest among them, typically use hand tools and animal traction, while mechanization is essentially limited to a small number of cash-crop plantations. Animal husbandry, agroforestry, fishing and other ancillary rural-sector activities are most often based on a household production model in which labor is the most important component, and even the retail, transportation and service sectors tend to favor labor-intensive practices. With an extremely high labor-to-capital ratio, the returns to labor across all sectors of the rural economy are extremely low.

### ***The Labor Force, Income and Employment Dynamics***

vii. The Zambian labor force numbered 4.94 million in 2010. Of these, 4.45 million were in employed in one of six segments (i.e. the formal, urban informal, rural informal, agricultural production, household enterprise, and multiple economic activities sectors); 484,612 workers, or

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<sup>1</sup> These and other socioeconomic characteristics of poverty in Zambia are described in greater detail in the previous World Bank Poverty Assessment (World Bank 2007).

roughly 10 percent of the labor force, were unemployed, and just over 10,000 were classed as unpaid family workers. According to the available data, in 2010, 60.2 percent of working-age individuals participated in the Zambian labor force, which is comparable to the rate of other African countries. Males registered a slightly higher participation rate than females (at 63 percent and 58 percent, respectively), and individuals in rural areas participated in the labor market at a higher rate than their counterparts in urban areas (at 63 and 56 percent, respectively).

**viii.** The breakdown by age group shows that employment was highest among individuals between 55 and 65 years of age and lowest among those between 15 and 24, which is to be expected given the typical impact of experience and seniority on hiring and worker retention. Also unsurprisingly, higher employment rates were recorded among respondents with more advanced levels of education; however, this trend was not uniform, and employment rates were highest for both those with very high and very low levels of education. The only exception was among respondents who reported having no education at all, but even their employment rate was fairly high given their relatively low labor force participation rate.

**ix.** Although Zambia's macroeconomic indicators tend to emphasize the importance of the mining industry, particularly given its crucial export role, mining is in fact responsible for only a small fraction of employment: just 1.3 percent nationwide. From a labor-market perspective the Zambian economy is characterized by the dominance of three sectors: agriculture and related activities, the public sector, and informal wholesale and retail commerce. The relatively small formal sector and both the urban and rural informal sectors are largely devoted to public and private service employment, with the formal sector focused on public administration and the informal sector concentrated in domestic transportation and trade.

**x.** The largest share of the employed workforce is involved in agricultural production, which in this analysis is classed as neither formal nor informal employment, as those definitions are virtually impossible to apply to agriculture with any meaningful consistency. In 2010, agriculture directly employed almost 1.7 million workers, or 38 percent of the national workforce, with the primary sector as a whole accounting for over 65 percent of total employment. The second-largest employment share was in the multiple activities sector at 21 percent; this segment is also strongly associated with the rural economy and often encompasses employment in agricultural production and related trades. Meanwhile, the formal sector accounted for 780,000 workers nationwide, or just 17.5 percent of total employment. The urban informal sector was responsible for just under 12 percent of total employment, while household enterprises (as the respondent's sole economic activity) accounted for 5.5 percent.

**xi.** The occupational cohort analysis of the labor market shows that agriculture is dominated by unskilled workers, while in both the formal and informal sectors the majority of workers are semi-skilled, with the former employing a substantial number of highly skilled workers. In fact, highly skilled professionals accounted for the largest share of the formal-sector workforce. In the urban informal sector the largest total number of workers was employed in the "service and sales" category. Given that employment in the rural informal sector is concentrated in domestic wholesale and retail trade, the occupational breakdown indicates that services and sales, together with skilled

rural-sector jobs, accounted for the second-largest number of workers in any segment after agriculture.

**xii.** In 2010, the mean monthly wage at the aggregate level was 789,628 Zambian Kwacha (ZMK) or just over US\$164 (using the average exchange rate for 2010 of ZMK 4,797 to US\$1). Formal sector workers earned an average of ZMK 2.65 million or about US\$550 per month, approximately 3.4 times more than the national average. The second-highest earners were those working in the urban informal sector, with a mean monthly wage of more than ZMK 500,000 (or just over US\$100). Mean monthly wages for those working in rural areas but not employed in the formal sector ranged from ZMK 55,799 to 140,917 (or US\$20-29).

**xiii.** Urban unemployment was substantially higher for female workers than for male workers (at 30.6 percent and 20.95 percent, respectively); in the rural labor market the difference was relatively minor, though female unemployment was still significantly higher in percentage terms. The age data indicate that urban youth (between ages 15 and 24) had the highest unemployment rate (54 percent) followed by young adults (age 25-34 at 22 percent). Urban unemployment continued to fall steadily among older cohorts, reaching a plateau at around 8 to 8.5 percent for workers aged 45 and above.

**xiv.** While younger workers with little or no schooling bear the brunt of unemployment in urban Zambia, almost all demographic cohorts experienced double-digit unemployment rates in urban areas, though unemployment dropped dramatically among the most highly educated. Urban residents with no education registered the highest unemployment rate in the country (41.7 percent). Meanwhile, the very low rates of unemployment for individuals with a University or Master's Degree suggest a shortage of highly educated workers nationwide; the total unemployment rate for workers with a University Degree was just over 4 percent, and for those with a Master's Degree it was less than one-half of one percent. Employment in the formal sector was dominated by males, with almost a quarter of all employed men working in this sector, while just over 10 percent of employed women held a formal-sector job.

**xv.** A natural tendency among policymakers is to view the concentration of poverty in rural areas as a cause to focus its antipoverty efforts on generating growth in the rural economy. Typical strategies include boosting agricultural support programs, increasing rural social spending, and extending physical and economic infrastructure through the countryside in the hope of spurring broad-based rural development. With the poorest quintile of the population deriving, on average, almost half of their food consumption from household production, and given the typically low yields produced by semi-subsistence farming, interventions to help boost agricultural productivity can directly benefit the rural poor, both through greater food security and the potential for income generation. Indeed the analysis indicates that the government's current agricultural support efforts have yielded modest, but positive, results. However, the design and implementation of these interventions are critical to their success and further refinements will be needed in order to make these programs more effective. The merits of related interventions, including the setting of price floors for maize production, should be evaluated in greater detail as they fall beyond the scope of this analysis, but given their large fiscal costs and questionable sustainability, alternative policy options should be considered.

**xvi.** When growth in the urban industrial and service sectors is robust and dynamic, creating new jobs as well as boosting incomes, the urban sector generates employment alternatives for the rural labor force and encourages the mobility of labor between sectors. . This process not only enables talented workers to seek greater returns in a more sophisticated urban labor market, but also has the potential to indirectly raise rural incomes by shifting the balance of factor intensities in the rural economy.

**xvii.** Greater labor-force mobility may generate additional returns by alleviating underemployment among the rural labor force, or in cases where family farms are employing labor above its productive equilibrium. At the same time, the progressively increasing density of economic activity in urban centers offers potential returns to scale and agglomeration, as well as diminished transportation costs, further accelerating the productivity of the urban economy.<sup>2</sup> The Zambian labor force, however, remains deeply truncated, with high structural urban unemployment acting as a one-way barrier to the mobility of labor. As a result, the returns to growth in the urban sector have largely failed to pass through to the rural workforce, and rural incomes have stagnated even as growth has rapidly increased.

### ***Poverty and Social Spending***

**xviii.** From a fiscal policy perspective, the movement of the rural poor towards urban centers may also increase the efficiency of social spending. In Zambia, the rural population has far less access to basic infrastructure and social services than do urban residents, which significantly impairs both the progressivity and pro-poor orientation of fiscal policy. Public infrastructure and social services are also far more expensive to provide to a widely dispersed, low-density population. The growth of the urban economy concentrates a greater share of the population in denser settlements, where schools, hospitals, government services, civil infrastructure and economic institutions such as banks and food markets can be provided by both the public and private sectors at a fraction of the marginal cost in rural areas.

**xix.** Although substantial progress has been made in extending key social services to the poor and underserved, the overall fiscal orientation of the Zambian public education and healthcare systems is currently neither pro-poor nor progressive, and across sectors this orientation is the result of unequal access. In terms of total expenditures the education sector accounts for a steady 4 percent share of GDP and 19 percent of all government spending. This share of GDP is comparable with that of both neighboring Namibia and South Africa. In terms of expenditure per student, tertiary education has the highest average followed by secondary, while primary education has the lowest average expenditure per student. In 2009, expenditure per student at the secondary-school level was 3 times that of the primary level, while spending per student at the tertiary level was a full 35 times that of the primary level. These averages place Zambia squarely in the middle of the distribution for Sub-Saharan Africa.

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<sup>2</sup> The economic impact of population shifts and relative economic densities is a highly complex and occasionally contentious subject, and the debates surrounding it extend far beyond the scope of the present analysis. For a far more thorough and detailed account of the potential advantages, and critical limitations, to rising economic concentration see the World Bank's *World Development Report* for 2009.

**xx.** The distribution of benefits of education spending is not progressive, and in fact among students in the richest quintile public spending is dramatically regressive. When considered in aggregate terms—that is, without differentiating by education level—per capita educational transfers are nearly flat across the first four consumption quintiles (i.e. the poorest 80 percent of the population) and then rise sharply for the richest quintile. In net terms—i.e., when households’ out-of-pocket contributions to public education are considered—the distribution of benefits turns slightly progressive for the first four quintiles, as private contributions tend to increase with income level. However, that progressivity disappears at the richest quintile, for which the net benefits of public education significantly exceed those accruing to other income groups. The same conclusions are evident when looking at total net benefits in addition to net benefits per student.

**xxi.** The analysis by educational level confirms that the distribution of tertiary education benefits drives the trend for aggregate education spending. For both primary and secondary schools net transfers per beneficiary are clearly progressive: unitary benefits after discounting households’ out-of-pocket contributions inversely correlate with household consumption. In other words the poorest students tend to benefit the most given the low cost to their families; these cost rise along with the students’ income level, while the benefits they receive remain essentially constant. Interestingly, the richest households contribute almost as much as they receive from public education (both in primary and secondary school), which is a sign of systemic progressivity. By contrast, the net unitary benefits of tertiary education are deeply regressive and pro-rich. The richest quintile captures a disproportionate share of the benefits from tertiary education despite their very high private contributions. Due to their lower contributions, the second-richest quintile actually benefits substantially more from tertiary education than all other consumption quintiles, including the richest.

**xxii.** This regressive and pro-rich distribution is the result of the dramatic overrepresentation of the top quintile in tertiary education. Students from the top quintile constitute about 89 percent of total enrollment in tertiary education, compared to just 42 percent of total enrollment in secondary education. In other words, regressive benefits are driven by inequality of access, not necessarily by public spending itself (which is typical of a universal education system). The selection of analytical scenarios does not change these results: methodological issues may cause imprecision in the analysis but do not call into question the regressive nature of the system.

**xxiii.** By regional standards public healthcare receives significantly less funding than does education. Expenditure data show that total public health spending in 2009 was roughly 2 percent of GDP, well below the expenditure share of many other countries in Sub-Saharan Africa. Between 2006 and 2009, public health spending as a share of total government expenditures stood at 9 percent on average, significantly below the Abuja declaration target of 15 percent. Moreover, the distribution of public health resources in Zambia is not pro-poor. Beneficiaries in the poorest quintile received about a third less in total public healthcare spending than their wealthier counterparts. The share of benefits accruing to the richest quintile is especially disproportionate; the top quintile represents only 15 percent of total beneficiaries but captures a third more in total benefits than the poorest quintile (even after out-of-pocket expenses are considered).

**xxiv.** Meanwhile, the net unitary benefits of public healthcare are regressive, that is, they increase along with the consumption level of beneficiaries. This is a result of public transfers not being targeted to the poor in any meaningful way. Although out-of-pocket contributions are progressive they are not significant even for the richest quintiles, and among the poorest quintiles out-of-pocket contributions are nearly flat, since a substantial proportion of beneficiaries do not pay for care either in health posts or in hospitals. Finally, the share of beneficiaries among the richest quintile that access more advanced forms of care at provincial or national hospitals (rather than local clinics) is twice that of the poorest quintile, which further contributes to the pro-rich nature of the healthcare system.

**xxv.** In terms of public education, healthcare and agricultural support programs the principal obstacle to pro-poor and progressive policy is *access*, the extent to which basic social services reach the poorest members of Zambian society. This is in part a consequence of inadequate program targeting (especially for agricultural support initiatives) and in part a result of the majority of the poor being dispersed throughout remote, low-density rural areas where the provision of services is logistically difficult and structurally expensive. The maintenance and staffing of facilities in remote areas is especially problematic, and service quality varies greatly as a consequence.

**xxvi.** Given the already stark differential in wage rates, poverty incidence and social service access between Zambia's rural and urban sectors, one might assume that a gradual movement of the population toward urban centers would already be underway. However, the relative population shares of rural and urban areas in 2010 (65 percent and 35 percent, respectively) are virtually identical to what they were two decades earlier. During the economic decline of the 1990s the population actually shifted in favor of the countryside, and while the population has again begun to shift in favor of urban centers over the past decade this trend has not kept pace with the growth of the urban economy. The slow growth of urban areas is due to the fact that the rapid increase in Zambian GDP over the past decade has not been accompanied by strong or sustained job creation in the urban economy. Instead, rising incomes have accrued primarily to the employed urban workforce—and especially to its most highly skilled segment—in a context of high, structural urban unemployment.

**xxvii.** The sharp differential between rural and urban employment rates acts as a one-way barrier between the rural and urban labor forces, stymieing (or, as in the 1990s, actually reversing) the trend towards greater concentration of economic activity in urban centers. At the same time full or near-full employment in the rural economy has failed to generate sustained growth in either marginal productivity or labor incomes. Despite modest progress over the decade, the pace of rural poverty reduction has slowed significantly in recent years, and rural poverty rates appear to be stabilizing at a level that is still intolerably high.

### ***Policy Options***

**xxviii.** As Zambia's experience in the 1970s and 1980s amply demonstrated, the growth and diversification of the urban economy cannot be achieved through interventionist economic policies, nor should the government actively strive to ensure the success of specific industries and sectors.

But such policies are in any event unnecessary: Zambia's industrial and service sectors have enormous growth potential, yet their development is too often stifled by an inefficient, occasionally arbitrary regulatory system coupled with (and contributing to) a critical lack of economic infrastructure, both public and private. Eliminating these obstacles will allow growth to occur organically, enabling entrepreneurs and existing firms to more fully exploit Zambia's comparative advantages.

**xxix.** Macroeconomic and regulatory reforms are particularly crucial both to boost overall growth and expand employment opportunities in the urban sector. While Zambia's current rankings in the *Doing Business* indicators are relatively solid (84<sup>th</sup> out of 183 countries worldwide and 7<sup>th</sup> out of 46 in Sub-Saharan Africa [*Doing Business* 2012]), its strong overall performance masks a number of critical weaknesses. Zambia's scores for cross-border trading are among the lowest in the world, an extraordinary liability for a landlocked country. The high costs associated with international trade present serious obstacles to broad-based growth in both the rural and urban sectors: the effective premium on imported fuel products diminishes the competitiveness of manufacturing and diminishes the profitability of Zambia's large domestic transport industry, while agricultural exports—already hampered by weak transportation infrastructure—face additional administrative expenses and time delays that reduce farm incomes and discourage investment in new productive technologies. On the domestic side, regulatory and infrastructure constraints diminish competition by deterring new entrants in growing sectors. In most sectors, including manufacturing and services, a relatively small number of firms exercise some form of monopoly power over different sectors, which translates into significant power over the domestic market. Meanwhile, considerable difficulties in obtaining construction permits not only limit the growth of construction (one of Zambia's most dynamic industries) but also impose high startup costs across sectors, while unreliable electricity, especially in more remote areas, hinders diversification in the rural economy.

**xxx.** Given the intense concentration of poverty in rural areas and its prevalence among small-scale farmers, the government's agricultural policies have considerable potential to improve the livelihoods of Zambia's poor. However, the current arrangement of agricultural support programs continues to be plagued by systemic weaknesses, which recent reform efforts have been unable to adequately address. The government's fertilizer-subsidy regime and other agricultural-input support policies are insufficiently targeted and have been only marginally effective at raising farmer incomes despite their enormous costs, while the public agencies tasked with providing extension services, agricultural research and technological innovation—policy avenues that have a demonstrated ability to produce broad and lasting impacts on marginal productivity—remain underfunded and severely lacking in technical capacity. As a result, research and analytical work on the agricultural sector is limited and in some cases methodologically weak, new scientific and economic technologies are not effectively disseminated to farmers, and extension remains inadequate in both the scope of its outreach and the content of its services.

**xxxi.** The government has steadily increased public funding for agricultural development in recent years, but these resources have been overwhelmingly devoted to the Fertilizer Support Program (FSP, now known as the Farmer Input Support Program [FISP]) and the Food Security Pack Program (FSPP), both of which provide subsidized agricultural inputs. These programs are intended to raise the productivity of small-scale farmers and those facing the threat of food insecurity. However, the

FSP, by far the larger of the two programs, does not expressly target the poor, and its distributional impact among maize producers is neither pro-poor nor progressive.<sup>3</sup> As with education and healthcare services, unequal access drives the distribution of benefits for both the FSP and FSPP. Wealthy farmers are far more likely to participate in these programs than are poor farmers, and as a result, wealthy participants outnumber poor participants at a rate of almost two-to-one. Participant contributions, meanwhile, are imposed at a fixed rate regardless of income level, and neither program uses means-testing as a criterion for inclusion. A set of relatively simple revisions to these programs—including means-testing of beneficiaries, scaling out-of-pocket contributions to participant income, and replacing the current input package with an electronic voucher system—could dramatically improve their progressivity and enhance their impact on the rural poor.

**xxxii.** Nevertheless, it remains unclear to what extent either program has actually succeeded in their common objective of raising cultivation intensity (productivity per hectare), as recent growth in aggregate production appears to be largely the result of expanded cultivation area and favorable weather conditions. Meanwhile, Zambia’s agricultural extension services, which should be disseminating critical information on agronomy techniques and providing high-quality impact analyses, remain severely underfunded and ill-equipped to achieve the increases in production intensity that represent their primary mission as public agencies. The ultimate value of input-subsidy programs must continue to be reassessed and evaluated against other funding priorities.

**xxxiii.** Relatedly, a large and increasing share of agricultural spending is devoted to the Food Reserve Agency (FRA), which under its expanded mandate not only manages the country’s strategic food reserve but also enables the government to directly influence the domestic price of maize (corn), Zambia’s primary staple crop. The FRA’s operations, which involve large-scale maize purchases at prices well above the market rate, constitute an effective production subsidy, which accrues only to the small fraction of Zambian farmers that sell maize to the FRA. FRA purchases are sufficiently large to increase the price of Zambian maize relative to the export-parity price, increasing food costs nationwide and decreasing the competitiveness of Zambian maize as an export crop. More recently, the FRA has begun setting floor prices for maize in an effort to encourage maize production. This policy has proven enormously expensive, with fiscal costs rising to between 1 and 2 percent of GDP, and while the price floor has indeed promoted maize production it has done little, if anything, to raise cultivation intensity. As a result, many farmers have simply shifted to maize production at the expense of other crops, countering the positive trend toward diversification in the agricultural sector. Given the exorbitant cost and questionable effectiveness of FRA policies, and in light of the critical priorities that must be foregone in order to fund the price floor, the World Bank has recommended that the FRA return to its original role of safeguarding food security and has proposed a set of reforms designed to enhance the efficiency of its operations.

**xxxiv.** Among these foregone priorities is the crucial area of social safety nets. As previous World Bank analytical work has noted, the amount spent on the FRA and the FSP annually would be enough

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<sup>3</sup> As described in Appendix F, the distribution of beneficiaries initially appears to be highly progressive across income groups, with the poor—as a share of the total population—being much more likely to participate than the rich. However, wealthier Zambians are also far less likely to produce maize; consequently, the wealthiest farmers—as a share of maize producers—are dramatically overrepresented among participants in both the FSP and FSPP.

to completely close the food poverty gap in Zambia. Agricultural subsidies and price-support programs vastly exceed social welfare spending, with total progressive transfers amounting to less than 5 percent of the combined budget for the FRA and FSP. Targeted cash transfers have a demonstrated ability to immediately alleviate poverty, and by scaling the transfer amounts to specific beneficiary conditions these programs can effectively promote a range of positive social outcomes, simultaneously addressing multiple dimensions of monetary and nonmonetary poverty. At present, the Zambian safety-net system suffers from serious coordination problems, but if an integrated programmatic framework could be developed, it would present a highly attractive alternative to agricultural subsidies and price supports as a means of reducing poverty.

**xxxv.** There is also much to be accomplished in the traditional social sectors. In order to fully reap the benefits of current and future economic growth the government must be prepared to provide social infrastructure and services that are more accurately targeted to the needs of the population, speeding poverty reduction through a pro-poor and progressive policy stance. Even when setting quality considerations aside, it is clear that Zambia's current social expenditure allocation is imperfectly structured, and fiscal policies do not consistently favor the country's poor. Certain elements of social spending are more progressive than others: primary education is far more equitably distributed than either secondary or tertiary education, and access to colleges, universities and technical schools is deeply regressive on the expenditure side. Healthcare access is uneven at all levels of the public health system, and while the poor are less likely to seek care at any level, they face especially difficult obstacles in obtaining more sophisticated forms of treatment at provincial or national institutions. Access is again the primary issue, and the poor are discouraged by the high transportation and opportunity costs of seeking care far from home.

**xxxvi.** Promoting organic growth through the development of a hospitable business and investment climate, avoiding distortive economic interventions, and maintaining a firm and credible commitment to fiscal stability will all be crucial to expanding employment opportunities in a robust and competitive labor market. The high unemployment rate in urban centers, particularly among workers with little education, and the extraordinary size of the informal sector nationwide, are cause for serious concern. In the absence of concerted and sustained efforts to strengthen the policy infrastructure on which the Zambian economy operates these factors will continue to sharply limit the benefits of economic growth.

**xxxvii.** In the shorter term the pervasive problems of uneven access to social services in rural areas, and among the poor nationwide, can be addressed by greater investment in poor and remote communities, though in the case of the latter these will come at a high marginal cost. Investments in rural service provision have generated important gains in social indicators, and the government and its development partners should continue to pursue pro-poor spending policies and strive to enhance the progressivity of its overall fiscal stance. Social safety net programs are an important component in poverty reduction, and recent innovations in conditional cash transfers and other forms of direct poverty alleviation should be given strong consideration as either alternative or complementary policy options. Agricultural development initiatives and other efforts to increase the productive capacity of the rural labor force have resulted in limited but positive effects on rural incomes, and the process of refining these policies and enhancing their targeting should be regarded

as an important priority. However, without sustained job growth in the urban industrial and service economy these efforts will ultimately have only a modest and marginal impact on poverty in Zambia.

**xxxviii.** This poverty assessment examines recent poverty and inequality trends in Zambia in an effort to present an accurate and reasonably comprehensive poverty profile. However, its scope is necessarily limited, and additional analytical work could serve as an important complement to the present analysis. Productive avenues for further study could include a more thorough assessment of the linkages between agricultural productivity and pro-poor growth, especially in rural non-farm activities, as certain comparable countries have reduced poverty by improving agricultural productivity and encouraging diversification in the rural sector. Similarly, additional work could evaluate in greater detail the specific policies that may assist the poor in securing and growing their capital assets, both physical and human, as well as improving the productivity of those assets.

**xxxix.** Areas for further study could also include an examination of the precise nature of rural-urban linkages in Zambia, especially regarding the impacts of rural-urban migration and both domestic and external remittances. Chapter 3, which analyzes the labor market, indicates that all wages in urban areas, even those for unskilled workers, are much higher than the average incomes of the rural population, yet much higher levels of unemployment also persist in urban areas; this situation certainly merits additional analysis. In terms of data and methodology, the survey design of the LCMS could be substantially improved by targeting a representative sample of small towns that do not fit neatly into the binary rural/urban classification. This would enable a more accurate assessment of the dynamic linkages between the rural and urban sectors, and an evaluation of those towns which have grown rapidly and achieved substantial reductions in poverty would make an important contribution to policy design aimed at poverty reduction.

## **Background**

### ***The Zambian Economy***

I. When it achieved its independence from Great Britain in 1964 there was great cause for optimism in Zambia. The new nation was classed as a middle-income country, it enjoyed substantial endowments of both human and natural capital, and it had escaped much of the violence and social upheaval that accompanied independence struggles elsewhere in Sub-Saharan Africa. However, the 1970s and 1980s saw these hopes steadily erode, as the government adopted a set of then-current development strategies based on active economic intervention and a high degree of state control. These strategies included, most notably, the doctrine of import-substitution industrialization, which in Zambia as elsewhere ultimately proved misguided and extremely damaging to both macroeconomic growth and poverty reduction. Sadly, Zambia's experience with these policies, and their lasting consequences, was in many ways emblematic of countries throughout the developing world.

**II.** During the early decades of independence growth was volatile, uneven, and in many cases predicated on an unsustainable arrangements of government policies. Subsidies, price supports and a selectively protectionist tariff structure created artificially profitable industries, which reflected state priorities rather than market conditions, and which could not survive without continued intervention. A boom in the international market price for copper, still Zambia's chief export, created an illusory sense of structural economic growth, but by the mid-1970s the price spike had run its course and the Zambian economy began to contract steadily. The government's interventionist policies were increasingly funded by external borrowing, and the country's debt profile rapidly deteriorated. Meanwhile the agricultural sector, which continues to serve as the primary source of income and employment for a majority of Zambians, was undermined by systematic price distortions, again designed to stimulate the growth of industries that ultimately proved unable to sustain themselves.

**III.** The 1990s saw the advent of multiparty democracy and with it a period of economic liberalization. Subsidies, price supports, distortive taxes and tariff policies were reduced or eliminated, and the government largely abandoned its interventions in specific industries and sectors. But while this period saw reduced inflation and important progress in the diversification of production and exports, the removal of interventionist policies forced a painful reallocation of resources throughout the economy. However necessary, Zambia's reorientation to market liberalism was also costly, and the economy contracted by an average of 1.5 percent per year during the decade.

**IV.** By the 2000s much of the worst had passed, and the reforms of the previous decade were beginning to revive organic growth. But Zambia was now a low-income country, and its poverty rate was over 70 percent. The country had also lost much of its human capital, as skilled professionals and entrepreneurs moved abroad seeking economic opportunities that were now scarce at home, and Zambia's vast deposits of natural wealth had been slowly but steadily depleted. Economic stagnation had been compounded by the deterioration of social conditions; school enrollment and completion rates fell, life expectancy declined, and the national healthcare system was ill-prepared to combat the rise of HIV/AIDS. Public infrastructure, much of which had been built on the strength of copper revenues in the 1960s and 1970s, had steadily deteriorated, as had the overall quality of governance.

**V.** Nevertheless, economic growth continued throughout the decade, reaching an impressive annual average of 5.7 percent, and by 2011 the World Bank again recognized Zambia as a middle-income country. Though leaving much to be desired, a new round of privatization reforms in the mining sector has spurred the revival of the copper and cobalt industries. Driven in part by new growth in mining, the construction and financial sectors are also on the rise, as is tourism and, more recently, the agricultural sector. Poverty rates have declined since the mid-1990s, falling to just over 60 percent in 2010, and important improvements have been observed in social indicators.

**VI.** Poverty reduction has slowed considerably, however, since the mid-2000s; recent changes in the national poverty rate have become increasingly ambiguous, and the future of the poverty profile remains in doubt. This is largely an effect of uneven income growth in the urban and rural economies. Rising incomes have been densely concentrated among a relatively small segment of

the urban workforce, while extremely high urban unemployment rates effectively block the rural labor force from participating in the country's more dynamic economic sectors, a phenomenon that will be discussed in detail throughout this analysis.

**VII.** The principal challenge faced by Zambian policymakers and the international donor community will be to extend the returns to growth throughout the country and especially to the rural poor. It is unlikely, however, that this will be achieved through standalone growth in the rural economy or through any of the present rural development strategies available to policymakers. In Zambia and elsewhere attempts at reducing poverty through direct intervention in the rural sector have proved both highly expensive and administratively demanding, and even the most successful rural development policies have produced only modest and dubious results. Marginal improvements in economic and social indicators can be accomplished through targeted interventions in the rural economy, but enduring, structural income growth and the widespread reduction of poverty will only be achievable through broad-based employment creation in the urban industrial and service sectors. To understand why, it is necessary to appreciate the peculiar nature and causes of both rural and urban poverty in Zambia and to recognize the long-term relationship between them.

#### ***A Note on the Data***

**VIII.** Before proceeding further it should be noted that the primary data source for this analysis is Zambia's 2010 Living Conditions Monitoring Survey (LCMS), which provides a detailed assessment of the population's current socioeconomic status and enables the evaluation of trends across multiple dimensions of poverty and wealth. Complementary and comparison data are provided by previous iterations of the LCMS as well as other government reports and previous World Bank analytical work. This analysis is therefore current as of 2010, and with the exception of select macroeconomic indicators 2010 is the final year for which data are available. A detailed discussion of the LCMS surveys, comparability issues between the most recent rounds, and details of the poverty measurement methods are discussed in Appendix A.

# Chapter 1: Poverty and Inequality

## A. Introduction

**1.1 Following a long period of low growth and declining per capita income Zambia has achieved a crucial restructuring of its economic policies, enabling the country to sustain the longest and faster period of economic expansion since independence in 1964.** After a long and difficult period of structural adjustment in the 1990s, which saw per capita GDP decline steadily as the economy reallocated resources to meet the demands of newly liberalized markets, the 2000s brought a return to growth, with GDP rising by an annual average of 5.6 percent over the decade. While poverty reduction has slowed in recent years, both moderate and extreme poverty rates fell significantly from the mid-1990s through the mid-2000s.

**1.2 Faster growth has been the result of increases in productivity in the key leading sectors, sustained by an improved macroeconomic environment and structural reforms.** Sound economic policies in the context of a favorable external environment have contributed to increased investment and rising incomes. A more secure macroeconomic stance, supported by official debt relief and concessional financing, helped to achieve a substantial reduction in public external debt. Fiscal deficits were moderate and sustainable, while inflation has both fallen considerably (from about 200 percent annually in the 1990s) and stabilized at single-digit levels.

**1.3 Major structural reforms, including efforts to reduce the government's role in key sectors, have succeeded not only in reducing fiscal pressures, but have also improved productivity in industries such as mining, construction and tourism.** The business environment across sectors, despite significant ongoing challenges, has improved substantially in the past decade. The agricultural sector has also exhibited strong growth in recent years, though this has been due to a mix of exogenous factors (i.e. good weather with steady rainfall) and the government's relatively expensive fertilizer subsidies, as well as organic growth in commercial agriculture. Low marginal productivity, however, remains a major constraint to income growth in rural areas and especially among the rural poor, who depend on agriculture for food and livelihood.

**1.4 Zambia's steadily rising GDP has been led by growth in the copper mining industry, which has benefited from higher global prices but also from substantial increases in foreign direct investment, which has been made possible by the structural reform of the sector.** The mining industry, however, employs only a small fraction of the Zambian labor force (just 1.3 percent) and the returns to growth in this sector have been very narrowly concentrated. In addition to mining, significant expansions have been observed in the construction and service sectors, and to a lesser degree in manufacturing. In terms of value-added the mining sector grew by an average of 10 percent from 2001 to 2011, while the construction sector grew by 15 percent, transport and communications by an average of 11 percent, and tourism-related activities by 8 percent.

Agriculture, which grew at an average rate of only 3 percent between 2001 and 2011, has expanded by more than 10 percent on average over the last four years.

**1.5 However, this record of growth has had an increasingly limited impact on poverty in recent years.** While positive economic growth rate is a powerful means in eradicating poverty (according to a strand of the literature, growth is the most powerful for poverty reduction, e.g., Dollar and Kraay 2002) since it raises poor people's wages, employment and productivity, this contrast significantly with the realities in Zambia as well as in many Sub Saharan African countries. In Zambia growth has not been sufficient pro-poor in both its quality and structure; growth in consumption has not spread to poorer places, groups and households (Sassa and Carlsson, 2002). Moreover, growth did not allow sufficient job creation since it has been mostly concentrated in mining, trade, and construction which are all mainly capital intensive and urban-based sectors (Cheelo and Zulu 2007). Zambia's overall poverty incidence remains high, at 60.5 percent according to World Bank estimates based on the 2010 Living Conditions Monitoring Survey (LCMS), slightly but not significantly lower than the estimates for 2006 (62.3 percent). In 2011, Zambia ranked 164<sup>th</sup> out of 187 countries in the UN Human Development Index (HDI).

**1.6 The high welfare inequality faced by Zambians constitutes also an obstacle to poverty alleviation, and partly explains why growth has not adequately translated into poverty reduction.** The Gini coefficient was 52.0 in 2010, again only marginally lower than in 2006 (52.6). There is increasing evidence that income poverty is reduced faster where there is greater equality (Gallup, Radelet and Warner, 1997; Roemer and Gugerty, 1997). Inequality may play a crucial role in the transformation of growth to poverty reduction; less initial inequality would imply a greater (absolute) value of the income elasticity, ceteris paribus, consequently a unit of growth would be accompanied by a larger amount of poverty reduction (Adams 2004; Bourguignon 2003; Easterly 2000; Epaulard 2003; Fosu 2009; Kalwij and Verschoor 2007; Ravallion 1997). When income and assets distributions are uneven, as it is the case in Zambia, the poorer are significantly disadvantaged in the growth process (Gugerty and Timmer, 1999)

**1.7 Nevertheless, a number of important social indicators have shown signs of improvement in the past decade.** There has been significant observed progress in education, including increases in primary and secondary school enrolment rates and marginal improvements in the youth literacy rate. According to the World Bank's World Development Indicators (WDI) total primary enrolment increased by 28 percent between 2000 and 2009, and the primary completion rate rose by 32 percent. Improvements in youth literacy rates during the same period were positive, but comparatively modest, with just a 2 percent increase in female literacy and a 9 percent increase in male literacy. Health outcomes have also improved, in particular with respect to mortality rates. Between 2000 and 2009 the under-5 mortality rate dropped from 16.6 to 14.1 percent, infant mortality fell from 99 to 86 per 1000 live births, and the maternal mortality rate declined from 6 percent to 4.7 percent.

**1.8 Despite these improvements, considerable challenges remain on a number of fronts.** Moderate and extreme poverty rates have been declining over the past decade, but both remain extremely high, and in recent years national-level changes have become statistically insignificant. While notable achievements have been made in improving access to education, the low overall

quality of education, and in particular the high student-to-classroom ratios (IOB, 2008) as well as long distances that students must travel to reach schools in rural areas (World Bank 2012a), are important unresolved issues. While laudable achievements have been made in combating the spread of HIV/AIDS, with prevalence rates now on the decline, HIV prevalence is still relatively high among adults. Despite these improvements in health outcomes, poor nutrition, which is directly linked to health, remains an important issue. In 2010, 45 percent of the under-five children suffer from stunting (moderate and severe)<sup>4</sup> – one of the highest in sub-Saharan Africa, which affects them by producing illness and death, but also reduced cognitive ability and poor learning. Numerous challenges persist across multiple dimensions of social and economic development, ranging from female empowerment to environmental protection.

**1.9 As in many developing countries, poverty in Zambia is heavily concentrated in rural areas.<sup>5</sup>**

Over the past decade the returns to national economic growth have accrued primarily to educated workers in urban centers (especially Lusaka and the Copperbelt region), while the more rural provinces along the nation’s periphery (especially Eastern, Northern, Western and Luapula) remain the poorest in the country.

**1.10 The rural-urban population distribution in 2010 (39 percent urban, 61 percent rural) was almost identical to that in 1990 (38 percent to 62).** Figures for 2000 and 2006 show a slight *negative* trend in the relative growth of urban centers during this part of the period, with population shares falling to roughly 35 percent urban versus 65 percent rural. This was in part the product of liberalization reforms in the agricultural sector, which boosted rural incomes in the late 1990s and 2000s at a time when industry was largely stagnant and many urban sector firms were in decline. Urban unemployment currently remains at over 25 percent, and while the 2010 data suggest that the urban population share is again on the rise, these changes are far too slight to infer a lasting shift in long-term trends.

**1.11 In this chapter we explore the evolution and distribution of poverty in Zambia.** The first section describes poverty trends from 1996 to 2010 at the national, urban, rural, and provincial levels. Given recent changes to the 2010 LCMS household survey and consequent comparability issues with previous data, we apply a survey-to-survey imputation method to determine the poverty trend from 2006 to 2010. Section B explores distributional changes in consumption expenditures including growth incidence curves. Section C presents trends in non-monetary indicators of poverty, namely health and education, and Section D discusses inequality trends.

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<sup>4</sup> Most recent year available from UNICEF (2012).

<sup>5</sup> Zambia’s Central Statistical Office defines “urban” and “rural” according to a commonly used international standard: an urban area must have at least 5,000 residents, fewer than half of whom are engaged in agriculture, and it must have basic civil and social-service infrastructure, including tarred roads, piped water, a post office, and at least one school and healthcare facility. It should be borne in mind that this is a binary classification and that substantial differences exist within, as well as between, urban and rural areas.

## **B. Poverty Trends**

**1.12** To monitor living conditions in Zambia, the **Zambian Central Statistical Office (CSO)** and its partners have been collecting nationally representative household survey data since 1996 through the **LCMS**. The design of the 2010 LCMS questionnaire, particularly the consumption module, changed substantially from 2006 (See Appendix A for details on the LCMS). Also, the survey period was a couple of months later in 2010 compared to the previous round, raising issues of seasonality. The consumption module of the 2010 LCMS questionnaire has many new and advantageous features, which significantly improve the accuracy of poverty measurement. However, due to these changes, and others, comparability of poverty estimates between 2010 and previous years was compromised.

**1.13** Given this comparability issue, we applied a survey-to survey-imputation methodology to track poverty over this period (see Box 0.1). **Hereafter, the revised values will be noted as 2006\*, where the asterisk indicates an imputed value.** The 2006\* values are compatible with 2010 estimates.

### Box 0.1 Poverty Measurement and Comparability

**For the 1996 to 2006 period, we use the CSO's revised poverty estimates and trends.** To establish a comparable trend between 1996 and 2006, the CSO Poverty Trends Report (2010) defined a comparable basket of goods and services across surveys and retroactively applied a common methodology across 1996, 1998, 2004, and 2006 rounds of the LCMS. Note that there is an additional LCMS survey for 2002/03, but this survey year was not included in the Poverty Trends Report and thus will be excluded here as well (See Appendix A for details on the LCMS).

**However, applying a similar method to the 2010 LCMS data was not considered appropriate for several reasons.** First, given the major changes to the 2010 LCMS questionnaire design, there may be systematic differences in the way households respond to the new survey (i.e. the expanded list of consumption items mentioned above). If this is the case, measured consumption would be biased even if items in the consumption aggregate were limited to those captured in both surveys. Second, the period in which the 2010 LCMS was conducted was later in the lean season than the 2006 LCMS. As consumption patterns and prices may vary by season, the approach above can only correct for differences in seasonal prices, not differences in seasonal consumption patterns. Third, as this approach requires that the poverty line be adjusted for inflation, the poverty estimates are sensitive to the choice of inflation factor used. Given recent concerns over the use of the CPI index, the accuracy of this adjustment is called into question.

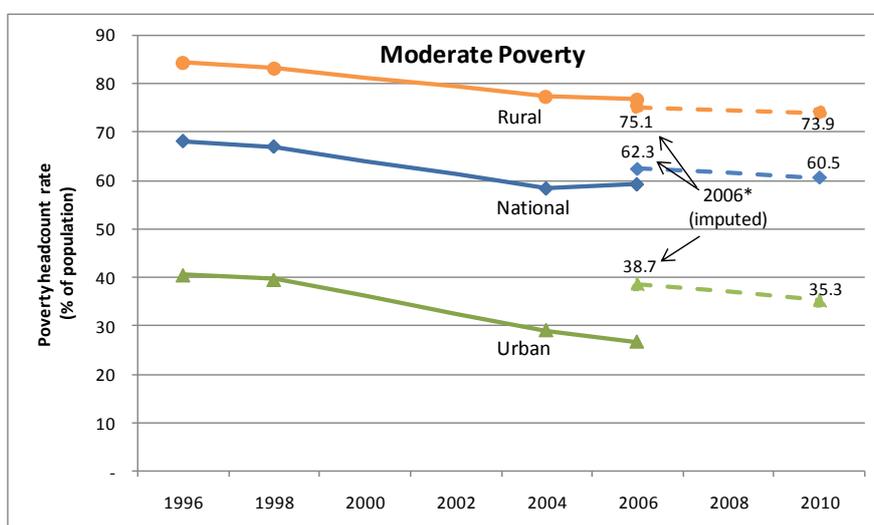
**This break in comparability between the 2006 and 2010 rounds of the LCMS presents an opportunity to redefine the poverty measurement methodology for 2010.** The consumption aggregate was redefined according to best practices. Separate rural and urban poverty lines were introduced to better reflect the difference in the cost of living between rural and urban areas, and spatial price adjustments across provinces were made. Continued application of this methodology is recommended for future survey rounds so that poverty trends will be consistently measured and the spatial distribution of poverty can be properly identified.

**To bridge the comparability gap between 2006 and 2010 we apply poverty mapping techniques (small area estimation-based methods) to track poverty over the period.** By applying the approach of Christiansen et al. (2011), we can circumvent the issue of different survey designs, seasonality, and poverty-line updates. This approach consists of three steps. First, we construct the consumption aggregate and poverty line for one of the survey years (i.e. 2010) to estimate poverty in that year, we then model consumption in that year based on various household characteristics. Second, we estimate consumption in 2006 in 2010 prices using the model from the previous step. As we only need the consumption aggregate to be constructed for one year, this approach addresses the comparability issues stemming from changes in the questionnaire design. The estimated consumption can be thought of as what consumption would have been recorded as had the 2010 questionnaire been used in 2006. This approach also addresses the seasonality issue, as predicted consumption in 2006 corresponds to the period of the 2010 model (i.e. February/March), rather than the actual survey period in 2006. Third, now that we have revised our consumption estimates for all households in 2006, we can estimate poverty using the 2010 poverty lines. Since the consumption aggregates (predicted and measured) and the poverty lines are all in 2010 prices, there is no need to adjust for inflation between survey years. However, the main assumption of this approach is that the model is suitable in both years. We discuss this methodology in more detail in Appendix A.

**National, Urban and Rural Poverty Trends (1996-2010)**

**1.14 In 2010, about 61 percent of Zambians were living in moderate poverty, and 39 percent were in extreme poverty.** Figure 0.1 and Figure 0.2, below, show the incidence of moderate and extreme poverty<sup>6</sup> at the national level as well as among urban and rural areas in 2010. The incidence of moderate poverty is over twice as high in rural areas (74 percent) as in urban centers (35 percent). In terms of extreme poverty, the picture is similar, but the rural-urban difference is even greater.<sup>7</sup> In rural areas, 53 percent of the population lives on less than the cost of the basic food basket, four times higher than the rate in urban areas (13 percent). This implies that the majority of rural residents struggle to meet even basic food needs (see Chapter 0 for a more thorough discussion of the incidence and correlates of poverty in rural and urban areas).

**Figure 0.1 Moderate Poverty Rates, 1996-2006 and 2006\*-2010**

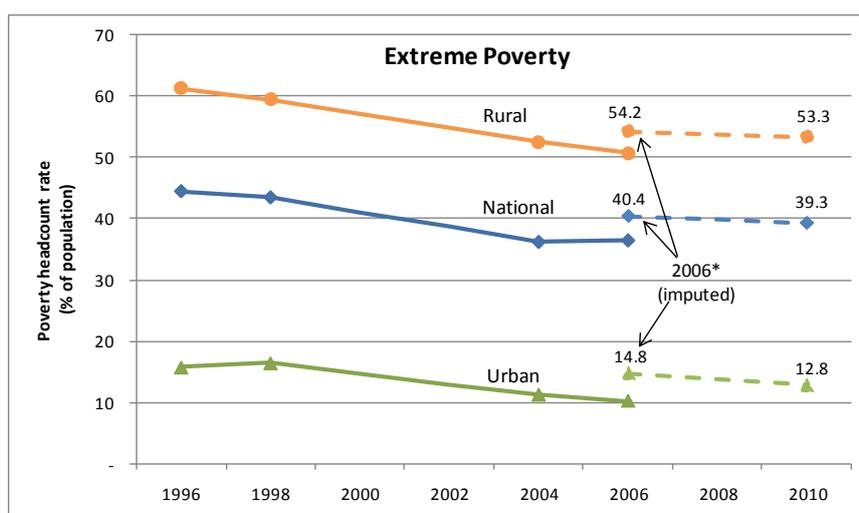


Source: World Bank estimates using 2006 and 2010 LCMS; CSO, Poverty Trends Report (2010)

<sup>6</sup> People living in moderate poverty are those whose total expenditures are below the national poverty line. People living in extreme poverty have total expenditures that are below the food-poverty line.

<sup>7</sup> It should be noted that rural poverty rates may be somewhat inflated due to the inability to correct for rural-urban price differences in costing-out the food basket for the poverty line. Separate price data for rural and urban areas are not available, and the unit values derived from the LCMS are noisy, as non-standardized units (e.g. heaps) are frequently used.

Figure 0.2 Extreme Poverty Rates, 1996-2006 and 2006\*-2010



Source: World Bank estimates using 2006 and 2010 LCMS; CSO, Poverty Trends Report (2010)

**1.15 Poverty is highly concentrated in rural areas, which are home to 80 percent of Zambia's poor.** This is due to a combination of a higher poverty incidence and larger population share, as roughly two-thirds of Zambians live in rural areas. As noted above, persistently high urban unemployment has prevented rural-urban migration from significantly altering the population distribution over time. Consequently, 80 percent of the moderately poor and 89 percent of the extremely poor are concentrated in rural areas, with little incentive to seek employment elsewhere. Despite the high urban unemployment rate, only 20 and 11 percent of the moderately and extremely poor, respectively, reside in urban areas (see Table 0.1).

Table 0.1 Distribution of the Poor and the Total Population, by Urban and Rural Areas, 2010

	Population share (%)	Distribution of moderately poor (%)	Distribution of extremely poor (%)
Urban	34.7	20.2	11.3
Rural	65.3	79.8	88.7

**1.16 Although poverty remains pervasive, national poverty rates declined from 1996 to 2006.** Over this period, the national moderate-poverty rate fell from 68.1 to 59.3 percent. This drop is due to large reductions in urban poverty rates (from 40.5 to 26.7 percent) and was modest reductions in rural poverty rates (from 84.2 to 76.8 percent). Extreme poverty followed the same declining trend, but compared to moderate poverty, the decrease in the number of Zambians living below the food-poverty line was somewhat smaller. The national headcount ratio for extreme poverty fell from 44.5 to 36.5 percent. However, more rural Zambians have managed to escape extreme poverty than their urban counterparts; the headcount ratio declined from 61.3 to 50.7 percent in rural areas and from 15.8 to 10.2 percent in urban areas.

**1.17 In 2010, 5.1 million Zambians were living in extreme poverty, with 7.9 million in moderate poverty.** Even though the percentage of Zambians living in moderate poverty declined between 1996 and 2006, the absolute number of poor increased from 6.5 million in 1996 to 6.9 million in 2006. Put simply, the population growth rate exceeded the rate of poverty reduction. However, the

total number of poor increased only in rural areas. In 2006, 5.9 million rural Zambians were moderately poor, compared to 5.1 million in 1996. By contrast, in urban areas the number of moderately poor dropped from 1.4 million in 1996 to 1.1 million in 2006. The number of extremely poor also increased in rural areas, rising from 3.7 million in 1996 to 3.9 million in 2006, but decreased in urban areas, falling from 0.6 million in 1996 to 0.4 million in 2010.

**1.18 The poverty incidence trends between 2006\* and 2010 for national, rural, and urban populations show slight decreases in both moderate and extreme poverty, though the observed changes are too small to be statistically valid.** (As described above, due to comparability issues 2010 poverty rates should only be compared with the imputed 2006\* estimates to calculate trends over this period.) Moderate poverty dropped from 62.3 percent to 60.5, urban moderate poverty fell from 38.7 to 35.3, and rural moderate poverty from 75.1 to 73.9 percent. Extreme poverty dropped from 40.4 to 39.3 percent, 14.8 to 12.8 percent in urban areas, and 54.2 to 53.3 percent in rural areas. Again, it is important to recognize that these changes are statistically insignificant and their analytical limitations should be taken into account (see Appendix A). In particular, it should be noted that the higher imputed urban poverty incidence for 2006\* is due primarily to the fact that different urban and rural poverty lines were used for 2010, and the new urban poverty line was higher than the single national poverty line used for the 1996-2010 period.

**1.19 The poverty gap and other measures of the severity of poverty followed a similar descending trend, as the headcount ratios declined over both periods, 1996-2006 and 2006\*-2010** (see Table 0.2). The poverty gap index<sup>8</sup> for moderate poverty was 27 percent of the poverty line and 14 percent for extreme poverty in 2010. The severity of poverty is greater in rural areas for both moderate and extreme poverty, though the gap has widened more for moderate poverty. This seems to be the result of deepening moderate poverty in rural areas; however, this effect has been offset by decreases in moderate poverty in urban areas. Over the 1996-2006 and 2006\*-2010 periods, the squared poverty gap declined gradually for moderate poverty. Meanwhile, the extreme-poverty gap declined only slightly between 1996 and 2004, and has remained fairly static since then, indicating that the situation of the extremely poor persists with only marginal improvements.

Table 0.2 Trends in Poverty Incidence, Depth and Severity, 1996-2006 and 2006\*-2010

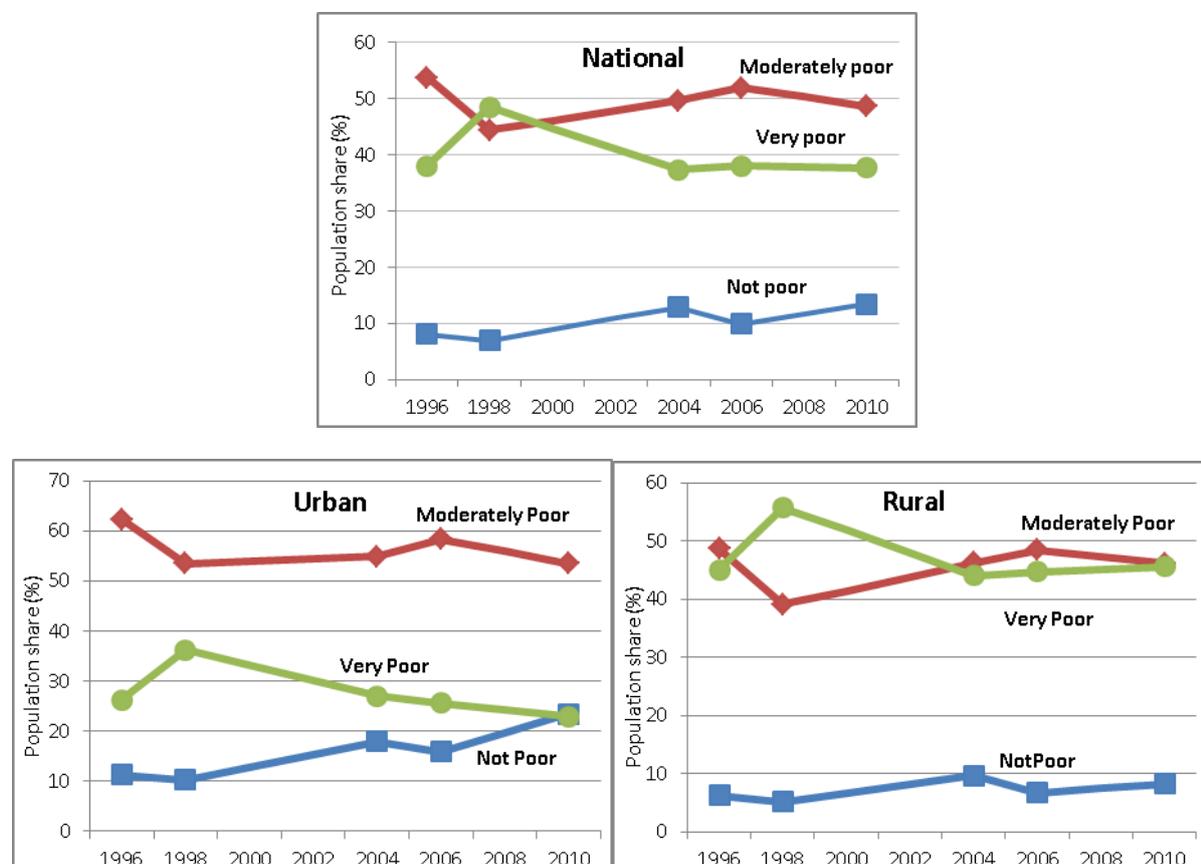
Moderate Poverty									
	Poverty Headcount (%)			Poverty Gap (%)			Squared Poverty Gap		
	National	Urban	Rural	National	Urban	Rural	National	Urban	Rural
Method A									
1996	68.1	40.5	84.2	33.7	13.9	45.2	20.5	6.7	28.5
1998	67.0	39.5	83.2	33.6	14.6	44.8	20.6	7.4	28.4
2004	58.4	29.1	77.4	28.3	10.3	39.8	16.9	5.0	24.6
2006	59.3	26.7	76.8	28.6	9.4	38.9	17.1	4.5	23.8
Method B									
2006*	62.3	38.7	75.1	28.1	14.6	35.3	15.8	7.4	20.4
2010	60.5	35.3	73.9	27.1	13.1	34.5	15.2	6.5	19.8
Extreme Poverty									

<sup>8</sup> The poverty gap index measures the average shortfall of individual consumption below either the moderate or extreme poverty line and is expressed as a percentage of the relevant poverty line.

	Poverty Headcount (%)			Poverty Gap (%)			Squared Poverty Gap		
	National	Urban	Rural	National	Urban	Rural	National	Urban	Rural
<b>Method A</b>									
1996	44.5	15.8	61.3	17.7	4.4	25.5	9.2	1.9	13.5
1998	43.5	16.5	59.5	17.4	5.1	24.7	9.2	2.3	13.3
2004	36.3	11.2	52.4	13.9	3.3	20.8	7.1	1.4	10.8
2006	36.5	10.2	50.7	14.0	2.8	20.0	7.2	1.1	10.4
<b>Method B</b>									
2006*	40.4	14.8	54.2	14.9	4.2	20.6	7.3	1.7	10.3
2010	39.3	12.8	53.3	14.4	3.7	20.0	7.1	1.6	10.0

**1.20** In terms of how Zambians perceive themselves, a smaller share of the population considered themselves to be poor in 2010 compared to previous years, although about 85 percent still think of themselves as poor (see Figure 0.3). The percentage of Zambians who feel “very poor” has remained relatively constant since 2004, the percentage of those who regard themselves as moderately poor decreased, while the percentage of those who do not consider themselves poor increased. This modest improvement in subjective poverty is consistent with the slight decrease in the objective, consumption-based measures. The reduction in self-assessed poverty may be a consequence of the current economic situation and reflect optimistic attitudes about continued economic growth, particularly in the mining, construction, and tourism sectors, and in other urban-based industries such as commercial transport and consumer retail.

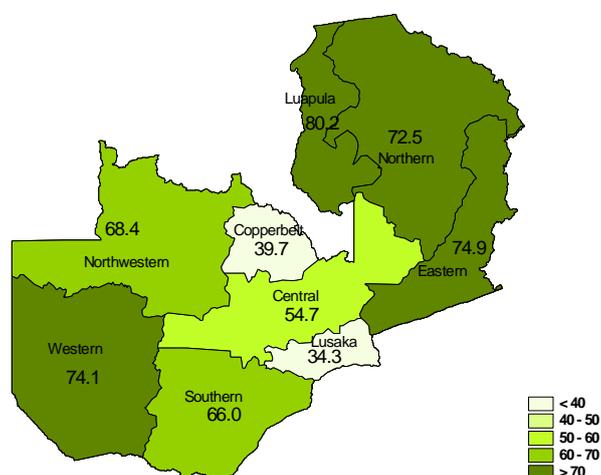
Figure 0.3 Subjective Poverty Trends, National, Rural and Urban Areas, 1996-2010



## Provincial Poverty Trends

**1.21 The distribution of moderate and extreme poverty across Zambia’s provinces reveals important regional dynamics.** In Lusaka, the poverty rate is lowest for both moderate poverty (34 percent) and extreme poverty (14 percent). The highest moderate and extreme poverty rates are found in Luapula, at 80 and 62 percent, respectively. Most provinces have moderate poverty rates of between 66 and 80 percent, and extreme poverty rates of between 42 and 62 percent. Lusaka continues to benefit from rapid growth in the construction, transportation and service sectors, fueled by domestic and foreign investment and by the relatively large presence of the public sector. In Luapula, on the other hand, growth is hampered by the relative isolation of the province and the low productivity of its mostly subsistence-agriculture-based economy (see Figure 0.4 and Figures B1-B3 in Appendix B).

Figure 0.4 Poverty Headcount Ratio (%) by Province, 2010



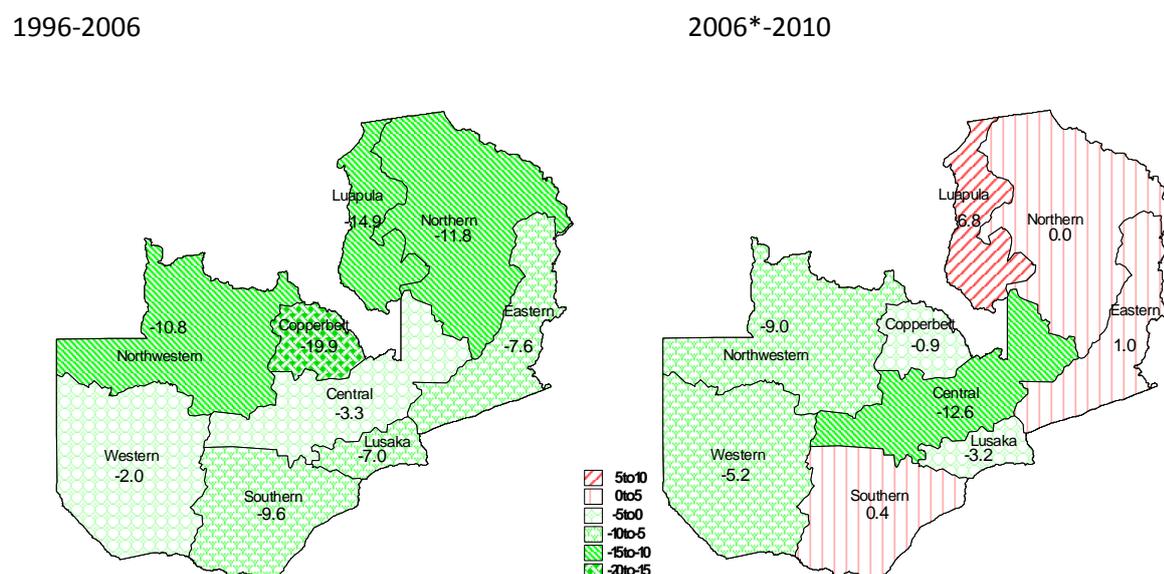
**1.22 While poverty rates by province give a general sense of the geographical distribution of poverty, population data demonstrate the relative contribution of each province to the national poverty rate.** Table 0.3, below, shows that Lusaka and Northwestern Provinces have the smallest fraction of poor people, while the Eastern and Northern Provinces have the largest. Lusaka has the country’s second-largest population (13.5 percent) after the Copperbelt (14 percent), but due to its low poverty rate it accounts for only a small fraction of the total poor population (8 percent for moderate poverty and 5 percent for extreme poverty). Luapula Province, with the country’s highest poverty rate, contributes significantly more to national poverty, even though its population is relatively small (8 percent).

Table 0.3 Poverty Incidence and Distribution, by Province, 2010

Province	Population Share (%)	Moderate Poverty		Extreme Poverty	
		Poverty Incidence (%)	Distribution of Poor (%)	Poverty Incidence (%)	Distribution of Poor (%)
Central	10.6	55.7	9.6	30.5	8.2
Copperbelt	14.0	39.7	9.8	18.3	7.0
Eastern	13.7	74.9	16.9	55.1	19.2
Luapula	8.2	80.2	10.8	61.8	12.8
Lusaka	13.5	34.4	7.7	13.8	4.8
Northern	12.7	72.5	15.3	50.2	16.3
Northwestern	5.8	68.4	6.6	48.7	7.2
Southern	12.9	66.0	14.1	42.0	13.8
Western	7.6	74.1	9.3	56.0	10.8

**1.23 Luapula, Eastern, and Southern Provinces have all seen their poverty headcount rates increase from 2006\* to 2010 (Figure 0.5).** These same provinces had previously, from 1996 to 2006, experienced reductions in poverty. In the other provinces the incidence of poverty declined over both periods, but to different degrees at different times. For example, in the Copperbelt the decrease in poverty was enormous over the 1996-2006 period (-19.9 percent), but change was almost negligible from 2006\* to 2010 (-0.9 percent). Central Province also experienced declining poverty levels, but here the decrease was much greater in 2006\*-2010 (-12.6 percent) than in 1996-2006 (-3.3 percent). The case of the Copperbelt is interesting, as the large drop in the poverty headcount rate corresponds to a period of economic reforms that had a positive impact on the growth of the mining sector. The data from 2006-2010, however, seem to indicate that after the consolidation of the mining industries following the reform process the sector's contribution to poverty reduction has almost disappeared. The low or even negative job creation rates observed in the Copperbelt confirm this. The jobless growth in the mining sector is thus the result of the reforms which enabled private firms to invest more in the mining sector and expand their operations, but using a production model increasingly capital intensive.

Figure 0.5: Percent Changes in Poverty Headcount by Province, 1996-2006 and 2006\*-2010



**1.24 The poverty gap decreased the most in Central and Northwestern Provinces from 2006\* to 2010. Luapula, Northern, and Eastern Provinces continue to have high poverty gaps, all of which increased over the period (Figure 0.6). However, from 1996-2006 all provinces seem to have experienced reductions in poverty gaps, ranging from 12.2 percentage points in Luapula to 1 percent in Western Province. The picture is similar for the severity of poverty (Figure 0.7). Central and Northwestern Provinces enjoyed the greatest reductions in the severity of poverty over 2006\*-2010, while poverty severity worsened in Luapula, Northern, and Eastern Provinces. Similarly, between 1996 and 2006, all provinces exhibited improvements in the severity of poverty, except in Western Province, where there was no significant change. The evidence from the regions shows that poverty is not homogenous; there are important variations in the incidence and the severity and depth of poverty among regions as argued also by Sassa and Carlsson (2002).**

Figure 0.6 % Change in the Poverty Gap Index by Province, 1996-2006 and 2006\*-2010

1996-2006

2006\*-2010

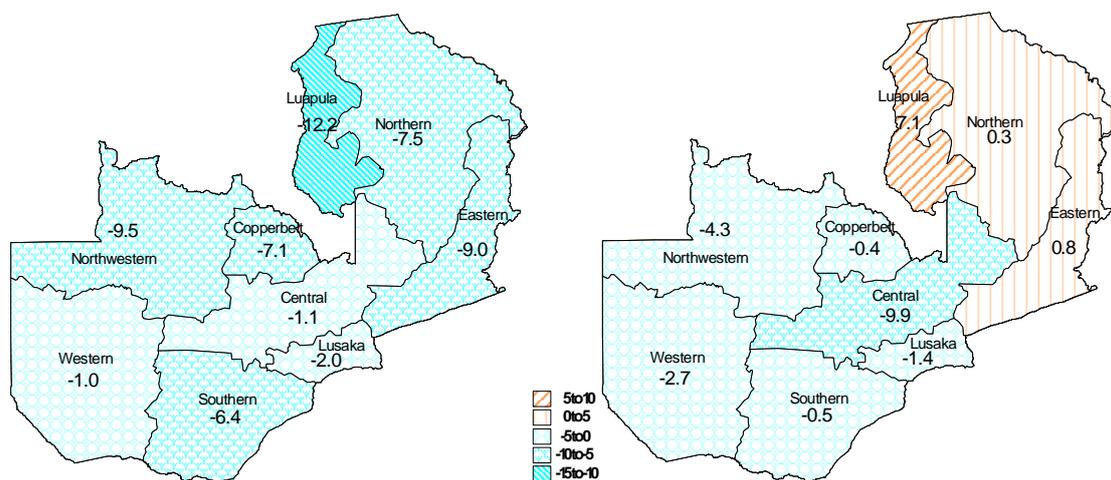
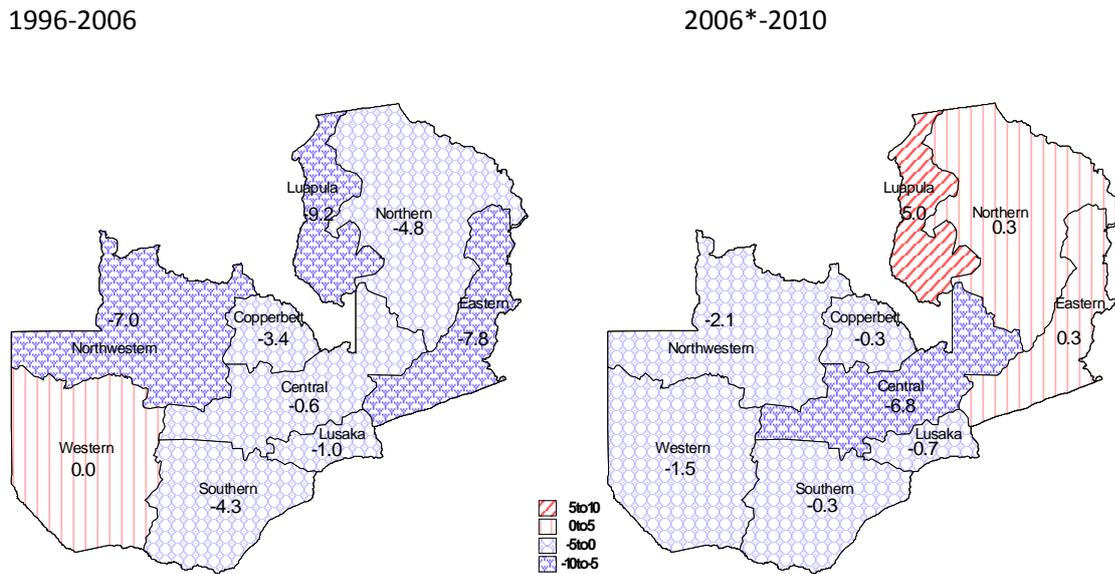


Figure 0.7 Change in the Squared Poverty Gap by Province, 1996-2006 and 2006\*-2010

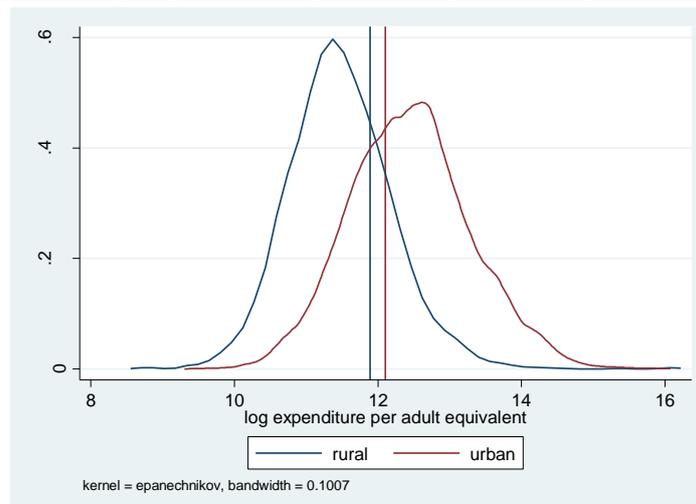


### C. Distributional Changes in Consumption Expenditures

**1.25** To better understand the trends in poverty incidence, the poverty gap index and the severity of poverty more generally, it is useful to analyze the changes in the distribution of consumption expenditures. On average, consumption expenditures are much higher in urban areas than in rural, and the consumption gap between the rich and poor has widened over time.

**1.26** The urban and rural distribution of (log) expenditures per adult in relation to their respective poverty lines (Figure 0.8) illustrates that the share of rural Zambians with standards of living below the rural poverty line (i.e. the blue vertical line on the left) is much larger than the share of urban inhabitants living below the urban poverty line (the red vertical line). The urban distribution is also wider than the rural distribution, indicating greater urban inequality, which is confirmed by the higher consumption-based Gini coefficient in urban areas, (see Figure 0.16).

Figure 0.8 Distribution of (Log) Expenditures per Adult Equivalent, by Urban and Rural Areas, 2010



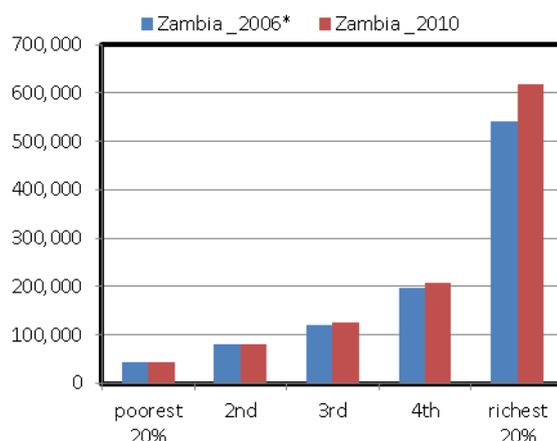
**1.27** In 2010, half of the urban population had monthly consumption expenditures of less than ZMK 248,463, and half of rural population had consumption expenditures of less than ZMK 92,959. Median consumption expenditures per adult equivalent increased more in urban areas than in rural areas between 2006\* and 2010. In urban areas, the median increased from 229,440 to 248,463 (in 2010 Zambian Kwacha), whereas in rural areas, the median increased only marginally from ZMK 91,752 to ZMK 92,959 (see Table 0.4). See Table B1 in Appendix B for expenditure trends during 1996-2010.

Table 0.4 Summary of Consumption Expenditures, 2006\* and 2010

	Median expenditures per month per adult equivalent (in 2010 ZMK)	
	2006*	2010
<b>Urban</b>	229,440	248,463
<b>Rural</b>	91,752	92,959

**1.28** In 2010, the difference between the rich and the poor in terms of average expenditures remained high. At the national level, the mean consumption expenditure per adult equivalent of the top quintile is about 14 times that of the bottom quintile (see Figure 0.9). The average consumption expenditure of the richest quintile is about 11 times that of the poorest in urban areas, and about 8 times higher in rural areas.

Figure 0.9 Mean Consumption Expenditures per Adult Equivalent, by Quintiles, 2006\*-2010



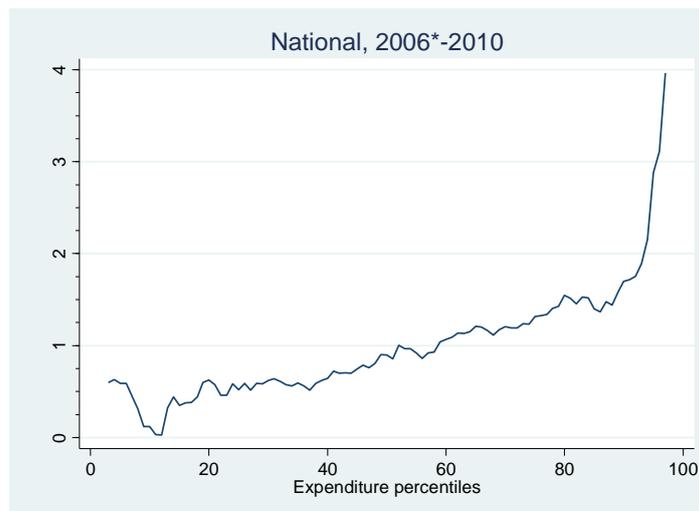
**1.29 Average consumption expenditures increased over both periods.** Nevertheless the expenditures of the two richest quintiles grew significantly more rapidly than the middle and lower quintiles (see Table B1 in Appendix B). The same trends occurred in both urban and rural areas (see Figure B4 in Appendix B).

**1.30** Central, Copperbelt, Lusaka, Northwestern, and Western Provinces had higher mean consumption expenditures per adult equivalent in 2010 than in 2006\*, which indicates that these provinces benefited from growth over the period. These same provinces also experienced reductions in the incidence and severity of poverty, as shown above. By contrast, Eastern, Luapula, Northern, and Southern Provinces experienced drops in average consumption expenditures between 2006\* and 2010, and experienced increases in poverty incidence (see Figure B5 in Appendix B).

#### *Growth Incidence Curves*

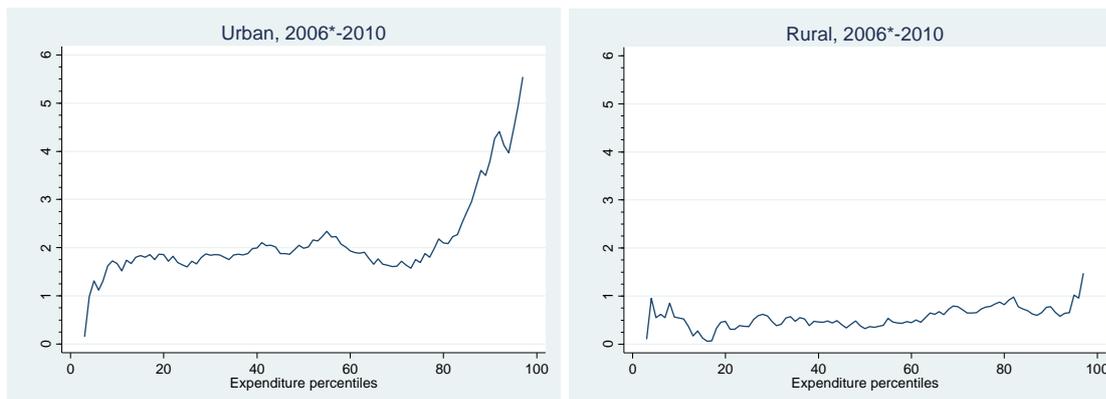
**1.31 The effect of economic growth on overall poverty reduction has been small, as much of the benefits of growth have accrued to those already above the poverty line.** The national growth incidence curve in Figure 0.10 shows real average annual growth rates between 2006\* and 2010 for each percentile of the consumption distribution. The positive slope indicates that consumption growth was positive and growth rates tended to increase as more for the wealthier quintiles, with an extremely sharp increase at the upper end of the distribution. For the lower two-thirds of the distribution, real average annual growth was less than one percent. While this may have pushed a small number of households close to the poverty line out of poverty, the overall effect on the poverty headcount ratio was very minor (i.e. from 62.3 to 60.5 percent).

**Figure 0.10 Growth Incidence Curve, 2006\*-2010**



**1.32** The benefits of economic growth were concentrated in urban areas. The comparison of the growth incidence curves for urban and rural areas in Figure 0.11 illustrates the difference between these areas. Whereas real annual consumption growth between 2006\* and 2010 was less than one percent for most of the rural population, growth rates in urban areas was about 2 percent for those in the 10<sup>th</sup> through the 80<sup>th</sup> percentiles and even higher for the top quintile of the urban distribution. Benefits to the poorest decile in urban areas were the smallest, though they were still positive.

**Figure 0.11 Growth Incidence Curves for Urban and Rural Areas, 2006\* - 2010**



## **D. Trends in Nonmonetary Poverty Indicators**

**1.33** Since poverty is a multidimensional phenomenon, nonmonetary indicators such as public health and education are important complements to the consumption-based indicators discussed above.

## Public Health

**1.34 Early childhood mortality rates have dropped drastically over the last 15 years – an impressive achievement for poverty reduction – but additional progress is still warranted.** Infant mortality, which measures the probability of infants dying before their first birthday dropped to 69 deaths (per 1,000 live births), in 2010 from 107 in 1992. Meanwhile, child mortality, the probability of children dying between the first and fifth birthday, was almost halved between 1992 and 2010, and under-five mortality was cut by nearly 40 percent over this period. In the five year period before the 1996 survey, nearly 20 percent of children died before seeing their fifth birthday, and as of 2010, this dropped to 12 percent of children dying before their fifth birthday. While these rates are still relatively high by international standards and additional progress is needed, this achievement is commendable (see Table 0.5).

Table 0.5 Child Mortality Rates, 1992-2010

Survey	Infant Mortality	Child Mortality	Under-five Mortality
DHS 1992	107	94	191
DHS 1996	109	98	197
DHS 2001-2002	97	81	168
DHS 2007	70	52	119
2010 (*)	69	n.a.	111

Note: All mortality rates are computed for the five-year period preceding the survey.

(\*) Data for 2010 is the most recent available from UNICEF, United Nations Population Division and United Nations Statistics Division

Source: CSO (2009), Zambia Demographic and Health Survey 2007.

**1.35 The nutritional status of children under the age of five improved in the 2000s,** as reflected by chronic and acute malnutrition indicators (Table 0.6). In 2010, 45 percent of children under age five were “stunted” (short for their age and chronically malnourished), 5 percent showed signs of “wasting” (thin for their height and acutely malnourished) and 15 percent were underweight (suffering from chronic or acute malnutrition, or a combination of both). According to the past three DHS surveys (in 1992, 1996, and 2001-02) stunting worsened for children under age five, and remains high and stagnant over 2007-2010<sup>9</sup>. The prevalence of underweight children slightly improved but it was stagnant over 1992-2010 and remained at the same level in 2010 as in 2007. Finally, wasting remained at roughly the same levels since 1992.

Table 0.6 Nutritional Status of Children under Five, 1992-2010

	1992	1996	2001-02	2007	2010(*)
Stunted children (%) <sup>1</sup>	46	49	53	45	45
Wasted children (%) <sup>2</sup>	6	5	6	5	5
Underweight children (%) <sup>3</sup>	21	19	23	15	15

Note: <sup>1</sup>“Stunting” is measured by height-for-age index; <sup>2</sup>“Wasting” is measured by weight-for-height index; <sup>3</sup>“Underweight” is measured by weight-for-age index.

(\*) Data for 2010 is the most recent available year, UNICEF (2012)

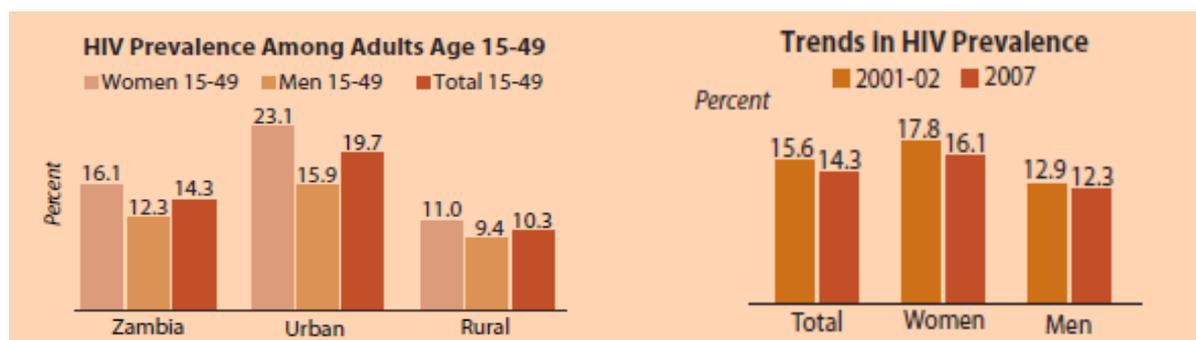
Source: CSO (2009), Zambian Demographic and Health Survey 2007

<sup>9</sup> According to the most recent estimates by National Food and Nutrition Commission for 2009 in 32 selected districts, the prevalence of stunting, underweight and wasting would be at 52 percent, 18 percent and 5 percent respectively

**1.36 Maternal mortality ratio<sup>10</sup> remains high.** At about 470 per 100,000 live births in 2008 (UNICEF, 2012), the maternal mortality ration (MMR) remains similar to those of lower income neighboring countries, but high compared to countries of similar income levels in Sub-Saharan Africa. Despite some improvement over time, the current progress in reducing child and maternal mortality does not guarantee the achievement of the health related MDGs by 2015 since the annual average rates of reduction (about 4.4 percent for child mortality and 5.5 percent for maternal mortality, are below the recommended rates for achieving these targets.

**1.37 In 2007, about 14 percent of Zambians of age 15-49 were HIV-positive** (Figure 0.12). Urban areas recorded HIV prevalence rates nearly two times higher than in rural areas (19.7 percent versus 10.3 percent). Prevalence rates were higher among women at the national level (16.1 percent compared to 12.3), but also in urban areas (23 percent versus 16 percent) and to a lesser extent in rural areas (11 percent versus 9.4 percent). The estimates for 2009 of the United Nations Program on HIV/AIDS (UNAIDS)<sup>11</sup> show further improvement of the HIV prevalence among adults aged 15-49; the prevalence HIV rate is shown to have decreased at 13.5 percent.

Figure 0.12 HIV Prevalence Rates and Trends, 2001-2007



Source: CSO (2009), Zambia Demographic and Health Survey 2007.

**1.38** HIV prevalence is still high by international standards, but decreased slightly from 15.6 percent in 2001-02 to 14.3 percent in 2007. This small but pivotal change is in line with the MDG target of halting and reversing the spread of HIV. However further reducing the HIV prevalence rate remains a challenge. The decline in HIV prevalence over the period was greater among women (from 18 percent to 16) than men (from 13 percent to 12).

### Education

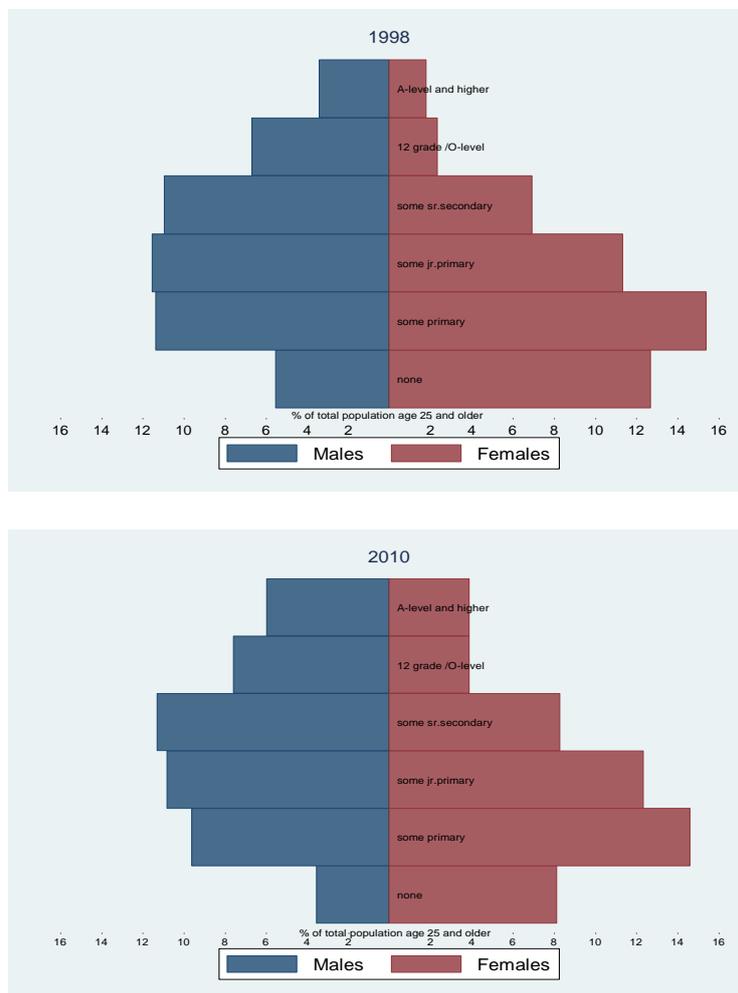
**1.39 Significant progress has been made in improving educational attainment.** The percentage of Zambians with no education at all significantly diminished over the decade, in particular among women. The attainment rate for tertiary education significantly increased both for men and women, although more so for men. The attainment rate for primary education also slightly increased for

<sup>10</sup> Number of deaths of women from pregnancy-related causes per 100,000 live births during the same time period.

<sup>11</sup> Report on the Global AIDS Epidemic (2010).

both genders, and more so for women. The attainment rate for junior and senior secondary-education indicators remained relatively stable for both men and women (see [Figure 0.13](#)).

**Figure 0.13: Highest Education Level Attained, Age 25 and above, by Gender, 1998 and 2010**



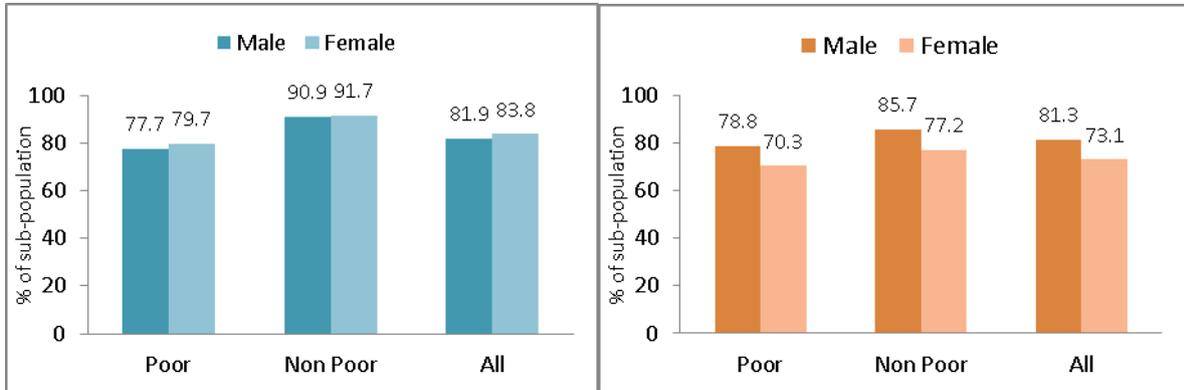
**1.40** In 2010, school attendance among students age 7-13 was marginally higher for girls than for boys, but the opposite was true among students age 14-18 (see [Figure 0.14](#)). While attendance rates were higher among wealthier students, female attendance rates at the primary level were slightly higher at all income levels. However, secondary enrollment was higher for male students; again, this pattern was consistent across income levels. A likely explanation for this reversal in trends is that a significant number of older female students drop out of school due to pregnancy. The evidence of the little difference in the inequality in education participation between girls and boys confirms the findings of the World Bank (2012)<sup>12</sup> that in Zambia gender explain very little of the inequality in school enrolment for children of 12-15 years old.

<sup>12</sup> World Development Report (2012), «Gender Equality and Development ».

Figure 0.14 School Attendance Rates, by Age Group, Gender, and Income, 2010

Ages 7-13

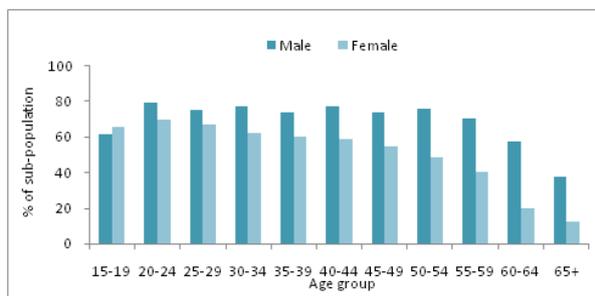
Ages 14-18



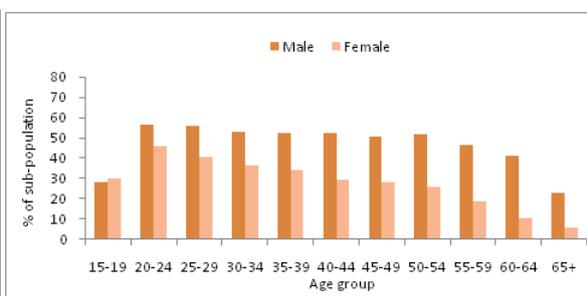
**1.41 While educational completion rates continue to be higher among males at all levels, this gender disparity has been shrinking over time.** Comparing younger cohorts to older cohorts in [Figure 0.15](#), it is clear that the difference in completion rates by gender is much smaller now than in previous generations. This convergence in school completion rates applies to both primary and secondary levels. *Ceteris paribus*, higher educational enrolment rates among women should translate into greater economic opportunities. While this trend is very encouraging, continuing efforts for gender equality in education is still warranted, in particular to reduce the disparity in secondary education completion rates.

Figure 0.15 Educational Attainment, by Gender and Age Cohort, 2010

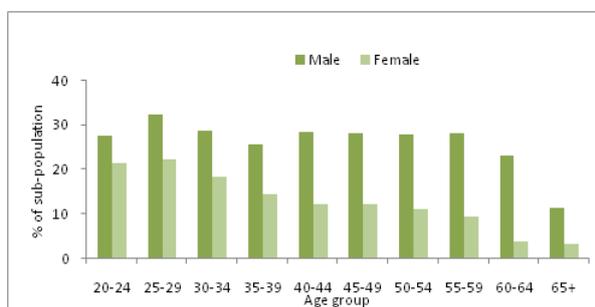
Primary



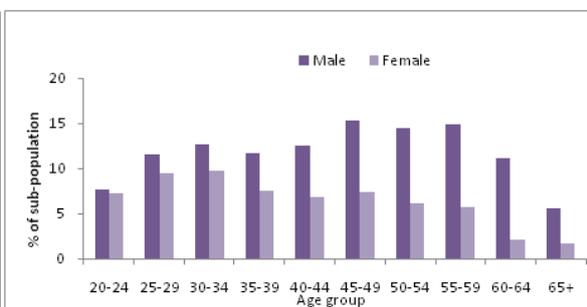
Jr. Secondary



Sr. Secondary



A-level

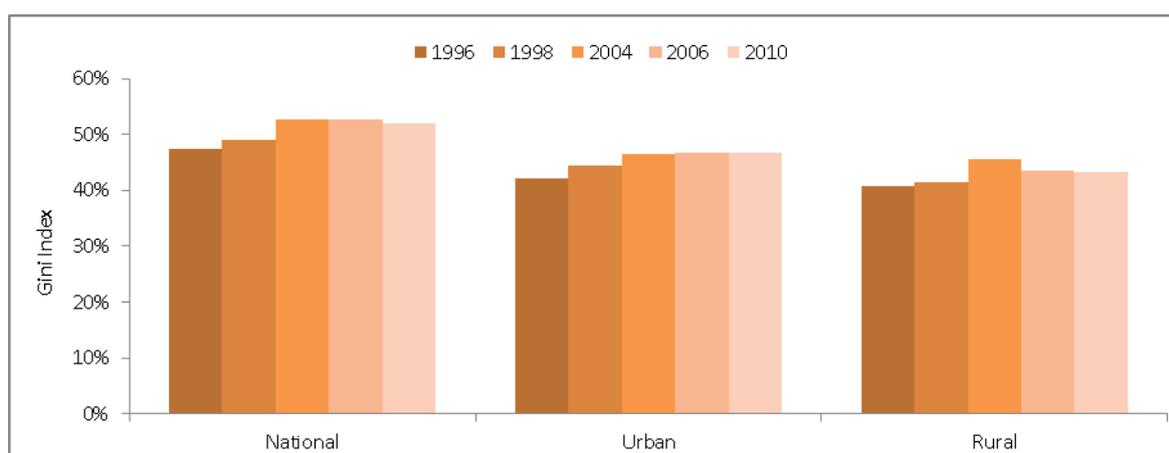


## E. Trends in Inequality

**1.42 With a Gini coefficient of 52 in 2010, the Zambian economy remains characterized by high levels of inequality.** Inequality within urban areas is higher than in rural areas, with a lot of variation observed across provinces. Over the years, disparities in average consumption expenditures between the rich and the poor continue to widen, especially in urban areas. Consumption inequality during the period was lowest in 1996, but rose steadily until 2004, after which it remained relatively stable until 2006, and finally dropped marginally in 2010 (Figure 0.16).

**1.43 Inequality is higher in urban areas.** In 2010 urban areas had a Gini coefficient of 46.8, compared to 43.2 in rural areas; this difference has increased over time, except for 2004 when a spike in rural inequality produced similar figures for both areas.

Figure 0.16 Trends in Gini Index, 1996-2010



**1.44 Inequality varies greatly across provinces.** In 2010, inequality was highest in Northwestern Province (Gini 62.4, see Table 0.7) followed by Lusaka Province (Gini 50.6). The distribution of welfare seems to have sharply deteriorated in Northwestern Province since 2004, when Northwestern had the lowest inequality of all nine provinces. In Lusaka Province, inequality was already high in 2004 and continued to increase in through 2010. Luapula and Eastern Provinces had the least inequality (Gini 40.1, and 40.9 respectively). Imbalances between provinces have widened over time.

Table 0.7 Trends in Gini Index by Province, 1996-2010

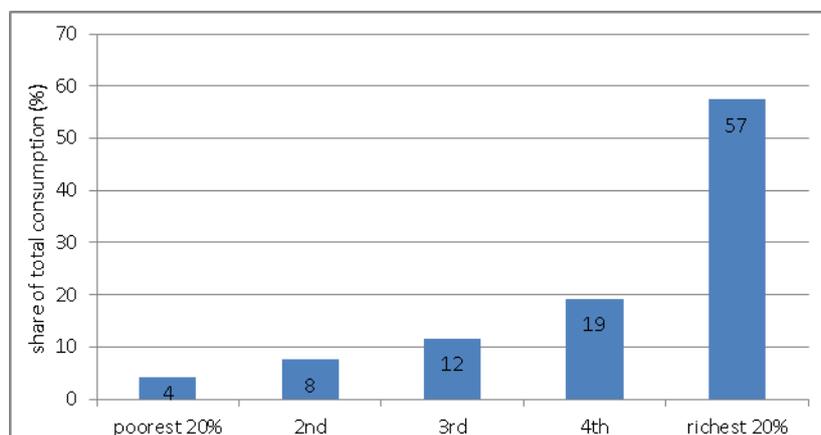
	1996	1998	2004	2006	2010
<b>Central</b>	41.0	49.7	47.3	46.5	42.8
<b>Copperbelt</b>	41.2	44.8	48.8	48.4	46.2
<b>Eastern</b>	43.9	40.1	46.8	44.4	40.9
<b>Luapula</b>	38.8	42.0	41.7	43.6	40.1
<b>Lusaka</b>	42.8	47.1	48.4	47.7	50.6
<b>Northern</b>	38.9	39.4	47.8	47.4	43.1
<b>Northwestern</b>	39.2	40.0	47.5	42.9	62.4
<b>Southern</b>	42.4	46.2	51.6	49.3	47.4
<b>Western</b>	44.4	44.3	46.5	47.5	47.4

**1.45 Disparities in consumption between the richest and the poorest are large.** The richest 20 percent of Zambians accounted for about 57 percent of total consumption expenditures in 2010, while the poorest 20 percent accounted for only 4 percent (see Figure 0.17<sup>13</sup>). The total consumption share of the top quintile was roughly 14 times more than the bottom quintile. In 2010, the expenditures per adult equivalent of the 90<sup>th</sup> percentile were almost ten times that of the 10<sup>th</sup> percentile. While the gap between the richest and poorest was already high in 1996, it increased over the period 1996-2006, but decreased (unevenly) between 2006 and 2010, falling at the national

<sup>13</sup> See also the distribution of total consumption by decile in 2010, Figure B6 in Appendix B.

level and in rural areas, but rising slightly in urban areas (Table 0.8). These trends in expenditures are mirrored by changes in income distribution. Rising inequality in urban areas again indicates that the largest share of economic growth is wealthier urban households, resulting in an increasingly highly unequal income distribution.

**Figure 0.17 Distribution of Total Consumption, by Quintile, 2010**



**Table 0.8 Expenditure Ratios, National, Urban and Rural, 1996-2010**

	National P90/P10	Urban P90/P10	Rural P90/P10
1996	8.5	6.3	6.1
1998	8.5	7.3	6.2
2004	10.8	8.1	6.8
2006	10.6	8.6	6.8
2010	9.6	8.8	5.9

**1.46 Inequality within urban and rural areas and within provinces accounts for over three quarters of total inequality.** The decomposable Theil measure of inequality, GE(1) in Figure 0.18, indicates that 23 percent of total inequality is due to inequality *between* rural and urban areas, while inequality *within* these areas accounts for 77 percent. Similarly, inequality *between* provinces accounts for 18 percent of total inequality, whereas inequality *within* provinces accounts for 82 percent. (See Table B2 in Appendix B for additional details on this decomposition).

Figure 0.18 Decomposition of Inequality, by Area and Province, 2010



## F. Conclusion

**1.47** In this analysis, survey-to-survey imputation methods were used to estimate the poverty trend between 2006 and 2010 due to comparability issues between the 2010 LCMS and previous rounds. To avoid the need for such procedures in the future, we recommend that a consistent methodology for data collection and poverty measurement be adopted to improve poverty monitoring and to support evidence-based policymaking.

**1.48** While the Zambian economy has exhibited strong overall growth in recent years, the returns to that growth have been narrowly concentrated, and have failed to reach the majority of the nation's poor. Although poverty rates were declining until the mid-2000s, only marginal progress has been made in recent years, and the small decreases in the poverty rate at national, urban, and rural areas between 2006 and 2010 are statistically insignificant. Growth incidence curves indicate that benefits of growth have mostly gone to the richer segments of the population in urban areas.

**1.49** As a result, the national poverty rate remains high, with about 60 percent of the population living in moderate poverty in 2010, and nearly 40 percent living in extreme poverty. Geographically, poverty rates are the lowest in Lusaka and Copperbelt provinces, and the highest in Luapula, Northern, Eastern, and Western provinces. With a Gini coefficient of 52 in 2010, inequality remains relatively high. Although inequality increased between 1996 and 2004, it has been relatively stable in recent years.

**1.50** On the other hand, non-monetary indicators of poverty show signs of improvement. Child mortality rates have dropped substantially, a major accomplishment that should be applauded. In addition, the nutritional status of children has improved, and HIV prevalence rates are now gradually

declining. Educational attainment has improved, in particular for females, narrowing the gender gap in education. Assets and housing conditions show marginal improvements, with the urban sector showing the greatest gains in asset accumulation. While these are all positive signs, continued progress in these areas is needed as the health statistics are still relatively poor by international standards and secondary education completion rates relatively low.

**1.51** In the following section we examine the characteristics of poverty in Zambia in greater detail expanding upon this analysis, and begin to explore the opportunities and constraints to effective poverty-reduction policies.

## Chapter 2: The Poverty Profile

### A. Introduction

**2.1** In the previous chapter we explored the evolution and distribution of poverty in Zambia. We have seen that although the national poverty rates have fallen since the mid-1990s, only marginal improvements have been made in recent years despite the sustained growth of the Zambian economy. The returns to growth have been heavily concentrated among the upper-income urban population, and the rising productivity of the mining sector in particular has had little impact on employment and incomes nationwide. We have also pointed out some progress in education and health indicators, and argued that some changes have been uneven.

**2.2** The following chapter will provide an in-depth look at the economic and demographic characteristics of the poor in Zambia. We will examine the causes of poverty and the obstacles to escaping it. As in many countries in Sub-Saharan Africa (SSA), poverty in Zambia is overwhelmingly concentrated in rural areas. In 2010, rural areas were home to 80 percent of the country's poor, and over half of the rural population lives below the extreme-poverty line. According to the latest LCMS survey, the prevalence of poverty is statistically highest among larger rural households in which the head-of-household is older, poorly educated and engaged in small-scale farming or self-employed. Survey respondents who described themselves as poor described a range of factors contributing to their poverty, including lack of agricultural inputs, inadequate capital, low wages, and the absence of economic opportunities.

**2.3** The lack of economic opportunity deserves particular consideration, and the analysis of income and employment data (presented in Chapter 3) reveals important dynamics between the rural and urban sectors. Rural unemployment is extremely low, but income growth is weak and poverty remains widespread. By contrast, urban centers have experienced both strong growth and a steady reduction in poverty rates over the past decade, but urban unemployment is persistently high. Achieving a better understanding of the characteristics of poverty in Zambia, and of the opportunities and constraints faced by the poor, will be vital to effective poverty-reduction policies.

**2.4** This chapter attempts to analyze the conditions of poverty in Zambia and the obstacles to poverty reduction and pro-poor growth. Section A describes the demographics of poverty and its social and economic correlates. Section B examines differences in household asset ownership and housing conditions between the poorest and richest quintiles of the population. Section C summarizes access to basic services, including schools and healthcare facilities. Section D explores the causes of poverty as described by households that identified themselves as poor in the LCMS.

## **B. Demographics of Poverty**

### **2.5 Poverty incidence tends to increase with the age of the head-of-household** (see Table 2.1).

In 2010, those living in households where the head was age 61 or older had the highest poverty incidence at 71 percent. Among households whose heads were ages 21 to 30, poverty incidence was the lowest at 51 percent. For households between these two groups, poverty incidence increases with the age of the head-of-household. This may be due in part to the mortality of parents from the AIDS epidemic, which has left children in need of caretaking by older relatives. While households headed by the elderly represent only about 12 percent of the total population, this demographic accounted for 14 percent of the poor in 2010.

### **2.6 The level of education attained by the head-of-household is a major determinant of the household's poverty status.**

In 2010, about 30 percent of the population lived in households whose head had not completed primary school, and about 80 percent of this group was in poverty. Poverty is less likely to impact Zambians who have completed secondary school, and households whose head completed senior secondary school (i.e. 12<sup>th</sup> grade) had a much lower poverty rate of 32 percent. While the supply of high school graduates has been increasing over time (see Chapter 1), continued poverty reduction will depend on the demand for better-educated workers in Zambia's labor market. While improvements in educational attainment are desirable in the abstract, unless the demand for skilled labor continues to grow, more and more graduates will find themselves competing for a finite number of jobs requiring higher levels of education and skills.

Table 2.1 Poverty in 2010, by Characteristics of Head-of-Household

	Poverty Rate (%)	Standard Error	Distribution of Poor (%)	Population Share (%)
<b>Gender</b>				
Male	60.0	1.0	79.6	80.3
Female	62.5	1.4	20.4	19.7
<b>Marital Status</b>				
Never married	34.3	2.8	1.9	3.4
Married or co-habiting	61.1	1.0	79.4	78.6
Separated, divorced or widowed	62.7	1.4	18.3	17.6
<b>Age</b>				
age <=20	59.4	6.2	0.4	0.4
age 21-30	50.7	1.4	14.0	16.7
age 31-40	57.2	1.3	30.4	32.1
age 41-50	64.2	1.5	25.3	23.9
age 51-60	64.4	1.6	16.0	15.1
age >=61	70.9	1.7	13.6	11.6
<b>Education</b>				
None	81.3	1.7	12.0	9.0
Some primary	79.6	1.1	28.9	22.0
Some jr. secondary	74.4	1.1	29.0	23.6
Some sr. secondary	57.9	1.4	20.7	21.7
12 grade / O-level	31.8	1.8	6.0	11.4
A-level, university, or higher	10.8	1.3	2.0	11.3
<b>Main Economic Activity</b>				
Wage employment	29.2	1.5	11.6	24.0
Nonfarm business	45.8	2.0	10.5	13.9
Farming, fishing, or forestry	78.7	0.9	68.9	53.0
Other	59.6	2.0	8.7	8.9
<b>Employment Status</b>				
Self-employed	71.9	0.9	80.4	67.7
Government, parastatal, or int'l org.	18.2	1.7	2.9	9.5
Private sector or entrepreneur	33.0	2.0	6.7	12.3
NGO employee	31.2	8.3	0.3	0.6
Other	58.9	2.0	9.7	10.0

Source: World Bank estimates using 2010 LCMS.

**2.7 For most of the poor, the head-of-household's main economic activity is agriculture.** A little over half of Zambia's population (53 percent) live in households where the head-of-household's main economic activity is agriculture (i.e. farming, fishing, or forestry), and 79 percent of these individuals are poor; as a result, this group accounts for 69 percent of the poor nationwide. About a quarter of the Zambian population lives in households where the head is a wage earner, and the poverty rate for this group was the lowest at 29 percent. Poverty rates among households whose head was mainly engaged in operating a nonfarm business were intermediate at 46 percent.

**2.8 Based on the employment status of heads-of-household, "self-employed" Zambians have high rates of poverty.** About 72 percent of self-employed Zambians were living below the poverty

line in 2010, and they comprise the vast majority of the labor force, about 68 percent.<sup>14</sup> This subgroup includes informal workers and those employed in small, family-run businesses, such as smallholder farms, and these forms of employment are typically characterized by a lack of job security and irregular income streams. In contrast, households whose head is employed by the government, a parastatal, or an international organization are much better-off: the poverty rate for this group is the lowest at 18 percent. Among households where the head runs a formal business with employees or is employed by the private sector or a non-governmental organization (NGO), poverty rates were in the range of 31 to 33 percent.

**2.10 In 2010, poverty incidence among female-headed households was slightly higher, but not significantly different than among male-headed households.** In the past, these differences were larger, but the disparity has gradually shrunk over time. In 1996, the difference in poverty incidence rates between male- and female-headed households was 5 percentage points. By 2010, it was down to a 2.5 percentage-point difference, that is, 62.5 and 60 percent for female- and male-headed households, respectively (see Table 2.1, above). It is worth noting that the narrowing gender gap in poverty rates coincides with the higher female educational attainment trends observed in the previous chapter.

**2.11 Comparing the richest and poorest quintiles of the population (in terms of consumption expenditures per adult equivalent), we find that the poorest quintile on average is characterized by a larger household size and an older head-of-household** (see Table 2.2). The poorest households tend to be bigger, averaging seven to eight members, while the richest quintile averages five to six members per household. Median age of the head-of-household is 44 years for the bottom quintile, significantly older than the average for the top quintile, which is 39 years. Among the poorest quintile, about 21 percent live in female-headed households, compared to 19 percent in the richest quintile.

**2.12 As for education and labor characteristics, the heads-of-household in the bottom quintile tend to be poorly educated, self-employed, and engaged in agriculture.** Among the bottom quintile, 17 percent live in households where the head has no education, 33 percent in households whose head has some primary education, 29 percent live in households whose head has some junior secondary education, and 16 percent live in households where the head has some senior secondary education. Only 4 percent of the people in the bottom quintile live in households where the head has completed senior secondary education or higher. The main economic activity of households in the bottom quintile is agriculture. 81 percent of the people in the poorest quintile live in households where the head is engaged in agriculture, while in the richest quintile only 11 percent do so. Moreover, of the 88 percent of those living in households where the head is self-employed, only about 2 percent live in households headed by an employee of the government, a parastatal, an international organization or a non-governmental organization (NGO), and only 2 percent more live in households whose head is employed in the private sector.

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<sup>14</sup> "Self-employed", in this context, means earning income from activities that do not pay a fixed wage or salary; self-employed Zambians are frequently smallholder farmers or members of the informal workforce.

Table 2.2 Summary of Household Characteristics for Poorest and Richest Quintiles, 2010

	Zambia (%)	Poorest Quintile (%)	Richest Quintile (%)
Household size (mean)*	6.5	7.5	5.6
Age of head (median)*	41	44	39
Female headed household	19.7	20.8	18.7
Disabled head	1.3	2.0	0.7
<b>Marital Status of Head</b>			
Never married	3.4	1.4	7.9
Married or co-habiting	78.6	79.2	75.1
Separated, divorced, or widow	17.6	18.8	16.7
<b>Education of Head</b>			
None	9.0	16.6	2.3
Some primary	22.0	32.5	4.9
Some jr. secondary	23.6	28.9	7.5
Some sr. secondary	21.7	16.4	20.7
12 grade / O-level	11.4	2.9	24.4
A-level, university, or higher	11.3	0.7	39.3
<b>Main Activity of Head</b>			
Wage employment	24.0	5.1	57.5
Run nonfarm business	13.9	6.7	20.9
Farming, fishing, or forestry	53.0	81.2	11.6
Other	8.9	6.6	9.7
<b>Employment Status of Head</b>			
Self-employed	67.7	88.3	33.5
Employed by government, parastatal, int'l org, ngo	10.1	1.5	29.0
Employed by private sector or entrepreneur	12.3	2.0	26.4
Other	10.0	8.1	11.2

Source: World Bank estimates based on 2010 LCMS.

Note: Except for the characteristics noted by an asterisk (e.g. household size or age of head), statistics in the table above represent the percentage of the sub-population living in households with these characteristics.

**2.13 In terms of diet, those in the poorest quintile tend to eat far fewer meals per day and consume less meat** (see Table 2.3). Among the poorest quintile, only 31 percent of individuals eat 3 or more meals per day on average, whereas among the richest quintile, 81 percent of individuals eat 3 or more meals per day. While the weekly frequency of vegetable consumption is roughly the same between the top and bottom quintiles, monthly frequency of meat consumption is significantly different. Among the poorest quintile, almost a quarter of the population did not consume any meat in the month prior to the survey, and nearly two thirds only consumed meat 1-5 times during the month. About 14 percent were able to consume meat more than 5 times in the month. In contrast, 43 percent of the richest quintile consumed meat 1-5 times per month and 55 percent did so more than 5 times.

Table 2.3 Food Consumption Patterns for Poorest and Richest Quintiles, 2010

	all (% of pop.)	poorest quintile (% of pop.)	richest quintile (% of pop.)
<b>National</b>			
1 meal per day	3.8	6.6	1.4
2 meal per day	45.4	62.5	17.2
3 or more meals per day	50.7	30.8	81.2
no meat in past month	12.3	23.5	2.0
meat 1-5 times in past month	60.6	62.9	42.9
meat > 5 times in past month	26.9	13.5	54.5
no vegetables in past week	0.6	1.0	0.5
vegetables 1-5 times in past week	14.1	14.6	13.7
vegetables >5 times in past week	85.3	84.3	85.7

Source: World Bank estimates based on 2010 LCMS.

### *Correlates of Poverty*

**2.14** Using regression analysis we can explore the relationship in 2010 between household welfare and a set of selected household characteristics. Our measure of household welfare, (log) expenditures per adult equivalent, is the total household consumption normalized by the size and composition of its members; this serves as the dependent variable in the regression. We explore the relationship between household welfare and the following set of variables: household size, area and province of residence, and various characteristics of the household head (gender, level of education, main economic activity, and type of employer). Table 2.4, below, presents the regression results. To interpret the coefficients in Table 2.4, it is helpful to consider the reference case (i.e. the excluded categories of a set of binary variables), which is a household in a rural area of Lusaka Province with an uneducated male head who is self-employed and engaged primarily in agriculture.

**2.15** After controlling for other factors, the level of educational attainment of the head-of-household is important in explaining the level of household welfare. There is a direct relationship between the education level of the household head and the expenditures per adult equivalent of the household. Those with a higher education level are more likely to have greater expenditures, as they are more likely to have better jobs and higher incomes. Households with a head having an A-level or higher education (12<sup>th</sup> grade or O-level education) have 109 percent (53 percent) higher welfare level relative to households with a head with no education, all else constant. However, despite the strong positive correlation between education and household income it is important to note that this relationship is not necessarily causal. As with the other factors discussed below, there are any number of independent variables that may contribute to both low educational outcomes and high poverty incidence.

**2.16** Other attributes of the household also correlate with income. Households in which the head-of-household runs a business have an average of 17 percent higher expenditures per capita relative to those in which the head is engaged in farming, forestry, or fishing, controlling for other factors. Similarly, heads-of-household employed by a public- or private-sector employer have an average of 17 to 23 percent higher expenditure levels than self-employed counterparts, respectively. Expenditures per adult equivalent also tend to decrease as the household size increases.

**2.17** Location plays an important role in consumption expenditures. *Ceteris paribus*, individuals residing in urban areas have on average a 43 percent higher welfare level than those in rural areas. Residents in Eastern, Luapula, Northern, Northwestern, Southern, and Western Provinces have an average of 19 to 36 percent lower expenditure levels compared to Lusaka Province residents. Residing in Central and Copperbelt Provinces is not correlated with any significant differences relative to Lusaka Province.

**Table 2.4 Consumption Regressions Results, 2010**

Dependent var: log per adult equivalent expenditures	coef.	
household size	-0.16	***
household size squared	0.01	***
female head	-0.03	
head: some but incomplete primary	0.06	*
head: completed primary, incomplete jr. sec	0.13	***
head: completed jr. sec, incomplete sr. sec	0.28	***
head: completed 12th gr or O-level	0.53	***
head: completed A-level or higher	1.09	***
head: wage employment for current activity	0.10	*
head: running business/self-employed	0.17	***
head: all other activities	-0.06	
head: employed by gov, parastat, int'l org, ngo	0.23	***
head: employed by private sector or employer/partner	0.17	***
head: other employment status	0.02	
urban area	0.43	***
Central	0.00	
Copperbelt	-0.03	
Eastern	-0.22	***
Luapula	-0.35	***
Northern	-0.26	***
Northwestern	-0.20	**
Southern	-0.19	***
Western	-0.36	***
_constant	12.22	***
R2	0.51	
N	19385	
rmse	0.62	
note: *** p<0.01, ** p<0.05, * p<0.1		

Source: World Bank estimates based on 2010 LCMS.

Note: Excluded dummy variables are following: uneducated head; agriculture as head's activity; self-employed head; Lusaka province; rural area.

### **Rural and Urban Poverty**

**2.18 Most of the poor in rural areas are small-scale farmers.** Rural households in the survey were categorized according to farm size (small, medium, or large) or as a non-agricultural household. Urban households were categorized according to the type of neighborhood (low-, medium- and high-cost). As shown in Table 2.5, 59 percent of the country's population is classified as living in small-scale farming households in rural areas. At the moderate poverty line, this group had a poverty headcount rate of 76 percent and accounted for over 90 percent of the rural poor and 74 percent of the country's poor. Small-scale farmers use family labor and mainly simple hand tools, and their

main activity is the production of food and fiber crops and livestock, mostly for subsistence. Their productivity is very low since their activity is often compromise by the lack of cash incomes, appropriate technological packages and irregular supply of inputs. Rural non-agricultural households had a poverty incidence of 50 percent, but due to its small population share this group accounted for just 3 percent of the country's poor. Among urban residents, poverty is concentrated in low-cost neighborhoods, as one might expect. This urban group had a poverty headcount rate of 44 percent, and accounts for over 90 percent of the urban poor and 19 percent of the country's poor.

**Table 2.5 Poverty Incidence and Distribution, by Household Type, 2010**

	Population Share (%)	Moderate Poverty		Extreme Poverty	
		Poverty Incidence (%)	Distribution of the Poor (%)	Poverty Incidence (%)	Distribution of the Poor (%)
<b>Rural</b>					
Small-Scale Farm	59.0	75.9	73.9	55.0	82.5
Medium-Scale Farm	2.3	66.6	2.6	43.5	2.6
Large-Scale Farm	0.1	19.9	< 0.1	16.0	< 0.1
Non-Agricultural	4.0	50.4	3.3	35.7	3.6
<b>Urban</b>					
Low-Cost	25.7	43.8	18.6	16.5	10.8
Medium-Cost	5.9	12.9	1.3	2.9	0.4
High-Cost	3.1	7.1	0.4	1.4	0.1

Source: World Bank estimates based on 2010 LCMS.

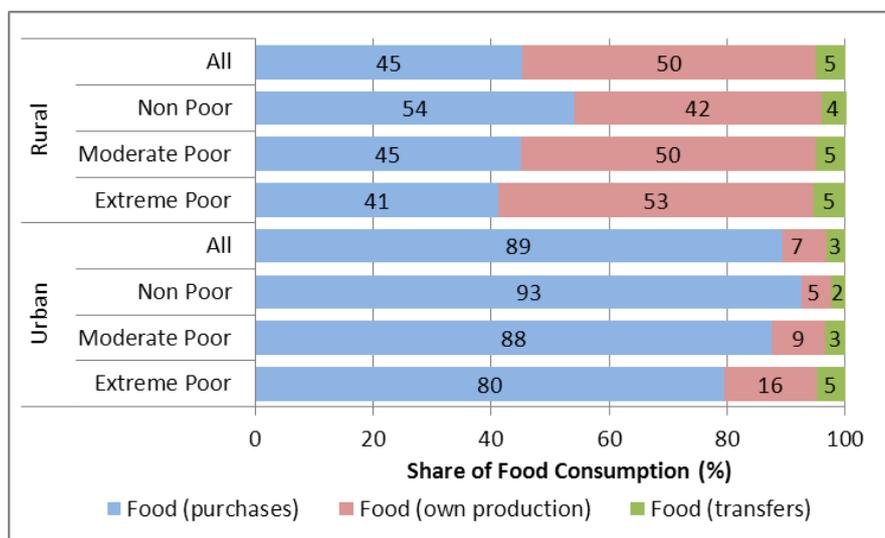
**2.19** Rural households, particularly the poor, depend on their own production for a large portion of their food (see Figure 2.1)<sup>15</sup>. Food expenditures vary considerably according to the area of residence and poverty status. In urban areas, the extreme poor purchased 80 percent of their food, with about 16 percent coming from own production and about 5 percent from transfers; the moderate poor purchased about 88 percent of their food. In rural areas, half or more of the food consumed by poor households was produced by the household (53 percent for extremely poor and 50 percent for moderately poor households). This is explained by the primary role of agriculture in rural areas and the predominance of food over nonfood cash crops, which has been bolstered in recent years by rising food prices. However, despite the larger share coming from own-production, most rural households are not self-sufficient and still need to purchase nearly half of their food requirements. Thus, large food price shocks have the potential of negatively impacting net food consuming household.

**2.20** By global standards, agricultural productivity (production per hectare) is relatively low in Zambia, and there is considerable potential for households to increase the size of their harvests for both consumption and sale (see Table C2 in Appendix C). There was a bumper maize (corn) harvest in 2009/2010 (see Table C3 in Appendix C), thanks to good weather, increased maize planting (see below) and the expansion of the government's input subsidy programs. According to Burke et al. (2010), 47 percent of the difference in maize production from 2009 to 2010 was attributed to weather conditions, 25 percent to the increased use of fertilizers from the public and private sectors, 23 percent to expanded cultivation area, and 5 percent to hybrid seed and improved management. Smallholder farmers face numerous supply-side constraints, such as limited area for cultivation,

<sup>15</sup> See also Table C1 in Appendix C for budget shares of the extremely poor, moderately poor and non-poor.

inadequate irrigation and drainage systems, lack of physical capital, low-quality seeds and fertilizers, and restricted access to credit. Programs designed to assist small-scale farmers may increase agricultural yields, but the Zambian government’s current efforts in this area suffer from significant targeting and expenditure-execution problems, and have thus far produced mixed results (see World Bank 2010).

Figure 2.1: Sources of Food for Urban and Rural Residents, 2010



Source: World Bank estimates based on 2010 LCMS.

**2.21** The government’s fertilizer-subsidy regime and other agricultural-input support policies in particular are insufficiently targeted, and these programs have been only marginally effective at raising farmer incomes despite their enormous costs. Meanwhile, the public agencies tasked with providing extension services, agricultural research and technological innovation—policy avenues that have a demonstrated ability to produce broad and lasting impacts on marginal productivity—remain underfunded and severely lacking in technical capacity. New scientific and economic technologies that are developed are not disseminated to farmers, and extension remains inadequate in both the scope of its outreach and the content of its services.

**2.22** The government has steadily increased public funding for agricultural development in recent years, but these resources have been overwhelmingly devoted to the Fertilizer Support Program (FSP, now known as the Farmer Input Support Program [FISP]) and the Food Security Pack Program (FSPP), both of which provide subsidized agricultural inputs. These programs are intended to raise the productivity of small-scale farmers and those facing the threat of food insecurity. However, the FSP, by far the larger of the two programs, does not expressly target the poor, and its distributional impact among maize producers is neither pro-poor nor progressive.<sup>16</sup> As with education and healthcare services, unequal access drives the distribution of benefits for both the FSP and FSPP. Wealthy farmers are far more likely to participate in these programs than are poor farmers, and as a

<sup>16</sup> As described in Appendix F, the distribution of beneficiaries initially appears to be highly progressive across income groups, with the poor—as a share of the total population—being much more likely to participate than the rich. However, wealthier Zambians are also far less likely to produce maize; consequently, the wealthiest farmers—as a share of maize producers—are dramatically overrepresented among participants in both the FSP and FSPP.

result, wealthy participants outnumber poor participants at a rate of almost two-to-one. Participant contributions, meanwhile, are imposed at a fixed rate regardless of income level, and neither program uses means-testing as a criterion for inclusion. A set of relatively simple revisions to these programs—including means-testing of beneficiaries, scaling out-of-pocket contributions to participant income, and replacing the current input package with an electronic voucher system—could dramatically improve their progressivity and enhance their impact on the rural poor.

**2.23** Nevertheless, it remains unclear to what extent either program has actually succeeded in their common objective of raising cultivation intensity (productivity per hectare), as recent growth in aggregate production appears to be largely the result of expanded cultivation area and favorable weather conditions. Meanwhile, Zambia’s agricultural extension services, which should be disseminating critical information on agronomy techniques and providing high-quality impact analyses, remain severely underfunded and ill-equipped to achieve the increases in production intensity that represent their primary mission as public agencies. The ultimate value of input-subsidy programs must continue to be reassessed and evaluated against other funding priorities.

**2.24** Relatedly, a large and increasing share of agricultural spending is devoted to the Food Reserve Agency (FRA), which under its expanded mandate not only manages the country’s strategic food reserve but also enables the government to directly influence the domestic price of maize (corn), Zambia’s primary staple crop. The FRA’s operations, which involve large-scale maize purchases at prices well above the market rate, constitute an effective production subsidy, which accrues only to the small fraction of Zambian farmers that sell maize to the FRA. FRA purchases are sufficiently large to increase the price of Zambian maize relative to the export-parity price, increasing food costs nationwide and decreasing the competitiveness of Zambian maize as an export crop. More recently, the FRA has begun setting floor prices for maize in an effort to encourage maize production. This policy has proven enormously expensive, with fiscal costs rising to between 1 and 2 percent of GDP, and while the price floor has indeed promoted maize production it has done little, if anything, to raise cultivation intensity. As a result, many farmers have simply shifted to maize production at the expense of other crops, countering the positive trend toward diversification in the agricultural sector. Given the exorbitant cost and questionable effectiveness of FRA policies, and in light of the critical priorities that must be foregone in order to fund the price floor, the World Bank has recommended that the FRA return to its original role of safeguarding food security and has proposed a set of reforms designed to enhance the efficiency of its operations.<sup>17</sup>

**2.25** Due to sustained food-price increases between 2006 and 2008, farmers shifted away from planting nonfood cash crops during the 2008/09 season (October 2008-September 2009). The planting area for nonfood crops decreased drastically, from 1.2 to 0.1 hectares for small-scale farmers and from 8 to 0.3 hectares for medium-scale farmers between the 2005/06 and 2008/09 seasons (see Table 2.6). This decrease was not fully compensated for by an equivalent expansion in the planting area for food crops. On the other hand, large-scale farmers responded to these price signals by drastically expanding the cultivation of food crops, from an average of 20 hectares in 2005/06 to 50 hectares in 2008/09. The Food Reserve Agency program, which established a price

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<sup>17</sup> For a comprehensive review of the FISP and FRA programs, as well as a detailed discussion on the main policy issues related to these program is Zambia see World Bank(2010) and World Bank (2012d)

floor on maize for smallholders, has also had a positive effect on increasing land dedicated to, and overall output, of maize and has to some extent boosted smallholder incomes of maize producers, though again targeting issues have limited the effectiveness of this policy.

Table 2.6 Mean Farm Area Planted, by Crop Type and Farm Size, in Hectares

	2005/06			2008/09		
	Food crops	Non-food crops	All crops	Food crops	Non-food crops	All crops
<b>National</b>	0.8	0.9	1.7	1.0	0.1	1.0
<b><i>Farm Size (rural)</i></b>						
<b>Small-Scale</b>	1.1	1.2	2.3	1.3	0.1	1.4
<b>Medium-Scale</b>	5.1	8.0	13.1	5.7	0.3	6.1
<b>Large-Scale</b>	20.1	15.6	35.7	50.2	0.7	50.8

Source: World Bank estimates based on 2006 and 2010 LCMS

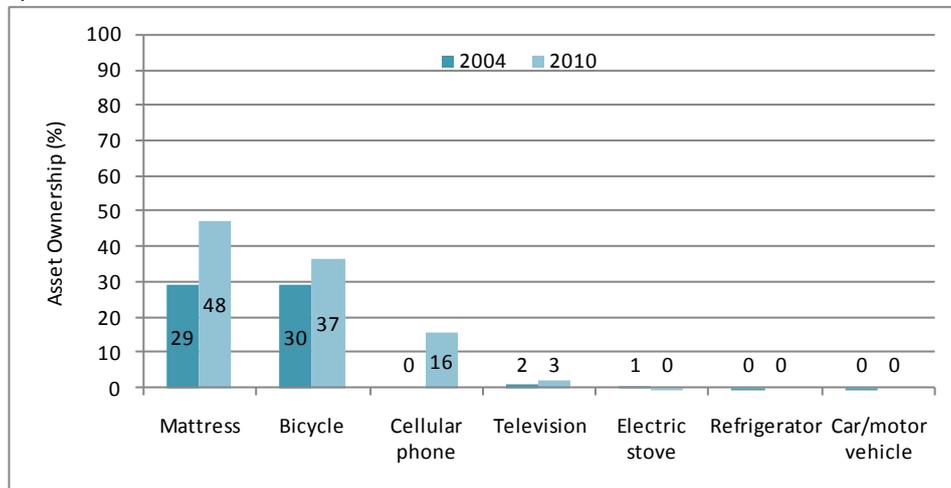
## C. Assets and Housing Conditions

**2.26** While both the rich and the poor accumulated assets to some extent between 2004 and 2010, the assets of the poorest quintile were still quite limited as of 2010. [Figure 2.2](#)<sup>18</sup> shows an increase in asset ownership for a variety of goods among both the top and bottom quintiles, indicating that even the poorest households are benefiting to some extent from recent growth. The marginal increases in asset ownership and the reduction of poverty in rural areas is likely to be at least in part a result of the recent bumper maize harvests. When comparing the level of asset ownership between the poorest and richest 20 percent of the population, the differences in assets remains stark. The poorest quintile increased their ownership of basic assets, such as mattresses, from 29 to 48 percent between 2004 and 2010. Moreover, 16 percent of the poorest quintile lived in households in which someone owned a cellular phone in 2010, and 37 percent of households had at least one bicycle. Ownership of more expensive assets like motor vehicles, televisions, computers, and household appliances is negligible among the bottom 20 percent. As indicated by the increase in ownership of luxury goods, those who appear to have benefited the most in recent years are richer urban Zambians. This supports the conclusions of the income analysis presented in the previous chapter.

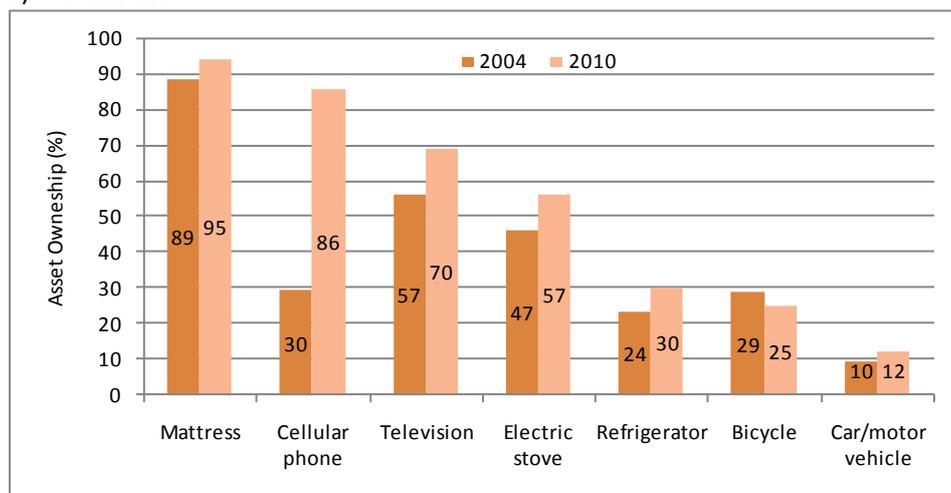
<sup>18</sup> For further details on asset ownership see Table C4 in Appendix C.

Figure 2.2 Asset Ownership for Poorest and Richest Quintiles, 2004 and 2010

a) Poorest 20%



b) Richest 20%

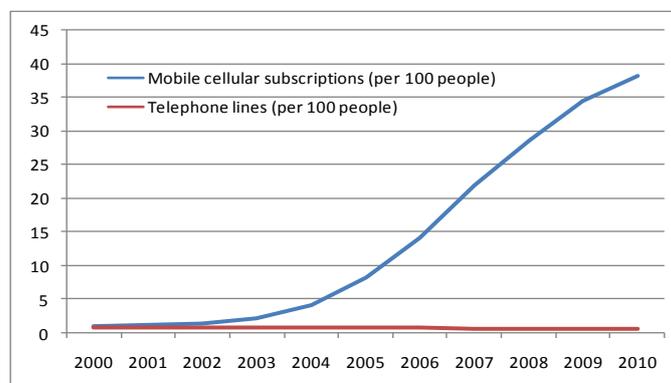


Source: World Bank estimates based on 2004 and 2010 LCMS.

**2.27 The use and ownership of cellular phones has expanded rapidly in both urban and rural areas.** While only 20 percent of urban Zambians lived in households in which a member owned a cell phone in 2004, this share increased to 80 percent in 2010. In rural areas, the percentage increased from nearly zero in 2004 to 32 percent in 2010. Figure 2.3 shows the clear dominance of cellular phones over land lines through the growth of subscriptions between 2000 and 2010. Even in the poorest quintile a substantial number of households have cell phones. In 2004, practically no one in the poorest quintile owned a cell phone, but by 2010, about 16 percent lived in households with at least one. The rapid growth of cell-phone ownership raises the prospect of extending innovative financial services (such as cellular banking) and development initiatives (such as phone-credit-based

conditional cash transfers) throughout Zambia, reaching consumers and beneficiaries even in more remote rural areas.<sup>19</sup>

**Figure 2.3 Cellular Phone and Land-Line Subscriptions in the 2000s**



Source: WDI

**2.28 Housing conditions have also showed signs of improvement between 2004 and 2010, but large disparities in housing quality between the richest and poorest quintiles still remain** (see [Figure 2.4](#))<sup>20</sup>. In 2010, 67 percent of the bottom quintile still lives in basic traditional dwellings, compared to just 10 percent of the top quintile. 33 percent of the poorest quintile lives in modern housing, while about 90 percent of the richest does. Only 0.3 percent of the poorest live in houses equipped with flush toilet, compared to 41 percent among the richest, while 20 percent of the bottom quintile does not have any toilet at all. Similarly, only 0.4 percent of the poorest has an electricity connection, compared to 63 percent of the richest. With regard to improved water sources (protected well, borehole, or tap) the conditions of poor Zambians are somewhat closer to that of the rich, with 43 percent of the poorest quintile having access to an improved water source, compared to 62 percent of the richest quintile.

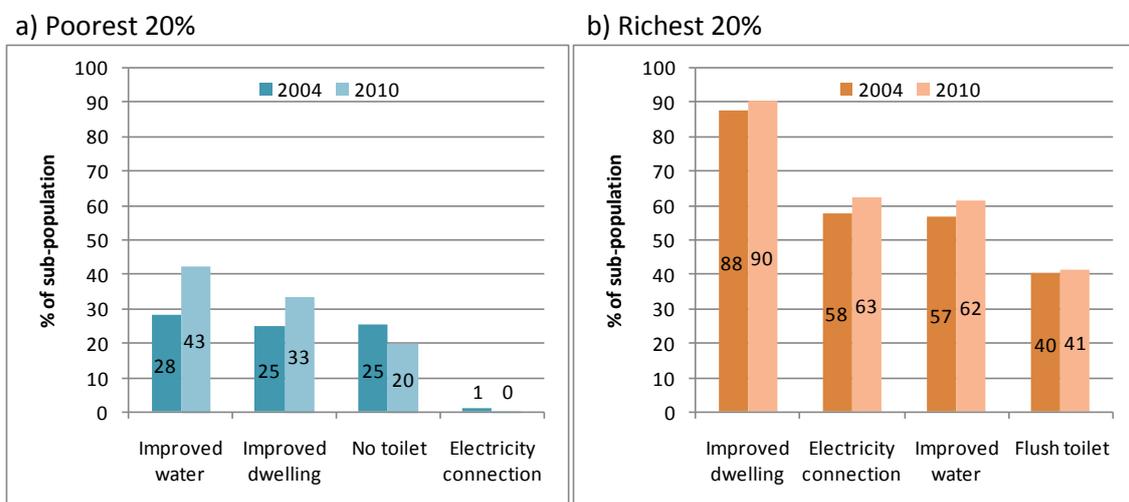
**2.29 Despite persistent disparities in living conditions between the rich and poor, comparisons over time show significant improvements.** Compared to 2004, fewer poor Zambians live in basic, traditional dwellings and more live in modern housing. However, the top quintile has also benefitted, and more rich Zambians now live in improved housing (around a 3 percent increase since 2004). Improvements have also been made in access to improved water sources for both the poorest and richest quintiles—a 15 percent increase for the poorest and a 5 percent increase for the richest. However, no significant changes have been observed with regard to electricity connections or home sanitation (flush toilets) for the poorest, though about 5 percent fewer people live in households with no toilet at all. Electricity connections have improved only for the richest quintile, which recorded a 5 percent increase in connections.

<sup>19</sup> However, despite the expansion of the use of mobile phones, the mobile telephony market in Zambia is not performing very well compared with other countries in Sub-Saharan Africa. There is a lack of competitive neutrality between state and private players, and a monopoly on the international gateway by the state owned. These partly affect the poor performance and remain an issue. Recent regulatory improvements such as relating to interconnection tariffs might however intensify competition and consequently improved performance going forward (Ellis, Singh, and Musonda, 2010).

<sup>20</sup> For further details on housing conditions see also Table C5 in Appendix C.

**2.30 Rural houses are less well-equipped than urban houses** (see Table C5 in Appendix C). 18 percent of Zambians in rural areas do not have a toilet in their house, compared to only 0.5 percent of urban Zambians. 34 and 54 percent of urban houses are equipped with a flush toilet and an electricity connection, respectively, whereas only 1.4 and 5 percent of rural houses have flush toilets and electricity. However, the percentage of households using an improved water source is similar in both areas, though a bit higher in urban areas, as might be expected (52 percent of urban vs. 45 percent of rural households). In addition, the absence of “productive assets” necessary for the agricultural activities (such as farm implements and storage facilities) is also an extremely important issue for rural households mainly engaged in agricultural activities). The lack of “productive assets” compromises the productivity of rural poor (Sassa and Carlsson, 2002); it is an attribute and cause of poverty (Imboela, 2004).

Figure 2.4 Housing Conditions for Poorest and Richest Quintiles, 2004 and 2010



Source: World Bank estimates based on 2004 and 2010 LCMS.

## D. Access to Basic Services

**2.31 A large percentage of rural Zambians continue to live far from basic public facilities and services** (see Table 2.7). In 2010, only 26 percent of the rural population had access to a food market situated within 2km of their home, compared to 89 percent of the urban population. Proximity to high schools, police stations and post offices varies considerably between urban and rural regions. Access is particularly limited in rural areas, where the poor are most concentrated: the population share living in close proximity to certain basic public facilities can be ten times lower for in rural areas than in urban areas. Improvements have been made, however, in the accessibility of rural healthcare facilities. About 5 percent of rural residents gained access to health care facilities between 2004 and 2010, while urban areas have seen a drop in access of around 4 percentage points. Nevertheless, only about a third of rural residents have adequate access to health facilities.

**2.32** Despite the fact that access to health centers remains limited in rural areas, the incidences of infant, child and under-five mortality are similar in both rural and urban areas (see Table C7 in Appendix C). However, mortality rates vary greatly by province and are strongly associated with provincial poverty rates. Central, Southern and Northwestern Provinces recorded the lowest incidences of infant, child and under-five mortality, whereas the highest mortality rates are observed in Luapula, Northern and Western Provinces, which are also the provinces with the highest incidence of poverty.

**2.33** **Access to a high school situated at less than 2km away (or less than an hour of travel time), has improved at the national level, mainly due to the improvements in urban areas.** Easier access to high schools resulted in increased school attendance (as mentioned in the previous section). In urban areas the increase in access might be due to the increase in the ownership of personal vehicles (the percentage of all urban Zambian car owners rose from 5 to 8 percent, and from 10 to 12 for the richest quintile, who generally reside in urban areas). Access to most of the other services and facilities recorded in the LCMS, such as healthcare facilities, banks, public transport, and police, either slightly improved or remained relatively constant in both terms of distance and travel time.

**2.34** **Access to a food market situated within 2 kilometers deteriorated at the national and urban levels; overall, fewer people had local access in 2010 than in 2004** (see Table 2.7). This would be less problematic if access to public transportation in urban areas had increased, but this is not the case. On the contrary, access to public transportation has also deteriorated. In rural areas, however, access to food markets improved both in terms of distance and travel time; this is correlated with improvements in public transport in rural areas, but is also due to the increased availability of private vehicle, especially bicycles, in rural areas (see Table C4 in Appendix C).

**2.35** **Despite modest improvements, access to a bank, post office, or high school remains limited for the poorest quintile.** Only 4 percent of the poorest have access to a bank situated within 2km, about 5 percent have access to a post office, and about 6 percent to a high school. The poorest are more likely to have access to public transportation (37 percent), health care facilities (34 percent) and food markets (27 percent). However, despite limited access to high schools among the poorest, the attendance rate for poor students aged 14-18 years old is about 70 percent (see Chapter 1, [Figure 0.14](#)), which is only 8 percent lower than the attendance rate for non-poor students in the same age group, who typically benefit from much better access to high schools.

Table 2.7 Access to Basic Services, 2004 and 2010

	2004					2010				
	Nat.	Urban	Rural	Poorest 20%	Richest 20%	Nat.	Urban	Rural	Poorest 20%	Richest 20%
<b>Percent of the Population with Facilities Within 2 Kilometers</b>										
Food market	51.7	93.9	24.6	23.4	40.7	48.9	89.4	26.4	27.4	76.6
Post office	23.7	51.6	5.9	5.1	15.9	17.1	39.3	4.7	5.4	34.2
High school	14.6	32.6	3.0	2.6	8.4	19.5	45.9	4.9	6.4	39.9
Health centre	49.9	83.0	28.7	30.2	42.0	49.9	79.3	33.6	34.2	71.6
Police	36.9	80.5	9.0	7.5	23.4	33.6	75.1	10.6	10.3	63.2
Bank	16.1	39.1	1.3	1.8	8.6	16.0	40.2	2.6	4.0	36.0
Public transport	59.6	90.9	39.5	35.2	51.6	56.7	88.2	39.2	37.5	80.6
<b>Percent of the Population with Facilities Less than 1 hour away</b>										
Food market	60.0	93.8	38.3	33.5	50.7	60.5	94.0	42.0	40.3	84.3
Post office	25.4	48.3	10.8	7.7	17.4	16.4	33.2	7.1	5.7	34.3
High school	6.6	12.9	2.5	3.2	2.7	10.6	20.9	4.9	4.8	18.9
Health centre	65.0	88.0	50.2	45.4	61.2	67.3	86.6	56.5	56.3	81.4
Police	38.5	72.3	16.9	12.1	27.3	34.0	63.2	17.7	17.1	55.2
Bank	13.1	28.6	3.2	2.0	5.5	15.2	35.5	3.9	2.2	40.0
Public transport	63.4	89.4	46.8	39.7	56.3	63.1	88.5	48.9	44.8	82.9

Source: World Bank estimates based on 2010 LCMS.

## E. Self-Identified Causes of Poverty

**2.36 The vast majority of Zambians considered themselves to be poor.** In 2010, about 87 percent of Zambians described themselves as poor: 49 percent said they think of themselves as “moderately poor” and 38 percent said they were “very poor” (see Chapter 1, Figure 0.3). These self-perceptions of poverty vary between rural and urban areas. In 2010, the percentage of people in rural areas who described themselves as “very poor” was twice that in urban areas (46 versus 23 percent). A much greater share of urban residents (23 percent) described themselves as “not poor” than did rural residents (8 percent). However, more urban residents described themselves as “moderately poor” (53 percent) than did respondents in rural areas (46 percent).

**2.37 In 2010, the majority of Zambians who considered themselves “very poor” or “moderately poor” cited the “lack of agricultural inputs and imports” as the main cause of their poverty** (see Figure 2.5). It is interesting to note that the importance ascribed to lack of agricultural inputs and imported goods has increased over time, despite the government’s efforts to provide input support and the increase in private-sector input purchases observed in 2009-2010 (cf. Burke 2010). Although the liberalization of agricultural markets, both for inputs and products, boosted farmer productivity in the late 1990s and 2000s, the impact of these reforms has by now largely run its course, and the potential returns to further policy interventions in the agricultural sector are limited. A recent World Bank assessment (World Bank 2010) of the Zambian government’s Fertilizer Support Program (FSP)<sup>21</sup> indicated that 82,000-146,000 tons of incremental maize output were attributable to the program in 2007/08 and that the cost of FSP maize was competitive when grown for food security in outlying areas. While it is clear that such programs can yield positive results, the design and implementation of agricultural interventions are critical and will need to be modified in future efforts, as the assessment also highlighted the need for clearer objectives, enhanced beneficiary selection criteria, and improvements in program implementation mechanics (such as the timing of the delivery of agricultural input packages). Furthermore, related interventions including the Food Reserve Agency’s setting of producer price floors should be evaluated, and other policy options should be considered vis-à-vis these agricultural input subsidies. For a more thorough analysis of the FSP and other agricultural support programs, see Appendix F.

**2.38 “Lack of capital” was the second most frequently cited reason for poverty in the 2010 LCMS.** About 18 percent of those who considered themselves poor pointed to the lack of capital as the main cause, and the share of respondents citing lack of capital has increased since 1996. As the majority of people are self-employed, many in small, family-run businesses, this is in many cases likely to be a lack of working capital, and suggests that people are unable to save sufficiently, and do not have adequate access to credit to expand their business activities or to launch new enterprises. In particular, the lack of access to agricultural credit has had negative effects on most of the poor households.

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<sup>21</sup> The FSP is now known as the Fertilizer Input Support Program (FISP)

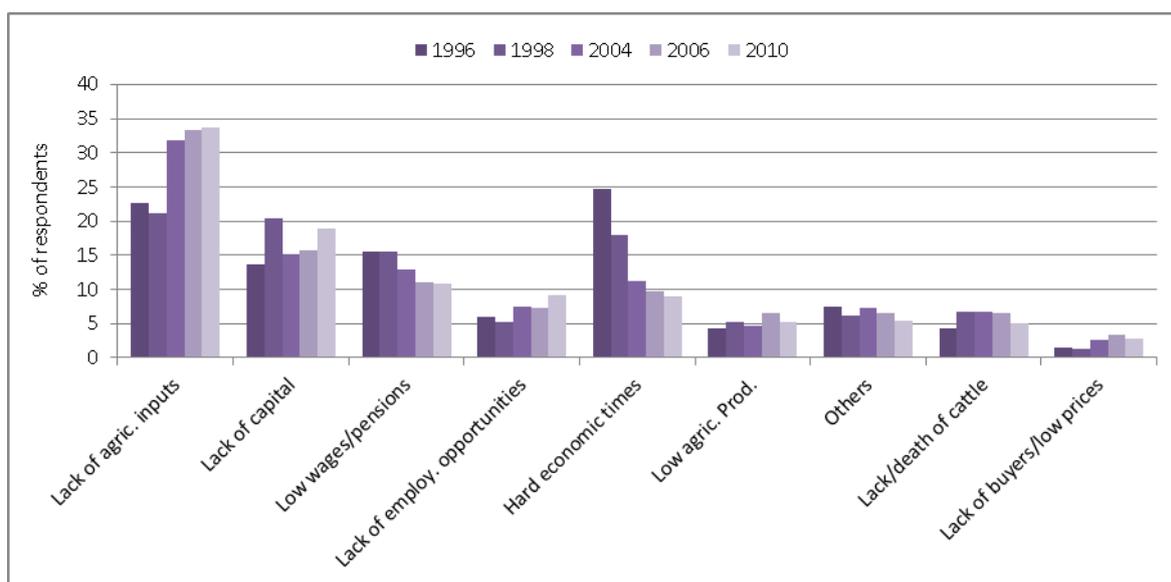
**2.39 “Hard economic times” are also cited among the most important reasons of for self-described poverty, but respondents appear less concerned with this in recent years.** This seems to imply a general feeling that the overall economy is improving, though the extremely high rate of self-described poverty also suggests that respondents feel that they are not personally able to benefit from the growth of the larger national economy.

**2.40 “Lack of employment” is also cited as an explanation for subjective poverty, and this concern has increased since 1996.** Two reasons might explain why Zambians seem increasingly concerned with the lack of employment opportunities. Unemployment and underemployment have continually increased and remain major problems. The privatization process in the late 1990s, which improved the performance of most firms—especially in the mining sector—has been accompanied by a restructuring of the labor market. New mines are significantly more capital intensive, and employment in the mining sector has fallen substantially in the last decade despite large increases in output. This resulted in net job destruction, as employment growth in other sectors has been unable to offset the effect.

**2.41** Moreover, Zambians’ growing concern with the lack of employment opportunities may also be correlated with increases in educational attainment. As the number of graduates increases, so do expectations of finding good employment opportunities, and limited job growth in more skills-intensive industries may result in frustrated ambitions.

**2.42 “Insufficient wages/pensions” is also regarded as an important reason for self-described poverty, although this seems to be on decline.** As employment in the formal sector shrunk in the wake of the privatization process, the quality of formal employment has also deteriorated, and real wages dropped significantly. However, the fact that this factor is currently accorded less importance as a cause of poverty might be the consequence of increasing concern with the lack of employment opportunities; inadequate wages are not likely to be cited by unemployed workers.

Figure 2.5 Main Reported Causes of Poverty among Self-Described “Poor” Households, 1996 - 2010



Source: World Bank estimates based on LCMS.

**2.43 Gender differences are observed with regard to “low wages/pensions” as a reason for poverty** (see Table 2.8). Male respondents assigned almost twice as much importance to this reason than female respondents. This might be because men are more likely to hold jobs where they receive wages or salaries, whereas women are more likely to work in agriculture, family enterprises, or as unpaid household labor (see Chapter 3, which details the Zambian labor market). Women also register a significantly higher unemployment rate. Due to these factors, women are less likely to cite low wages despite being paid significantly less than men with a comparable level of education. Women with no education earn only 65 percent of that earned by their male counterparts, while women with a tertiary level of education earn about 95 percent (Burger, Burger, and van der Berg 2004).

**Table 2.8 Gender Differences in Reasons Cited for Poverty**

	Low wages/pensions		Lack of Employment Opportunities	
	Male	Female	Male	Female
<b>1996</b>	17.6	7.3	6.5	3.4
<b>2010</b>	11.8	7.1	9.6	7.6

*Source: World Bank estimates based on LCMS.*

**2.44 Men are more likely than women to cite the lack of employment opportunities as the main reason for their poverty, despite experiencing a significantly lower unemployment rate.** According to the LCMS the unemployment rate for women was 11 percent, while the unemployment rate for men was only 9 percent. A comparison to the 2008 Labor Force Survey data (CSO 2010) reveals that the unemployment rate for women has fallen considerably (from 18 percent in 2008), while declining more modestly for men (from 12 percent in 2008). The rising trend of female employment may explain female respondents’ being less likely to identify a lack of employment opportunity as a cause for poverty. Women have, however, become more likely to cite this cause over time.

## **F. Conclusion**

**2.45 An in-depth analysis of the nature, characteristics and causes of poverty in Zambia lends further support to the conclusions presented in the previous chapter: that although national macroeconomic growth has been strong in recent years, its benefits have been sharply limited.** Rising incomes have been concentrated in the employed urban workforce, especially among its wealthiest and most highly skilled segment. With limited rural development and substantial truncation between the urban and rural economies, the rural poor have been largely excluded from the benefits of recent economic growth. As a result, rural poverty remains extremely high; the medium-term trend in rural poverty reduction has gradually diminished over time and is now approaching a standstill. Poverty in Zambia continues to be a predominantly rural phenomenon, with poverty incidence highly concentrated among small-scale farmers with little or no formal education.

**2.46** With the poorest quintile of the population deriving, on average, more than half of their food consumption from household production—combined with the fact that yields are typically relatively low—interventions to help boost agricultural productivity can directly benefit the rural poor, both through greater food security and the potential for income generation. The main reason for poverty cited among households who consider themselves as poor in 2010 was the lack of agricultural inputs. A recent World Bank assessment of the government’s Fertilizer Support Program indicates that such interventions can yield positive results. However, the design and implementation of such interventions are critical and need to be modified to be more effective (WB 2010). Furthermore, related interventions including the Food Reserve Agency’s setting of producer price floors should be evaluated, and other policy options should be considered vis-à-vis these agricultural input subsidies.

**2.47** Access to basic services has improved, but additional progress is still necessary. Disparities in access to basic health services, education, and public transportation persist between rural and urban areas as well as between the rich and poor nationwide. The effective provision of education and healthcare, as well as the extension of infrastructure and the targeted use of sector-specific support policies, can achieve meaningful increases in productivity, raising incomes and promoting better economic and social conditions. In addition, well targeted social safety nets can help protect the poor and promote greater economic opportunities.

**2.48** To extend the benefits of economic growth to the nation’s poor and improve public access to cost-effective infrastructure and services, Zambia must foster the growth of new and diverse economic activities to spur the development of a robust economy. Recent growth in the mining, construction, financial services and tourism industries is a positive sign, but without broad-based job creation the returns to that growth will remain heavily concentrated among a small portion of the national labor force. While the supply of high school graduates has been increasing over time, continued poverty reduction will depend on the demand for better-educated workers in Zambia’s labor market. Improvement in educational attainment is a worthy goal in itself, but unless the demand for skilled labor continues to grow, more and more graduates will find themselves competing for a finite number of jobs requiring higher levels of education and skills. The following section examines the Zambian labor market in greater detail, and it is hoped that this analysis will reveal opportunities for expanding the returns to growth and enhancing its impact on poverty reduction nationwide.

# Chapter 3: The Labor Market, Employment and Wages

## A. Introduction

**3.1** This chapter will provide a profile of the Zambian labor market in 2010, describing its principal features and attempting to explain some of its more troubling characteristics. Following this introduction, Section B discusses the datasets to be used. Section C introduces our proposed multi-sector model of the Zambian labor market. In addition, we provide a descriptive overview of employment through selected supply-side characteristics. Section D further explores the characteristics of the employed and unemployed workforce. Particular attention is paid to the significant difference in rural and urban unemployment rates, the most salient feature of the Zambian labor market. In Section E wage-rate data are presented across the labor-market segments, and the distribution of income is examined both within and between employment categories. The analysis is supported by an attempt to verify the employment characteristics of the Zambian labor market using a multinomial logit model. Subsequently, a modified Mincerian earnings function is presented in order to investigate the determinants of income for employed individuals. Section G presents the conclusions of the analysis.

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## B. Data and Definitions Used in the Analysis

### *The Dataset*

**3.2** The LCMS has been conducted by the Zambian CSO since 1996. The main objective of the survey is to measure the living standards of households in Zambia across a range of economic and social welfare indicators. The survey contains information on income, expenditure, poverty and inequality as well as access to public goods and services, such as education and healthcare. The LCMS has been conducted six times, in 1996, 1998, 2002/3, 2004, 2006, and 2010. This chapter uses only the data from the most recent survey, 2010.

**3.3** The LCMS covers all of Zambia's nine provinces and includes both rural and urban areas. Surveys are conducted using a sample of households, which are differentiated by province, district, "Census Supervisory Areas" and "Standard Enumeration Areas". Sample households are also classified according to what the CSO refers to as "strata". In the case of urban areas, households are categorized into strata based on the property values of their neighborhoods. Rural households are classified based on the type of agricultural activity the household is involved in. These strata are defined as follows (CSO, 2008:11):

- Rural small-scale agricultural households
- Rural medium-scale agricultural households
- Rural large-scale agricultural households
- Rural non-agricultural households

- Urban low-cost housing residential areas
- Urban medium-cost housing residential areas
- Urban high-cost housing residential areas

### ***Definitions and Exclusions***

**3.4** In keeping with the international working age classification, we limit the analysis to individuals between 15 and 65 years of age. In addition, the analysis focuses solely on those individuals who identified themselves as participants in the labor force; i.e. it excludes full-time students, too old to work or early retirees, prison inmates, and other individuals<sup>22</sup> who are neither employed nor seeking employment. According to the National Pension Scheme Authority of Zambia, individuals qualify for the old age pension either at the age of 65 or at the age of 55 conditional on having reported 180 months of continuous employment (15 years). Those who received an old-age pension and were older than 54, but still reported participating in the labor force were therefore excluded from the analysis. The labor force is thus defined as all individuals between 15 and 65 years old that are either employed in the various segments of our multi-sector labor market model, unemployed but seeking work, or employed as unpaid family workers.<sup>23</sup>

**3.5** For the income-analysis component (Sections E and F), it is important to note that various restrictions were applied to the data. The analysis is based entirely on income generated by labor, i.e. through wages, salaries, and the sale of agricultural produce; it does not include investment income, rent, or other returns to capital. Income from pensions (even those earned through previous work), survivor benefits, public assistance and welfare programs, and other transfer payments are also excluded.

**3.6** Wage earners are categorized as individuals working in the various segments of the labor market and reporting a positive monthly wage or salary. Agricultural income is defined as income generated by the households from the sale of crops and livestock.<sup>24</sup> As we discuss in greater detail below, all labor-force participants (employed, unemployed, and unpaid family workers) residing in a household with a positive agricultural income are included in the household's income analysis. We assume a unitary household model and therefore attribute equal shares of the income reported by the household to all members classified as labor-force participants.

## **C. Statistical Characteristics of the Labor Market Model**

**3.7** The first segment in our model is formal-sector employment, which includes all individuals who reported being employed by a firm with more than five total employees and are entitled to

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<sup>22</sup> The "Other" category encompasses all those who are either unwilling or unable to work. It includes persons who live on income from investments, savings, inheritance, remittances, charity, family support, et cetera, as well as individuals who are physically or mentally disabled.

<sup>23</sup> The LCMS defines "unpaid family workers" as "persons who normally assist in the family business or farm but do not receive any pay or profit for the work so performed".

<sup>24</sup> A third component, namely income from the sale of eggs, milk, hides and other animal products, was omitted due to the absence of those data.

work-related benefits such as a pension, gratuity or paid leave.<sup>25</sup> All formal sector employees are included in this segment regardless of their location (rural or urban). Fewer than 30 percent of formal-sector workers reside in rural areas, and a plurality of these (42 percent) are employed in the community, social and personal services (CSP) subsector, that is, in local public-service positions. Because the rural formal sector is so small and so much of it is devoted to public service, it is difficult to draw statistically valid conclusions from the available data. Consequently, the rural and urban formal sectors are collapsed into a single category.

**3.8** The second labor market segment is the urban informal sector. This segment includes all individuals classified as informally employed and working in an urban area, irrespective of their primary economic activity. The informal sector, according to the LCMS classification, is comprised of individuals who own or are employed by a business with fewer than five employees and who are not entitled to standard formal-sector employment benefits.<sup>26</sup>

**3.9** The rural informal sector is the third segment of our proposed labor market model. This sector is comprised of all individuals who are classified as informally employed, as defined above, and who work in a rural area.

**3.10** The fourth segment, agricultural production, captures all employment in agriculture and related activities in rural areas, excluding only household-level sales of crops and livestock. Employment in agricultural production cannot be neatly divided into formal and informal activities. Respondents who were classified as belonging to either the formal or informal sector based on their answers to the questions related to firm size and worker benefits are not included in this segment. Subsistence farming is included in this section, as we cannot separate these workers from those employed in other forms of agriculture, such as paid day laborers or commercial farm staff.

**3.11** The fifth segment consists of individuals employed in household-level agricultural sales; borrowing from the work of Fox and Kweka (2011), we refer to this segment as “employment in household enterprises”. This segment also includes respondents who were initially classified in the survey as unpaid family workers (UFWs) or as unemployed, but who reside in households which earn a positive income from the sale of crops and/or livestock.<sup>27</sup> Income per worker is determined by dividing total household income from crop and livestock sales by the number of segment-eligible workers in the household.

**3.12** The sixth segment covers individuals engaged in multiple economic activities. For example, a number of respondents who identified themselves as employed in either the formal or informal sector also reported having a second job or receiving income from another economic activity, such as farming or raising livestock. These individuals have been specifically allocated to the multiple activities segment and are not double-counted in other segments. Table D3 (see Appendix D)

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<sup>25</sup> The segment includes unpaid family workers who reported that they are employed in the formal sector.

<sup>26</sup> Note that, as discussed above, this segment includes unpaid family workers who reported that they were working in the urban informal sector.

<sup>27</sup> Though it may seem contradictory, unemployed workers can still be considered income earners if they describe themselves as seeking employment but reside in a household that earns income from the sale of crops or livestock, since it can be reasonably assumed that they both participate in generating that income and also benefit from it.

presents a matrix of all six employment categories, including overlapping respondents. As the table shows, around 9.5 percent of formal-sector employees—a small but significant share—are also involved in agricultural activities. On the other hand a much larger share (40 percent) of the rural, informal workforce is also employed in household enterprises. This would seem to suggest that informal employment and household enterprise activities often serve as complementary income sources for the rural population. Consequently, the multiple activities segment captures a substantial proportion of workers in both the rural-informal and household-enterprise sectors.

**3.13** x segments cover the entirety of the income-earning workforce though, again, it is important to note that this may include UFWs and even the unemployed, so long as they reside in households which reported income from agricultural sales. The two remaining segments of the Zambian labor force consist of unemployed individuals and UFWs who do not earn household income from the sale of crops or livestock, and are therefore considered zero income earners in the model, but who nevertheless remain in the labor force.

**3.14** This eight-sector model serves as the basis of our descriptive and econometric overview of the Zambian labor market. Table 3.1 presents a snapshot of the Zambian Labor Force. Specifically, it shows the Labor Force Participation Rate (LFPR), employment rate and unemployment rate by basic demographic characteristics. The final six columns present a breakdown of the six employment segments according to these characteristics.

**3.15** The data indicate, in aggregate terms, that the Zambian labor force numbered 4.94 million in 2010. Of these, 4.45 million were in employment in one of our six segments; 484,612 were unemployed, and just over 10,000 were UFWs. According to the available data, in 2010, 60.2 percent of working-age individuals participated in the Zambian labor force.<sup>28</sup> The Zambian labor force is decomposed by respondent demography in order to assess how labor force participation rates (LFPRs) vary by characteristics such as gender and location. Males register a slightly higher participation rate than females (at 63 percent and 58 percent, respectively), and individuals in rural areas participate in the labor market at a higher rate than their counterparts in urban areas (at 63 and 56 percent, respectively).

**3.16** A breakdown by age cohorts indicates a non-linear relationship between age and LFPR. Labor force participation reaches its maximum among the 25-34-year-old age group at 76 percent; participation rates decline among older workers, reaching a low of 67 percent for those aged 45 to 54, but then rebounds to 75 percent for the oldest cohort, workers aged 55-65. For education, the estimates unsurprisingly present a strong positive correlation between LFPR and educational level. Individuals with no education had an LFPR of 61 percent, while the LFPR for individuals with any degree of primary or secondary education, but no secondary-school diploma, range between 85 and 88 percent; labor force participation rises to 92-93 percent for those with a diploma or university

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<sup>28</sup> Table D2 (see Appendix D) presents international labor force participation rates (LFPR). At a glance, the LFPR cross-country comparison for the selected countries suggests that in the sample of African economies, Zambia's LFPR remains within the mean of the cohort. Botswana has the highest participation rate of the selected countries with a rate of 76.6 percent. Algeria, on the other hand, has the lowest participation rate at 43.3 percent. Liberia, Mauritius, South Africa and Zambia each have a participation rate of approximately 60 percent.

degree and reaches 96 percent for workers with a Master's degree, the highest academic qualification recorded in the LCMS.

**3.17** The breakdown by provinces indicates only minor regional differences in labor force participation. The highest rate was in Eastern Province (66 percent), while the lowest is in the Copperbelt Province (54 percent). Finally, disaggregating labor force participation by the LCMS demographic 'strata' (see above) reveals only minor differences, with most categories clustering around 57 percent. The stratum with the lowest LFPR was the urban middle class at 55 percent; meanwhile, small-scale farmers registered the highest LFPR at 63 percent.

Table 3.1 Trends in Labor Force Participation, Employment and Unemployment, 2010

					Composition of Employment					
	LFPR (Labor Force as % of Working Age Population)	Employment Rate (% of Labor Force)	Unemployment Rate (% of Labor Force)	Unpaid Family Work (% of Labor Force)	Formal Sector (%)	Urban Informal (%)	Rural Informal (%)	Agricultural Production (%)	Household Enterprises (%)	Multiple Activities (%)
By Gender										
Male	63.03	90.9	8.94	0.1	24.2	12.52	6.4	39.22	4.86	12.81
Female	57.53*	89.0	10.7	0.3	10.56	11.32	5.17	37.14	6.09	29.72
By Location										
Rural	62.64	98.2	1.62	0.1	7.31		8.15	53.64	5.34	25.57
Urban	56.02*	74.5*	25.18*	0.3	42.86	41.46			5.78	9.9
By Age										
15-24	39.82	79.4	20.18	0.4	8.19	6.66	4.97	27.93	13.83	38.42
25-34	75.96*	90.5*	9.31*	0.2	21.42	14.64	6.81	35.2	4.35	17.58
35-44	73.15*	95.9*	4.09*	0.0*	21.84	14.12	6.65	41.26	2.39	13.74
45-54	67.21*	96.8*	3.11*	0.1*	19.88	11.88	4.42	48.77	1.28	13.77
55-65	75.02*	97.5*	2.51*	0.0*	11	9.24	3.5	56.26	1.36	18.64
By Education										
None	60.88	93.5	6.51	0.0	17.64	8.95	2.83	37.95	2.88	29.75
Grade 1-8	87.83*	93.9	5.89	0.2*	5.9	8.36	6.41	49.09	4.56	25.68
Grade 9-11	85.44	88.5	11.37	0.1*	16.31	19.66	7.52	33.19	5.46	17.87
GCE O-level	87.14	73.9*	25.77*	0.3*	36.22	23.17	5.08	12.11	12	11.42
GCE A-level	88.27	86.5	13.52	0.0	53.02	10.38	2.97	19.46	1.3	12.87
Diploma/Certificate	92.72*	91.5	8.47	0.0	79.59	12.04	1.14	2.6	2.13	2.51
University Degree	92.38*	95.9	4.14	0.0	91.74	3.23	1.08	0.81	1.07	2.07
Master's Degree	95.98*	99.6	0.43	0.0	95.89	0.12	1.18	1.56		1.24
Total	60.16	90.0	9.81	0.2	17.54	11.94	5.8	38.19	5.47	21.06

Source: Authors' calculations based on the Living Conditions Monitoring Survey for 2010; \* indicates statistical significance at a 95 percent for the reference group

Notes: 1. "Formal employment" includes all individuals reported as employed by a firm with 5 or more employees and entitled to a pension,, paid leave and other benefits.

2. "Urban informal" are all those reported as employed, residing in an urban area, working in a business with fewer than 5 employees, are not entitled to benefits as well as those identifying themselves as 'unpaid family workers'.

3. "Rural informal (non-agricultural)" refers to respondents who were employed, living in a rural area, and working in a business with fewer than 5 employees, are who are not entitled to benefits as well as those reporting their employment status as 'unpaid family worker'. Respondents who reported their main economic activity as farming, fishing or forestry were excluded.

4. All respondents whose main economic activity was farming, fishing or forestry and who did not indicate whether they are formally or informally employed. Thus, subsistence farming is also included in this section as we cannot separate subsistence farming from other forms of agriculture.

5. "Household enterprises" refers to those individuals that are classified as unpaid family workers or unemployed, but reside in households which earn income from sales of crops or livestock.

6. The unemployment rate and unpaid family worker rate does not include workers who reported a positive agricultural income; only zero income unemployed and unpaid family workers are considered.

**3.18** According to the data, 90 percent of the national labor force was employed in 2010. While many employee characteristics, such as gender, education and most age cohorts, presented only minor or easily explained differences in employment, a stark differential was evident in rural and urban employment rates. In 2010, the rural employment rate was dramatically higher than the urban rate (at 98.2 and 74.5 percent, respectively). This suggests that almost all rural labor force participants were working in 2010; while more than one-in-four urban workers were unemployed. The breakdown by age group suggests that employment was highest among individuals between 55 and 65 years of age and lowest among those between 15 and 24, which is to be expected given the typical impact of experience and seniority on hiring and worker retention. Also unsurprisingly, higher employment rates were recorded for respondents with higher levels of education; however, this trend was not uniform, and employment rates were highest for both those with very high and very low levels of education. The only exception was among respondents who reported no education at all, but even their employment rate was fairly high given their relatively low LFPR.

**3.19** The provincial and strata characteristics are presented in Table D4 (see Appendix D). The strata decomposition presents interesting though not unexpected results—particularly in terms of rural/urban employment trends. Employment rates were significantly higher for all rural strata—ranging from 89 to 100 percent, compared to just 73 to 78 percent for their urban counterparts. Rural unemployment was extremely low, especially in the agricultural sector, which registered an unemployment rate of between 0 and 1 percent. Urban unemployment, however, ranged from 21 percent (for the upper-income housing stratum) to nearly 26 percent (for the lower-income stratum).

**3.20** The provincial results indicate that as with the overall LFPR, the Eastern Province had the highest share of employed workers, while the Copperbelt had the lowest. This could be a reflection of the urban/rural composition of provinces. The Copperbelt province is highly urbanized, whereas Eastern Province is predominantly rural. For example, in 2010, 80.15 percent of labor force participants in the Copperbelt province were classified as urban residents while less than 10 percent of labor force participants in the Eastern province were classified as urban residents.

**3.21** In terms of employment segments, the largest share of the employed was those who reported that they were involved in agricultural production. Employment in this segment accounts for almost 1.7 million workers or 38 percent of total employment in Zambia in 2010. The second-largest employment share is in the multiple activities sector, at 21 percent of total employment, suggesting that the pursuit of multiple economic activities by the workforce is a key feature of the Zambian labor market. Meanwhile the formal sector, nationwide, accounted for 780,000 workers, or 17.5 percent of total employment. The urban informal sector was responsible for just under 12 percent of total employment while household enterprises (as the respondent's sole economic activity) only accounted for 5.5 percent of total employment.

**3.22** Overall, the majority of urban workers were employed either in the formal (43 percent) or informal sector (41 percent). More than half of rural workers were employed in agricultural production, with a further quarter engaged in multiple activities. The results by gender indicate that agricultural production was the dominant activity for both genders with almost the same number of

males and females (approximately 891,000 vs. 806,000 workers) employed in this segment. The formal sector, by contrast, was dominated by males, with almost a quarter of all employed men working in this sector, while just over 10 percent of employed women held a formal-sector job. However, almost a third of women (more than 644,000) indicated that they were involved in multiple economic activities, while approximately 13 percent of men (or just less than 300,000) reported more than one economic activity. This suggests that women were more likely to hold multiple jobs or earn income through some secondary business. The breakdown of employment by age confirms the relative importance of agriculture for all age categories. With the exception of the 15 to 24-year-old age group, in each age cohort agricultural production is the dominant form of employment.

**3.23** In terms of the unemployment rate,<sup>29</sup> the vast differential between rural and urban areas is its most salient characteristic. As noted, the urban unemployment rate is very high, at 25.2 percent, compared with a rural unemployment rate of just 1.6 percent. The lack of time-series data makes it difficult to test hypotheses regarding the reasons for this differential; however, it seems clear that elements of the Harris-Todaro model (1970) are at work, with extremely high urban unemployment substantially offsetting the wage-rate incentives offered by the urban economy. A combination of this and other factors, including structural constraints on the supply of skilled labor, the likely use of efficiency wages in the urban sector, and the peculiar characteristics of rural labor markets, may help to explain vast employment differential between rural and urban areas.

## **D. An Overview of the Employed and Unemployed Workforce**

**3.24** Focusing on the economic-sector breakdown of the workforce, Table 3.2 and Table 3.3 present the results of the distribution of individuals across both the three traditional sectors (agriculture and resource extraction, industry, and services) and a set of specific sub-sectors. Formal employment, as well as both urban and rural informal employment, is mainly driven by the tertiary (or service) sector (at 62, 82, and 52 percent shares of those labor-force segments, respectively). The main contributor to total formal employment is CSP services, which has the highest total number of workers of any economic subsector. The CSP subsector is dominated by government positions, indicating, unsurprisingly, that the government of Zambia is a major source of formal employment. Overall, more than 300,000 Zambian workers are public-sector employees.

**3.25** The urban and rural informal sectors, on the other hand, are represented mainly by wholesale and retail workers (268,000 and 104,000, respectively). The three remaining labor-force segments (agricultural work, household enterprises, and multiple economic activities) fall under the primary sector, specifically agriculture. At the economic sector level then, the Zambian labor market is dominated by three employment categories: agriculture, wholesale and retail trade, and public-

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<sup>29</sup> The international comparison presented in Table C2 (Appendix C) suggests that the aggregated Zambian unemployment rate also remains within the mean of the cohort. South Africa registered the highest unemployment rate in the sample, whereas Liberia had a relatively low unemployment rate (25 and 3.6 percent respectively). Algeria, Egypt, Morocco and Zambia each had an unemployment rate of approximately 10 percent.

sector services. The single large employer, however, is the agriculture, forestry and fishing sector, accounting for almost 70 percent of total employment in the Zambian economy.

**3.26** The occupational cohort analysis shows that in the formal and both the rural and urban informal sectors, the majority of workers are semi-skilled, with the formal employing a substantial number of highly skilled workers. In fact, highly skilled professionals (of which there are 188,000) accounted for the largest share of the formal-sector workforce. In the urban informal sector the highest total number of workers (246,000) was employed in the “service and sales” category. Given that the rural informal sector<sup>30</sup> is dominated by the wholesale and retail trade, the occupational breakdown indicates that services and sales, together with skilled rural-sector jobs, accounted for the largest number of workers in any segment besides agriculture.

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<sup>30</sup> According to our employment breakdown, rural informal workers are individuals who own or are employed by a business with fewer than five employees and who do not receive standard worker benefits and who, of course, live in rural areas.

Table 3.2 Employment by Economic Sector (ISIC Revision 4)

	Formal Sector		Urban Informal		Rural Informal		Agriculture		Household Enterprises		Multiple Activities		Total	
	Total ('000s)	Share (%)	Total ('000s)	Share (%)	Total ('000s)	Share (%)	Total ('000s)	Share (%)	Total ('000s)	Share (%)	Total ('000s)	Share (%)	Total ('000s)	Share (%)
<b>Primary Sector</b>														
Agriculture, forestry and fishing	107	66	21*	84	81	98	1,664*	100	48*	100	873*	100	2,794	98
Mining and quarrying	55	34	4*	16	2*	2	2*	0			2*	0	65	2
<b>Total Primary Sector</b>	<b>162</b>	<b>21</b>	<b>25</b>	<b>5</b>	<b>83</b>	<b>33</b>	<b>1,666</b>	<b>99</b>	<b>48</b>	<b>96</b>	<b>875</b>	<b>97</b>	<b>2,859</b>	<b>68</b>
<b>Secondary Sector</b>														
Manufacturing	51	47	43	61	30*	79	1*	100			4*	100	129	58
Electricity, gas and water	15	14	1*	1		0							16	7
Construction	42	39	27*	38	8*	21							77	35
<b>Total Secondary Sector</b>	<b>108</b>	<b>14</b>	<b>71</b>	<b>14</b>	<b>38</b>	<b>15</b>	<b>1</b>	<b>0</b>			<b>4</b>	<b>0</b>	<b>222</b>	<b>5</b>
<b>Tertiary Sector</b>														
Wholesale and retail trade	62	12	268*	62	104*	79	5*	33	1*	50	15*	65	455	42
Transport, storage and communication	48	10	36	8	4*	3		0			1*	4	89	8
Financial and business services	17	3	1*	0									18	2
Community, social and personal (CSP) services	284	57	22*	5	8*	6		0				0	314	29
Real estate and scientific/technical activities	12	2	6	1									18	2
Accommodation & ICT services	38	8	16*	4	5*	4	7*	47			3*	13	69	6
Other	36	7	80*	19	10*	8	3*	20	1*	50	4*	17	134	12
<b>Total Tertiary Sector</b>	<b>497</b>	<b>65</b>	<b>429</b>	<b>82</b>	<b>131</b>	<b>52</b>	<b>15</b>	<b>1</b>	<b>2</b>	<b>4</b>	<b>23</b>	<b>3</b>	<b>1,097</b>	<b>26</b>
<b>Total</b>	<b>767</b>		<b>525</b>		<b>252</b>		<b>1,682</b>		<b>50</b>		<b>902</b>		<b>4,178</b>	

Source: Authors' calculations from 2010 Living Conditions Monitoring Survey

Notes: 1. \*Indicates statistical significance at a 95 percent level to the reference group (Formal Sector)

2. Standard Errors in parentheses

3. Industrial classifications according to International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4

4. Individuals who reported being unemployed or unpaid family workers, but residing in a positive agricultural income household, are included in the analysis as they have been allocated to the household enterprises employment segment.

Table 3.3 Employment, by Occupation

	Formal Sector		Urban Informal		Rural Informal		Agriculture		Household Enterprises		Multiple Activities		Total	
	Total ('000s)	Share (%)	Total ('000s)	Share (%)	Total ('000s)	Share (%)	Total ('000s)	Share (%)	Total ('000s)	Share (%)	Total ('000s)	Share (%)	Total ('000s)	Share (%)
Managers	28	13	10*	56	5*	63							43	18
Professionals	188	87	8*	44	3*	38							199	82
<b>Highly Skilled</b>	<b>216</b>	<b>28</b>	<b>18</b>	<b>3</b>	<b>8</b>	<b>3</b>							<b>242</b>	<b>6</b>
Technicians	65	17	12*	3	5*	4				1*	5		83	9
Clerks	48	12	12*	3									60	6
Service & Sales Workers	118	30	246*	64	75*	56	2*	33	1*	100	12*	63	454	49
Craft & Trade Workers	87	22	78	20	38*	29	3*	50			4*	21	210	23
Operators & Assemblers	72	18	36*	9	15*	11	1*	17			2*	11	126	14
<b>Semi-skilled</b>	<b>390</b>	<b>51</b>	<b>384</b>	<b>73</b>	<b>133</b>	<b>53</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>19</b>	<b>2</b>	<b>933</b>	<b>22</b>
Elementary Occupations	133	81	103	83	36*	48	34*	2	11*	22	126	14	443	15
Armed Forces	9	5	1*	1			7	0			2*	0	19	1
Skilled agricultural and fishery workers	22	13	20	16	75*	100	1635*	98	38	78	757*	86	2 547	85
<b>Low Skilled</b>	<b>164</b>	<b>21</b>	<b>124</b>	<b>24</b>	<b>111</b>	<b>44</b>	<b>1676</b>	<b>100</b>	<b>49</b>	<b>98</b>	<b>885</b>	<b>98</b>	<b>3009</b>	<b>72</b>
<b>Total</b>	<b>770</b>		<b>526</b>		<b>252</b>		<b>1682</b>		<b>50</b>		<b>904</b>		<b>4 184</b>	

Source: Authors' calculations from the 2010 Living Conditions Monitoring Survey

Notes: \*Indicates statistical significance at a 95 percent level to the reference group (Formal Sector)  
Standard Errors in parentheses

**3.27** The relatively small formal sector and both the urban and rural informal sectors are dominated by service employment, with the formal sector focused on public administration and informal jobs concentrated in domestic transportation and trade.

Although Zambia's macroeconomic indicators tend to emphasize the importance of the mining industry, particularly given its crucial export role, mining is in fact responsible for only a small fraction of employment: just 1.3 percent nationwide. From a labor-market perspective the Zambian economy is characterized by the dominance of three International Standard Industrial Classification (ISIC)-categorized sectors: agriculture and related activities, the public sector, and informal wholesale and retail trade.

### ***Urban-Rural Linkages and the Unemployment Differential***

**3.28** As noted above, urban unemployment was at 25.2 percent in 2010, whereas rural unemployment was just 1.6 percent. In order to analyze this disparity, two performance indicators are utilized: the 'target growth rate' and the 'employment absorption rate'. The 'target growth rate' is the employment growth rate necessary to sustain employment at a given level, and is calculated by positing the growth of employment at the same rate as the growth of the labor force over the period under review (in this case, from 2004 to 2010). The formula for determining the 'target growth rate' is:

$$TGR = \frac{EAP_{kt} - EAP_{kt-1}}{L_{kt-1}}$$

Where *EAP* represents the economically active population for group *k*, and *L* represents the number of employed workers.

**3.29** The 'employment absorption rate', on the other hand, is the ratio of actual employment growth to the target growth rate, expressed as a percentage. An employment absorption rate close to 100 percent indicates that actual employment growth is close to keeping pace with the growth of the labor force; if the rate is below 100 percent, unemployment is rising, and above 100 percent unemployment is declining.

**3.30** The above data suggest then that while rural employment grew at a rate sufficient to absorb new entrants—indeed significantly faster—urban labor markets grew sluggishly. It is likely that the growth in rural employment was to a certain extent, driven by households engaged in agricultural production absorbing excess labor. Whilst it is difficult to provide conclusive evidence with only the 2010 data at our disposal, the notion of low barriers to employment entry in rural areas, combined with multiple options available to work-seekers at the household level - does make this a plausible hypothesis.

**3.31** As seen in Table 3.4, while rural employment grew at a very rapid 31.2 percent over the period, the target growth rate was only 18.81 percent. As a result, the rural employment absorption rate was 165 percent: In other words, job growth was more than sufficient to maintain the

employment rate. In fact, it modestly exceeds the growth of the labor force—and unemployment consequently declined in both relative and absolute terms in rural Zambia.

Table 3.4 Employment Shifts, by Location

					Target Growth Rate	Employment Absorption Rate
<b>Rural</b>	<b>2004</b>	<b>2010</b>	<b>Change</b>	<b>% Change</b>		
Employment	2,412,351	3,164,926	752,575	31.20		
Unemployment	55,365	51,551	-3,815	-6.89		
Labor Force	2,768,271	3,221,930	453,659	16.39	18.81	165.89
<b>Urban</b>						
Employment	1,206,356	1,279,482	73,126	6.06		
Unemployment	180,953	432,404	251,451	138.96		
Labor Force	1,507,945	1,717,150	209,205	13.87	17.34	34.95

*Source:* Authors' calculations from the 2010 Living Conditions Monitoring Survey

*Note:* The 2010 unemployment rate represents the original unemployment rate and does not take into account the new segmentation used in this analysis.

**3.32** In urban areas, by contrast, actual employment grew at just 6 percent from 2004 to 2010. In order to maintain the unemployment rate at its 2004 level, urban employment would have needed to grow by 17.34 percent over the period, nearly three times the observed rate. In other words, while the number of urban jobs grew significantly during the period, the number of available workers increased by more than twice as much. Consequently, urban unemployment rose by nearly 140 percent between 2004 and 2010.

**3.33** Table 3.5 disaggregates rural and urban unemployment by age and education, highlighting a number of important labor-market characteristics. The first notable observation is that only two respondent characteristics, CGE A-level education and location in Luapula Province, do not have significantly different estimates. However, across all other individual characteristics large differences between rural and urban unemployment are present.

**3.34** The results indicate that urban unemployment was substantially higher for female workers than for male workers (30.6 percent versus 20.95 percent); in the rural labor market the difference was relatively minor, though female unemployment was still significantly higher in percentage terms. The age data indicate that urban youth (between ages 15 and 24) have the highest unemployment rate (54 percent) followed by young adults (age 25-34 at 22 percent); urban unemployment continues to fall steadily among older cohorts, reaching a plateau at around 8 to 8.5 percent for ages 45 and above.

**Table 3.5 Decomposition of Rural and Urban Unemployment Rates**

	<b>Rural</b>	<b>Urban</b>
Male	1.38	20.95*
Female	1.84	30.63*
15-24	3.57	54.44*
25-34	1.37	22.07*
35-44	0.50	10.53*
45-54	0.70	8.15*
55-65	0.41	8.51*
None	0.00	41.67*
Grade 1-8	1.28	26.02*
Grade 9-11	0.88	24.99*
GCE O-level	4.86	34.08*
GCE A-level	12.97	13.82
Diploma/Certificate	1.87	10.92*
University Degree	0.00	4.92*
Master's Degree	0.00	0.46*

*Source:* Authors' calculations from Living Conditions Monitoring Survey 2010

*Notes:* \* indicates 95 percent statistical significant different urban-rural unemployment rates.

Provincial rates are reported in Appendix D, Table D9

**3.35** In terms of education, urban residents with no education had the highest unemployment rate (41.7 percent), and the largest relative difference between urban and rural unemployment rates was also highest for this cohort. Those living in urban areas with a General Certificate of Education (GCE) O-level education had the second highest unemployment rate at 34 percent, with the rate for their rural counterparts almost 30 percentage points lower. It is important to note that the extremely low rates of unemployment for individuals with a University or Master's Degree suggest a shortage of highly educated workers, particularly in urban areas.

**3.36** The final characteristic is province: The Copperbelt and Lusaka Provinces had the highest unemployment rates for both rural and urban residents. The largest relative difference between urban and rural unemployment was found in Central Province, which had the third highest urban unemployment rate and the third lowest rural unemployment rate. Ultimately, however, urban unemployment rates were far higher in every province. Consequently, provinces with relatively large urban populations were more likely to register high overall levels of unemployment.

**3.37** Ultimately though, while young workers with little or no schooling bear the brunt of unemployment in urban Zambia, it is evident that almost all demographic cohorts analyzed here have suffered double-digit unemployment rates in urban areas.

## E. Income Dynamics

**3.38** Table 3.6 **Error! Reference source not found.** provides a snapshot of the income statistics by employment segment. To reiterate, in our treatment of income dynamics, agricultural income is defined as income generated by households from the sale of crops and livestock divided by the household's total number of labor-force participants, whether classified as employed, unemployed, or unpaid family workers.<sup>31</sup> We compare the mean and median monthly income for each segment as well as the level of wage inequality within each segment as measured by the Gini coefficient. In the final column we show the ratio of the mean and median wage in each segment relative to the formal sector. We also present the estimates for all those not working in the formal sector (i.e. employment segments two to six).

**3.39** In 2010, the mean monthly wage at the aggregate level was 789,628 Zambian Kwacha (ZMK) or just over US\$164.<sup>32</sup> The data suggest that only those employed in the formal sector earned more than the national average: in fact, formal sector workers earned approximately 3.4 times more than the mean monthly wage. The average formal sector wage of ZMK2.65 million was slightly more than US\$550 per month at the mean exchange rate for 2010. The occupational breakdown presented earlier suggests that these high earners were mostly highly skilled professional workers working in the public service.

**3.40** The second highest earners were those working in the urban informal sector, with a mean monthly wage of just more than ZMK 500,000 (or just over US\$100). This is, however, less than one-fifth of the mean monthly income of an individual working in the formal sector. The relative earnings premium associated with formal-sector employment is even starker when the wages of those working in rural areas (and not working in the formal sector) are considered. Mean monthly wages ranged from ZMK 55,799 to 140,917 (or US\$20-29). Those working in household enterprises earned the lowest income. This segment includes unpaid family workers and the unemployed who reside in households with positive income from the sale of crops and/or livestock and who were allocated a share of the total household income from the agricultural sales for the purposes of our analysis. The relatively low wage is therefore not surprising. Overall, those not working in the formal sector earned a mean wage equal to less than four percent of the mean wage in the formal sector. These differential returns between the formal sector and the other sectors are important. They suggest possible evidence of the attraction to urban areas amongst the workforce, despite the high open unemployment rates in urban areas.

**3.41** While a similar pattern is evident when median monthly wages are considered, the differences between formal sector earnings and wages earned in the other segments are even more pronounced. For example, the median wage at the aggregate level is less than four percent of the

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<sup>31</sup> This implies an equal intra-household income allocation rule, which of course will not be accurate in all cases, but is nevertheless a reasonable assumption in the aggregate.

<sup>32</sup> For comparison we use the average exchange rate for 2010, which was ZMK 4,797: US\$1.

median wage in the formal sector. The median wage for non-formal workers is less than three percent of the formal sector median wage. In addition, for all employment segments, the median wage is fifty percent or less of the mean wage, possibly suggesting the presence of a small number of relatively high earning individuals in all six segments. At the aggregate level, for example, the median wage is only five percent of the mean monthly wage. The fact that the median wages are generally so much lower than the mean wages already suggests high levels of wage inequality in the labor market. The results for the Gini coefficient below confirm that the Zambian economy displays relatively high levels of wage income inequality.

**Table 3.6 Key Income Statistics, by Employment Segment**

	<b>Mean Median Gini</b>	<b>Ratio to Formal Sector Wage: Mean Median</b>
<b>Formal Sector</b>	2,647,096 1,096,942 0.69	
<b>Urban Informal</b>	512,092 260 000 0.62	0.193 0.237
<b>Rural Informal</b>	140,917 35 979 0.74	0.053 0.033
<b>Agriculture</b>	65,674 24,583 0.67	0.025 0.022
<b>Household Enterprises</b>	55,799 20,000 0.71	0.021 0.018
<b>Multiple Activities</b>	95,889 25,000 0.73	0.036 0.023
<b>Non-formal</b>	99,337 26,905 0.75	0.038 0.025
<b>Total</b>	789,628 40,000 0.88	0.298 0.036

*Source:* Authors' Calculations from the 2010 Living Conditions Monitoring Survey

*Notes:* See Tables D 10 and D 11 in Appendix D for complete decomposition of mean and median income by demographic and other characteristics.

**3.42** At the aggregate level, Zambia has a very high Gini coefficient on labor market income at 0.88. The results by segment suggest that the lowest Gini coefficient is found in the urban informal sector whilst the rural informal sector and multiple activities sector have the highest Gini coefficient. However, across all segments the Gini coefficient remains close to the 0.7 level, indicating a low level of inequality variance between employment sectors. International comparisons are difficult to make as estimates for wage inequality (as opposed to aggregate income inequality) for developing countries are not widely available. Other African and lower-middle-income countries have Gini

coefficients based on *aggregate* income, which varies from as low as 0.389 for Cameroon to as high as 0.631 for South Africa (World Bank, 2012).

**3.43** In the table below, we present the income percentile differentials by employment segment. In an attempt to provide a more nuanced overview of wage inequality, we consider three logarithmic wage measures: The (90-10), (90-50) and (50-10) differentials. The (90-10) differential is the difference between the log of wages at the 90<sup>th</sup> and 10<sup>th</sup> percentiles, while the (90-50) and (50-10) differentials represents the difference in log wages at the 90<sup>th</sup> and 50<sup>th</sup> and 50<sup>th</sup> and 10<sup>th</sup> percentiles, respectively.<sup>33</sup>The (90-10) log differential effectively represents the difference in wages between those at the top- and bottom-ends of the wage distribution. It is thus one possible measure of labor market inequality at the extremities of the distribution. The (90-50) log distribution measures inequality in the top half of the labor market, while the (50-10) log differential reflects income distribution in the bottom half. At the aggregate level, Table 3.7 indicates that the (90-50) log differential is 3.4, while the (50-10) log differential is 2.27, suggesting greater income inequality in the top half of the wage income distribution. However, when decomposing the differentials across the multiple sectors, an opposing trend is observable across all six segments: The log of the (50-10) differential is larger than the (90-50) differential, suggesting a greater level of wage inequality in the bottom half of the income distribution compared to the top half.

Table 3.7 Income Inequality Measures for Log Income

	90-10	90-50	50-10
<b>Formal Sector</b>	2.72	1.16	1.56
<b>Urban Informal</b>	4.62	1.18	3.44
<b>Rural Informal</b>	4.5	2.12	2.38
<b>Agriculture</b>	3.7	1.70	2.00
<b>Household Enterprises</b>	4.06	1.87	2.19
<b>Multiple Activities</b>	3.71	1.69	2.02
<b>Non-Formal</b>	4.12	2.03	2.09
<b>Total</b>	5.67	3.4	2.27

Source: Authors' calculations from the 2010 Living Conditions Monitoring Survey

**3.44** When the logged differentials for all non-formal sectors are considered, however, the results suggest that wage inequality in the top-and bottom-end of the distribution is almost exactly the same, with the (50-10) log differential only slightly larger. The results presented in Table 3.6 show that the mean and median wages for those working in the formal sector are much higher than for those working in the five non-formal segments. Moreover, the relatively high wage rates earned by the less than 18 percent of workers who are employed in the formal sector sufficient to ensure that the (90-50) log differential for the national estimates exceeds the (50-10) differential. The wage difference between the formal sector and all non-formal segments greatly exceeds the differences between the non-formal segments. This raises the possibility that formal employers are paying an efficiency-wage premium to attract qualified labor from a small pool of skilled workers. The presence of efficiency wages in the formal sector (which is largely urban) would distort expectations for workers in the rural labor force, boosting rural-urban migration even in the context of high urban

<sup>33</sup> The 90-10 differential equals the sum of the 90-50 and 50-10 differentials since the  $\log(90/10) = \log(90/50) + \log(50/10)$ .

unemployment. This effect would at least partially explain the why high urban unemployment is observed in tandem with extremely low rural unemployment.

**3.45** Finally, we investigate whether the relatively high level of aggregate wage inequality is the result of inequality within or between cohorts. In order to estimate these between- and within group inequality drivers, we utilize the well-known Theil index.<sup>34</sup> (The results can be found in Appendix D, Table D12.) Overall, the data for gender, location, and age group indicate that inequality in the labor market is driven almost exclusively by differences *within* these groups rather than between them. Only at the aggregate level does wage inequality between men and women contribute a small share (of less than four percent) to total labor income inequality. Age differences are also quite small, with the under-25 and over-25 cohorts exhibiting an overall wage differential of just five percent. The aggregate results suggest that wage inequality between rural and urban areas contribute approximately eight percent to total wage inequality. Ultimately, however, wage inequality in each area exceeds even the considerable difference between rural and urban labor markets. Finally, we compare the relative contributions of education by comparing the average wage of workers with a GCE O-level or lower and those with a GCE A-level or higher. The results show that education makes a very substantial contribution to wage inequality, but only in certain sectors. At the aggregate level, the inequality between the two education classifications contributes approximately 19 percent to total inequality. However, the income differential in three largely rural segments—agriculture, household enterprises, and multiple activities—is insignificant. The returns to education in the formal and urban informal sectors, however, are considerable. This would appear to compound the incentive for educated workers to seek employment in the urban economy, even in a context of high, structural unemployment.

## F. Determinants of Employment: A Multinomial Logit Model

**3.46** A two-stage model is assumed to in order to determine the factors that influence labor-force participation. We first calculated individuals' probability of choosing an employment sector, and then estimated Mincerian wage equations for the multiple segments available to the employed. We assume that the distribution of workers in these labor market segments is not random. Individuals therefore face seven mutually exclusive choices: formal sector ( $j=1$ ), urban informal ( $j=2$ ), rural informal ( $j=3$ ), agriculture ( $j=4$ ), household enterprises ( $j=5$ ), unemployed and unpaid family worker with zero income ( $j=6$ ), or multiple economic activities ( $j=7$ ). Multiple economic activities include all those who reported two or more economic activities. Employment-sector choice is modeled as being a factor of human capital characteristics and locational factors. We assume unemployment and unpaid family work, given the zero income here, as falling into one labor market segment.

**3.47** Our first equation is the standard conditional multinomial logit model for the probability that an individual chooses any of the above sectors:

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<sup>34</sup> The Theil index is a measure of inequality that, unlike the Gini coefficient, allows us to measure inequality within groups, on the one hand, and inequality between groups on the other, and to assess their relative contributions to overall inequality

$$P_j = \frac{\exp(Z_j \alpha_j)}{[1 + \sum_{j=1}^J \exp(Z_j \alpha_j)]}$$

Where  $Z$  represents the vector of explanatory variables and  $\alpha_j$  is a vector of unknown parameters of the alternative  $j$ . A selection term for the alternative,  $j$ , is constructed as follows:

$$\varphi_j = \frac{\vartheta(H_j)}{\tau(H_j)}, \text{ where } H_j = \tau^{-1}(P_j),$$

With  $\vartheta$  representing the standard normal density function, and  $\tau$  representing the standard normal distribution function.

The second stage of the model calculates Mincerian wage equations according to the traditional human-capital framework, where human-capital characteristics and locational factors explain log wages:

$$\ln W_j = \beta_j + \beta_j X_j + \mu_j$$

With  $W$  denoting wages (or income, in our model),  $X_j$  is a vector of explanatory variables, and  $\mu_j$  is the random error term. The estimated  $\varphi_j$  is then included in the explanatory variables of the wage equations to determine implied wage equations, which provide more consistent estimates of the parameters.

**3.48** The explanatory variables included in both the multinomial logit as well as the earnings functions are as follows: A dummy variable for location is included indicating whether the individual resides in an urban or rural area. The referent variable is rural. Gender dummies are also included to test for variance in the labor force between genders. Female is the referent. Age is included and categorized into five different age groups; this is to capture any non-linear and differential returns associated with different age groups. The referent is 15 to 24 years. Education is represented by an education spline variable. As with the age variable, education might have a non-linear relationship to labor force participation. The education spline is thus included to control for non-linear returns to education. The final variable included in both equations is a regional dummy. The region of residence is included to control for different labor market opportunities depending on region-specific effects. Central Province is the referent.

**3.49** The multinomial logit has an additional identifying variable not included in the wage equation, namely whether the individual is married or not. Household variables normally relate to the participation process, and thus are fairly common in participation probits (Bhorat & Leibbrandt, 2001). It is included as the characteristic of the household the individual resides in, might impact on decision to participate (or not) in the labor market. The earnings function includes economic sector, occupation, and experience variables. 'Agriculture' is the referent for the industry dummies, as it is the largest employment sector in Zambia. The occupation dummies' referent is elementary occupation. Finally, experience is calculated as age minus the number of years of schooling minus six (which represents the age of entry into school). A quadratic term is also included.

## ***Estimation Results***

**3.50** The multinomial logit estimates for selection into various forms of labor market activity show the marginal effects of each variable on the probability of participating in a particular segment of the labor market (see Table D6 in Appendix D). This is in effect its empirical, multivariate application to our multi-sector model. The referent segment is the formal sector. The results indicate that individuals residing in urban areas are more likely to participate in the urban informal sector or be unpaid family workers or unemployed, and that the combined workers in these sectors exceed the total formal-sector workforce. This lends support, in a multivariate context, to the validity of the high urban unemployment rates observed above.

**3.51** The age calculations support the hypothesis that the youth are more likely to be unemployed compared to other age groups. The results also suggest that older individuals are more likely to be employed in agriculture. Workers in household enterprises, unpaid family workers and the unemployed show a negative linear trend: as age increases, participation in these sectors declines. This suggests that these segments are comprised predominantly of young people and confirms the results from our descriptive overview. The results for the multiple economic activities segment, on the other hand, indicate that participation in this sector increases with age.

**3.52** The education splines indicate that educational attainment is a powerful predictor of employment, as the probability of working in the formal sector is strongly correlated with education. However, individuals with a GCE O-level certificate, and no further qualification, are more likely to work in household enterprises.

**3.53** The results of the selectivity-corrected income equations are presented in Table D7 (see Appendix D). Results for the first cohort, location, indicate that for employed workers the conditional earnings offered by the urban formal sector are 19 percent greater than rural formal sector workers. Indeed, within this formal sector segment, there may be an incentive for rural workers to migrate to urban areas in search of higher paid formal sector jobs. As mentioned earlier, a large share of rural formal sector workers are employed in the agriculture sector (38 percent). The decomposition data presented in Table D10 (see Appendix D) indicate that mean wages are considerably lower in the formal agriculture sector than the average for formal sector employment. In fact, mean formal-sector agricultural wages are not only the lowest in the formal sector, but are only equal to about one-fifth of the mean income of workers in the formal sector.

**3.54** The results by occupation confirm the wage premium associated with higher skilled occupations in the formal sector, with “managers” and “professionals” on average earning between 76 and 91 percent more than the referent category, “elementary occupations”, i.e. unskilled formal-sector workers. As highlighted earlier, workers employed in formal-sector agriculture earn the lowest wages in the sector. The results from the income equation confirm that formal-sector agricultural workers earn even less than “elementary occupations”. Agricultural workers in the rural informal sector as well as those engaged in multiple activities also earn less than unskilled formal-

sector workers.<sup>35</sup> Across nearly all segments, workers in highly skilled and semi-skilled occupations earn more than those in elementary, or unskilled, occupations.<sup>36</sup>

**3.55** The estimates by industrial classification suggest that, with a few exceptions, workers employed in the agriculture, forestry and fishing sector earn less than workers in other sectors, adding to the numerous factors that produce the dramatic rural-urban wage differential. In the formal sector, workers in the largely urban mining industry earned about 80 percent more than workers employed in formal-sector agriculture. Within the formal sector, only workers employed in the “wholesale and retail trade” and “other” classifications earned less than their counterparts working in agriculture.<sup>37</sup> Across all employment cohorts, our results show that experience has a non-linear or insignificant relationship with income. Thus, all the labor market segments reward experience financially but at a decreasing rate.

## G. Conclusion

**3.56** Among the most important objectives of this analysis is to propose a multi-sector labor market model that is valid within the context of Sub-Saharan Africa. Given the difficulties of dealing with unusual, hard-to-define, or empirically opaque categories such as unpaid family workers, household-level income and employment units, etc., it is hoped that this analysis will help to advance our understanding of the atypical conditions of African labor markets.

**3.57** The data ultimately suggest a number of important conclusions regarding the Zambian labor market. First, a very high urban unemployment rate is accompanied by an extremely low rural rate. This implies that Zambia may be subject to one or more of a particular set of labor-market distortions that are common in developing economies yet remain imperfectly understood: (i) the existence of a rural/urban wage-rate differential that is sufficiently large to create multiple employment-rate equilibria, (ii) the use of efficiency wages by formal-sector employers, and (iii) the above-market employment of household labor in rural areas.

**3.58** The first hypothesis, multiple equilibria, is supported by the sizeable income disparities observed between the urban informal sector and all segments of the rural labor market. The average wage for urban informal workers is more than three-and-a-half times the average for rural informal workers; it is over five times the average for employment in multiple economic activities, nearly eight times the average for agricultural work, and more than nine times the average for

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<sup>35</sup> It may be important to note, however, that conditional mean income for skilled agricultural workers employed in the household enterprises segment is 75 percent greater than for elementary-occupation workers.

<sup>36</sup> The exceptions are clerks and craft workers in the rural informal sector. The relatively small sample of clerks in rural informal areas might account for the result for this occupation group, while craft workers in rural informal areas are probably engaged in small scale, low earning craft activities.

<sup>37</sup> The lower earnings of workers employed in retail and wholesale trade in both the urban and rural informal sector reflects the dominance of small informal traders in these areas. While some non-formal industry segments do offer lower wages than the agriculture sector, a closer inspection of the estimates (see Table C6), reveals relatively small numbers of workers in recorded as working in these industries. Statistical errors due to inadequate sample size might explain the observed wage differentials.

employment in household enterprises. Moreover, average wages in the urban *informal* sector do not necessarily reflect workers' expectations for the urban labor market as whole. Indeed, wages in the urban formal sector (determined through the selectivity-corrected income equations) are a full 19 percent higher than in the rural formal sector, which are by far the highest in the rural economy. The sizeable gulf between rural and urban wage rates cuts across every measured segment of the labor market, and this differential would appear more than adequate to sustain a high degree of structural unemployment in the urban economy.

**3.59** This situation may be exacerbated by the use of efficiency wages in the formal sector. The average formal sector wage is more than five times the average for the urban informal sector, and a staggering 18.8 times the average for the rural informal sector. The differentials with the other sectors are even larger. Although insufficient comparison data limit our ability to draw conclusions, the extent to which formal sector wages outstrip all non-formal sectors would suggest that formal-sector employers are paying a premium to attract highly skilled workers from a small and hotly contested pool. The very low rates of unemployment among educated workers appear to support the conclusion that an inadequate supply of skilled workers is driving wage-based competition among employers, and the extremely high LFPRs for workers with advanced academic qualifications also appear to indicate that the returns to skilled labor are unusually high in the Zambian market. Whatever its cause, the presence of excessively efficiency wages would further skew incentives in the largely-urban formal sector, and could promote continued rural-urban migration even in a context of high urban unemployment.

**3.60** A third potential factor involves the idiosyncratic nature of rural labor markets in developing countries. Because rural labor is frequently employed at the household level—not just in household enterprises, but also on family farms and in family-owned businesses—in many cases employers are also heads-of-household. As a result, they are more willing than other employers to hire excess labor (i.e. family members in need of employment), and are more reluctant to lay off workers in response to changing market conditions. This effect could easily push the rural unemployment rate below its natural equilibrium, either alone or in conjunction with the other market-distorting phenomena described above.<sup>38</sup>

**3.61** The above analysis has attempted, through the lens of a proposed multi-sector labor market model for Zambia, to provide a descriptive and econometric assessment of its employment, unemployment and income characteristics on the basis of the empirical snapshot provided by the 2010 LCMS data. It is hoped that further analyses based on time-series data will be able to both enrich our understanding of employment dynamics in Zambia and throughout Sub-Saharan Africa, as well as testing the validity and comprehensiveness of our multi-sector labor market model.

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<sup>38</sup> It is also possible that the apparently low rate of rural unemployment in fact masks a high degree of underemployment. However, the LCMS data are not sufficiently specific to examine this possibility further.

# Chapter 4: Poverty and Social Spending

## A. Introduction

**4.1 Fiscal policy is one of the principal tools available to a government seeking to promote economic equity and reduce poverty.** In many cases it will also prove to be the most powerful, given its power to immediately and dramatically impact the distribution of income and consumption of public services. Goñi, Lopez, and Serven (2008), among many others, offer compelling evidence of the extraordinary distributional potential of fiscal policy: they show that the difference in income inequality between Latin America (the most unequal region in the world) and Western Europe (the most equal region) is striking only after redistributive fiscal policies—taxes and transfers—are taken into account.<sup>39</sup> In Sub-Saharan Africa, Sahn and Younger (2000) conclude that even though overall social spending is progressive, it is not pro-poor, because social services and other public expenditures disproportionately benefit the wealthy.<sup>40</sup>

**4.2** At the sector level, recent evidence (Cuesta and Martinez-Vazquez [2012]) shows that not every fiscal tool has the same distributive impact: primary and secondary education spending and income taxation are found to be generally progressive, while tertiary education, curative health care, energy subsidies, and indirect taxes are by and large regressive. However, the redistributive impacts of fiscal policy are not universal, and large differences are observed across countries and between regions (c.f. Breceda, Rigolini and Saavedra [2009]).

**4.3 The statistics for Africa are among the worst: continent-wide only 13 percent of people in the poorest income quintile benefits from social safety net programs,<sup>41</sup> well below the 41 percent share for the world as a whole.** Only 20 percent of the beneficiaries of African safety net programs belong to the poorest quintile, significantly below the global average of 30 percent (World Bank 2012b). Evidence also shows that the fiscal policies of many developing countries are even less effective at reducing income inequality in practice than they are in principle, because the scope for active redistribution is limited by low levels of domestic revenue collection. For this reason, Zambia's capacity to use its fiscal policy for redistributive purposes is likely to be limited at best.

**4.4 This chapter analyzes the distributional effect of public education and healthcare spending<sup>42</sup> in Zambia using the most recent data from the 2010 LCMS and focusing on the**

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<sup>39</sup> The Euro-15 Gini coefficient drops from 0.45 to 0.35 when social spending and taxes are added to the initial distribution of incomes. For Latin America–6 (Argentina, Brazil, Chile, Colombia, Mexico, and Peru), the Gini coefficient falls only slightly from 0.49 to 0.47.

<sup>40</sup> By contrast, a host of literature (see Fiszbein and Schady 2009) has shown substantive redistributive social impacts from well-targeted conditional cash transfers (CCTs) at a relatively low fiscal cost, between 0.5 and 1 percent of GDP.

<sup>41</sup> Social safety net programs include redistributive transfers, social security payments, disability allowances, in-kind food programs and other forms of social assistance such as school nutrition or antipoverty work programs, *inter alia*. See World Bank (2008).

<sup>42</sup> For a similar assessment of the progressivity and pro-poor orientation of Zambia's agricultural-input support programs, see Appendix F.

**“traditional” social sectors, education and public health.** Ultimately, the analysis addresses the extent to which spending in these areas is pro-poor and progressive; that is, its benefits primarily accrue to the poor and do so at an increasing rate as welfare levels decrease. The chapter is organized as follows: the next section briefly describes the benefit-incidence analysis methodology. Section 3 presents an overview of key institutional issues involved in the public provision of education and healthcare in Zambia. Section 4 discusses data sources and procedures for linking official information on public spending with household data on beneficiaries. Section 5 discusses the results, which are separated into two sets: one breakdown for beneficiaries, and the other for benefits. Section 6 concludes the analysis.

## B. Methodology

**4.5** In order to assess the progressivity and ostensible pro-poor orientation of public spending in Zambia, this analysis uses traditional benefit-incidence techniques to explore how the welfare benefits of public education and healthcare expenditures are distributed across the population. A benefit incidence analysis (BIA) is a procedure used to estimate how much of a given expenditure (or taxation) category is received (imposed) by (on) a particular socioeconomic group or geographical area. A BIA aims not only at identifying how much people in the lowest income groups receive or pay (that is, how “pro-poor” spending or revenue collection is), but also how “progressively” it does so—that is, how the cost or benefit correlates with a given welfare measure, such as income, consumption or wealth. A number of methodological steps go into performing a BIA (see van de Walle [1998]):

1. Approximate the value to consumers of a public service—typically by equating it to the cost of providing the service;
2. Identify all beneficiaries of the service;
3. Obtain *gross* unitary benefits by dividing total benefits (from step i) among total beneficiaries (from step ii);
4. Rank the identified beneficiaries in the household dataset according to some agreed measure of welfare (such as, for example, deciles or quintiles of household per capita consumption); and
5. Assign the gross unitary benefit (as obtained in step iii) across the distribution of beneficiaries identified in the household dataset and compute the shares of the services that are allocated to different portions of the population. The unit of analysis is, typically, the representative household by quintile or decile of the income or consumption distribution on a per capita basis.

In order to calculate *net* benefits two additional steps are needed:

6. Calculate the out-of-pocket household per capita spending from the household dataset; and
7. Subtract the out-of-pocket household per capita spending to the expenditure assigned as the benefit. The resulting figure is the net unitary benefit per individual or household after receiving a public service.<sup>43</sup>

**4.6** This approach has a number of important strengths, but is not without its weaknesses as well. A significant advantage of this methodology is in the simple and powerful policy implications it produces. The analysis identifies which socioeconomic groups benefit the most from various fiscal policies and highlights how these policies impact the poor. Conceptually, however, a BIA rests on strong operational assumptions: for instance, the approach assumes that publicly provided services are homogeneous across all consumers, yet quality may vary enormously. A BIA also assumes that benefits received by individuals are equal to the costs of service provision; a perfect translation of taxes to consumers with no significant distortions arising from illegal behavior. Additionally, since data are more often available at the household rather than the individual level, additional assumptions must be made about the distribution of resources within the household. A common practice is to assume equitable intra-household allocations and to rely on per capita measures as the household's representative welfare measure. Finally, analysis BIA says nothing as to why the results are the way they are and rarely provides insights about how a certain program or policy influences behavior of beneficiaries (or non-beneficiaries).

**4.7** The precision of an incidence analysis depends on the quality and disaggregation of the available data. For example, an incidence analysis on health care in Zambia would ideally require that public health expenditures be disaggregated at the provincial level by institutional type: hospitals (levels 1 to 3), clinics and health posts, etc., and by the type of care received, i.e. inpatient versus outpatient. However, it is only possible to obtain data at the provincial level for combined expenditures on level 1 and 2 hospitals and combined expenditures on clinics and health posts. Additionally, only nationally aggregated expenditure data on level 3 hospitals are available. This limits the precision of the estimates.<sup>44</sup> In addition, households are assumed not to change their behavior after they receive (or fail to receive) benefits. All households are also assumed to value the transfers they receive and the contributions they make equally, regardless of quality differentials or household composition, circumstances, and preferences: one Zambian Kwacha (ZMK) worth of primary education services is valued exactly the same as one kwacha of secondary or tertiary education. Also, all expenditures are valued equally within each spending category, regardless of income level or expenditure subset. For example, a kwacha spent by a poor household on primary education is valued the same as a kwacha spent by a rich household on tertiary education.

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<sup>43</sup> As for data requirements, the first three steps rely on information about public spending in the relevant sectors and the beneficiaries or users of those services, which is typically available from the implementing agencies of the government. The last four steps require information on household consumption and expenditure patterns by income category, which can be obtained from national survey data, in this case the Zambian LCMS.

<sup>44</sup> It is, however, hard to say by how much. To the extent that there are wide differentials across regions not explained by population or demographic factors (or even socioeconomic factors that can be controlled for with available information, such as level of income), the assumption of uniform allocation may be seriously misleading.

## C. Education and Healthcare Spending

### *Education Spending*

**4.8** The 1996 national education strategy, “Educating our Future”, lays down the basis for the reform of the sector in terms of increasing access to quality education at all levels of the education system, achieving high levels of student retention, and strengthening educational progression and completion rates with an emphasis on girls, the poor and members of vulnerable groups. Three major policy initiatives were launched under this strategy, including the elimination of school fees for up to grade 7, the establishment of a re-enrollment policy for girls who leave school because of pregnancy, and the adoption of the 9-3-4 education structure (detailed in Appendix E).

**4.9** The restructured education system is organized according to four levels: early childhood education (pre-schooling), basic schooling, high school, and tertiary degree programs. Basic education consists of nine years of schooling, high school requires three years, and tertiary education (including universities, business colleges, technical colleges, teacher training colleges and skills training institutes) varies depending on the particular field and degree program, but generally requires about four years.

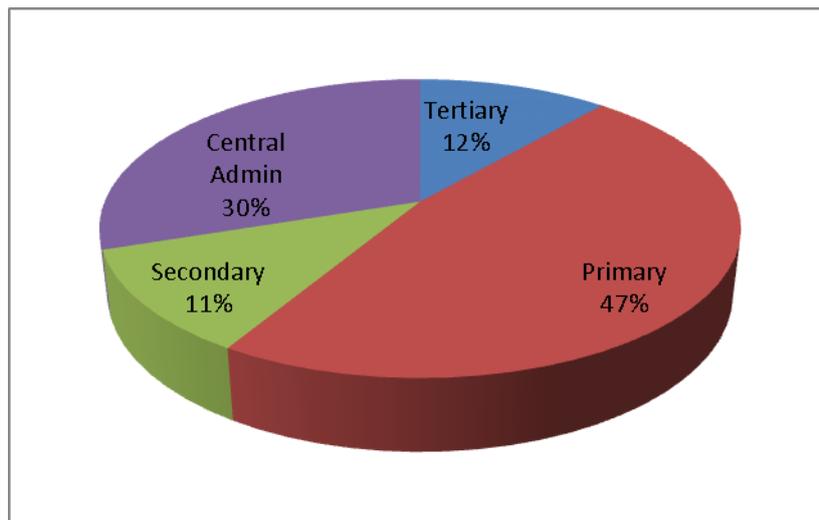
**4.10** In terms of public spending, the education sector accounts for a steady 4 percent share of GDP and 19 percent of all government expenditures. This share of GDP is comparable with that of neighboring Namibia and South Africa (World Bank 2012c). Primary education expenditures are relatively steady at about 2 percent of GDP or 8-9 percent of total government spending. Secondary education expenditures fluctuate slightly at around 0.4 percent of GDP or 2 percent of total government spending.

**4.11** As shown in Figure 4.1, primary education receives the largest share of education spending, followed by administration at the various levels. However, in terms of expenditure per student, the tertiary level has the highest average followed by the secondary level, with primary education having the lowest average expenditure per student.<sup>45</sup> In 2009, expenditure per student at the secondary-school level was 3 times that of the primary level, while spending per student at the tertiary level was a full 35 times that of the primary level. These averages place Zambia squarely up in the middle of the distribution for Sub-Saharan Africa (World Bank 2012c).

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<sup>45</sup> Expenditure per student is calculated by dividing public expenditure in each educational level by the number of students enrolled at the corresponding level, as indicated in Table 4.2.

Figure 4.1 Allocation of Education Sector Expenditures, 2009



Source: Authors' estimates, compiled from MoFNP financial reports

**4.12** The reform of the education sector has contributed to increasing enrollment rates at both the primary and secondary levels. According to the Ministry of Education, between 2005 and 2009 primary-school enrollment grew by 15 percent, while secondary-school enrollment grew by 30 percent.<sup>46</sup> However, enrollment at the tertiary level fell by 14 percent during the same period, indicating that the increased 'throughput' from the secondary level could not be absorbed. Recent efforts to address this challenge include the establishment of new tertiary institutions as well as the upgrading of existing ones, which was announced by the new government in 2011.

### ***Healthcare Spending***

**4.13** The basic operational guidelines of the Zambian healthcare system are set out in the Health Policy Framework of 1991, "Managing for Quality: A Healthy People Policy Framework". That strategy aimed to develop a health-service delivery system characterized by "equity of access to cost effective, quality health care as close to the family as possible". As a result, the government embarked on a set of ambitious health-sector reforms, the most visible outcome of which was a three-tiered organizational structure for public health institutions and services.

**4.14** The first tier of care is provided at the local level by district hospitals, health centers and health posts. The second tier consists of the larger provincial general hospitals. These hospitals both provide care directly and receive referrals from first-tier institutions, treating patients in need of more sophisticated care. The third tier consists of national and specialized hospitals, the highest-level referral hospitals in Zambia, which focus on patients with rare conditions or in need of complex treatments. Cases that cannot be effectively treated at second-tier hospitals are referred to third-tier hospitals. At each level a specified basic health-service package is publicly funded and available to the public at no charge. Importantly, more specialized services at the higher levels of the healthcare system may also be free if they are accessed by referral from a lower-level institution.

<sup>46</sup> Ministry of Education Statistical Bulletin, 2005, 2006, 2008, 2009

**4.15** In an attempt to address unstable public-health funding arising from broader fiscal and macroeconomic volatility, Zambia introduced a system of user fees in 1993, though certain exemptions for specific services and specific age groups were allowed. In 2006 these fees were abolished for all primary health services in rural areas. In November 2011 user fees for primary healthcare were also eliminated in urban areas. According to Masiye et al (2008), the removal of user fees in rural areas was seen as a tool for bridging the rural-urban income divide and improving healthcare equity. However, its impact on the quality and accessibility of health care remains unclear, even after additional efforts were undertaken to increase health funding and provide for a more efficient distribution of drugs and other medical supplies.

**4.16** In order to address public health priorities in a cost-effective and equitable manner, a substantial share of resources should be allocated to the lowest level of the healthcare system, i.e. first-tier institutions. However, in practice just over a third of health expenditures are allocated to primary healthcare. Expenditure data show that total public health spending is roughly 2 percent of GDP, well below the expenditure share of many other countries in Sub-Saharan Africa.<sup>47</sup> Between 2006 and 2009, public health spending as a share of total government expenditures stood at 9 percent on average, significantly below the Abuja declaration target of 15 percent.<sup>48</sup>

**4.17** A more refined measure of primary health spending used by the Ministry of Health (MoH) is the allocation of non-personnel funds at the district level. The latest available estimates show that non-personnel allocations of healthcare spending to districts increased from 8 percent of the total spending at districts in 2006 to 14 percent in 2007 and 16 percent in 2008 (MoH 2009).

**4.18** Table 4.1 shows that there has been a general improvement in all key indicators for utilization of health services, despite these relatively low levels of public spending, which has been attributed in part to the abolition of rural user fees for primary care in 2006. These improvements, however, have not been equally strong across indicators.

Table 4.1 Key Healthcare Indicators, 2006-2008

Percent	2006	2007	2008
Utilization rate of primary health services	1.2	1.3	1.6
Institutional deliveries	43	45	45
Percentage of immunized children (worst performing districts)	67	62	68
HIV positive eligible clients accessing antiretroviral drugs (ARVs)	33	53	67
HIV positive pregnant women receiving a complete course of ARVs	11	15	23

*Source:* Ministry of Health

<sup>47</sup> Shares of public health care spending over GDP in the region are 9.3% in Sierra Leone, 3.9% in Namibia, 3.8% in Chad, 3.6% in Malawi, 3.5% in Niger, 3.4% in South Africa, 3.2% in Senegal. Nigeria and Ethiopia, at 2.1%, have similar shares than Zambia. Kenya, at 1.4%, has a lower rate. See World Bank, Data Indicators, 2012b.

<sup>48</sup> In April 2001, heads of state of African Union countries met and pledged to set a target of allocating at least 15% of their annual budget to improve the health sector. Ten years later, only one country had met this target (WHO, 2011).

## D. Data Sources and the Distribution of Benefits

### *Data Sources*

**4.19** The empirical analysis presented below is based on the 2010 LCMS, which was designed to monitor the impact of the Fifth National Development Plan (2006-2010) and to constitute a baseline for the Sixth National Development Plan (2011-2015).<sup>49</sup> The survey includes modules covering health, education, economic activities, household expenditures and household agricultural production. The LCMS is a nationwide survey covering both rural and urban areas in all nine provinces. The survey includes representative samples for each of Zambia's 72 districts. The total sample set includes 19,398 households, 8,469 of which are rural. The information was collected between February and March of 2010.

**4.20** The LCMS also identifies beneficiaries of most social spending programs, including public health and education services. It does not, however, include information on beneficiaries of the Public Welfare Assistance Scheme, who may receive food subsidies or other cash transfers, nor does it record beneficiaries of school feeding programs or programs providing support to orphans and vulnerable children. Consequently, the impact of these programs on public health and education outcomes—and their potential contribution to the overall progressivity and pro-poor orientation of social spending—cannot be assessed.

**4.21** The BIA presented here combines LCMS data on government expenditures in education and healthcare programs at the provincial level. The latest available information for the education sector is for 2009 and covers both total spending and the number of beneficiaries enrolled in basic, secondary and tertiary institutions; enrollment data for 2010 are also available. For healthcare, the latest provincial-level information is from 2008 and includes expenditure data and the number of beneficiaries (counted as patients or recorded as services provided) at tier 1 and tier 2 healthcare providers.

### *Allocation of Education Benefits*

**4.22** As part of the LCMS, households were asked about their education expenditures.<sup>50</sup> Answers report the total amount spent by the household on the education of all its members in 2009, but no expenditure information was recorded for 2010. The LCMS VI includes disaggregated information on school fees, other contributions, private tuition, textbook fees, the cost of stationery and other school supplies, uniforms and other education expenses, which make up the household total.

**4.23** Because households were only asked to report their 2009 expenses, the current BIA focuses only on students who were attending basic education, high school, or tertiary education institutions in 2009.

Table 4.2 Education Data Modeling

	Problems	Solutions/Assumptions
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<sup>49</sup> Both plans are part of a series of medium-term strategies with the objective of “making Zambia a prosperous middle-income country by 2030” (Government of the Republic of Zambia, 2011).

<sup>50</sup> For a more detailed description of the survey methodology, see Appendix E.

1	<p>Inconsistencies between reported age, school level and grade and between grades individuals reportedly attended in 2009 and 2010.</p> <p>(These problems affect 6.5% of those attending school in 2010)</p>	<p><b>Main Assumption:</b> Children do not attend a grade if they are below the official enrollment age.</p> <ul style="list-style-type: none"> <li>• We check potential inconsistencies in the data by using the official age-to-grade correspondence shown in Appendix E. The official age to be enrolled in 1<sup>st</sup> grade is 7. We therefore assume as infeasible any information on children aged 4 or less who are reported to be in first grade or higher.</li> <li>• We follow this rule of “enrollment feasibility” with high school and tertiary education students: it is assumed that anyone aged 13 or younger in 2009 could not be in high school and anyone 16 or younger could not be in college or university.</li> <li>• Since primary school is the lowest level considered, we eliminate from the sample everyone who was 4 years old or younger in 2009.</li> <li>• In cases with missing information about the school level attended in 2009, we used the age of the students to estimate school level.</li> </ul>
2	<p>Information about whether the school attended is public or private is only provided for 2010. No information is available about the type of school attended in 2009 or before.</p>	<p><b>Main assumption:</b> Students attended the same type of school (public or private) in 2009 as in 2010.</p> <ul style="list-style-type: none"> <li>• We ignore the possibility of students changing between public and private schools between years.</li> <li>• As a result, cases involving individuals enrolled in 2009 but not enrolled in 2010, possibly because they graduated or left school, are without data on school type. (This affects 2411 of 33268 cases, or 7.2% of cases)</li> </ul> <p>Since we cannot obtain additional information about the type of school attended for those observations, we consider <u>two scenarios</u>:</p> <ul style="list-style-type: none"> <li>• <b>Scenario 1</b> We assume that <u>all</u> students for whom we do not have school-type information attended public school.</li> <li>• <b>Scenario 2</b> We assume that <u>all</u> students for whom we do not have school-type information attended private school.</li> </ul> <p>These two scenarios provide an upper and a lower value for our calculations.</p>

3	<p>Contributions to education are reported at the household level, so it is not possible to know the amount spent on each individual. (69% of households with at least one enrolled student have more than one enrolled student)</p> <p>Households may have members at different levels and in both the public and private systems, but we cannot analyze expenditure differences between individuals. (Households with at least one member going to public schools and another to private school include some 10.5% of all households with at least one member in public school under Scenario 1, and 17.1% under Scenario 2).</p>	<p><b>Main assumption:</b> In households with more than one member attending school we evenly distribute the amount spent on education between school attendants. That is, we assume that households spent the same amount in each student independently of the type of school or the school level he or she attended.</p>
4	<p>Even after these assumptions there are still students for which we do not have schooling information for 2009. (2.5% of subjects age 7-31 do not have schooling information for 2009)</p>	<p><b>Main assumption:</b> All subjects for whom we do not have complete information about schooling, school level or type of school are assumed not to be attending school.</p>
5	<p>Official data on per-student public expenditure for colleges reported by the Ministry of Education refers only to teachers' colleges, excluding trade colleges, technical schools, agricultural colleges or nursing and paramedical schools. (In 2009 combined public spending on technical colleges and agricultural colleges was 3% higher than spending on teachers colleges; the number of students, however, is not available.)</p>	<p><b>Main assumption:</b> Public expenditure per student in all colleges is the same as the expenditure per student in teacher colleges.</p>
6	<p>Outlier observations (0.1% of households)</p>	<p><b>Main assumption:</b> Expenditures on education larger than the mean log-expenditure plus three times the standard deviation (considering only positive values of expenditure) are considered unreliable and are excluded from the analysis.</p>

Source: Authors' calculations

### ***Allocation of Healthcare Benefits***

**4.24 The public health section of LCMS contains health-status information for each household member during the 15 days prior to the survey.**<sup>51</sup> The information reported in the survey is for 2010, the year the survey was collected. However, 2008 is the most recent year for available official information on the number of public healthcare beneficiaries (patients/visits) and for government expenditures on: (i) Health Posts and Clinics; (ii) Provincial Hospitals; and (iii) National and

<sup>51</sup> For a more detailed description of the healthcare portion of the LCMS, see Appendix E.

Specialized Hospitals. Ideally, the BIA would obtain from the survey data each member's number of visits to public health facilities during the year and then combine that information with official expenditure reports. However, in practice this is not possible. Table 4.3 describes the assumptions that were necessary in order to resolve a number of inconsistencies in matching the official administrative data with the household-level information recorded in the LCMS.

Table 4.3 Healthcare Data Modeling

	<b>Problems</b>	<b>Solutions/Assumptions</b>
1	<p>Most recent official beneficiary and expenditure information refers to 2008, while household-level LCMS information refers to 2010.</p>	<p><b>Main Assumption:</b> 2008 spending is representative of 2010 spending.</p> <ul style="list-style-type: none"> <li>• We deflate the private expenditure data for 2010 (from the LCMS survey) and the government expenditure data for 2008 (from official sources) and express both in 2009 prices.</li> <li>• We assume that government expenditures (both in terms of real value and distribution) remained constant between 2008 and 2010.</li> <li>• We assume that the number and distribution of beneficiaries by welfare level remained constant between 2008 and 2010.</li> <li>• We assume that households' healthcare expenditures (both real value and distribution) remained equal between 2008 and 2010.</li> </ul>
2	<p>From the survey we know:</p> <ol style="list-style-type: none"> <li>a) The number of people who were ill or injured during the 15 days before the survey.</li> <li>b) The amount spent on healthcare for each individual during the 15 days before the survey.</li> <li>c) If subject visited a public health facility for treatment.</li> </ol> <p>But we do not know:</p> <ol style="list-style-type: none"> <li>a) If a reported visit actually took place during the 15 days before the survey or earlier.</li> <li>b) If a patient visited a health facility other than the reported visit to a hospital</li> <li>c) The number of visits to hospitals or health posts during the 15 days before the survey.</li> </ol>	<p><b>Assumptions for Method 1:</b></p> <ul style="list-style-type: none"> <li>• We assume that all reported visits occurred during the 15 days before the survey.</li> <li>• If a respondent reported going to a hospital, we assume he/she went to the hospital during the 15 days before the survey and assign the official per-beneficiary hospital expenditure to that respondent. We then aggregate that information to determine total healthcare expenditures per quintile.</li> </ul> <p><b>Assumptions for Method 2:</b></p> <ul style="list-style-type: none"> <li>• We assume that annual government expenditures on healthcare facilities are distributed homogeneously across the year. Therefore we divide the official information by 24 to pro-rate for a 15-</li> </ul>

3	All information on public spending and number of beneficiaries (i.e. patient visits) is annual.	<p>day period.</p> <ul style="list-style-type: none"> <li>We use the household survey data to determine the composition of beneficiaries by income quintile.</li> <li>We use these proportions to assign to each quintile a share of the 15-day government expenditure.</li> </ul> <p><b>Assumptions for both methods:</b></p>
4	The number of survey participants who reported visiting a hospital during the previous 15 days is almost equal to the number who reported visiting a clinic. But this does not correspond with the information from official sources, which shows that the annual number of health center beneficiaries is 9 times the number of hospital beneficiaries.	<ul style="list-style-type: none"> <li>Households' out-of-pocket expenditure is the same under both methods.</li> <li>The 15-day government expenditure calculation, however, ends up being different for each method. In method 1 we keep expenditure-per-beneficiary constant according to the official data, where each health-facility visit is recorded as a separate beneficiary. In method 2, we hold official annual expenditure constant and divide it by the number of beneficiaries (not visits) reported in the survey.</li> </ul>
5	Some individuals reported being injured during the survey period, but did not report any further information about their condition. (1.71% of surveyed individuals)	Since respondents did not report any additional information about their condition or any treatment they may have received, we consider these cases as misreported and treat them as if no injury occurred.
6	A small number of respondents received medicines from public facilities but did not report an official patient visit. (1% of those who received medicines from public facilities)	The proportion of respondents reporting treatment without a visit is very small and we disregard the discrepancy. We consider only the expenditure of those who received treatment as a patient.
7	The survey does not differentiate between facility levels, and we cannot determine the number of patient visits to third-tier hospitals.	We add public expenditures on third-tier hospitals to the other two tiers and divide by the total number of patients. We then assign the resulting expenditure to each patient.
8	The LCMS records information about health posts and clinics separately, but the official public spending data does not differentiate between them.	We aggregate health post and clinic data to match it with the official spending reports.
9	Outlier observations. (0.3% of sample)	Within each quintile we discard cases in which household expenditures on hospitals or other facilities were larger than the mean log-expenditure plus three times the standard deviation (including only positive expenditure values).

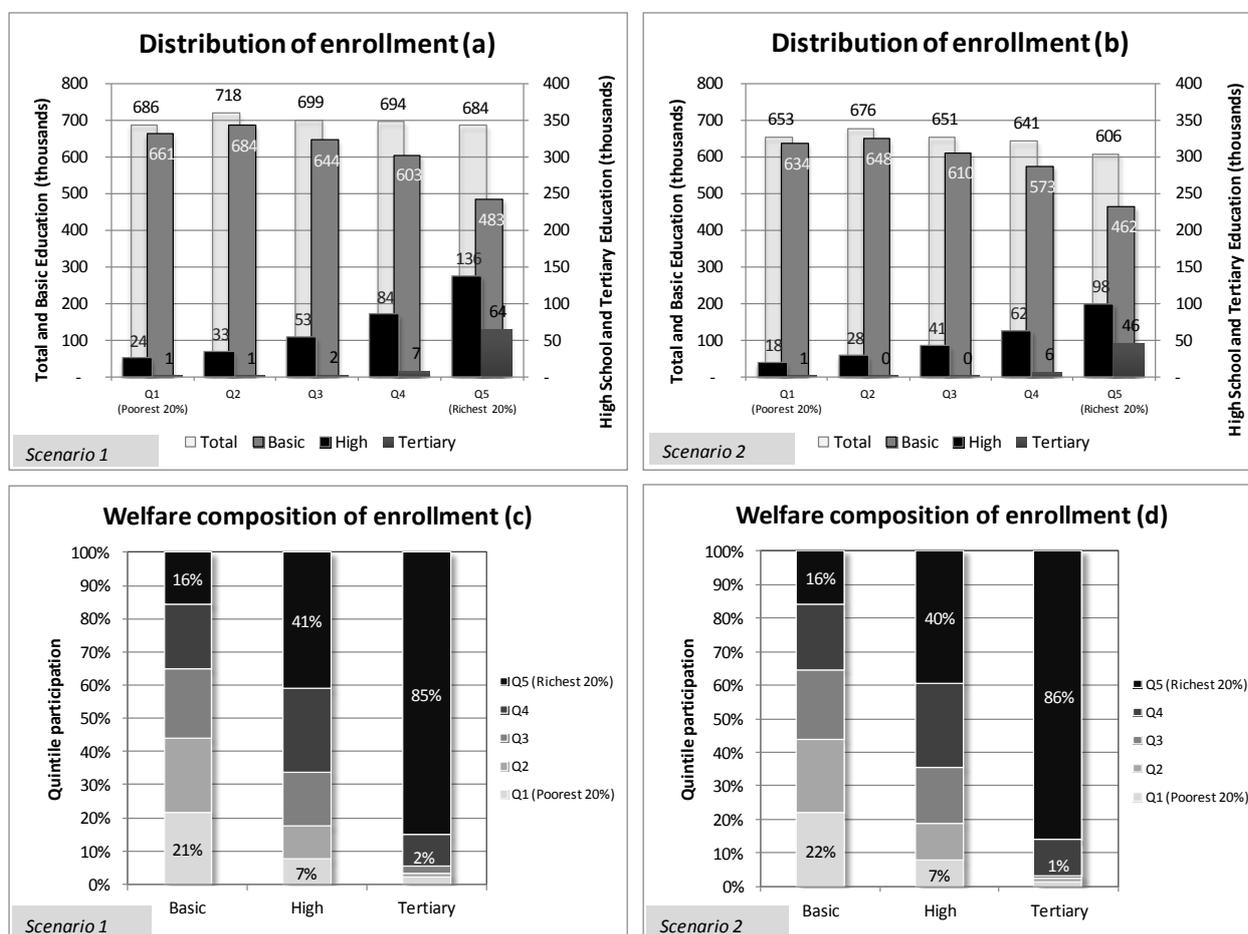
Source: Authors' calculations

## E. Results

### Beneficiary Participation: Education

**4.25** Access to public primary education in Zambia is relatively uniform across consumption, which is the yardstick used to describe different socioeconomic groups in this analysis. This is particularly true across the lower four quintiles of the consumption distribution, and it is only among the richest quintile that the number and the share beneficiaries decline significantly. The breakdown is very different for secondary education, where the number and share of beneficiaries increase rapidly with consumption levels, and for tertiary education, where the vast majority of beneficiaries (over 85 percent) are concentrated in the top quintile: see Figure 4.2, below. The methodology for assigning beneficiaries in scenarios 1 and 2 (see Table 4.2, above) does not alter these findings.

Figure 4.2 Distribution of Beneficiaries, Education



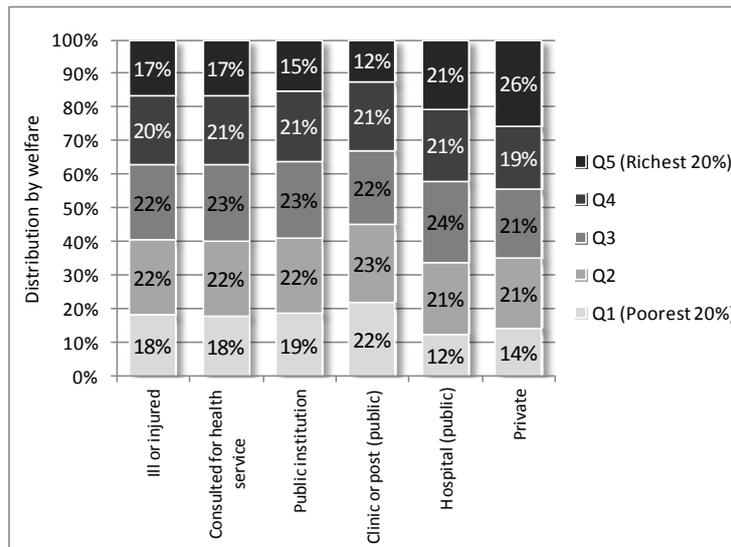
Source: LCMS VI

### Beneficiary Participation: Healthcare

**4.26** Those individuals who reported being ill or injured during the 15 days before the survey follow a uniform distribution across socioeconomic groups: see “Ill or Injured” in Figure 4.3, below. The same distribution is observed both for those who did not report visiting any public facility and among those visiting a public facility. In contrast, the distribution of beneficiaries visiting clinics (or

health posts) and hospitals follows an uneven pattern: the distribution is somewhat equal for the intermediate three quintiles of the distribution, but shares vary significantly for the top and the bottom quintiles. In effect, the share of the poorest individuals going to clinics or posts is double that of the richest quintile, while the opposite is the case for hospital attendance. In fact, the distribution of hospital beneficiaries is very similar to that of private healthcare providers: see “Private” in Figure 4.3.

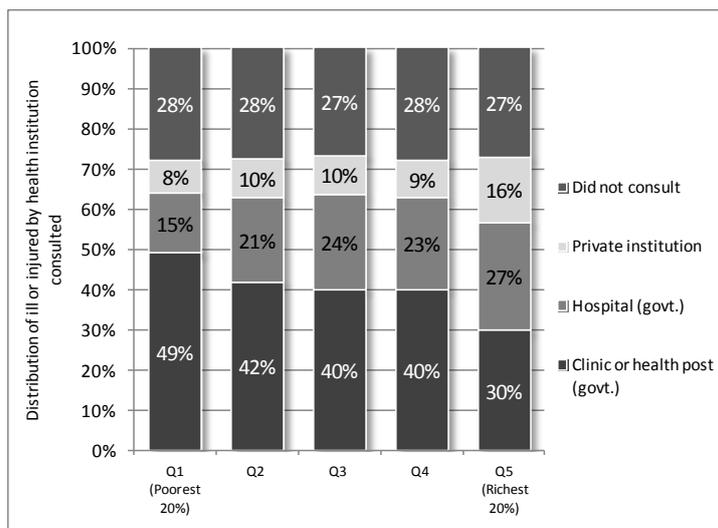
Figure 4.3 Distribution of Beneficiaries, Healthcare



Source: LCMS VI

**4.27** Figure 4.3 shows the behavior of respondents who reported being ill during the reference period. A similar percentage of all socioeconomic groups decided not to visit a healthcare provider despite feeling ill (just below 30 percent for all quintiles). When they do seek care, however, the type of health provider they access is strongly associated with their socioeconomic group. Respondents in the richest quintile are roughly twice as likely to use a private provider as are those in other quintiles. They are also less likely to visit a public clinic or health post.

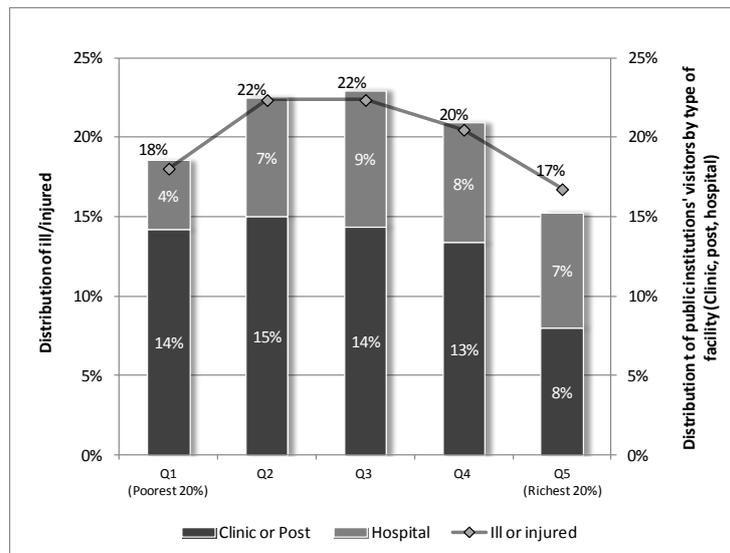
Figure 4.4 Distribution of Healthcare Provider Consulted (Both Public and Private) by Consumption Level



Source: LCMS VI

**4.28** Looking at the socioeconomic distribution of patients attending *public* healthcare institutions, Figure 4.5 displays a non-linear pattern, with increasing shares of patients across the intermediate quintiles (2 to 4). Patients from the richest quintile are the least likely to use public healthcare providers, as might be expected. What is somewhat more surprising is that when visiting public facilities high-income patients are equally likely to go to public clinics and health posts (tier 1 institutions) as to public hospitals (tiers 2 and 3): other socioeconomic groups rely more on primary services and are twice or even three times more likely to attend a clinic or health post than a hospital. This could reflect wider opportunities for choice among richer households, that is, a greater capacity to select services according to the specific needs of their health condition. Also, it might suggest that rich households assess a better quality of clinics that is sufficient high to meet their demand for services. However, there is no evidence by which to evaluate any quality consideration.

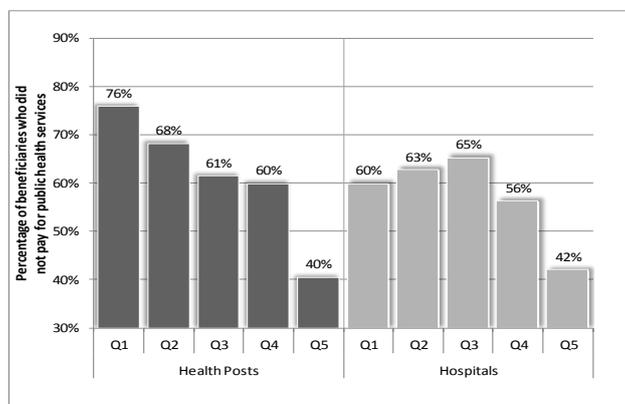
Figure 4.5 Distribution of Patients by Healthcare Provider (Public Only) and Consumption Level



Source: LCMS VI

**4.29** Quality considerations aside, the data indicate that the proportion of households not paying for services received in health posts or clinics and hospitals is both high and similar across socioeconomic groups, except for the richest quintile (see Figure 4.6). A significant share (40 percent of patients) from the richest quintile did not pay fees for services either in health posts or hospitals.

Figure 4.6 Percentage of Patients Accessing Free Public Health Services by Consumption Level



Source: LCMS VI

### The Analysis of Benefits: Education

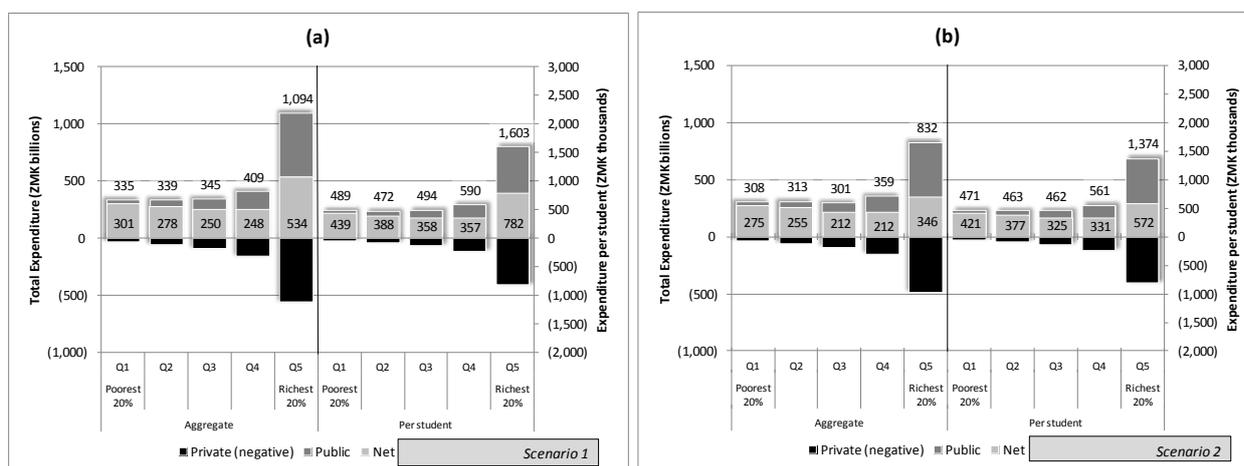
**4.30** Public education spending in Zambia is not progressive, in fact among students in the richest quintile public spending is dramatically regressive. When education spending is considered in aggregate terms, that is, without differentiating by education level (see Figure 4.12, below), per capita educational transfers are nearly flat across the first four quintiles and then rise sharply for the richest quintile. This is true whether assuming that unidentified students are enrolled in public or private schools (scenarios 1 and 2, respectively). In net terms—that is, when households' out-of-pocket contributions to public education are considered—the distribution of benefits turns slightly progressive for the first four quintiles, as out-of-pocket contributions tend to increase with income

level. However, that progressivity disappears at the richest quintile, for which the net benefits of public education significantly exceed those accruing to other quintiles (see Figure 4.7, below). The same conclusions are obtained when looking at *total* net benefits rather than *per student* net benefits.

**4.31** Results by educational level, (see Figure 4.8, Figure 4.9 and Figure 4.10), confirm that the distribution of tertiary education benefits drive the trend for aggregate education spending. For both primary school (see Figure 4.8) and high school (see Figure 4.9) net transfers per beneficiary are clearly progressive: unitary benefits after discounting households' out-of-pocket contributions inversely correlate with household consumption. Interestingly, the richest households contribute almost as much as they received from public education (both in primary and secondary school), a sign of systemic progressivity. By contrast, the net unitary benefits of tertiary education (Figure 4.10) are deeply regressive and pro-rich. The richest quintile captures a disproportionate share of the benefits from tertiary education, but the second-richest quintile benefits substantially more from tertiary education than all other consumption quintiles, including the richest. This is due to the richest quintile's greater private contribution to public tertiary education.

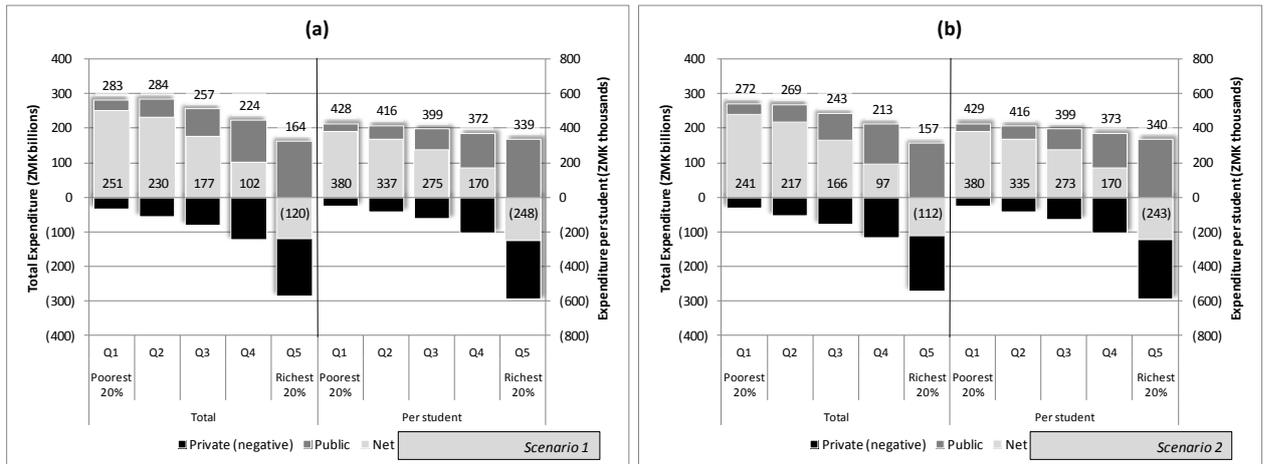
**4.32** This regressive and pro-rich distribution is the result of the dramatic overrepresentation of the top quintile in tertiary education. Students from the top quintile constitute about 89 percent of total enrollment in tertiary education, compared to 42 percent of total enrollment in secondary education. In other words, regressive benefits are driven by inequality of access, not necessarily by public spending itself (which is typical of a universal education system). The selection of scenarios does not change these results: the inability to determine the type of education establishment attended causes imprecision but does not call into question the regressive nature of the system.

Figure 4.7 Aggregate Unitary Benefits of Education



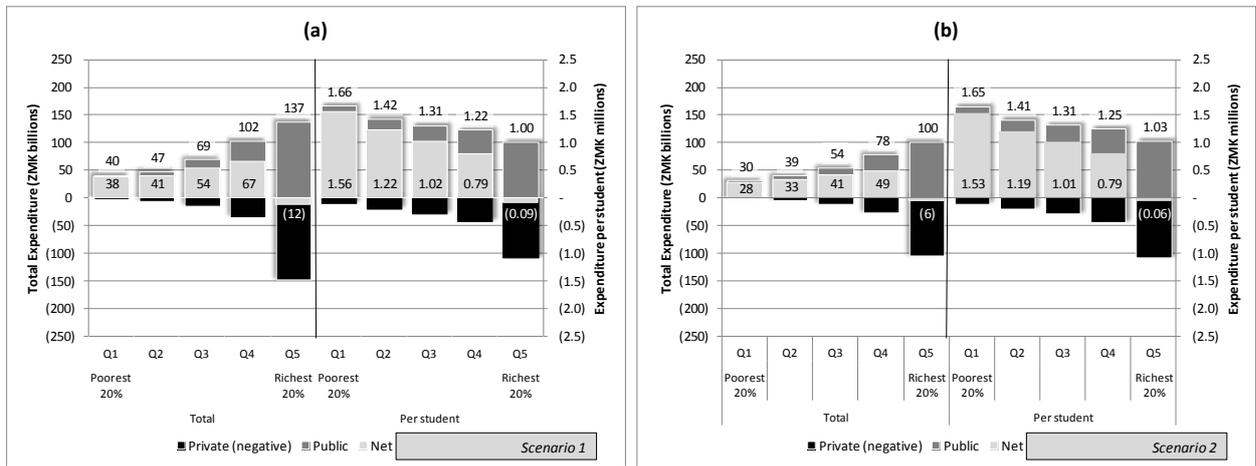
Source: LCMS VI, MoE

Figure 4.8 Unitary Benefits by Level of Education: Primary



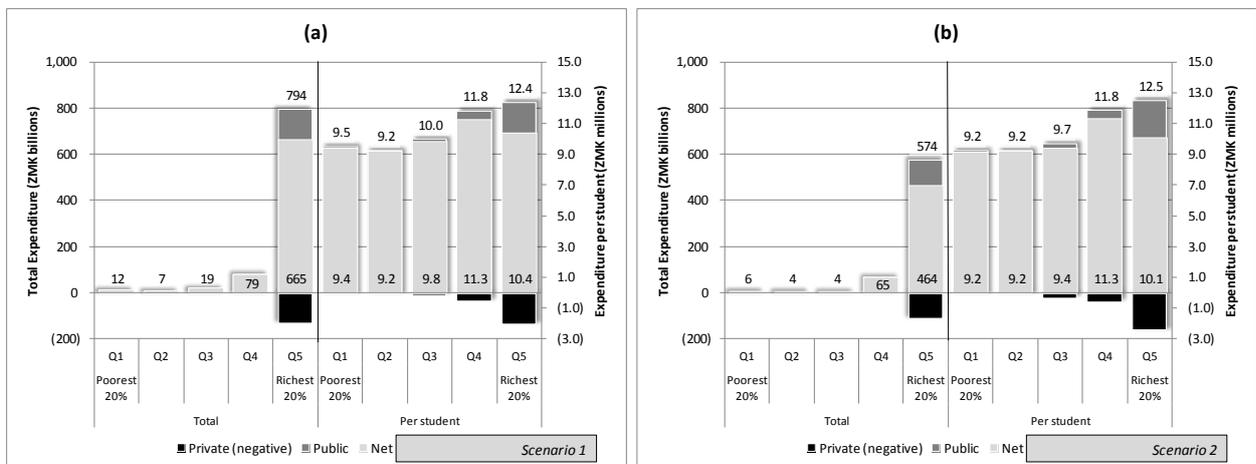
Source: LCMS VI, MoE

Figure 4.9 Unitary Benefits by Level of Education: Secondary



Source: LCMS VI, MoE

Figure 4.10 Unitary Benefits by Level of Education: Tertiary

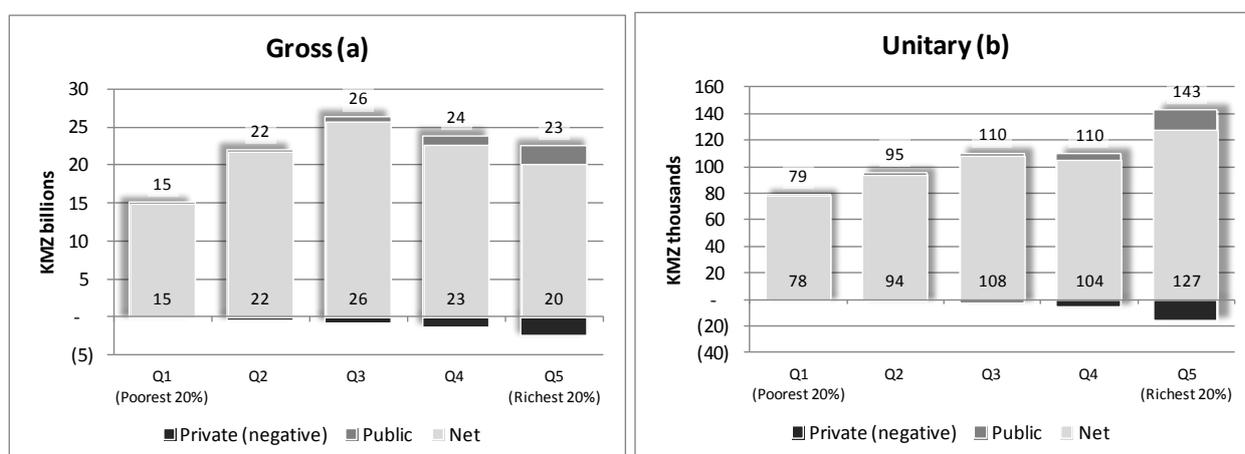


Source: LCMS VI, MoE

## The Analysis of Benefits: Healthcare

**4.33** The distribution of public health resources in Zambia is not pro-poor. Reviewing the results from method 1 (see Figure 4.11), beneficiaries in the poorest quintile received about a third less in total public healthcare spending than their wealthier counterparts. This cannot be explained by a significantly lower incidence of illness among the poor, as they consulted for health services at roughly the same rate as other consumption groups (see Figure 4.3). Especially disproportionate is the share of benefits accruing to the richest quintile, which represents only 15 percent of total beneficiaries but captures a third more in total benefits than the poorest quintile (even after out-of-pocket expenses are considered). In unitary terms, (see Figure 4.11), the situation is even less pro-poor: net unitary benefits are regressive, that is, they increase along with the consumption level of beneficiaries. This is a result of public transfers not being targeted to the poor in any particular way. Although out-of-pocket contributions are progressive they are not significant even for the richest quintiles. And among the poorest quintiles out-of-pocket contributions are nearly flat, since a substantial proportion of beneficiaries do not pay for pay for care either in health posts or in hospitals (see Figure 4.6, above). Finally, the share of beneficiaries among the richest quintile that use tier 2 or tier 3 hospitals (rather than tier 1 clinics) is twice that of the poorest quintile, which further contributes to the pro-rich nature of the healthcare system.

Figure 4.11 Gross and Unitary Benefits of Public Health Care, Method 1



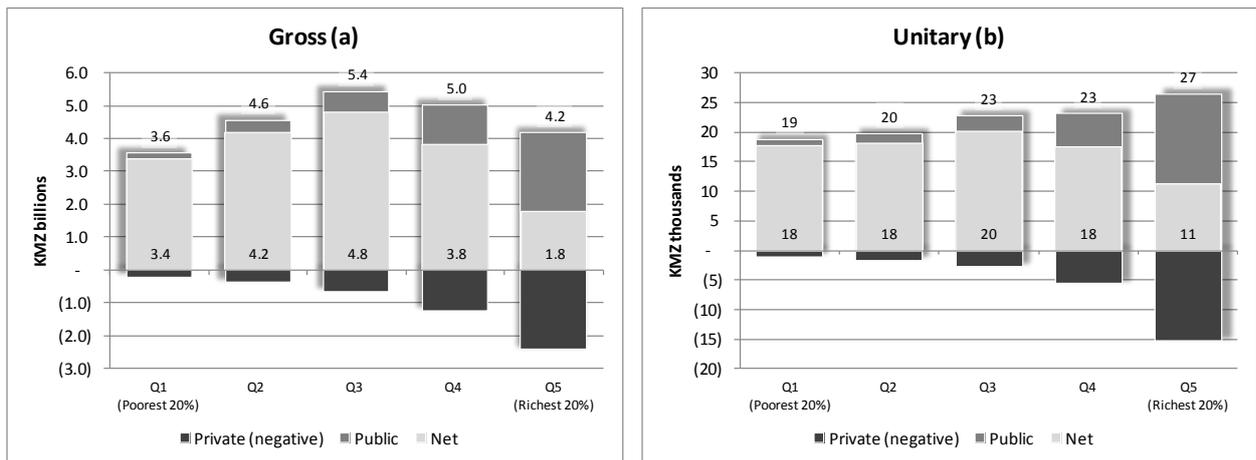
Source: LCMS VI

**4.34** Unlike education, healthcare results are sensitive to the assumptions made on the periodicity of health-related episodes. Interestingly, the results of the second method—which annualizes the information reported by the household in the 15 days prior to the survey—differ significantly from the non-annualized distributive results of method 1, (see Figure 4.12, below). Method 2 calculates a lower share of benefits accruing to the richest quintile and, more importantly, produces a mixed picture as far as net unitary benefits are concerned. Net unitary benefits increase with welfare levels for the first three quintiles but decrease thereafter, and the change is especially pronounced from the fourth to the fifth quintiles.

**4.35** Two factors contribute to these results. First, method 2 turns sporadic visits during the 15 days prior to the survey into frequent visits throughout the year. First, mistakes from annualizing

sporadic visits may be larger for health posts than they are for hospitals, since hospital visits are typically associated with more severe conditions. Second, those visiting hospitals may have previously visited clinics or health posts, but these visits may not be reported as the individual is asked only to identify the facility from which services were received. As poor households use clinics and health posts more frequently, and some clinic and health-post visits by richer households are not reported in the survey, these two effects make the distribution less regressive than in method 1.

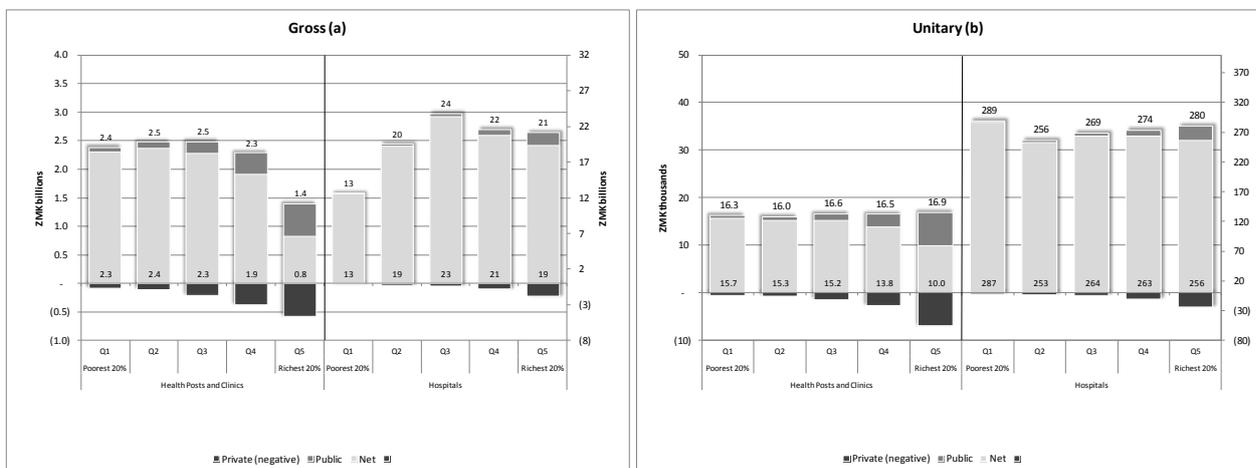
**Figure 4.12 Gross and Unitary Benefits of Public Healthcare, Method 2**



Source: LCMS VI

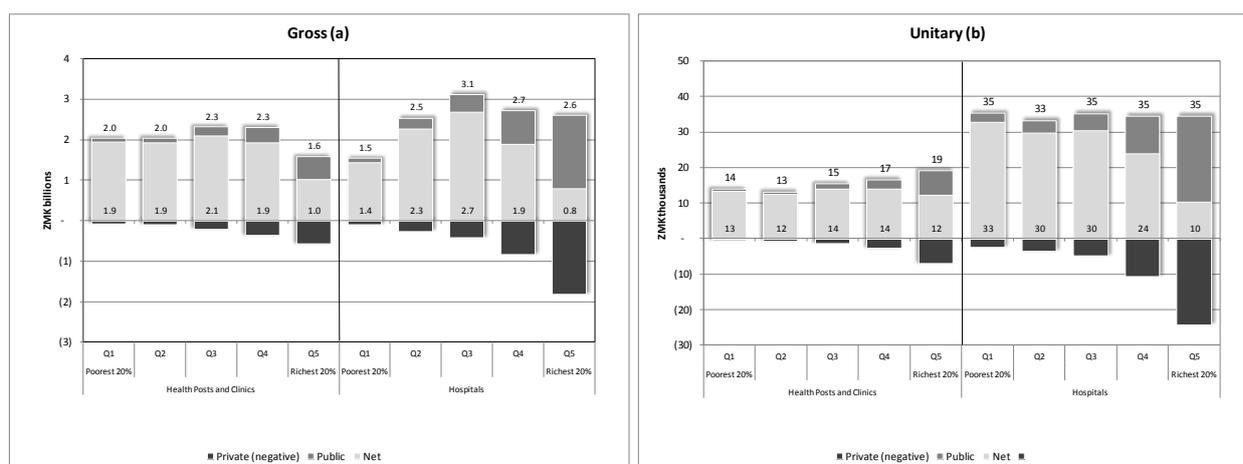
**4.36** Figure 4.13 disaggregates the analysis between health posts/clinics and hospitals. The BIA results are driven by the mixed pattern of hospital-related net benefits. Again, the richest quintile captures more benefits than the poorest quintile—both in total and per-patient terms—while the opposite is the case for health post- and clinic-provided services. The key here is that net benefits received via hospitals substantially exceed those provided by posts and clinics because hospitals provide more sophisticated, and costly, forms of care. However, the second scenario (see Figure 4.14, below), changes the distribution for hospital benefits: assuming annualized benefits, the poorest now capture a larger share than the richest for the reasons indicated above, i.e. sporadic visits are treated as routine and rich patients’ visits to clinics and health posts are not considered.

**Figure 4.13 Gross and Unitary Benefits of Public Healthcare by Provider, Method 1**



Source: LCMS VI

Figure 4.14 Gross and Unitary Benefits of Public Healthcare by Provider, Method 2



Source: LCMS VI

## F. Conclusions and Policy Implications

**4.37** This benefit-incidence analysis has evaluated the extent to which education and healthcare spending in Zambia is pro-poor and progressive. In order to be pro-poor, a policy must concentrate its benefits on the poorest members of society. In order to be progressive, it must display an inverse correlation of benefits to welfare level across all beneficiaries: the poorer the beneficiary, the greater the benefit. Evaluating the progressivity and pro-poor nature of public programs is fundamental to understanding the equity implications of development policies, even when their ultimate explicit objective may not be, or may not exclusively be, to offset income inequality or promote social welfare.

**4.38** The results of the analysis clearly indicate that overall public education spending in Zambia is neither pro-poor nor progressive, but while this is true for the system as a whole it is not true for all of its parts. The net unitary benefits of primary and secondary education are clearly both pro-poor and progressive. However, their progressivity is ultimately outweighed by the extreme concentration of tertiary-education benefits among the wealthiest members of Zambian society. This is not so much a result of spending inequities or a tertiary education spending bias (only 12 percent of the total education budget is goes to tertiary education) but of unequal access to tertiary education and its benefits. Members of the richest quintile attend universities, colleges and technical schools at a rate that vastly exceeds that of the poor. By contrast, access to primary education is basically uniform, in line with the government's objective of providing universal service. Secondary education is neither as pro-poor, nor as progressive as primary, and a large proportion of beneficiaries are from the richest quintile, but when including private contributions, secondary education is progressive.

**4.39** The state of public healthcare is quite different. Access to public facilities follows a bell curve, with the middle quintiles more likely to receive benefits than either the richest or the poorest. This result is not explained by differences in demand, as the reported incidence of illness (within the 15 days prior to the survey) is essentially uniform across socioeconomic groups. In the upper quintiles this result is to be expected, since the rich contribute more to finance their demand of public healthcare and are also more likely to seek care from private providers. Nevertheless, out-of-pocket contributions could be better targeted, as the analysis shows that more than 40 percent of beneficiaries from the top quintile do not pay anything whatsoever for care received in public facilities.

**4.40** Taken together, these public spending patterns lend themselves to three overall conclusions. First, due to unequal access to public services the gross benefits of public spending *increase* with consumption level, meaning that service provision is neither pro-poor nor progressive. Second, households contribute more to public services as their welfare levels increase; meaning that public services are progressive only in terms of contributions, not in terms of benefits. Third, when both of these patterns are combined the distribution of net benefits is consequently mixed: unitary net benefits (the benefits to each individual minus any costs they incur) are regressive for education, but slightly progressive for healthcare.

**4.41** The policy recommendations derived from this analysis are not meant to be sector-specific given the level of aggregation used for the analysis; however, it is clear that *access* to education and healthcare is neither progressive nor pro-poor, despite the government's stated policy objectives for these areas. The goal of universal service provision does not necessarily translate into a uniform distribution of benefits, let alone one that is pro-poor and progressive; even where public policies are deliberately targeted to benefit the poorest and most vulnerable, progressivity is far from assured.

**4.42** In education, the progressivity of access to primary and secondary school, which should be a laudable achievement in its own right, is obliterated by the effective restriction of university, college and technical school access to only the very richest members of Zambian society. Alleviating this inequality will require policies that actively strive to expand the benefits of tertiary education to members of all income groups.

**4.43** Access is also a key concern in public healthcare. Low-income patients are less likely to seek care than their wealthier counterparts and also appear less likely to move beyond their primary-care provider, despite frequently being eligible for no-cost treatment at provincial or national hospitals. This is likely due to a combination of factors, including the limited availability of health-service providers in remote areas (and consequent difficulty of access among the rural poor) and the relatively high transportation and opportunity costs faced by poor patients attempting to seek care in a provincial or national center. Meeting the challenge of expanded healthcare access will require innovative solutions, such as the possible use of transportation vouchers for referral patients or other measures specifically designed to reduce the cost of healthcare access across all its dimensions, not merely the expense of the treatment itself.

**4.44** Even when setting quality considerations aside, it is clear that Zambia's current social expenditure allocation is imperfectly structured, and fiscal policies do not consistently favor the country's poor. Certain elements of social spending are more progressive than others: primary education is far more equitably distributed than either secondary or tertiary education, and access to colleges, universities and technical schools is deeply regressive on the expenditure side. Healthcare access is uneven at all levels of the public health system, and while the poor are less likely to seek care at any level, they face especially difficult obstacles in obtaining more sophisticated forms of treatment at provincial or national institutions. Access is again the primary issue, and the poor are discouraged by the high transportation and opportunity costs of seeking care far from home.

**4.45** The pervasive problems of uneven access to social services in rural areas, and among the poor nationwide, can be addressed by greater investment in poor and remote communities, though in the case of the latter these will come at a high marginal cost. Investments in rural service provision have generated important gains in social indicators, and the government and its development partners should continue to pursue pro-poor spending policies and strive to enhance the progressivity of its overall fiscal stance. Social safety net programs are an important component in poverty reduction, and recent innovations in conditional cash transfers and other forms of direct poverty alleviation should be given strong consideration as either alternative or complementary policy options. Agricultural development initiatives and other efforts to increase the productive capacity of the rural labor force have resulted in limited but positive effects on rural incomes, and the process of refining these policies and enhancing their targeting should be regarded as an important priority. However, without sustained job growth in the urban industrial and service economy these efforts will ultimately have only a modest and marginal impact on poverty in Zambia.

# Bibliography

Adams, R. H. (2004). "Economic Growth, Inequality and Poverty: Estimating the Growth Elasticity of Poverty". *World Development*, 32 (12): 1989–2014.

Beegle, K., J. De Weerd, J. Friedman, and J. Gibson (2010). "Methods of Household Consumption Measurement through Surveys: Experimental Results from Tanzania". World Bank Policy Research Working Paper 5501. The World Bank: Washington DC

Bhorat, H. and Leibbrandt, M. (2001). Modeling Vulnerability and Low Earnings in the South African Labour Market". In *Fighting Poverty: Labour Markets and Inequality in South Africa*. UCT Press: Cape Town.

Breceda, K., J. Rigolini, and J. Saavedra (2009). "[Latin America and the Social Contract: Patterns of Social Spending and Taxation](#)". *Population and Development Review* Vol. 35, No. 4. pp. 721–48

Burger, R., Burger, R., and S. van der Berg (2004). "A Note on Trends in the Zambian Labour Market Between 1991 and 1998". Stellenbosch University: Matieland, South Africa

Bourguignon, F. (2003). "The Growth Elasticity of Poverty Reduction: Explaining Heterogeneity across Countries and Time Periods". In T. S. Eicher and S. J. Turnovsky (eds), *Inequality and Growth: Theory and Policy Implications*. Cambridge, MA: MIT Press

Burke, W.J., Jayne, T.S. and A. Chapoto (2010). "Factors Contributing to Zambia's 2010 Maize Bumper Harvest", Food Security Research Project Working Paper No. 48. The World Bank: Washington DC

Central Statistical Office of the Republic of Zambia (2011). *The Monthly Bulletins*. Available online at [www.zamstats.gov.zm](http://www.zamstats.gov.zm)

Central Statistics Office of the Republic of Zambia (2010a). "Poverty Manual". mimeo

Central Statistics Office of the Republic of Zambia (2010b). "Poverty Trends Report: 1996-2006". mimeo

Central Statistics Office of the Republic of Zambia (2009). "Zambia Demographic and Health Survey 2007"

Chapoto, A. (2010), ACF/FSRP Research Paper Presented at the Zambia National Farmers Union Congress: Lusaka

Cheelo, C., J.J. Zulu. (2007). "*Zambia: Debt Strategies to Meet the Millenium Development Goals (Final Report)*". Lusaka: UNDP

Christiansen, L., P. Lanjouw, J. Luoto, and D. Stifel (2011). "Small Area Estimation-Based Prediction Methods to Track Poverty: Validation and Applications." World Bank Policy Research Working Paper 5683. The World Bank: Washington DC

Craig, J. (2000). "Evaluating privatization in Zambia: a tale of two processes". *Review of African Political Economy*. 27(85): 355-66

- CSPR (Civil Society for Poverty Reduction), "Poverty Reduction Strategy Paper for Zambia", <http://www.sarpn.org/CountryPovertyPapers/Zambia/Strategy/>
- Cuesta, J., and J. Martinez-Vazquez (2012). "Analyzing the Distributive Effects of Fiscal Policies: How to Prepare (Analytically) for the Next Crisis?" In *Fiscal Policies and the Financial Crisis*, ed. O. Canutto, O. Dobson-Blanco, and M. Bramhatt. The World Bank: Washington DC
- Dollar, D., and A. Kraay (2002). "Growth is Good for the Poor". *Journal of Economic Growth*, 7 (3): 195–225
- Easterly, W. (2000). "The Effect of IMF and World Bank Programs on Poverty". Mimeo. Washington, DC: World Bank
- Elbers, C., J. Lanjouw, and P. Lanjouw (2003). "Micro-Level Estimation of Poverty and Inequality." *Econometrica*. Vol. 71, No 1. pp.355-364
- Ellis, K., R. Singh, and C. Musonda. (2010). "Assesing the Economic Impact of Competition: Findings from Zambia". ODI Research Report. London: Overseas Development Institute
- Epaulard, A. (2003). "Macroeconomic Performance and Poverty Reduction". Working Paper 03/72. Washington, DC: IMF
- Fields, G.S. (2010). "Labor Market Analysis for Developing Countries". *Working Papers*. Paper 157. <http://digitalcommons.ilr.cornell.edu/workingpapers/157/>
- Fields, G.S. (2005). "A Guide to Multisector Labor Market Models". *Social Protection Discussion Paper Series*. No. 0505. [http://siteresources.worldbank.org/INTLM/Resources/390041-1103750362599/Fields\\_MultisectorLMGuide.pdf](http://siteresources.worldbank.org/INTLM/Resources/390041-1103750362599/Fields_MultisectorLMGuide.pdf)
- Fiszbein, A. and N. Schady (2009). "Conditional Cash Transfers: Reducing Present and Future Poverty". World Bank: Washington DC.
- Fosu, A. K. (2009). "Inequality and the Impact of Growth on Poverty: Comparative Evidence for Sub-Saharan Africa". *Journal of Development Studies*, 45 (5): 726–45
- Fox, L & Kweka, J. (2011) "The Household Enterprise Sector in Tanzania: Why it Matter and Who Cares". *Policy Research Working Paper 5882*. The World Bank. Available online at <http://econ.worldbank.org>
- Gallup, J., S. Radelet and A. Warner. (1997). "Economic growth and the income of the poor". CAER Discussion Paper No. 36. Cambridge, MA: Harvard Institute for International Development
- Goñi, E., H. Lopez, and L. Serven (2008). "Fiscal Redistribution and Income Inequality in Latin America." World Bank Policy Research Working Paper No. 4487. The World Bank: Washington DC
- Giugale, M., A. Narayan and J. Saavedra (forthcoming) "Opportunities for Children in Africa: A Study of Twenty Countries in sub-Saharan Africa". The World Bank: Washington DC
- Gugerty, M.K. and C.P.,Timmer. (1999). "Growth, Inequality, and Poverty Alleviation: Implications for Development Assistance". CAER II Discussion Paper No. 50. Cambridge, MA: Harvard Institute for International Development

- Heckman, J.J. (1974). "Shadow Prices, Market Wages and Labor Supply". *Econometrica*. No 42. pp. 679-94.
- IOB (2008). "Primary Education in Zambia". Impact Evaluation No. 312. Policy and Operations Evaluation Department, Netherlands Ministry of Foreign Affairs: The Hague.
- ILO (2008). "Zambia, Social Protection Expenditure and Performance Review and Social Budget". The International Labor Organization: Geneva. Available at: [www.ilo.org/publns](http://www.ilo.org/publns)
- Imboela, B. (2004). *The political economy of the local: An inquiry into the causes of rural livelihoods vulnerability in developing countries*. Unpublished doctoral dissertation, University of Delaware, Newark
- Jolliffe, D. (2001). "Measuring absolute and relative poverty: The sensitivity of estimated household consumption to survey design". *Journal of Economic and Social Measurement*. No 27. pp. 1-23
- Kalwij, A., and A. Verschoor (2007). "Not by Growth Alone: The Role of the Distribution of Income in Regional Diversity in Poverty Reduction". *European Economic Review*, 51: 805–29
- LCMS (2010) "Living Conditions Monitoring Survey 2010". Central Statistical Office of the Republic of Zambia, Living Conditions Monitoring Branch. The Government of the Republic of Zambia: Lusaka
- LFS (2010) "Labour Force Survey Report – LFS 2008". Central Statistics Office of the Republic of Zambia, Labour Statistics Branch. The Government of the Republic of Zambia: Lusaka
- Masiye F, Chitah B M, Chanda P and Simeo F (2008). "Removal of user fees at Primary Health Care facilities in Zambia: A study of the effects on utilisation and quality of care". EQUINET Discussion Paper Series 57. EQUINET, UCT HEU: Harare
- Ministry of Education (2008). Educational Statistical Bulletin 2008. Republic of Zambia: Lusaka
- Ministry of Education (2007). Educational Statistical Bulletin 2007. Republic of Zambia: Lusaka
- Ministry of Education (2006). Educational Statistical Bulletin 2006. Republic of Zambia: Lusaka
- Ministry of Finance and National Planning (2010). Financial Report for the Year Ended 31<sup>st</sup> December 2009. Republic of Zambia: Lusaka
- Ministry of Finance and National Planning (2009) Financial Report for the Year Ended 31<sup>st</sup> December 2008. Republic of Zambia: Lusaka
- Ministry of Finance and National Planning (2008) Financial Report for the Year Ended 31<sup>st</sup> December 2007. Republic of Zambia: Lusaka
- Ministry of Finance and National Planning (2007) Financial Report for the Year Ended 31<sup>st</sup> December 2006. Republic of Zambia: Lusaka
- Ministry of Health (2009). Annual Health Statistical Bulletin 2008. Republic of Zambia: Lusaka
- Ministry of Health (2001). National Strategic Plan 2001-2005. Republic of Zambia: Lusaka

Ravallion, M. (1997). "Can High Inequality Developing Countries Escape Absolute Poverty?" *Economics Letters*, 56: 51–7

Republic of Zambia (2011). Sixth National Development Plan, 2011-2015: Sustained Economic Growth and Poverty Reduction. Available at: [siteresources.worldbank.org/INTZAMBIA/Resources/SNDP\\_Final\\_Draft\\_\\_20\\_01\\_2011.pdf](http://siteresources.worldbank.org/INTZAMBIA/Resources/SNDP_Final_Draft__20_01_2011.pdf)

Roemer, M., and M.K. Gugerty. (1997). "Does Economic Growth Reduce Poverty?" CAER Discussion Paper No. 5, Cambridge, MA: Harvard Institute for International Development

Sahn, D. and S. Younger (2000). "Expenditure Incidence in Africa: Microeconomic Evidence". *Fiscal Studies*. Vol. 21, No. 3, pp. 329–347

Sassa, O. and J. Carlsson. (2002). *Aid and Poverty Reduction in Zambia: Mission Unaccomplished*. Uppsala: The Nordic Africa Institute

Szeftel, M. (1998). "Misunderstanding African Politics: Corruption & the Governance Agenda". *Review of African Political Economy* 76: 221-40

Tansel, A. (2005). "Public-Private Employment Choice, Wage Differentials, and Gender in Turkey". *Economic Development and Cultural Change*. Vol. 53, No 2. pp. 453-477

Todaro, M.P. and Harris, J.R. (1970). "Migration, Unemployment and Development: A Two-Sector Analysis". *The American Economic Review*. Vol. 60, No.1 pp.126-142

van de Walle, D. (1998). "[Assessing the Welfare Impacts of Public Spending](#)". *World Development* Vol. 26, No 3. pp. 365-79

UNAIDS (2010). "Report on the Global AIDS Epidemic 2010". Joint United Nations Programme on HIV/AIDS. [www.unaids.org/globalreport/AIDSScorecards.htm](http://www.unaids.org/globalreport/AIDSScorecards.htm)

UNICEF (2012). "The State of the World's Children: Children in an Urban World". United Nations Children's Fund, NY: USA.

World Bank (2012a). World dataBank: World Development Indicators and Global Development Finance.

[http://databank.worldbank.org/ddp/home.do?Step=2&id=4&hActiveDimensionId=WDI\\_Series](http://databank.worldbank.org/ddp/home.do?Step=2&id=4&hActiveDimensionId=WDI_Series)

World Bank (2012b). Social Protection Databases. Available at: <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTSOCIALPROTECTION/EXTSAFETYNETSANDTRANSFERS/0,,contentMDK:22986320~menuPK:8117027~pagePK:210058~piPK:210062~theSitePK:282761,00.html>

World Bank (2012c). Data Indicators. Available at: <http://data.worldbank.org>

World Bank (2012d). Operational Plan for Making Adjustments to the Food Reserve Agency and the Farmers' Input Support Program: Recommendations to the Government of Zambia. Mimeo.

World Bank (2011). "Zambia: Country Economic Memorandum". *Policies for Growth and Diversification*. Report No. 28069-ZM. The World Bank: Washington DC

World Bank (2010). "Zambia: Impact Assessment of the Fertilizer Support Program: Analysis of Effectiveness and Efficiency". Report No. 54864-ZM, World Bank: Africa Region

World Bank (2008). *Social Protection Atlas*. World Bank Human Development Network: Washington DC

World Bank (2007). "Zambia: Poverty and Vulnerability Assessment". The World Bank: Washington DC

World Development Report (2012), "Gender Equality and Development". The World Bank: Washington DC

World Health Organization (2011). "The Abuja Declaration: Ten Years On". WHO: Geneva. Available at: [www.who.int/healthsystems/publications/abuja\\_declaration/en/index.html](http://www.who.int/healthsystems/publications/abuja_declaration/en/index.html)

# Appendix A

## Poverty Measurement

### Description of LCMS Surveys

Key aspects of the LCMS surveys from 1996 to the most recent 2010 round are summarized in Table A1. With the exception of the LCMS III survey in 2002/2003 which was conducted over twelve months using a rolling sample, the other rounds of the LCMS survey were conducted over a two month period near the end or beginning of the calendar year. The 2002/2003 LCMS survey also differed from the other rounds in that it used the diary method (as opposed to recall method) to collect expenditure and consumption data. The sampling frame of the 1996 and 1998 LCMS surveys were based on the 1990 Census of Population and Housing, and the subsequent LCMS surveys were based on the 2000 Census. The sample size ranges from about 10,000 to 20,000 households depending on the year.

A two-stage stratified cluster sample design has been used for the LCMS surveys. In the first stage, Standard Enumeration Areas (SEA) served as the primary sampling units, and the SEAs were selected with probability proportional to size within each stratum defined by province, and urban/rural areas. However, with the aim of obtaining estimates for every district, additional SEAs were selected for small districts such that a minimum of 6 SEAs (7 SEAs for LCMS I) were selected for each district. Also, in some cases, the number of urban and rural SEAs was adjusted slightly to augment the sample size of certain urban areas that exhibited a high degree of variation in estimates in the preceding round. It should be noted that district-level estimates require close examination of confidence intervals as the sample size can be small.

In the second stage, about 15 and 25 households were sampled from rural and urban SEAs, respectively. Rural households were stratified according to scale of agricultural activity (non-agricultural, small-scale farm, medium-scale farm, and large-scale farm). Within each rural SEA, 7 households were selected from small-scale, 5 from medium-scale, 3 from non-agricultural, and in addition, all large scale farm households were selected if available. Urban SEAs were implicitly stratified into low cost, medium cost and high cost areas according to CSO's and local authority classification of residential areas. About 15 and 25 households were sampled from rural and urban SEAs, respectively. However, the number of rural households selected in some cases exceeded the desired sample size of 15 households depending on the availability of large scale farming households.

**Table A1: Summary of Living Conditions Monitoring Surveys (1996-2010)**

Survey Name	Dates	Method for expenditure data	Coverage	Sampling Frame	Sample Design	Primary Sampling Units	Sample Size (# households)
LCMS I	Sep 1996 - Nov 1996	Recall	National	1990 Census of Population and Housing	<p><b>Two-stage stratified cluster sample design.</b></p> <p>- <b>First stage:</b> Standard Enumeration Areas (the primary sampling unit) were selected with probability proportional to size within each stratum, defined by province and urban/rural area. Adjustments were made for small districts such that a minimum of 6 SEAs (7 SEAs for LCMS I) were selected for each district. It should be noted that district-level estimates require close examination of confidence intervals as sample size for some districts is small.</p> <p>- <b>Second stage:</b> About 15 and 25 households were sampled from rural and urban SEAs, respectively. Rural households were stratified according to scale of agricultural activity (non-agricultural, small-scale farm, medium-scale farm, and large-scale farm). Within each rural SEA, 7 households were selected from small-scale, 5 from medium-scale, 3 from non-agricultural, and in addition, all large scale farm households were selected if available.</p>	610 SEAs	6,550 urban 5,220 rural
LCMS II	Nov 1998 - Dec 1998	Recall	National			~800 SEAs	8,223 urban 8,487 rural
LCMS III	Nov 2002 - Oct 2003 (12 month survey with rolling sample)	Diary	National	2000 Census of Population and Housing		520 SEAs (52 SEAs countrywide in each cycle of rolling sample)	4,831 urban 4,902 rural
LCMS IV	Dec 2004 - Jan 2005	Recall	National			1,048 SEAs	8,939 urban 10,376 rural
LCMS V	Dec 2006 - Jan 2007	Recall	National			988 SEAs	9,530 urban 9,132 rural
LCMS VI	Feb 2010 - Mar 2010	Recall	National			1,000 SEAs	10,920 urban 8,465 rural

Urban areas are defined by the Central Statistical Office mainly by two criteria: population size and economic activity. The minimum population size of an urban area is 5,000 people, and the main economic activity of the population must be non-agricultural, such as wage employment. In addition, the area must have basic modern facilities such as piped water, tarred roads, post office, police post, and health center. Each of the urban localities (i.e. SEAs) were then classified into low, medium and high cost housing neighborhoods based on a combination of the Local Government Administration and CSO criteria on housing standards. All urban SEAs were physically visited by CSO mappers with locality classification from the local government and determined whether the SEA was low, medium or high cost based on the local government definition and the actual observation of the mapper.

Rural households were stratified according to the scale of agricultural activity into the following four strata: small scale, medium scale, large scale, and non-agricultural. Using the definitions in Table A2, each household's scale of operation for each of the three agricultural activities (crops, livestock, and poultry) were determined. A household was then classified according to the highest value on each scale of farming activity. For example, a household might be classified as small scale in the crop area criterion yet rank as medium scale in the livestock criterion. Such a household would fall under the medium scale stratum.

**Table A2: Stratification of Rural Households in LCMS**

	Small scale	Medium scale	Large scale	Non-agricultural
Area under Crop	Less than 5 ha	5 to 20 ha, inclusive	Over 20 ha	None
Livestock	Less than 5 exotic dairy cows	5 to 20 exotic dairy cows, inclusive	Over 20 exotic dairy cows	None
	No beef cattle	Up to 50 beef cattle	Over 50 beef cattle	None
	No exotic pigs	Up to 10 exotic pigs	Over 10 exotic pigs	None
Poultry	No broilers	Up to 6000 broilers	Over 6000 broilers	None
	No Layers	Up to 1000 layers	Over 1000 layers	None
			Parent stock of poultry	

Source: LCMS Report

### Measurement of poverty from 1996 to 2006

For the 1996 to 2006 period, we use the CSO's revised poverty estimates and trends. To establish a reasonably comparable trend between 1996 and 2006, the CSO Poverty Trends Report (2010) defined a comparable basket of goods and services across surveys and retroactively applied a common methodology across 1996, 1998, 2004, and 2006 rounds of the LCMS. Due to differences described above for the 2002/03 LCMS survey, it was excluded from the Poverty Trends Report and thus was not reported here as well.

However, applying a similar method to the 2010 LCMS data was not considered appropriate for several reasons. First, given the major changes to the 2010 LCMS questionnaire design, there may be systematic differences in the way households respond to the new survey (i.e. the expanded list of consumption items mentioned above). If this is the case, measured consumption would be biased even if items in the consumption aggregate were limited to those captured in both surveys. Second, consumption patterns and prices may vary by season, and this approach can only correct for

differences in seasonal prices, not differences in seasonal consumption patterns. Third, as this approach requires that the poverty line be adjusted for inflation, the poverty estimates are sensitive to the choice of inflation factor used. Given recent concerns over the use of the CPI index, the accuracy of this adjustment is called into question. These issues are discussed further in the following section.

#### Comparability Issues for 2006 and 2010 LCMS

The comparability of consumption and poverty measures between the 2006 and 2010 rounds of the LCMS is likely to be compromised due to differences in questionnaire design, seasonality concerns arising from differences in the survey periods, and concerns about the quality of the CPI index for updating the poverty line.

- 1) **Major change to questionnaire design:** The total number of expenditure items listed in the LCMS survey increased from 87 items in 2006 to 213 items in 2010 (See Table A3). The number of food items (excluding alcohol and tobacco) more than tripled, from 39 items to 128 items, and the number of nonfood items almost doubled, from 48 items to 85 items. Beegle et al. (2010) and Jolliffe (2001) find that questionnaires with a longer, more detailed listing of items tend to increase measured consumption and lower estimates of poverty. Thus, the major expansion in the number of items in the 2010 LCMS undermines the comparability of consumption aggregates between 2006 and 2010.

**Table A3: Questionnaire Design of 2006 and 2010 LCMS Consumption Modules**

		2010 LCMS	2006 LCMS
<b>Number of items</b>	<b>Food</b> (excluding alcohol and tobacco)	<ul style="list-style-type: none"> <li>• 128 items</li> </ul>	<ul style="list-style-type: none"> <li>• 39 items</li> </ul>
	<b>Nonfood</b> (excluding remittances)	<ul style="list-style-type: none"> <li>• 85 items (including 9 alcohol and tobacco items)</li> </ul>	<ul style="list-style-type: none"> <li>• 48 items (including 2 alcohol and tobacco items)</li> </ul>
	<b>TOTAL</b>	<b>213</b>	<b>87</b>
<b>Recall period</b>	<b>Food</b>	<ul style="list-style-type: none"> <li>• 4 week recall for maize grain and meal</li> <li>• 2 week recall for all other food items</li> </ul>	<ul style="list-style-type: none"> <li>• 1 month recall for maize grain and meal</li> <li>• Both 2 week <u>and</u> 1 month recall for all other food items</li> </ul>
	<b>Nonfood</b>	<ul style="list-style-type: none"> <li>• 1 month recall for frequent expenses</li> <li>• 1 year recall for less frequent expenses</li> </ul>	<ul style="list-style-type: none"> <li>• 1 year recall for educational expenses</li> <li>• Both 1 month <u>and</u> 1 year recall for other items</li> </ul>

- 2) **Seasonality:** 2010 LCMS was fielded primarily in February and March, whereas the 2006 LCMS was fielded primarily in December and January (See Table A4). According to the interview date recorded in the 2010 LCMS, 82% of households were surveyed in February, 17% in March, and 1% in other months (or data was miscoded). For the 2006 LCMS, 34% of

households were surveyed in December, 65% in January, and about 1% in other months (or data was miscoded). According to the FEWS NET seasonal calendar, the December/January period is typically considered the “peak hunger period”, and the February/March period is the “green harvest” period when cereal prices usually peak. Thus, this two month shift in the survey period can lead to systematic differences in reported consumption in the surveys and thereby undermine comparability between 2006 and 2010.

**Table A4: Survey Period of 2006 and 2010 LCMS**

2006 LCMS			2010 LCMS		
Interview Month	Number of Households	Percent	Interview Month	Number of Households	Percent
December 2006	6,368	34.1	February 2010	15,833	81.6
January 2007	12,176	65.2	March 2010	3,367	17.4
other	118	0.6	other	193	1.0
	18,662	100		19,393	100

- 3) **Inflation adjustments:** There have been concerns raised over the appropriateness of using the CPI index in Zambia to update the total poverty line from one survey year to the next. As a result, the alternative used recently has been to construct a food price index using select line items from the CPI in order to adjust the total poverty line. However, this assumes that food and nonfood inflation are similar. These adjustments to the poverty line from survey to survey are critical to the comparability of the poverty estimates, and errors in the chosen price index can drastically effect poverty estimates and seriously undermine comparability.

#### Survey-to-Survey Imputation Method

#### **How does the conversion of trends of non-consumption data to consumption poverty trend work?**

First, using the LCMS 2010 data, we estimated a consumption model by regressing household expenditure per adult equivalent ( $Y_{10}$ ) on various socio-economic indicators, like household size, household head’s education level, head’s employment type, ownership of assets, and access to services ( $X_{10}$ ). We started with a simple model with household size, household size squared, and a set of binary variables for head’s education. Using (single) stepwise selection, we then add variables that are highly correlated with the household expenditure with a p-value of less than 0.05 and improve the model fit (adjusted- $R^2$ ). The model takes the following form:

$$Y_{10,h} = f(X_{10,h}; \beta_{10}) = \beta_{10}^0 + \beta_{10}^1 * X_{10,h}^1 + \beta_{10}^2 * X_{10,h}^2 + \beta_{10}^3 * X_{10,h}^3 + \varepsilon_{10,h} \quad (1)$$

where,  $\varepsilon_{10,h}$  , represents household level errors.

Then, we apply this model to LCMS 2006 data to predict household expenditure per adult equivalent in 2010 prices ( $Y_{06}$ ). In other words, we used the coefficients ( $\beta_{10}$ ) estimated in the 2010 regression but introduced poverty correlates of 2006 ( $X_{06}$ ). Household level errors are drawn from the distribution estimated in the regression using the 2010 data. The predicted household expenditures

are comparable if certain assumptions hold (see below). The prediction model takes the following form:

$$Y_{06,h} = f(X_{06,h}; \beta_{10}) = \beta_{10}^0 + \beta_{10}^1 * X_{06,h}^1 + \beta_{10}^2 * X_{06,h}^2 + \beta_{10}^3 * X_{06,h}^3 + \varepsilon_{06,h} \quad (2)$$

Poverty rates of 2006 are estimated using the predicted 2006 household expenditure (in 2010 prices) and the 2010 poverty lines. The poverty rates are reliable if consumption patterns did not change much between 2006 and 2010; the error structure did not change; and poverty correlates are comparable between 2006 and 2010. These assumptions cannot be tested. Another important caveat for this analysis is that the predicted expenditure of 2006 will be comparable to that of 2010, but this means that inaccuracy of the 2010 expenditure data will be also preserved. For example, if spatial price differences were not controlled when the 2010 expenditures were constructed, then the predicted expenditures of 2006 would also have the problem of not controlling for spatial prices. Therefore, if possible, we should construct the best possible expenditure data from the LCMS 2010 data; then the property will be preserved in the 2006 predicted expenditure data as well.

### **How reliable is this analysis?**

The small area method developed by Elbers, Lanjouw, and Lanjouw (2003) was widely used to produce reliable poverty rates at a finely disaggregated level. Household surveys have a very limited sample if we focus on a small area. Elbers et al (2003) approach is to produce consumption models using the household survey data and apply them to census households. Although the census does not have consumption data, we can predict the household expenditure for each census household by applying the models to the census data. This approach has been scrutinized by academic researchers, and in general, if the application is done properly, the results are quite robust and reliable.

Another application of the small area estimation method is to develop consumption models in a reference year and apply them to years when household surveys do not have reliable consumption data. Our analysis for Zambia data belongs to this group. Christiansen et al. (2011) tested this approach for three countries – Russia, Vietnam and Kenya. The results are mixed. For Vietnam and Kenya, the ELL approach could predict well household expenditure and poverty rates; however, for Russia, it did not perform well. This is likely because a large economic crisis hit the country in the middle of survey series and might have changed the consumption models.

The reliability of this analysis is strictly dependent on how plausible the key assumptions are. One key assumption is that the relationship between poverty and the non-monetary poverty correlates measured in the survey is assumed not to change between 2006 and 2010 – i.e. the model is stable. More concretely, if having a secondary education increases household expenditure 10 percent on average in 2010, it would also increase household expenditure 10 percent in 2006. However, there is no guarantee that this assumption is satisfied, and there is no way to test it. It also assumes that non-consumption data (or poverty correlates) are measured comparably in both 2006 and 2010 surveys. This can be observed. A third issue is the requirement that the correlates are satisfactory predictors of consumption. If not, the level of consumption and in turn poverty cannot be predicted with very much accuracy.

Given the limitations, we should see the poverty trend estimated from this analysis with caveats. Furthermore, it would be more appropriate to see the trends of non-consumption data and poverty estimates together for examining whether living conditions in Zambia have improved in general.

### **Description of the World Bank's consumption aggregate and poverty lines for 2010 LCMS**

This break in comparability between the 2006 and 2010 rounds of the LCMS presents an opportunity to redefine the poverty measurement methodology for 2010. The consumption aggregate was redefined according to best practices. Separate rural and urban poverty lines were introduced to better reflect the difference in the cost of living between rural and urban areas, and spatial price adjustments across provinces were made. Continued application of this methodology is recommended for future survey rounds so that poverty trends will be consistently measured and the spatial distribution of poverty can be properly identified.

#### Consumption Aggregate

The consumption aggregate is comprised of food and nonfood components. For the food component, we included all available items in the 2010 LCMS (i.e. 128 items, excluding alcohol and tobacco) and all sources (i.e. purchases, consumption from own-production, and transfers). For the nonfood component, we included all items except for hospital stays, payments to hospital/health center/surgery, other health expenses, loan repayments, and all remittances (item numbers 195, 198, 200, 210, 212, and 215-217).

We used the exact same set of imputations for rental values, electricity payments, and water payments that were previously calculated by the CSO's consultants. The imputed values were used for observations where actual or estimated values were not reported and the household indicated elsewhere in the questionnaire that they owned a home or had electricity or water services.

All household expenditures were converted into monthly terms and then normalized using the CSO's adult equivalent scale. Extreme outliers were dropped (i.e. observations with no reported food consumption (8 households) and per adult equivalent values greater than 4 standard deviations from the mean (5 households)).

Spatial adjustments to account for cost of living differences across provinces were done by dividing the consumption aggregate by the Laspeyres index previously constructed by the CSO/DFID consultants. This price index was based on median prices at the province level for select individual items used to construct the CPI. The prices cover the period between January and April 2011. The Laspeyres price index at the province level is shown in Table A5.

**Table A5: Laspeyres Price Index**

Province	Price Index
Central	0.94
Copperbelt	1.03
Eastern	0.98
Luapula	0.98
Lusaka	1.10
Northern	0.95
North-Western	1.07
Southern	0.96
Western	0.88
Central	0.94

Source: CSO/Gottingen

As prices between urban and rural areas often differ, it would have been preferable to account for price differences between urban and rural areas of each province. However, the unit values that can be estimated directly from the consumption module of the 2010 LCMS survey were extremely noisy due to the fact that several hundred units were recorded (beyond the 24 choices included in the survey) and conversion tables between units was not available. Due to time constraints, we were not able to clean this data and further evaluate whether the data quality of the unit values in the 2010 LCMS would be suitable for constructing alternative price indices that account for the urban and rural differences.

#### Poverty Lines

Separate rural and urban poverty lines were defined for 2010. First, we started with the food poverty line that was previously defined by CSO/DFID consultants using the 2006 basket and valued using individual prices of goods in the CPI in 2010. This food poverty line was 98,505 Kwacha per month per adult equivalent. Second, we estimated the food budget share of households with per adult equivalent expenditures near the food poverty line for urban and rural areas. This was done non-parametrically. The food budget shares for urban and rural areas were 54.6% and 67.5% respectively. Third, we derived the total poverty lines ( $z_t$ ) for urban and rural areas by dividing the food poverty line ( $z_f$ ) by the respective food budget shares ( $b_f$ ):  $z_t = z_f / b_f$ . This yielded poverty lines of 180,551 and 146,054 (Kwacha per month per adult equivalent) for urban and rural areas respectively. The difference between the urban and rural poverty lines is due to the higher nonfood consumption observed in urban areas.

**Table A6: Urban and Rural Poverty Lines and Food Budget Shares**

	Total Poverty Line (Kwacha per month per adult equivalent)	Food Poverty Line (Kwacha per month per adult equivalent)	Food Budget Share (%) (near food poverty line)
Urban	180,551	98,505	54.6
Rural	146,054	98,505	67.5

We would have preferred to define separate urban and rural food baskets as our preliminary analysis suggested different consumption patterns between urban and rural areas. However, as mentioned above, the unit values estimated from the consumption module were extremely noisy and could not be used to cost out separate urban and rural food poverty lines. In light of these considerations, we decided to use the existing food poverty line described above.

In the questionnaire, households were asked “How much money do you think is needed to by your household in a month to have an adequate /minimum standard of living?” When we compare responses by urban and rural areas, we find that the median value among those that we have classified as moderate poor was 176,991 and 114,155 Kwacha (normalizing by adult equivalents) in 2010 for urban and rural areas, respectively. This lends support to using two separate poverty lines for urban and rural areas as described above.

**Table A7: Subjective assessment of the cost to achieve an adequate standard of living, in 2010**

	all	extreme poor	moderate poor	non-poor
<b>Urban</b>				
self assessed amount needed by household for adequate standard of living, in Kwacha (median)	1,500,000	800,000	1,000,000	2,000,000
self-assessed amount, normalized by adult equivalents, in Kwacha (median)	291,545	131,926	176,991	400,000
total expenditure per adult equivalent, in Kwacha (median)	248,463	72,146	137,067	358,285
<b>Rural</b>				
self assessed amount needed by household for adequate standard of living, in Kwacha (median)	500,000	500,000	500,000	800,000
self-assessed amount, normalized by adult equivalents, in Kwacha (median)	107,143	83,333	114,155	185,529
total expenditure per adult equivalent, in Kwacha (median)	92,959	62,342	118,537	208,668

The urban median value above is remarkably close to the urban poverty line that we constructed, 180,551 Kwacha per month per adult equivalent. The rural median value above is less than our rural poverty line of 146, 054 by roughly 32,000 Kwacha, suggesting that the rural poverty may be overestimated. The difference may arise in part because the CPI prices were compiled mainly from urban locations. Since the CPI item prices were used to price out the food basket, the food poverty line for rural areas may be biased upward assuming urban food prices are higher than rural prices, and in turn, the total rural poverty line may also be biased upwards. Rural prices were not available and the unit price data from the survey were not of good enough quality to use as a substitute.

## RESULTS

Trends of non-consumption data in general indicate some improvements between 2006 and 2010. Comparing education levels of household heads across surveys, we see that the share of household heads with A-level or higher education increased from 17% to 23% in urban areas. In rural areas, we see some improvements at the senior secondary school level (16% in 2006 and 19% in 2010) as well as slight increase at A-level and higher (3% to 5%). Other indications include improvements in housing. For example, households with better flooring material increased from 78 % to 84% and 16% to 20% in urban and rural areas respectively. Ownership of various assets increased somewhat over the period as well (see Tables A8 and A9 for details).

The models explain a lot of the variation, in particular the urban model which has an adjusted R-square of 0.71. The fit for the rural model is less with an adjusted R-square of 0.48 but still not bad (see Tables A1 and A2 in the Appendix for details).

**Table A8: Rural Consumption Model and Means of Covariates**

dep var: log exp per a.e.	2010 rural model		2006-rural		2010-rural	
	Coef.	Std. Err.	Mean	Std. Err.	Mean	Std. Err.
constant	12.03	0.04	.	.	.	.
household size	-0.24	0.01	5.14	0.03	5.32	0.03
household size squared	0.01	0.00	32.91	0.36	35.31	0.40
head: age	0.00	0.00	42.38	0.16	42.45	0.16
head marital status: single	0.13	0.03	0.04	0.00	0.04	0.00
head educ: primary	0.06	0.02	0.32	0.00	0.30	0.00
head educ: jr. secondary	0.11	0.02	0.27	0.00	0.28	0.00
head educ: sr. secondary	0.13	0.02	0.16	0.00	0.19	0.00
head educ: 12 grade/O-level	0.23	0.03	0.05	0.00	0.05	0.00
head educ: A-level & higher	0.46	0.04	0.03	0.00	0.05	0.00
head activity: wage employment	0.17	0.03	0.10	0.00	0.12	0.00
head activity: nonfarm business	0.07	0.02	0.07	0.00	0.08	0.00
head: self-employed	0.12	0.02	0.86	0.00	0.83	0.00
dwelling type: house/apt., etc.	0.16	0.02	0.10	0.00	0.16	0.00
better cook device	0.13	0.02	0.16	0.00	0.20	0.00
better floor	0.16	0.02	0.16	0.00	0.20	0.00
own: bed	0.16	0.02	0.51	0.01	0.61	0.01
own: bicycle	0.14	0.01	0.45	0.01	0.46	0.01
own: electric iron	0.20	0.04	0.03	0.00	0.03	0.00
own: motor vehicle	0.54	0.05	0.01	0.00	0.01	0.00
own: radio	0.12	0.01	0.50	0.01	0.43	0.01
own: sofa	0.13	0.02	0.09	0.00	0.15	0.00
own: table	0.09	0.02	0.13	0.00	0.16	0.00
own: tractor	0.55	0.09	0.00	0.00	0.00	0.00
own: tv	0.19	0.02	0.08	0.00	0.12	0.00
public transport < 1 hr	0.06	0.01	0.48	0.01	0.49	0.01
model: F=306.6980, R2=0.4797, adjR2=0.4781, n=8343						

**Table A9: Urban Consumption Model and Means of Covariates**

dep var: log exp per a.e.	2010 urban model		2006-urban		2010-urban	
	Coef.	Std. Err.	Mean	Std. Err.	Mean	Std. Err.
constant	12.55	0.03	.	.	.	.
household size	-0.30	0.01	5.13	0.03	5.09	0.02
household size squared	0.01	0.00	33.11	0.35	32.46	0.32
head: age	0.00	0.00	40.23	0.13	40.85	0.12
head educ: jr. secondary	0.05	0.02	0.15	0.00	0.14	0.00
head educ: sr. secondary	0.13	0.02	0.28	0.00	0.27	0.00
head educ: 12 grade/O-level	0.21	0.02	0.26	0.00	0.23	0.00
head educ: A-level & higher	0.37	0.02	0.17	0.00	0.23	0.00
head activity: wage employment	0.09	0.01	0.48	0.01	0.48	0.00
head activity: nonfarm business	0.10	0.01	0.28	0.00	0.27	0.00
dwelling type: house/apt., etc.	0.07	0.01	0.77	0.00	0.79	0.00
better cook device	0.13	0.02	0.93	0.00	0.95	0.00
better floor	0.13	0.02	0.78	0.00	0.84	0.00
better garbage	0.12	0.02	0.17	0.00	0.15	0.00
better light	0.12	0.02	0.50	0.01	0.54	0.00
better toilet	0.19	0.01	0.37	0.00	0.34	0.00
own: bed	0.19	0.02	0.88	0.00	0.91	0.00
own: computer	0.22	0.02	0.03	0.00	0.07	0.00
own: electric iron	0.13	0.02	0.38	0.00	0.43	0.00
own: electric/gas stove	0.10	0.02	0.40	0.01	0.47	0.00
own: freezer	0.11	0.01	0.19	0.00	0.25	0.00
own: motor vehicle	0.46	0.02	0.07	0.00	0.10	0.00
own: refrigerator	0.16	0.02	0.18	0.00	0.23	0.00
own: sofa	0.12	0.01	0.55	0.01	0.59	0.00
own: table	0.08	0.01	0.31	0.00	0.31	0.00
own: tv	0.13	0.01	0.55	0.01	0.61	0.00

model: F=1052.0927, R2=0.7104, adjR2=0.7097, n=10749

Consumption and Poverty Trends

**Table A10: Summary Statistics of the Consumption Aggregates**

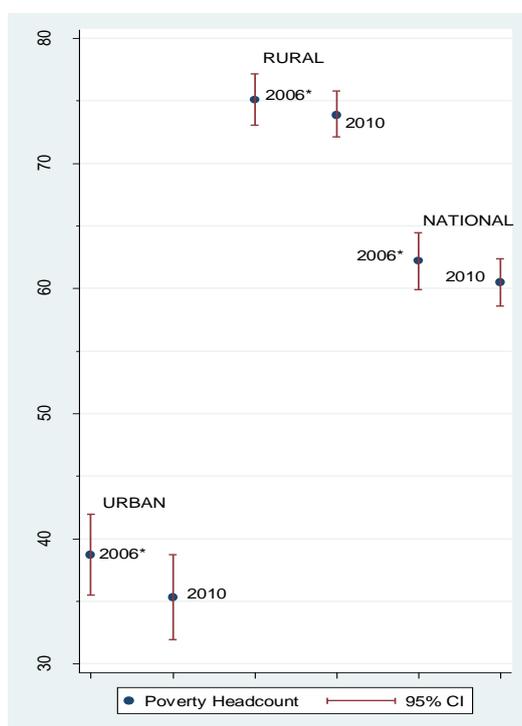
	Median (Kwacha per month per adult equiv.)		Ratio p90/p10	
	2006*	2010	2006*	2010
<b>Urban</b>	229,440	248,463	8.1	8.8
<b>Rural</b>	91,752	92,959	5.8	5.9

\* denotes survey to survey poverty mapping results.

Our projection of 2006 consumption in 2010 prices suggests a modest increase in median consumption in urban areas between 2006 and 2010, and a very small increase in rural areas. Turning to poverty, our estimates are inconclusive. Although the poverty rate at the national level appears to have declined slightly between 2006 and 2010, once we take into account the margin of error, the change is not statistically significant. Thus, while it is true that there are some signs of

improvements in living conditions, the estimated confidence interval does not allow us to conclude that there was indeed a change in headcount poverty.

**Table A11: Poverty Headcount Ratio Estimates for 2006\* and 2010 with 95% Confidence Intervals**



\* denotes survey to survey poverty mapping results.

It should be noted that this result is not restricted to our analysis. We conducted statistical tests for poverty trends based on CSO estimates and found that the change in headcount poverty between 2006 and 2010 is not statistically significant.<sup>52</sup> In other words, we cannot say with confidence that poverty decreased (or increased) during this period, at least according to these monetary poverty measures.

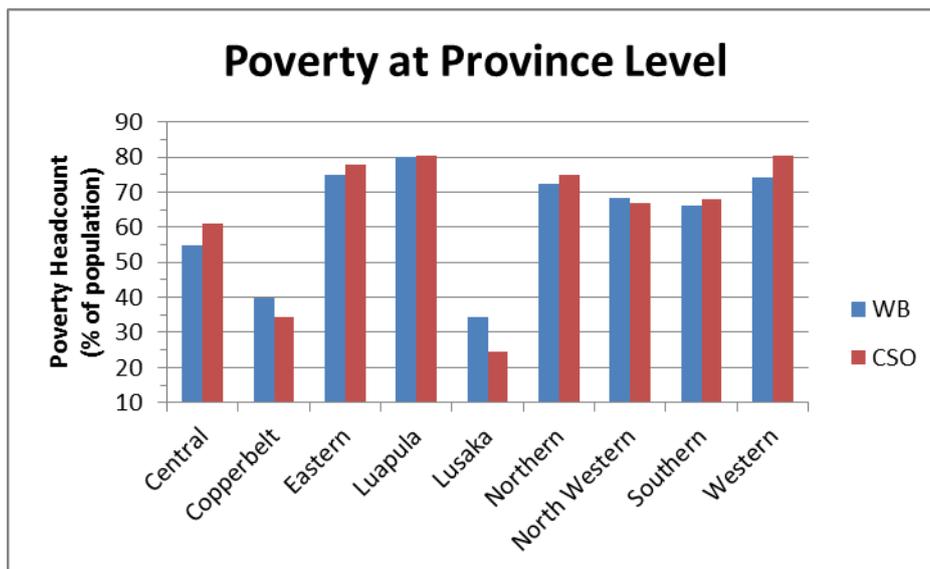
**Table A12: Headcount Poverty Estimates with 95% Confidence Intervals**

	CSO's Poverty Trends Report		Trend with Survey to Survey Poverty Mapping-Based Approach	
	1996	2006	2006*	2010
Urban	40.5	26.7	38.7	35.3
	(36.9 , 44.1)	(23.6 , 29.7)	(35.5 , 41.9)	(31.9 , 38.7)
Rural	84.2	76.8	75.1	73.9
	(82.4 , 86.0)	(75.0 , 78.6)	(73.1 , 77.1)	(72.1 , 75.8)
National	68.1	59.3	62.2	60.5
	(66.1 , 70.1)	(57.2 , 61.3)	(59.9 , 64.5)	(58.6 , 62.4)

\* denotes survey to survey poverty mapping results.

<sup>52</sup> Using the "pov2006wi.dta" and "pov2010wi.dta" data files received from the CSO, standard errors for the 2006 and 2010 headcount poverty estimates accounting for survey design were 0.964 and 0.995, respectively. The corresponding test statistic for equality of the poverty rates was 1.59, so the difference in the 2006 and 2010 estimates is not statistically significant at 5% (or even 10%) significance level.

**Figure A1: Headcount Poverty Estimates by Province**



Furthermore, while the national poverty estimates above may look similar to those of the CSO, the provincial poverty profile (in Figure A1) illustrates the differences between the World Bank and CSO estimates. One major methodological difference is that the CSO did not make any spatial price adjustments for recent estimates. As a result, the CSO estimates tend to overestimate poverty in the Central, Eastern, Northern, Southern, and Western provinces, in which the cost of living is lower. On the other hand, poverty in the Lusaka, Copperbelt, and North Western provinces, in which the cost of living is higher, would tend to be underestimated without such adjustments (see the Figure A1 in the Appendix for poverty rates in urban and rural areas of each province). We highly recommend the use of spatial price index to adjust for the cost of living differences within the country.

### **Robustness Checks**

**Robustness Check #1:** As suggested in Christiaensen et al. (2011), we assessed the predictive performance of our urban and rural model specifications on a random sub-sample of the survey data. We first split the 2010 data into sub-samples A and B by randomly selecting half of the observations in each primary sampling unit. We did this separately for urban and rural sectors. Using the same set of variables as in the model for the full sample, we calibrated the consumption models using sub-sample A and then predicted 2010 consumption using covariates of sub-sample B. Applying the same rural and urban poverty lines (146,054 and 180,551 Kwacha per adult equivalent per month), we then predicted poverty rates for the sub-sample and compared them to the “true” poverty rates estimated directly from the full sample. As Table A13 shows, the predicted 2010 poverty rates (36.0% and 73.4% for urban and rural areas, respectively) are close to the 2010 “true” poverty rates (35.3% and 73.9% for urban and rural areas, respectively), and the predicted poverty rates lie well within the 95% confidence interval of the “true” values, shown in parentheses in the table. These results indicate that the selected consumption models perform well in predicting poverty in 2010.

**Table A13: Performance of the consumption model in predicting poverty (robustness check)**

	<b>2010 full sample (direct estimate)</b>	<b>2010 sub-sample* (predicted)</b>
<b>Urban</b>	35.3 (31.9, 38.7)	36.0 (32.2, 39.8)
<b>Rural</b>	73.9 (72.1, 75.8)	73.4 (71.0, 75.8)

**Robustness Check #2:** We checked if reversing the direction of the predictions would change the trends. In other words, instead of specifying a model with 2010 data and predicting consumption and poverty in 2006, we reversed the order and specified the consumption models using 2006 data and predicted consumption and poverty in 2010. Since we had not constructed consumption aggregates and poverty lines for 2006, we used the existing 2006 consumption aggregate prepared by the DFID consultants and the 2006 national poverty line (106,413 Kwacha per adult equivalent per month) for this check. The results in Table A14 indicate a slight decrease in the poverty, which is consistent with the trend found when 2006 poverty is predicted.

**Table A14: Poverty trends with direction of predictions reversed (robustness check)**

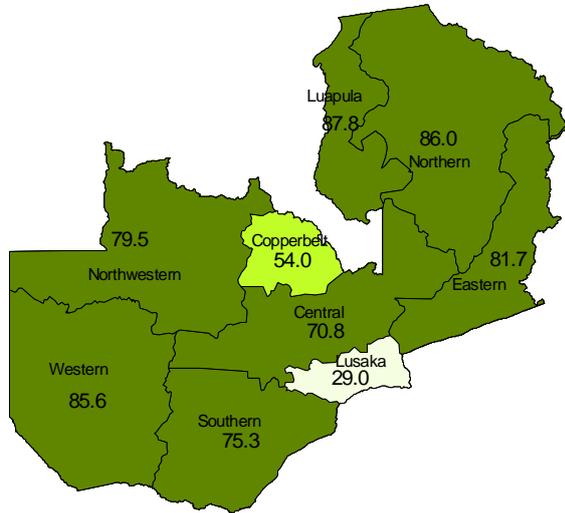
	<b>2006 (direct estimate)</b>	<b>2010* (predicted)</b>
<b>Urban</b>	26.7 (23.5, 29.8)	25.0 (21.5, 28.5)
<b>Rural</b>	76.8 (74.8, 78.7)	73.4 (71.3, 75.5)

# Appendix B

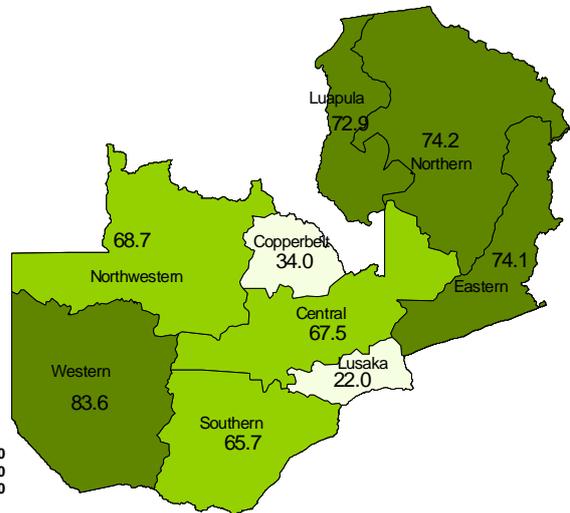
## Poverty Trends

Figure B1: Poverty Headcount (% of population)

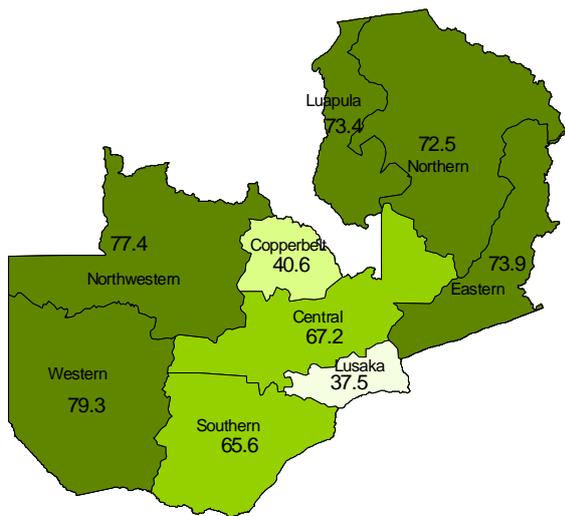
1996



2006



2006\*



2010

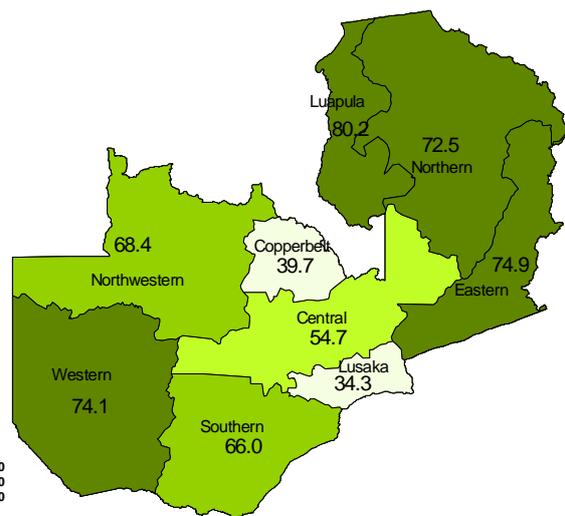
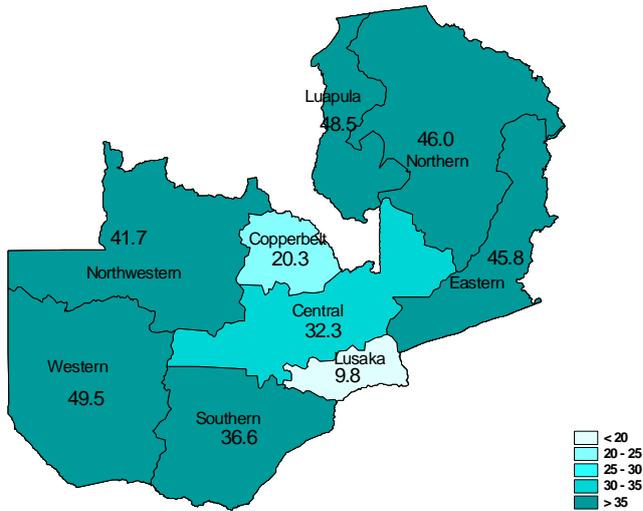
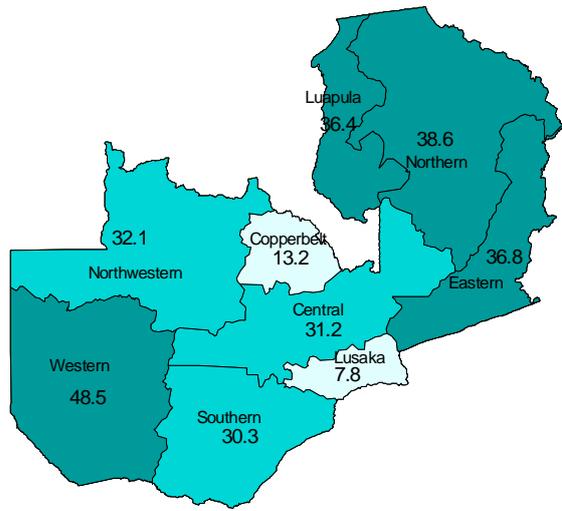


Figure B2: Poverty Gap (% of poverty line)

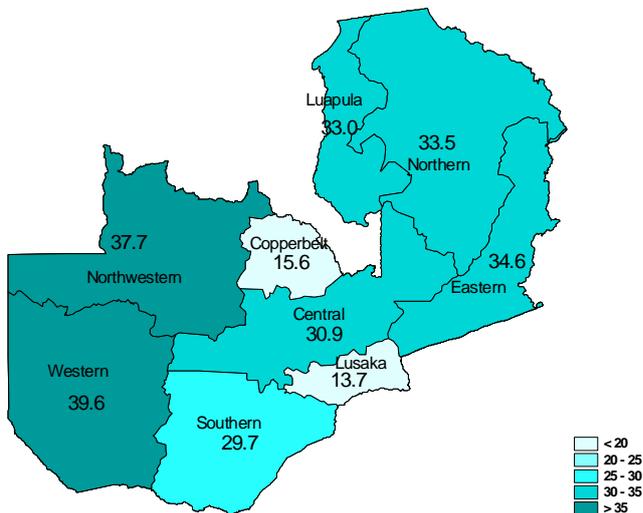
1996



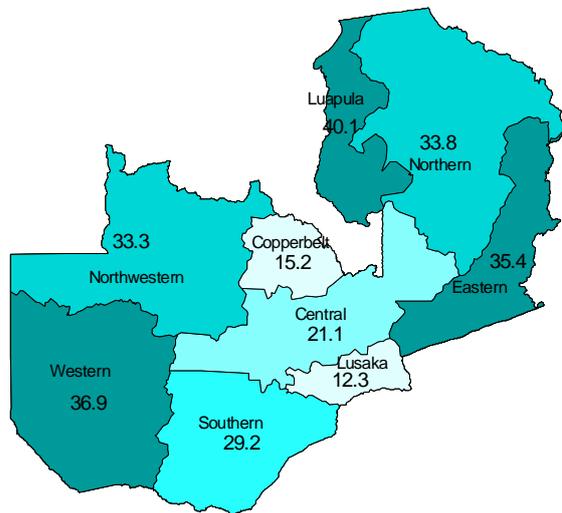
2006



2006\*

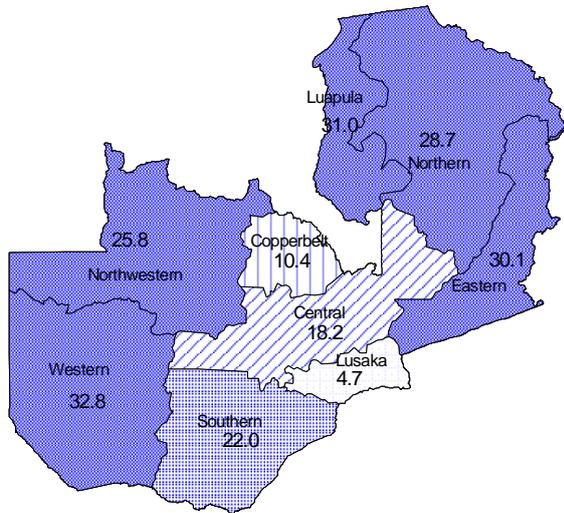


2010

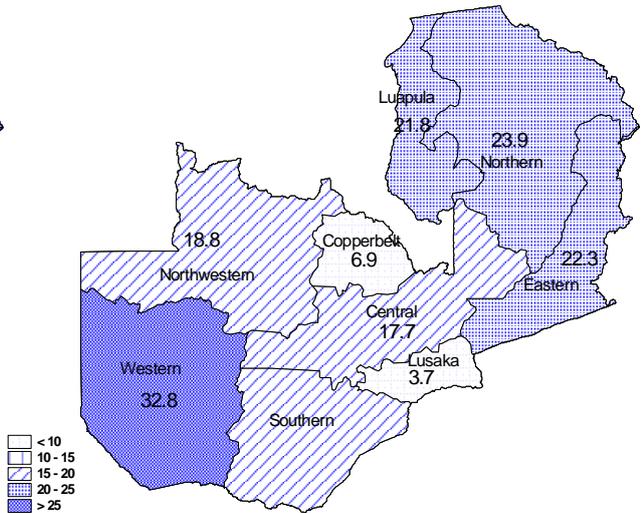


**Figure B3: Squared Poverty Gap**

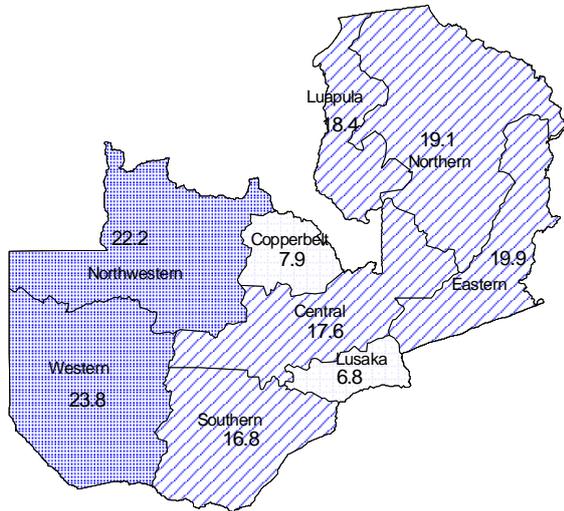
1996



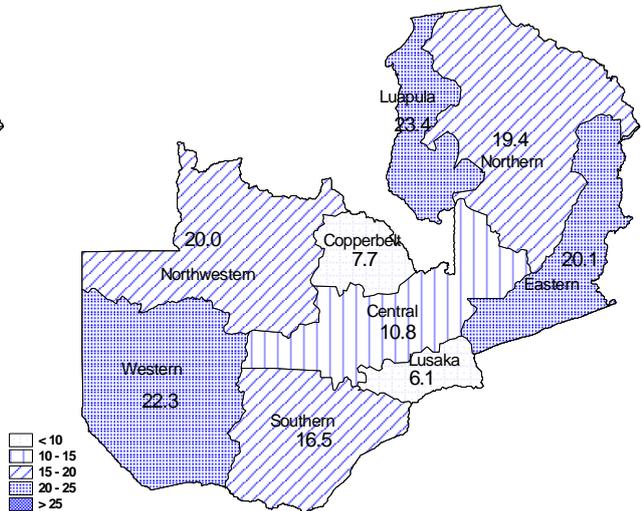
2006



2006\*



2010

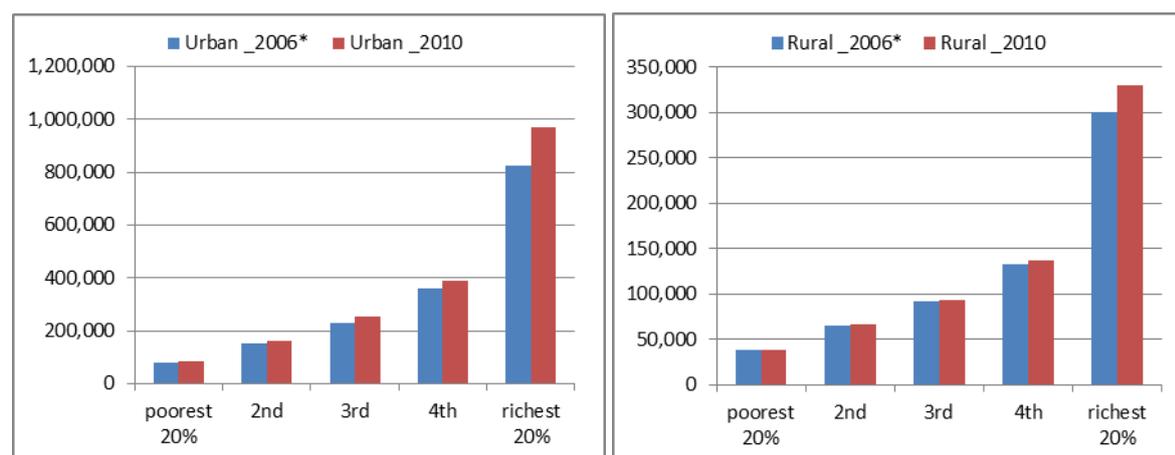


**Table B1: Household expenditures per adult equivalent, 1996-2006 (in 2006 Kwacha)**

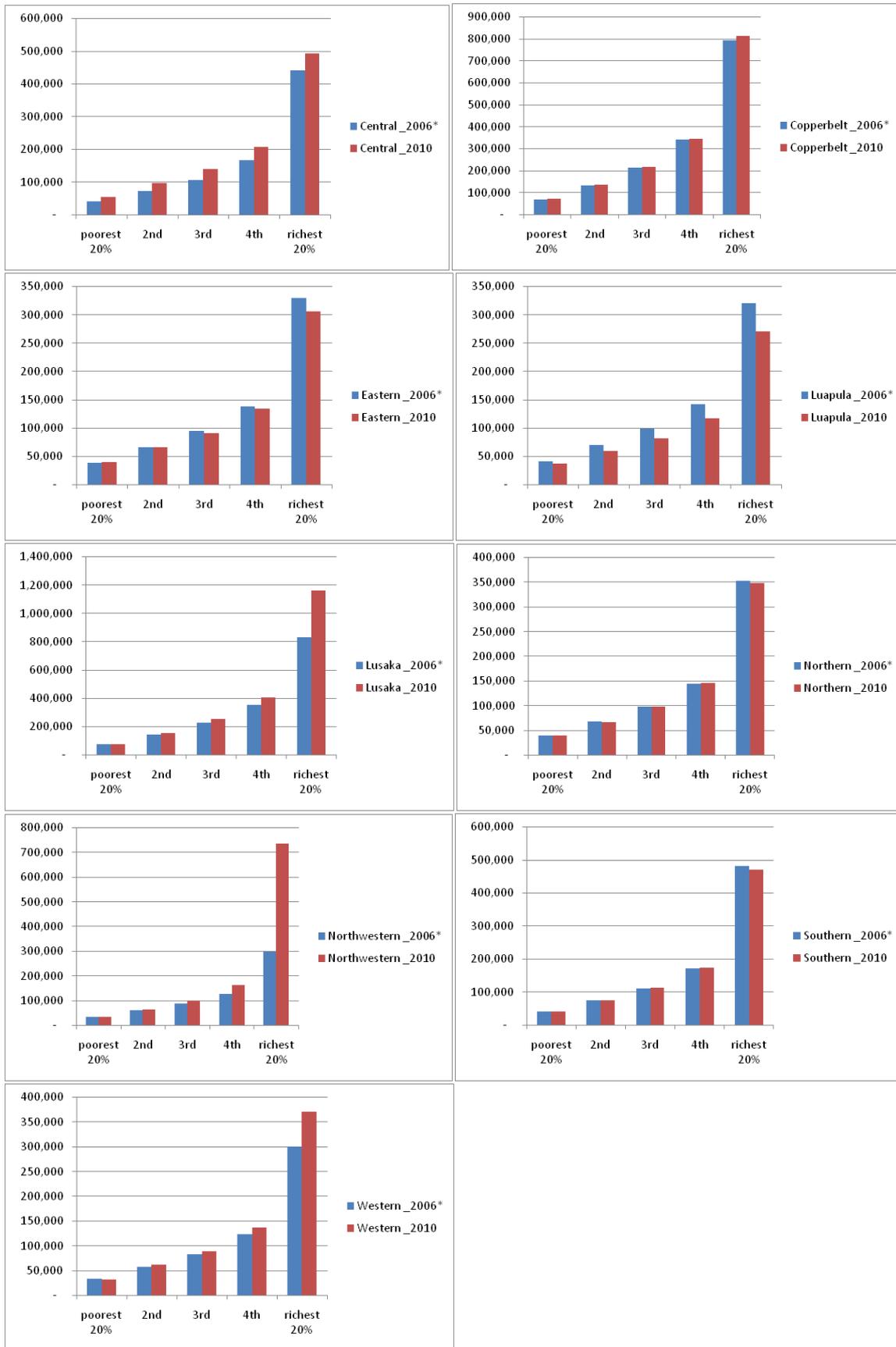
	1996	1998	2004	2006
National (mean)	109,345	112,886	148,743	147,151
Rural	70,799	71,963	88,430	87,048
Urban	175,250	182,126	242,361	258,943
National (median)	71,214	72,831	86,393	85,067
Rural	51,602	52,350	59,158	61,583
Urban	126,357	126,605	163,135	174,567
Poorest 20%	25,166	24,619	27,852	27,740
Quintile 2	46,524	46,043	53,818	53,704
Quintile 3	72,123	72,962	87,388	85,871
Quintile 4	114,417	116,173	147,515	145,341
Richest 20%	288,595	304,741	427,161	423,157

Note: National poverty lines were used to deflate nominal expenditures into 2006 prices.

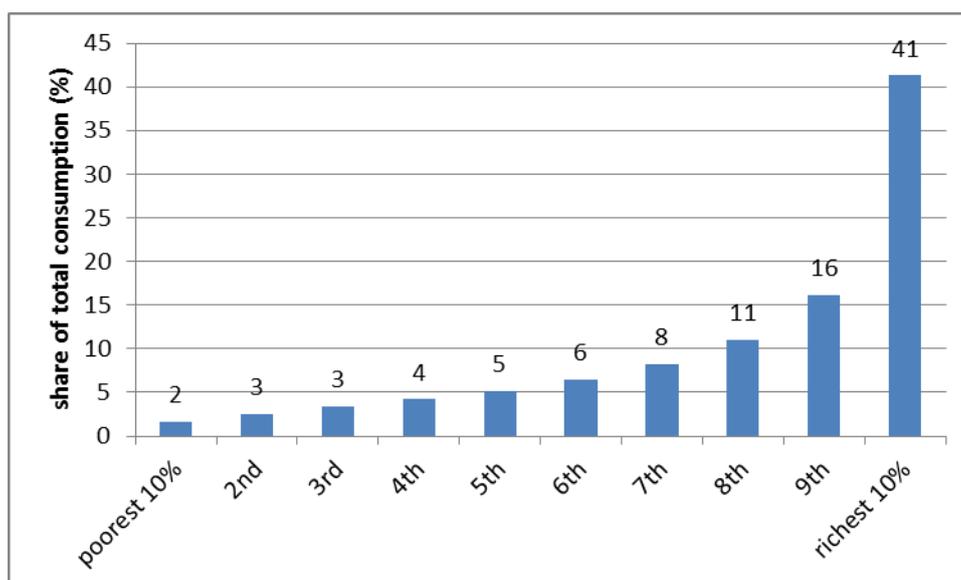
**Figure B4: Mean consumption expenditures per adult equivalent, by quintiles and area of residence, 2006\* - 2010**



**Figure B5: Consumption expenditures per adult equivalent, by quintiles and province, 2006\*-2010**



**Figure B6: Distribution of total consumption by deciles, 2010**



**Table B2: Decomposition of inequality by area of residence and province, 2010**

<b>Area of Residence</b>			
	<b>GE(0)</b>	<b>GE(1)</b>	<b>GE(2)</b>
Total	46.8	55.1	135.5
Urban	38.0	40.4	67.7
Rural	32.1	44.8	209.6
Within-group inequality	34.1	42.2	121.8
Between-group inequality	12.7	12.9	13.8
Between as a share of total	27.1	23.4	10.2
<b>Province</b>			
	<b>GE(0)</b>	<b>GE(1)</b>	<b>GE(2)</b>
Total	46.8	55.1	135.5
Central	31.2	34.9	69.3
Copperbelt	37.1	38.8	62.2
Eastern	28.1	32.0	56.7
Luapula	26.4	31.8	63.5
Lusaka	45.3	47.2	79.0
Northern	31.3	35.4	63.3
Northwestern	70.9	116.7	650.1
Southern	38.4	43.6	89.4
Western	38.8	47.7	124.5
Within-group inequality	37.0	45.0	124.6
Between-group inequality	9.8	10.1	10.9
Between as a share of total	20.9	18.3	8.1

**Table B3: Millennium Development Goals**

Millennium Development Goals				
	1990	1995	2000	2009
<b>Goal 1: Eradicate extreme poverty and hunger</b>				
Employment to population ratio, 15+, total (%)	57	58	61	61
Employment to population ratio, ages 15-24, total (%)	40	42	46	46
Income share held by lowest 20%	0,7	4,2	3,3	..
Malnutrition prevalence, weight for age (% of children under 5)	21,2	19,6	19,6	14,9
Poverty gap at \$1.25 a day (PPP) (%)	40	29	27	..
Poverty headcount ratio at \$1.25 a day (PPP) (% of population)	63	62	55	..
Prevalence of undernourishment (% of population)	35	38	43	43
Vulnerable employment, total (% of total employment)	65	78	81	..
<b>Goal 2: Achieve universal primary education</b>				
Literacy rate, youth female (% of females ages 15-24)	..	..	66	68
Literacy rate, youth male (% of males ages 15-24)	..	..	73	82
Persistence to last grade of primary, total (% of cohort)	..	..	87	79
Primary completion rate, total (% of relevant age group)	..	..	61	93
Total enrollment, primary (% net)	..	75	69	97
<b>Goal 3: Promote gender equality and empower women</b>				
Proportion of seats held by women in national parliaments (%)	7	10	10	15
Ratio of female to male primary enrollment (%)	..	92	93	98
Ratio of female to male secondary enrollment (%)	..	..	81	83
Ratio of female to male tertiary enrollment (%)	..	..	46	..
Share of women employed in the nonagricultural sector (% of total nonagricultural employment)	16,6	..	33,7	..
<b>Goal 4: Reduce child mortality</b>				
Immunization, measles (% of children ages 12-23 months)	90	86	85	85
Mortality rate, infant (per 1,000 live births)	108	105	99	86
Mortality rate, under-5 (per 1,000)	179	176	166	141
<b>Goal 5: Improve maternal health</b>				
Adolescent fertility rate (births per 1,000 women ages 15-19)	..	..	152	139
Births attended by skilled health staff (% of total)	51	47	47	47
Contraceptive prevalence (% of women ages 15-49)	15	26	22	41
Maternal mortality ratio (modeled estimate, per 100,000 live births)	390	490	600	470
Pregnant women receiving prenatal care (%)	92	96	93	94
Unmet need for contraception (% of married women ages 15-49)	31	27	13	27
<b>Goal 6: Combat HIV/AIDS, malaria, and other diseases</b>				
Children with fever receiving antimalarial drugs (% of children under age 5 with fever)	..	..	58	43
Condom use, population ages 15-24, female (% of females ages 15-24)	..	11	17	17
Condom use, population ages 15-24, male (% of males ages 15-24)	..	34	36	39
Incidence of tuberculosis (per 100,000 people)	300	540	600	470
Prevalence of HIV, female (% ages 15-24)	..	..	..	11,3
Prevalence of HIV, male (% ages 15-24)	..	..	..	4
Prevalence of HIV, total (% of population ages 15-49)	8,9	16,3	15,5	15,2
Tuberculosis case detection rate (all forms)	72	74	79	74
<b>Goal 7: Ensure environmental sustainability</b>				
CO2 emissions (kg per PPP \$ of GDP)	0,4	0,3	0,2	0,2
CO2 emissions (metric tons per capita)	0,3	0,2	0,2	0,2
Forest area (% of land area)	66	63	60	56
Improved sanitation facilities (% of population with access)	46	47	47	49

Improved water source (% of population with access)	49	51	54	60
Marine protected areas (% of total surface area)	..	..	..	0
Terrestrial protected areas (% of total surface area)	..	..	..	41,1
<b>Goal 8: Develop a global partnership for development</b>				
Debt service (PPG and IMF only, % of exports, excluding workers' remittances)	15	18	16	1
Internet users (per 100 people)	0,0	0,0	0,2	5,5
Mobile cellular subscriptions (per 100 people)	0	0	1	28
Net ODA received per capita (current US\$)	60	223	76	86
Telephone lines (per 100 people)	1	1	1	1

Source: World Development Indicators

**Table B4: Subjective and consumption-based measures of poverty, 2010**

	all (%)	extreme poor (%)	moderate poor (%)	non-poor (%)	poorest quintile (%)	richest quintile (%)
<b>National</b>						
self assessed as "very poor"	37.7	52.6	39.6	21.9	53.7	12.6
self assessed as "moderately poor"	48.6	41.3	52.8	53.6	40.1	52.4
self assessed as "non poor"	13.5	5.9	7.4	24.4	6.1	34.9
<b>Urban</b>						
self assessed as "very poor"	22.9	52.3	33.8	13.4	59.2	9.7
self assessed as "moderately poor"	53.3	40.0	57.2	54.6	32.6	51.2
self assessed as "non poor"	23.5	7.2	8.8	31.8	7.8	38.9
<b>Rural</b>						
self assessed as "very poor"	45.6	52.6	43.0	33.1	53.2	22.5
self assessed as "moderately poor"	46.1	41.5	50.3	52.2	40.8	56.6
self assessed as "non poor"	8.2	5.7	6.6	14.6	5.9	20.8

## Appendix C

### Monetary and Nonmonetary Poverty

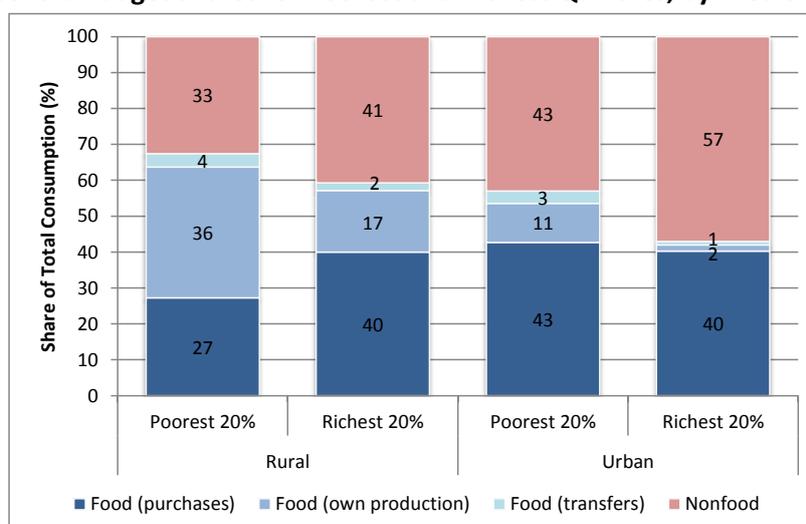
**Table C1: Budget Shares of Food and Nonfood Expenditures, 2010**

	All	Extremely Poor	Moderately Poor	Non-Poor	Poorest 20%	Richest 20%
<b>National</b>						
Food expenditure share (%)	60.3	66.6	61.7	53.4	66.5	46.6
- share purchased (%)	34.7	30.0	36.0	38.8	28.5	40.2
- share from own production (%)	22.9	33.0	23.0	12.8	34.4	5.2
- share from transfers (%)	2.7	3.6	2.8	1.8	3.7	1.2
Nonfood expenditure share (%)	39.7	33.4	38.3	46.6	33.5	53.4
<b>Urban</b>						
Food expenditure share (%)	48.2	56.7	52.2	45.1	57.0	43.0
- share purchased (%)	43.1	45.1	45.7	41.8	42.7	40.3
- share from own production (%)	3.6	8.9	4.7	2.2	10.9	1.7
- share from transfers (%)	1.5	2.7	1.8	1.1	3.4	1.0
Nonfood expenditure share (%)	51.8	43.3	47.8	54.9	43.0	57.0
<b>Rural</b>						
Food expenditure share (%)	66.8	67.8	67.2	64.4	67.4	59.3
- share purchased (%)	30.3	28.0	30.3	34.9	27.3	40.0
- share from own production (%)	33.2	36.1	33.6	26.9	36.4	17.2
- share from transfers (%)	3.3	3.7	3.3	2.7	3.7	2.1
Nonfood expenditure share (%)	33.2	32.2	32.8	35.6	32.6	40.7

Note: Moderate poor excludes extreme poor.

Source: World Bank estimates based on 2010 LCMS.

**Figure C1: Household Budget Shares for Poorest and Richest Quintiles, by Area of Residence, 2010**



Source: World Bank estimates based on 2010 LCMS.

**Table C2: Agricultural Productivity**

## LOW PRODUCTIVITY

Crop yields (Mt/ha) year, Zambia vs Global Averages

Crop	2001/02	2003/04	2005/06	2007/08	2009/10	Global*
Maize	1.0	1.7	1.5	1.3	2.1	4.47
Sorghum	0.7	0.7	0.5	0.5	0.9	2.66
Rice	1.0	1.0	1.3	1.2	1.7	3.84
Millet	0.7	1.0	0.7	1.0	1.1	0.82
Sunflower	0.4	0.5	0.4	0.5	0.6	-
Groundnuts	0.4	0.7	0.5	0.6	0.7	1.35
Soybean	0.7	0.6	0.7	0.7	1.0	-
Cotton	0.8	1.1	0.9	0.8	1.0	7

\*COMESA

Source: Anthony Chapoto (2010), ACF/FSRP Research presented at the Zambia National Farmers Union Congress, Lusaka, 2010.

**Table C3: Agricultural Output  
Zambia National Production per Agricultural  
household (Metric Tonnes)**

Crop	2001/02	2003/04	2005/06	2007/08	2009/10	Trend
Maize	0.58	1.07	0.98	0.93	1.66	Upward
Sorghum	0.03	0.03	0.01	0.01	0.02	Constant
Rice	0.02	0.01	0.01	0.02	0.03	Constant
Millet	0.05	0.04	0.03	0.03	0.03	Constant
Sunflower	0.01	0.01	0.01	0.01	0.02	Constant
Groundnuts	0.05	0.06	0.05	0.07	0.11	Upward
Soybeans	0.00	0.01	0.02	0.01	0.02	Constant
Cotton	0.07	0.12	0.13	0.06	0.05	Up and down
Beans	0.04	0.03	0.04	0.05	0.06	Constant
Sweet Potatoes	0.08	0.07	0.08	0.09	0.17	upward

Source: Anthony Chapoto (2010), ACF/FSRP Research presented at the Zambia National Farmers Union Congress, Lusaka, 2010.

**Table C4: Asset Ownership, 2004 and 2010**

ASSETS										
	2004					2010				
	Nat.	Urban	Rural	Poorest 20%	Richest 20%	Nat.	Urban	Rural	Poorest 20%	Richest 20%
Bed	67.5	89.3	53.5	40.4	89.2	71.1	90.4	60.6	47.4	92.3
Mattress	60.9	88.5	43.2	29.3	88.7	71.7	93.2	59.9	47.7	94.5
Radio / stereo	52.3	66.2	43.4	28.3	73.2	47.2	56.3	42.2	28.8	62.4
Television	22.3	47.9	5.8	1.5	56.6	28.9	59.6	12.2	2.5	69.5
Land Telephone	2.0	4.7	0.3	0.1	7.2	0.7	1.7	0.11	0.0	2.4
<b>Cellular phone</b>	<b>8.5</b>	<b>19.7</b>	<b>1.4</b>	<b>0.0</b>	<b>29.5</b>	<b>48.9</b>	<b>79.9</b>	<b>32.0</b>	<b>15.7</b>	<b>86.1</b>
Computer	1.4	2.2	1.0	0.6	3.8	2.45	6.2	0.4	0.1	9.3
Gas stove	0.6	1.0	0.3	0.1	1.6	0.5	1.0	0.2	0.0	1.6
Electric stove	15.3	36.4	1.7	0.5	46.6	17.7	45.2	2.8	0.1	56.5
Refrigerator	7.2	16.8	1.1	0.3	23.7	8.5	21.6	1.4	0.0	29.9
Private water pump	0.5	0.4	0.5	0.0	1.5	0.6	1.0	0.3	0.0	1.7
<b>Bicycle</b>	<b>34.2</b>	<b>23.6</b>	<b>41.0</b>	<b>29.5</b>	<b>28.9</b>	<b>36.0</b>	<b>19.0</b>	<b>45.3</b>	<b>36.9</b>	<b>25.0</b>
Motorcycle	0.4	0.5	0.4	0.1	1.0	0.5	0.4	0.6	0.5	0.9
Car/motor vehicle	2.7	5.2	1.1	0.2	9.6	3.2	8.1	0.5	0.0	12.3

Source: World Bank estimates based on LCMS.

**Table C5: Housing conditions, 2004 and 2010**

HOUSING CONDITIONS										
	2004					2010				
	Nat.	Urban	Rural	Poorest 20%	Richest 20%	Nat.	Urban	Rural	Poorest 20%	Richest 20%
Poor dwelling	45.5	9.4	68.6	74.8	12.4	38.5	6.3	56.4	66.6	9.6
Improved/ Good dwelling	54.6	90.6	31.3	25.1	87.6	61.5	93.7	43.7	33.4	90.4
Improved water*	40.2	47.2	35.6	28.2	57.0	47.1	51.6	44.6	42.6	61.5
Electricity connection	21.1	49.2	3.1	1.0	57.8	21.8	53.0	4.5	0.4	62.5
Flush toilet	14.6	34.7	1.7	1.1	40.4	13.1	34.0	1.4	0.3	41.1
No toilet	13.1	0.4	21.2	25.2	2.7	11.9	0.5	18.3	20.0	1.6

Note: (\*) Protected well /spring, borehole or own tap.

Source: World Bank estimates based on 2010 LCMS.

**Table C6 : Probit regression of moderate poverty**

Dependent var: poverty status	coef.	
household size	0.26	***
household size squared	-0.01	***
female head	0.04	
head: some but incomplete primary	-0.04	
head: completed primary, incomplete jr. sec	-0.15	**
head: completed jr. sec, incomplete sr. sec	-0.43	***
head: completed 12th gr or O-level	-0.89	***
head: completed A-level or higher	-1.63	***
head: wage employment for current activity	-0.09	
head: running business/self-employed	-0.36	***
head: all other activities	0.09	
head: employed by gov, parastat, int'l org, ngo	-0.61	***
head: employed by private sector or employer/partner	-0.38	***
head: other employment status	-0.11	
urban area	-0.35	***
Central	-0.13	
Copperbelt	-0.05	
Eastern	0.24	**
Luapula	0.51	***
Northern	0.31	***
Northwestern	0.19	
Southern	0.23	**
Western	0.43	***
_constant	-0.39	***
R2	0.28	
N	19385	
note: *** p<0.01, ** p<0.05, * p<0.1		

Source: World Bank estimates based on 2010 LCMS.

**Table C7: Mortality Rates, by Gender, Area, and Province, 2007**

<b>Survey ZDHS 2007</b>	<b>Infant mortality</b>	<b>Child mortality</b>	<b>Under-five mortality</b>
<i>Gender</i>			
Male	91	66	151
Female	73	55	124
<i>Residence</i>			
Urban	80	56	132
Rural	82	62	139
<i>Province</i>			
Central	64	57	118
Copperbelt	79	59	132
Eastern	82	75	151
Luapula	97	66	157
Lusaka	85	55	135
Northern	94	72	159
North-Western	65	46	108
Southern	64	42	103
Western	97	47	139

*Note:* All mortality rates are computed for the ten-year period preceding the survey.

*Source:* CSO, (2009), ZDHS 2007.

## Appendix D

### Labor and Employment

**Table D1: Overview of the Zambian Labor Market, 2010**

	Number	% Share
Working Age (15-65)	8 209 220	
Labour Force	4 939 081	60.17
Expanded Employment (including unpaid family workers and HH enterprises)	4 454 469	
Formal Sector	779 591	17.50
Urban Informal	530 468	11.91
Rural Informal (Non-Agric)	257 848	5.79
Agriculture	1 697 514	38.11
Household Enterprises-self employed	242 966	5.45
Multiple Activities	936 022	21.01
Unpaid Family Work and zero sales income	10 060	
Unemployed and zero sales income	484 612	

**Table D2: Labor force participation and unemployment rates, 2010**

	Labor Force Participation Rate	Unemployment Rate
Algeria	43.3	10
Botswana	76.6	
Egypt	48.8	9.4
Kenya	66.3	
Liberia	60.9	3.6
Mauritius	59.5	8.4
Morocco	49.5	10
Nigeria	55.5	4.9
South Africa	60.4	25
<i>Zambia</i>	<i>60.2</i>	<i>9.8</i>

Source: ILO (2010) [http://laborsta.ilo.org/applv8/data/EAPEP/eapep\\_E.html](http://laborsta.ilo.org/applv8/data/EAPEP/eapep_E.html); Office National des Statistiques (ONS) – Algeria; Central Agency for Public Mobilization And Statistics - Arab Republic of Egypt; Liberia Bureau of Statistics; The Central Statistics Office (CSO) - Republic of Mauritius; HCP Morocco Statistics; National Bureau of Statistics, Federal Republic of Nigeria; Statistics South Africa; Own Calculations from Living Conditions Monitoring Survey 2010 and Quarterly Labor Force Survey 2010Q2. South Africa expanded labor force participation rate used.

**Table D3: Matrix of new segmentation, accounting for multiple activities**

	Formal Sector	Urban Informal	Rural Informal (Non-Agricultural)	Agriculture	Household Enterprises-self employed	Unpaid Family Work and zero sales income	Unemployed and zero sales income
<b>Formal Sector</b>	870 101			90 511			
<b>Urban Informal</b>		652 005		88 807	18 661		
<b>Rural Informal (Non-Agricultural)</b>			981 823		651 856		
<b>Agriculture</b>	90 511	88 807		1 697 514			
<b>Household Enterprises-self employed</b>		18 661	651 856		242 966		
<b>Unpaid Family Work and zero sales income</b>						10 060	
<b>Unemployed and zero sales income</b>							484 612
<b>Share of Individuals reporting multiple activities</b>	9.42	14.15	39.90	9.55	73.40	0	0

Source: Own Calculations from Living Conditions Monitoring Survey 2010

**Table D4: Trends in Labor force participation, employment and unemployment**

	LFPF (LF as % of Working Age Population)	Employment (% of Labor Force)	Unemployment Rate	Unpaid Family Work (% of Labor Force)	Formal Sector (% of Employment)	Urban Informal (% of Employment)	Rural Informal (% of Employment)	Agriculture (% of Employment)	Household Enterprises (% of Employment)	Multiple Activities (% of Employment)
<b>By Province</b>										
Central	59.31	93.5	6.27	0.2	15.04	8.18	8.02	39.37	5.77	23.62
Copperbelt	54.06	76.4	23.51	0.1	38.74	29.89	2.31	12.52	7.14	9.4
Eastern	65.94	98.2	1.72	0.1	5.78	2.96	4.09	47.14	5.4	34.63
Luapula	61.16	96.0	3.68	0.3	6.67	2.44	7.72	53.61	3.89	25.67
Lusaka	59.94	74.6	25.04	0.3	43.09	36.91	4.7	4.94	4.35	6.01
Northern	62.56	97.5	2.35	0.2	5.95	4.51	6.21	54.75	3.76	24.82
North West	56.63	95.4	4.28	0.3	11.52	5.49	6.84	52.23	6.58	17.35
Southern	59.99	93.2	6.65	0.2	16.95	7.97	6.12	36.26	6.43	26.26
Western	62.62	96.7	3.02	0.3	9.95	3.65	8.9	56.18	6.54	14.79
<b>By Stratum</b>										
Small-Scale Agricultural	63.18	98.8	1.1	0.1	5.45	0	6.93	56.05	5.43	26.15
Medium-Scale Ag.	58.24	100.0	0.02	0.0	4.52	0	5.91	47.56	7.8	34.21
Large-Scale Ag.	58.83	100.0	0	0.0	4.92	0	4.35	32.31	7.69	50.72
Non-Ag. Rural	57.51	89.2	10.45	0.3	40.48	0	30.13	17.19	2.22	9.98
Low-Cost Urban	56.12	73.9	25.76	0.3	36.42	45.91	0	0	5.88	11.79
Medium-Cost Urban	55.37	74.7	25.04	0.3	57.99	30.79	0	0	5.62	5.6
High-Cost Urban	56.47	78.7	21.09	0.2	62.62	28.12	0	0	5.35	3.91
<b>Total</b>	60.16	90.0	9.81	0.2	17.54	11.94	5.8	38.19	5.47	21.06

Source: Own Calculations from Living Conditions Monitoring Survey 2010

**Table D5: A Profile of the Employed**

	<b>Formal Sector</b>	<b>Share</b>	<b>Urban Informal</b>	<b>Share</b>	<b>Rural Informal</b>	<b>Share</b>	<b>Agriculture</b>	<b>Share</b>	<b>Household Enterprises</b>	<b>Share</b>	<b>Multiple Activities</b>	<b>Share</b>
<b>By Gender</b>												
Male	550042 (27342)	70.6	284505 (20709)	53.6	145567 (10766)	56.5	891429 (38435)	52.5	110460 (7769)	45.5	291156 (16746)	31.1
	[496388;603695]		[243867;325144]		[124440;166695]		[816006;966851]		[95215;125704]		[258294;324018]	
Female	229120 (14454)	29.4	245608 (16700)	46.3	112222 (9829)	43.5	805875 (41504)	47.5	132140 (8987)	54.4	644802 (34014)	68.9
	[200756;257485]		[212836;278380]		[92934;131510]		[724429;887321]		[114504;149775]		[578055;711548]	
<b>By Location</b>												
Rural	231260 (19453)	29.7			257848 (18557)	100.0	1697514 (75328)	100.0	168989 (14056)	69.6	809315 (46977)	86.5
	[193086;269434]				[221432;294264]		[1549695;1845333]		[141407;196571]		[717130;901500]	
Urban	548331 (37124)	70.3	530468 (36163)	100.0					73976 (6021)	30.4	126707 (12257)	13.5
	[475481;621180]		[459505;601432]						[62161;85792]		[102654;150760]	
<b>By Age</b>												
15-24	83962 (7030)	10.8	68222 (5117)	12.9	50949 (5402)	19.8	286178 (17878)	16.9	141768 (8956)	58.3	393665 (23291)	42.1
	[70168;97756]		[58181;78263]		[40349;61550]		[251095;321260]		[124194;159342]		[347960;439370]	
25-34	319480 (16788)	41.0	218344 (16342)	41.2	101648 (8865)	39.4	525043 (25151)	30.9	64884 (6055)	26.7	262225 (15509)	28.0
	[286535;352425]		[186275;250412]		[84252;119045]		[475688;574398]		[53003;76765]		[231791;292660]	
35-44	223700 (13692)	28.7	144626 (10761)	27.3	68115 (6232)	26.4	422638 (20779)	24.9	24499 (3236)	10.1	140788 (8935)	15.0
	[196832;250568]		[123509;165744]		[55885;80344]		[381863;463414]		[18149;30849]		[123255;158322]	
45-54	118799 (7041)	15.2	70998 (6529)	13.4	26415 (3120)	10.2	291510 (16306)	17.2	7659 (1515)	3.2	82294 (5948)	8.8
	[104983;132615]		[58186;83810]		[20293;32537]		[259512;323509]		[4686;10632]		[70622;93965]	

55-65	33650 (2801) [28154;39146]	4.3	28278 (2796) [22792;33764]	5.3	10721 (1728) [7329;14113]	4.2	172144 (10022) [152477;191812]	10.1	4156 (993) [2207;6105]	1.7	57050 (4699) [47829;66271]	6.1
<b>By Education</b>												
None	490 (356) [-207;1188]	0.1	249 (176) [-96;594]	0.0	79 (58) [-35;192]	0.0	1055 (559) [-41;2152]	0.1	80 (80) [-77;238]	0.0	827 (610) [-370;2024]	0.1
Grd 1-8	129770 (11831) [106554;152987]	16.6	183776 (14834) [154667;212885]	34.6	141018 (11094) [119249;162788]	54.7	1079155 (50107) [980827;1177482]	63.6	100319 (8247) [84135;116502]	41.3	564491 (31125) [503413;625569]	60.3
Grd 9-11	139571 (8959) [121991;157152]	17.9	168245 (12223) [144259;192231]	31.7	64328 (6515) [51543;77112]	24.9	283957 (15782) [252988;314926]	16.7	46690 (4495) [37869;55511]	19.2	152876 (10605) [132065;173687]	16.3
CGE O level	176623 (12500) [152094;201153]	22.7	112989 (10604) [92181;133797]	21.3	24777 (3427) [18052;31503]	9.6	59053 (5380) [48495;69611]	3.5	58503 (4483) [49705;67301]	24.1	55690 (5277) [45336;66045]	5.9
CGE A level	3963 (1173) [1662;6264]	0.5	776 (340) [109;1443]	0.1	222 (222) [-214;658]	0.1	1454 (632) [213;2695]	0.1	97 (66) [-32;227]	0.0	962 (500) [-20;1943]	0.1
Diploma/Cert	233729 (15402) [203505;263953]	30.0	35351 (3997) [27507;43195]	6.7	3338 (992) [1391;5285]	1.3	7623 (1470) [4738;10509]	0.4	6243 (976) [4328;8157]	2.6	7385 (1208) [5015;9755]	0.8
Degree	33959 (4396) [25332;42586]	4.4	1197 (372) [466;1928]	0.2	399 (386) [-358;1155]	0.2	300 (175) [-43;643]	0.0	396 (206) [-9;801]	0.2	765 (302) [173;1358]	0.1
Masters	8698 (2402) [3985;13411]	1.1	11 (11) [-10;32]	0.0	107 (107) [-103;317]	0.0	142 (112) [-79;362]	0.0			113 (90) [-63;289]	0.0

**By Province**

Central	72261 (12132) [48455;96068]	9.3	39331 (9025)	7.4	38555 (7670)	15.0	189174 (29211)	11.1	27747 (4777)	11.4	113487 (18474)	12.1
Copperbelt	206886 (23597) [160581;253191]	26.5	159645 (23378) [113769;205521]	30.1	12323 (2510)	4.8	66885 (13272)	3.9	38150 (4963)	15.7	50182 (9186)	5.4
Eastern	39882 (7107) [25935;53828]	5.1	20414 (5592)	3.8	28244 (5365)	11.0	325460 (42338)	19.2	37299 (8530)	15.4	239087 (31524)	25.5
Luapula	25241 (4612) [16191;34292]	3.2	9244 (2971)	1.7	29220 (7687)	11.3	202835 (34564)	11.9	14730 (4007)	6.1	97117 (16142)	10.4
Lusaka	233943 (29906) [175258;292629]	30.0	200367 (26586) [148197;252538]	37.8	25490 (6248)	9.9	26837 (6976)	1.6	23622 (3733)	9.7	32637 (6586)	3.5
Northern	36282 (5456) [25576;46988]	4.7	27509 (5150)	5.2	37837 (9730)	14.7	333698 (39433)	19.7	22919 (4440)	9.4	151291 (21286)	16.2
North West	28632 (5712) [17424;39840]	3.7	13647 (3836)	2.6	17008 (3932)	6.6	129868 (19453)	7.7	16357 (3222)	6.7	43135 (10857)	4.6
Southern	99166 (14217) [71267;127065]	12.7	46634 (9285)	8.8	35805 (6498)	13.9	212135 (29648)	12.5	37612 (6629)	15.5	153637 (20595)	16.4
Western	37298 (7616) [22352;52244]	4.8	13675 (4002)	2.6	33365 (7647)	12.9	210622 (35707)	12.4	24530 (6035)	10.1	55449 (13255)	5.9
<b>By Stratum</b>												
Small Scale Agri	157046 (12697) [132131;1814]	20.1			199880 (15195) [170062;229699]	77.5	1616552 (72625) [1474037;1759067]	95.2	156637 (13443) [130257;183017]	64.5	754076 (44555) [666645;841507]	80.6

	962]				]													
Medium Scale Agri	4776 (795)	0.6			6253 (1327)	2.4			50285 (5329)	3.0			8250 (1536)	3.4			36166 (4418)	3.9
	[3216;6335]				[3648;8858]				[39827;60743]				[5237;11263]				[27497;44835]	
Large Scale Agri	195 (89)	0.0			172 (74)	0.1			1280 (440)	0.1			305 (112)	0.1			2009 (575)	0.2
	[20;369]				[28;317]				[416;2144]				[84;525]				[881;3137]	
Non Agri Rural	69243 (9374)	8.9			51542 (6645)	20.0			29397 (4321)	1.7			3798 (1198)	1.6			17064 (4461)	1.8
	[50848;87638]				[38502;64583]				[20917;37878]				[1447;6148]				[8310;25819]	
Low Cost Urban	337083 (28887)	43.2	424972 (34918)	80.1					54442 (5576)				22.4				109089 (12139)	11.7
	[280398;393769]		[356450;493493]										[43501;65383]				[85268;132909]	
Medium Cost Urban	129764 (21732)	16.6	68903 (11211)	13.0					12578 (2350)				5.2				12530 (2394)	1.3
	[87118;172410]		[46903;90904]										[7967;17189]				[7832;17228]	
High Cost Urban	81483 (15335)	10.5	36594 (7586)	6.9					6956 (1397)				2.9				5088 (1065)	0.5
	[51391;111576]		[21707;51480]										[4216;9697]				[2998;7178]	
<b>Total</b>	<b>779591 (38765)</b>	<b>100.0</b>	<b>530468 (36163)</b>	<b>100.0</b>	<b>257848 (18557)</b>	<b>100.0</b>			<b>1697514 (75328)</b>	<b>100.0</b>			<b>242966 (14450)</b>	<b>100.0</b>			<b>936022 (46387)</b>	<b>100.0</b>
	<b>[703520;855661]</b>		<b>[459505;601432]</b>		<b>[221432;294264]</b>				<b>[1549695;1845333]</b>				<b>[214611;271320]</b>				<b>[844994;1027050]</b>	

Source: Own Calculations from Living Conditions Monitoring Survey 2010

Notes: Standard Errors in parentheses  
95 percent confidence intervals in brackets

**Table D6: Multinomial logit estimates of labor force sector choice**

VARIABLES	(I)	(II)	(III)	(IV)	(V)	(VI)	
	Formal Sector	Urban Informal	Rural Informal	Agriculture	Household Enterprises	Unpaid Family Work and unemployed	Multi-sector activities
urban		22.04*** (0.255)	-36.27*** (0.0790)	-36.01*** (0.0760)	-0.785*** (0.0888)	1.806*** (0.107)	-1.355*** (0.0733)
male		-0.756*** (0.0578)	-0.355*** (0.100)	-0.343*** (0.0751)	-0.998*** (0.0864)	-1.121*** (0.0651)	-1.361*** (0.0703)
age_25_34		-0.0545 (0.0941)	-0.118 (0.146)	-0.339*** (0.112)	-1.292*** (0.113)	-1.345*** (0.0878)	-1.189*** (0.104)
age_35_44		-0.190* (0.103)	-0.0382 (0.168)	-0.124 (0.129)	-1.802*** (0.153)	-2.185*** (0.110)	-1.420*** (0.119)
age_45_54		-0.315*** (0.118)	-0.110 (0.203)	0.409*** (0.155)	-2.269*** (0.227)	-2.462*** (0.148)	-1.142*** (0.141)
age_55_65		-0.0589 (0.165)	0.791*** (0.296)	1.683*** (0.239)	-1.596*** (0.318)	-2.288*** (0.206)	0.113 (0.209)
none_gr8		-0.0811** (0.0339)	-0.0114 (0.0401)	-0.0624* (0.0324)	-0.0649 (0.0417)	-0.0973** (0.0386)	-0.0905*** (0.0316)
gr9_gr11		-0.205*** (0.0487)	-0.135 (0.0942)	-0.394*** (0.0736)	-0.260*** (0.0793)	-0.209*** (0.0601)	-0.355*** (0.0637)
CGE_O		-0.460*** (0.115)	-0.456* (0.258)	-0.631*** (0.203)	0.446** (0.196)	0.156 (0.139)	-0.261 (0.166)
CGE_A		-1.290** (0.503)	-1.018 (1.111)	0.0816 (0.572)	-2.413*** (0.742)	-1.129* (0.638)	-0.279 (0.494)
Diploma/Cer		-0.172 (0.506)	-1.901* (1.144)	-3.236*** (0.595)	0.139 (0.751)	-0.748 (0.643)	-2.381*** (0.515)
Degree		-1.551*** (0.299)	0.432 (1.026)	-0.979 (0.721)	-0.155 (0.494)	-0.758** (0.328)	0.253 (0.550)
Master's		-3.401*** (1.056)	1.704 (1.628)	3.311** (1.686)	-34.91*** (0.547)	-2.030* (1.121)	0.492 (0.998)
Copperbelt		-0.190** (0.0858)	-0.720*** (0.174)	-0.852*** (0.133)	-0.105 (0.132)	0.383*** (0.104)	-0.727*** (0.118)
Eastern		0.342*** (0.132)	-0.151 (0.193)	0.351** (0.149)	0.595*** (0.186)	-0.215 (0.209)	1.074*** (0.144)

Luapula	-0.516*** (0.143)	0.725*** (0.194)	0.674*** (0.162)	0.202 (0.202)	-0.134 (0.199)	0.912*** (0.157)
Lusaka	0.0685 (0.0858)	-0.453** (0.181)	-2.264*** (0.159)	-0.768*** (0.143)	0.364*** (0.104)	-1.312*** (0.132)
Northern	0.232** (0.113)	0.677*** (0.183)	1.056*** (0.143)	0.492*** (0.184)	0.00741 (0.159)	1.141*** (0.139)
N-western	-0.249* (0.132)	0.267 (0.215)	0.497*** (0.168)	0.450** (0.187)	-0.129 (0.175)	0.230 (0.166)
Southern	-0.00559 (0.104)	-0.473*** (0.162)	-0.462*** (0.125)	-0.0543 (0.155)	0.0614 (0.129)	0.130 (0.121)
married	-0.190*** (0.0631)	0.0969 (0.117)	0.505*** (0.0891)	-1.371*** (0.0999)	-1.155*** (0.0712)	-0.0951 (0.0811)
Constant	-19.73 (0)	1.016*** (0.300)	2.930*** (0.238)	2.552*** (0.293)	1.653*** (0.284)	3.651*** (0.232)
Observations	34,373	34,373	34,373	34,373	34,373	34,373

Source: Own Calculations from Living Conditions Monitoring Survey 2010

Notes: Robust Standard Errors in parenthesis \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The coefficients are the marginal effect of each variable on the probability of participating in a particular labor market segment relative to the base category (formal sector)

**Table D7: Selectivity corrected estimates of income equations**

VARIABLES	(I) Formal Sector	(II) Urban Informal	(III) Rural Informal	(IV) Agriculture	(V) Household Enterprises	(VI) Multiple activities
Urban	0.192*** (0.0686)				-0.701*** (0.174)	-0.124* (0.0708)
Male	0.192*** (0.0566)	0.472*** (0.136)	-0.139 (0.189)	0.000380 (0.0641)	-0.160 (0.174)	-0.152** (0.0667)
none_gr8	0.0691** (0.0341)	-0.0148 (0.0580)	-0.00756 (0.0488)	0.116*** (0.0197)	0.0327 (0.0467)	0.0984*** (0.0178)
gr9_gr11	0.240*** (0.0485)	0.267*** (0.0939)	0.349*** (0.122)	0.160*** (0.0512)	0.0511 (0.180)	0.212*** (0.0550)
CGE_O	0.00371 (0.101)	0.172 (0.238)	-0.279 (0.371)	-0.0715 (0.198)	0.571 (0.452)	0.00412 (0.164)
CGE_A	0.459*** (0.135)	-1.565*** (0.320)	1.722*** (0.626)	-0.587 (0.388)	-2.604 (4.302)	-0.605* (0.313)

<b>Diploma/Cert</b>	0.129	1.977***	-1.355	0.895**	3.290	1.174**
	(0.134)	(0.295)	(1.005)	(0.455)	(4.317)	(0.460)
<b>degree</b>	0.300***	1.930***	2.824***	-0.0579	1.536**	-0.144
	(0.0845)	(0.703)	(0.996)	(0.375)	(0.765)	(0.661)
<b>Master's</b>	0.451***		-6.092***	1.233***		0.844
	(0.126)		(0.819)	(0.473)		(0.621)
<b>Managers</b>	0.907***	0.865*	-0.125			5.232***
	(0.121)	(0.466)	(0.852)			(0.404)
<b>Professionals</b>	0.756***	0.557*	-0.431		-0.0386	5.989***
	(0.101)	(0.319)	(0.732)		(0.375)	(0.579)
<b>Technicians</b>	0.633***	0.285	0.0423	1.683***		1.333**
	(0.111)	(0.313)	(0.645)	(0.289)		(0.615)
<b>Clerks</b>	0.478***	0.286	-1.073***		2.133*	-0.0420
	(0.0942)	(0.361)	(0.343)		(1.224)	(1.513)
<b>Service workers</b>	0.113	-0.0647	-0.0696	1.110**	-0.262	0.612
	(0.0859)	(0.172)	(0.267)	(0.443)	(1.184)	(0.688)
<b>Agriculture</b>	-0.338*	-0.150	-0.948***	0.379	0.754***	-0.182*
	(0.187)	(0.230)	(0.276)	(0.307)	(0.171)	(0.0990)
<b>Craft workers</b>	0.242**	-0.117	-1.616***	-0.917	1.306*	0.529
	(0.117)	(0.213)	(0.473)	(0.636)	(0.683)	(0.843)
<b>Operators</b>	0.483***	0.551***	-0.616	1.489	0.341	1.468***
	(0.102)	(0.213)	(0.445)	(0.987)	(0.788)	(0.481)
<b>Armed forces</b>	0.639***	0.854	1.308**	1.866***		0.187
	(0.153)	(0.631)	(0.575)	(0.459)		(0.603)
<b>Mining</b>	0.794***	1.065***	-1.735***			0.281
	(0.106)	(0.320)	(0.560)			(0.288)
<b>Manufacturing</b>	0.0212	0.0275	-0.0274		0.693	-1.089*
	(0.108)	(0.275)	(0.430)		(0.673)	(0.560)
<b>Utilities</b>	0.423***	1.110***				3.601**
	(0.140)	(0.315)				(1.511)
<b>Construction</b>	-0.361	0.187	1.195**		-0.846**	-3.360***
	(0.224)	(0.321)	(0.583)		(0.362)	(0.837)
<b>Trade</b>	-0.210*	-0.714***	-1.154***		0.258	-0.226
	(0.126)	(0.260)	(0.335)		(1.180)	(0.441)
<b>Transport</b>	0.136	0.299	0.401			0.699
	(0.119)	(0.280)	(0.717)			(0.567)
<b>Finance</b>	0.514***	0.395	0.145			
	(0.121)	(0.604)	(0.434)			
<b>CSP</b>	0.187*	0.781***	0.273		1.282***	-2.349***
	(0.0989)	(0.231)	(0.696)		(0.376)	(0.608)

<b>Real Estate and Scientific/Technical activities</b>	0.307*** (0.115)	-3.270*** (1.225)	1.819** (0.756)		-2.299*** (0.727)	-1.657** (0.703)
<b>Accommodation</b>	0.0670 (0.103)	0.492* (0.295)	-0.131 (0.544)		-1.459*** (0.288)	-0.292 (0.546)
<b>Other</b>	-0.271* (0.144)	0.711*** (0.221)	-0.877* (0.526)		1.373 (0.903)	0.118 (0.675)
<b>experience</b>	0.0355*** (0.00794)	0.0154 (0.0224)	0.0393 (0.0301)	0.0351*** (0.00992)	0.00449 (0.0282)	0.0345*** (0.00889)
<b>Experience Square</b>	-0.000441** (0.000183)	-0.000587 (0.000467)	-0.00102 (0.000666)	-0.000496*** (0.000183)	0.000167 (0.000618)	-0.000393** (0.000182)
<b>emplambda</b>	-0.00720 (0.00837)	-0.104 (0.115)	0.0301 (0.0790)	0.110 (0.117)	-0.0144** (0.00667)	0.0152 (0.0350)
<b>Constant</b>	10.86*** (0.276)	10.94*** (0.550)	10.84*** (0.628)	8.135*** (0.390)	9.201*** (0.565)	9.448*** (0.184)
<b>Observations</b>	7,113	2,288	928	6,363	2,058	4,829
<b>R-squared</b>	0.385	0.214	0.174	0.055	0.055	0.125

Source: Own Calculations from Living Conditions Monitoring Survey 2010

Notes: Robust Standard Errors in parenthesis \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Provincial cohorts were included in the earnings functions.

**Table D8: Employment, by industry and occupation**

	Formal Sector	Urban Informal	Rural Informal	Agriculture	Household Enterprises	Multiple activities
<b>By Occupation</b>						
Managers	28129 (3417) [21423;34834]	9914 (2664) [4687;15141]	4611 (1793) [1092;8130]		123 (123) [-119;365]	314 (150) [20;609]
Professionals	188115 (11536) [165478;210751]	8260 (1272) [5763;10757]	3342 (2138) [-854;7538]		15 (15) [-14;45]	304 (135) [39;569]
Technicians	64988 (6373) [52483;77494]	12036 (1807) [8490;15581]	4771 (1236) [2346;7196]	173 (173) [-167;513]	13 (13) [-13;39]	995 (411) [188;1803]
Clerks	47606 (4156) [39451;55762]	11699 (3459) [4910;18487]	227 (198) [-162;616]		360 (360) [-346;1065]	459 (226) [16;902]

Service & Sales Workers	117572 (8842)	245980 (18419)	74952 (8450)	2088 (634)	772 (347)	11556 (1684)
	[100221;134923]	[209837;282124]	[58370;91535]	[845;3332]	[92;1452]	[8252;14861]
Skilled agricultural and fishery workers	22332 (3440)	19875 (2617)	75261 (7990)	1634808 (72589)	38014 (6231)	756919 (42682)
	[15582;29082]	[14740;25010]	[59582;90941]	[1492364;1777252]	[25787;50241]	[673162;840675]
Craft & Trade Workers	86748 (6262)	78016 (6391)	38063 (4253)	2925 (962)	326 (249)	3758 (1450)
	[74459;99037]	[65474;90558]	[29717;46408]	[1039;4812]	[-164;815]	[912;6603]
Operators & Assemblers	72233 (6310)	35948 (3707)	15316 (2642)	756 (511)	207 (147)	1600 (905)
	[59852;84615]	[28674;43222]	[10131;20500]	[-246;1758]	[-80;495]	[-175;3375]
Elementary Occupations	132932 (12640)	103102 (10135)	35994 (4749)	33627 (13125)	10616 (3897)	125749 (17529)
	[108128;157736]	[83214;122990]	[26676;45313]	[7872;59382]	[2969;18263]	[91351;160147]
Armed Forces	9085 (1963)	1237 (493)	471 (254)	6623 (4537)		1695 (747)
	[5232;12938]	[269;2205]	[-28;970]	[-2281;15527]		[228;3161]
<b>By Industry</b>						
Agriculture, forestry and fishing	107120 (15011)	20630 (2668)	80653 (7983)	1664134 (73334)	47944 (7315)	873470 (45141)
	[77663;136576]	[15394;25866]	[64987;96318]	[1520228;1808040]	[33589;62299]	[784889;962052]
Mining and quarrying	54861 (8364)	3763 (886)	1779 (1104)	1658 (767)	0 (0)	2455 (1012)
	[38447;71274]	[2024;5503]	[-387;3946]	[152;3164]	[0;0]	[470;4440]
Manufacturing	51427 (4705)	42521 (3890)	29529 (4262)	1321 (670)	399 (263)	3743 (1506)
	[42194;60659]	[34887;50155]	[21165;37892]	[6;2635]	[-116;915]	[787;6699]
Electricity, gas and water	15122 (2354)	857 (420)				15 (15)
	[10503;19740]	[34;1681]				[-14;45]
Construction	42493 (4339)	27330 (3177)	7668 (1447)	70 (53)	96 (96)	270 (204)
	[33978;51008]	[21096;33565]	[4827;10508]	[-34;173]	[-92;285]	[-130;67]
Wholesale and retail trade	61661 (5117)	268258 (19785)	104280 (10447)	4565 (1184)	1331 (526)	15499 (2471)

	[51620;71702]	[229432;307083]	[83780;124780]	[2242;6889]	[299;2363]	[10650;20348]
	47849	36442	4473	289		578
Transport, storage and communication	(4884)	(3972)	(1510)	(261)		(341)
	[38265;57432]	[28647;44237]	[1511;7436]	[-222;801]		[-91;1247]
	16987	1211	108	27		
Financial and business services	(2550)	(343)	(108)	(27)		
	[11984;21990]	[538;1885]	[-104;320]	[-26;81]		
	283516	21923	8087	480	28	447
Community, social and personal (CSP) services	(15017)	(2820)	(1646)	(313)	(20)	(206)
	[254047;312985]	[16389;27458]	[4856;11318]	[-134;1094]	[-11;67]	[42;852]
	12072	5712	243		87	127
Professional	(1941)	(1700)	(193)		(87)	(127)
	[8262;15881]	[2377;9048]	[-136;621]		[-83;256]	[-122;375]
	38374	16124	5070	6901		2879
Accommodation & Info Services	(3916)	(2632)	(1600)	(4592)	103(103)	(1207)
	[30690;46059]	[10960;21289]	[1930;8209]	[-2110;15912]	[-99;306]	[510;5248]
	35729	80440	10397	2626	604	3567
Other	(4013)	(8380)	(1912)	(2626)	(305)	(1393)
	[27854;43605]	[63996;96885]	[6646;14148]	[-2527;7778]	[4;1203]	[833;6301]
<b>Total</b>	<b>779591</b>	<b>530468</b>	<b>257848</b>	<b>1697514</b>	<b>242966</b>	<b>936022</b>
	<b>(38765)</b>	<b>(36163)</b>	<b>(18557)</b>	<b>(75328)</b>	<b>(14450)</b>	<b>(46387)</b>
	<b>[703520;855661]</b>	<b>[459505;601432]</b>	<b>[221432;294264]</b>	<b>[1549695;1845333]</b>	<b>[214611;271320]</b>	<b>[844994;1027050]</b>

Source: Own Calculations from Living Conditions Monitoring Survey 2010

Notes: Standard Errors in parentheses  
95 percent confidence intervals in brackets

**Table D9: Unemployment rates, by province**

	<b>Rural</b>	<b>Urban</b>		<b>Urban/Rural Gap</b>
Central	1.08	24.01	*	22.25
Copperbelt	4.47	28.22	*	6.32
Eastern	0.86	10.94	*	12.71
Luapula	2.81	10.99		3.91
Lusaka	4.25	28.97	*	6.82
Northern	0.86	11.81	*	13.69
North Western	1.43	16.14	*	11.31
Southern	1.33	23.71	*	17.83
Western	2.13	10.35	*	4.87

Source: Own Calculations from Living Conditions Monitoring Survey 2010

**Table D10: Decomposition of Mean Income**

	<b>Formal Sector</b>	<b>Urban Informal</b>	<b>Rural Informal</b>	<b>Agriculture</b>	<b>Household Enterprises</b>	<b>Multiple activities</b>
Male	2647095.6 (506,007.1)	512091.7 (31,766.1)	140916.5 (14,608.2)	65674.2 (3,597.7)	55798.6 (4,633.1)	95888.6 (12,133.6)
	[1654137;3640054.2]	[449755.9;574427.6]	[112250.3;169582.7]	[58614.3;72734.2]	[46706.9;64890.3]	[72078.3;119699]
Female	2044161.7 (254,083.1)	421089 (74,782.9)	129503.1 (36,122.3)	56199 (2,994.2)	61379.1 (4,836.6)	66875.5 (4,131.5)
	[1545563.9;2542759.6]	[274339.4;567838.7]	[58618.8;200387.5]	[50323.3;62074.7]	[51888.1;70870.1]	[58768.2;74982.9]
Rural	3544547.5 (1,228,116.6)		135989.1 (18,733.0)	61258.5 (3,018.9)	54235.4 (4,422.6)	69071 (5,579.8)
	[1134563.3;5954531.7]		[99228.7;172749.6]	[55334.4;67182.6]	[45556.9;62914]	[58121.4;80020.5]
Urban		473642.7 (38,437.2)			69096.1 (8,494.3)	130201.3 (23,340.6)
	[1787051.7;2255675.3]	[398215.8;549069.7]			[52427.4;85764.8]	[84399.1;176003.5]
15-24	749922.3 (65,546.7)	378580.7 (101,467.4)	109993.7 (14,367.7)	46792.6 (4,395.5)	54016.2 (3,834.0)	49245.4 (3,099.6)
	[621297.3;878547.4]	[179467.1;577694.3]	[81799.3;138188.1]	[38167.2;55418.1]	[46492.6;61539.8]	[43162.9;55327.9]
25-34	2441245.3 (525,567.5)	482448.8 (41,181.5)	125318.9 (15,748.6)	60928.9 (3,598.1)	60271.7 (8,950.4)	73284.9 (7,078.8)
	[1409902.3;3472588.2]	[401636.6;563261]	[94414.9;156223]	[53868.1;67989.6]	[42708;77835.5]	[59393.9;87176]
35-44	2889255.2 (978,604.8)	482662.1 (58,999.1)	119192.1 (13,864.4)	71044.4 (5,938.2)	69418.7 (8,624.6)	87128.1 (10,018.4)
	[968898.3;4809612]	[366885.7;598438.5]	[91985.4;146398.7]	[59391.7;82697.2]	[52494.2;86343.2]	[67468.5;106787.6]
45-54	2877599 (502,958.0)	580163.3 (91,768.8)	147072.6 (32,449.2)	60828.7 (3,870.4)	105828.3 (38,939.9)	135326.3 (31,764.8)
	[1890623.5;3864574.4]	[400081.7;760245]	[83396.2;210749]	[53233.6;68423.7]	[29414.9;182241.8]	[72993;197659.6]
55-65	2547358.9 (340,875.9)	423983.3 (88,772.3)	401469.6 (318,503.0)	61825.1 (5,164.0)	47410 (9,519.8)	157101.2 (41,433.9)
	[1878444;3216273.9]	[249781.7;598184.9]	[-223542;1026481.2]	[51691.5;71958.6]	[28728.9;66091]	[75793.6;238408.7]
None	4500000		84755.1 (31,956.7)	20389.9 (2,391.6)	3888.90	16411 (11,430.4)
	[450000;450000]		[22045.2;147465.1]	[15696.7;25083.1]	[3888.9;3888.9]	[-6019.4;38841.3]
Grd 1-8	485235.6 (73,219.8)	283039.1 (36,092.6)	88600.8 (7,677.7)	53708 (2,589.8)	45141.7 (4,085.2)	53597 (2,714.6)
	[341553.4;628917.8]	[212213.1;353865.1]	[73534.5;103667.2]	[48625.8;58790.1]	[37125.1;53158.4]	[48270.1;58924]

Grd 9-11	788287 (42,991.7)	408977.2 (42,396.4)	128218.7 (15,652.2)	83554.4 (7,620.8)	58524.2 (8,344.7)	98190.9 (10,208.7)
	[703922.7;872651.3]	[325780.9;492173.5]	[97503.7;158933.6]	[68599.7;98509]	[42149.1;74899.4]	[78157.9;118223.9]
CGE O level	1627069.7 (339,610.2)	537333.9 (38,419.5)	247133.4 (62,525.8)	111395.8 (10,940.7)	77875.8 (7,908.2)	180213.5 (48,944.5)
	[960638.5;2293500.8]	[461941.7;612726.1]	[124436.4;369830.3]	[89926.3;132865.3]	[62357.2;93394.5]	[84167.7;276259.3]
CGE A level	2028837 (314,435.4)	56666.70	5250000	101018.5 (83,928.8)	120010.4 (58,589.2)	868714.8 (911,937.7)
	[1411807.5;2645866.6]	[56666.7;56666.7]	[525000;525000]	[-63678.5;265715.4]	[5038.4;234982.4]	[-920818.3;2658247.9]
Diploma/Certificate	4447339.2 (1,089,839.7)	1137018 (133,644.1)	753250.2 (241,412.5)	219202.7 (58,784.1)	177601 (44,153.8)	853956.9 (278,578.7)
	[2308701.6;6585976.9]	[874762.6;1399273.5]	[279516.3;1226984]	[103848.2;334557.2]	[90956.1;264245.8]	[307290.4;1400623.4]
Degree	4999392.4 (457,414.2)	2105316.2 (363,508.7)	7231050.3 (344,859.4)	42750.3 (10,665.8)	809684.7 (652,747.1)	2988823.9 (1,809,082.4)
	[4101789.6;5896995.2]	[1391988.1;2818644.3]	[6554318.5;7907782.1]	[21820.4;63680.3]	471227.9;2090597.3	[-561213.5;6538861.3]
Masters	8142566 (963,953.3)	3]	4388.90	223899.2 (132,803.5)		183361.5 (40,311.8)
	[6250960.5;10034171.6]		[4388.9;4388.9]	[-36706.6;484505]		[104255.9;262467.1]
Central	1203994.7 (143,781.9)	335101 (44,920.1)	145263.5 (16,313.9)	109188.2 (13,869.7)	100048 (16,262.2)	133208 (25,533.3)
	[921845.5;1486143.9]	[246952.4;423249.5]	[113250;177277]	[81971.1;136405.2]	[68136;131960.1]	[83102.9;183313.1]
Copperbelt	2025900.6 (161,711.9)	451941.1 (50,269.0)	150897.9 (33,455.1)	65069.5 (12,720.0)	50560.1 (7,031.6)	127945.1 (49,945.5)
	[1708566.6;2343234.7]	[353296.1;550586.1]	[85247.5;216548.3]	[40108.5;90030.5]	[36761.7;64358.5]	[29934.9;225955.3]
Eastern	4858408.5 (3,747,693.6)	328246.7 (78,069.4)	242992.5 (119,324.7)	68148.3 (6,759.6)	60507.6 (11,518.9)	60141.9 (5,661.3)
	[-2495846;12212663.1]	[175047.9;481445.5]	[8836.7;477148.3]	[54883.6;81412.9]	[37903.6;83111.6]	[49032.5;71251.4]
Luapula	12297813.9 (8,636,542.6)	95964. (36,405.9)	57785.7 (14,775.5)	27761.8 (3,304.3)	22793.6 (6,049.2)	23552.8 (2,857.7)
	[-					
	4650031.7;29245659.4]	[24523.7;167405.2]	[28791.1;86780.3]	[21277.7;34246]	[10923;34664.3]	[17945;29160.7]
Lusaka	2000936 (225,956.0)	534919.8 (48,326.7)	240138.5 (59,970.6)	73931.1 (16,760.9)	81311.1 (20,040.3)	142818.7 (42,069.0)
	[1557533.2;2444338.9]	[440086.3;629753.4]	[122455.6;357821.3]	[41040.6;106821.7]	[41985.1;120637.1]	[60265;225372.5]
Northern	3397218.9 (1,709,320.0)	206287.1 (58,597.7)	79556.4 (13,677.1)	49924.9 (3,843.5)	39186.3 (6,485.4)	60276.9 (4,462.8)

	[42949.3;6751488.4]	[91298.5;321275.8]	[52717.2;106395.6]	[42382.6;57467.2]	[26459.7;51913]	[51519.3;69034.5]
	1653929.7	745906.7	108976.9	63746.9	47273.3	88105.8
North Western	(216,280.1)	(193,832.9)	(33,055.7)	(9,747.2)	(11,641.2)	(33,990.3)
	[1229514.2;2078345.2]	[365540.3;1126273]	[44110.3;173843.6]	[44619.5;82874.3]	[24429.2;70117.4]	[21405.2;154806.3]
	2090511.4	702213.7	146599.7	64280.6	60358.2	83356.9
Southern	(565,561.1)	(347,479.9)	(25,471.2)	(4,401.1)	(8,450.8)	(17,674.8)
	[980687.3;3200335.4]	[20339.4;1384087.9]	[96616.5;196582.8]	[55644.2;72917.1]	[43774.8;76941.7]	[48673;118040.9]
	2074596.1	582193.4	59231.9	41703.2	45533.1	57122.5
Western	(558,505.4)	(338,197.6)	(15,811.0)	(10,918.0)	(8,091.1)	(14,379.9)
	[978617.7;3170574.5]	[-81465.7;1245852.5]	[28205.3;90258.5]	[20278.3;63128.1]	[29655.5;61410.6]	[28904.1;85340.9]
	3429149.9		121310.3	53310.2	42773.9	48880.6
Small Scale	(1,444,940.4)		(20,709.0)	(2,636.6)	(3,664.8)	(2,670.6)
	[593683.4;6264616.4]		[80672.2;161948.4]	[48136.3;58484.2]	[35582.4;49965.4]	[43640;54121.3]
	2808693.9		268771.1	263629	185677.1	215367.1
Medium Scale	(553,638.3)		(65,613.8)	(25,269.0)	(28,824.7)	(30,707.0)
				[214042.6;313215.3]		
	[1722266.5;3895121.3]		[140014.4;397527.7]	]	[129113.1;242241]	[155109.5;275624.8]
	9391481.9		2951104.4	1160534.3	2666281.5	4134736.4
Large Scale	(3,273,565.1)		(807,765.3)	(345,692.5)	(1,016,540.5)	(1,491,572.4)
	[2967629.3;15815334.4]		[1365993.1;4536215.7]	[482167.5;1838901.1]	[671481.9;4661081.1]	[1207762.1;7061710.6]
	]		]	]	]	]
	3879215.4		211111.9	30319.7	31859.5	159427.3
Non Agric	(2,429,496.7)		(34,839.4)	(5,452.9)	(17,981.3)	(123,331.3)
	[-888286.8;8646717.5]		[142745.2;279478.7]	[19619.4;41020.1]	[-3425.9;67144.9]	[-82590.8;401445.3]
	1432361.7		425489.2		42818.4	101628(
Low Cost	(132,542.5)		(43,720.5)		(5,298.1)	24,030.2)
	[1172267.9;1692455.4]		[339694.5;511283.8]		[32421.7;53215]	[54472.6;148783.4]
	2340939.2		733217.9		154927.9	282663.6
Medium Cost	(203,018.8)		(127,974.9)		(34,217.2)	(69,223.6)
	[1942546.9;2739331.5]		[482087.4;984348.3]		[87782.2;222073.7]	[146823.3;418504]
	3822463.4		520022.8		119558	371887.5
High Cost	(294,535.0)		(55,098.7)		(24,160.6)	(114,180.1)
	[3244485.1;4400441.7]		[411900.3;628145.3]		[72146.8;166969.3]	[147827;595947.9]
	547932	264042	119230.8	60726.2	69674.8	72992.6
Agriculture	(62,110.4)	(55,127.6)	(16,427.3)	(3,032.6)	(10,199.8)	(5,517.2)
	[426050.2;669813.9]	[155862.6;372221.3]	[86994.8;151466.8]	[54775.2;66677.1]	[49659.3;89690.2]	[62165.9;83819.2]
	3087186.9	1120087.5	19574.5	36750.5		57832.9
Mining	(304,135.7)	(216,965.0)	(1,271.4)	(14,466.2)		(36,603.5)

		[694327.5;1545847.5				
	[2490368.1;3684005.6]	]	[17079.5;22069.5]	[8362.8;65138.1]		[-13995.7;129661.5]
	1317555.1	958882.1	96825.3	11148.3	39533.7	522706.6
Manufacturing	(108,739.2)	(464,398.6)	(25,167.3)	(3,484.8)	(4,684.1)	(524,626.4)
	[1104171.4;1530938.8]	[47572.5;1870191.8]	[47438.4;146212.1]	[4309.9;17986.6]	[30342;48725.5]	[-506790.8;1552203.9]
	2736983.1	808032.9				
Electr & Water	(268,843.4)	(149,378.7)				962416.70
	[2209419.9;3264546.3]	[514900.5;1101165.4]				[962416.7;962416.7]
	1409480.7	475950.7	200802.5	5833.30	62500	46951.5
Construction	(225,480.8)	(60,561.3)	(47,275.5)			(61,375.9)
	[967009.9;1851951.5]	[357108.6;594792.9]	[108031.8;293573.2]	[5833.3;5833.3]	[6250;6250]	[-73489.1;167392.1]
	991536.1	351754.5	75809.8	83526.2	73597.9	84028.6
Trade	(90,792.8)	(42,385.1)	(8,465.4)	(28,596.6)	(24,056.4)	(21,888.5)
	[813369.4;1169702.7]	[268580.3;434928.6]	[59197.7;92421.9]	[27409.9;139642.5]	[26391;120804.7]	[41075.8;126981.3]
	1719667.8	660621.1	390772.7	366441		405338.3
Transport	(465,949.6)	(62,897.6)	(117,012.2)	(4,990.2)		(87,769.7)
	[805314.5;2634021.1]	[537194.3;784047.9]	[161154.6;620390.8]	[356648.5;376233.5]		[233103.9;577572.7]
	4398988.9	997303.4	2400000	2500000		
Fin Services	(501,299.9)	(495,485.3)				
	[3415266.1;5382711.8]	[24990.9;1969616]	[240000;240000]	[250000;250000]		
	3868989.8	733886	771478.8	64297.2	67285.1	4696359.3
CSP	(920,999.8)	(142,807.0)	(405,130.7)	(30,276.8)	(3,694.5)	(2,486,025.5)
		[453649.7;1014122.4				
	[2061671.6;5676308]	]	[-23526.9;1566484.5]	[4883.8;123710.7]	[60035.1;74535.1]	[-182077.5;9574796.1]
	2540619.2	357270.9	3500000		31250	15104.20
Professional Services	(320,408.0)	(184,996.1)				
	[1911868.5;3169369.9]	[-5755.1;720297]	[350000;350000]		[3125;3125]	[15104.2;15104.2]
	1413147.7	632937.5	198058.8	120408.8	3819.40	204083.3
Accom & Info	(195,996.2)	(171,889.0)	(75,735.7)	(19,196.8)		(130,924.7)
	[1028535.8;1797759.6]	[295632.3;970242.8]	[49439.3;346678.4]	[82738.1;158079.6]	[3819.4;3819.4]	[-52835.9;461002.5]
	1015965.5	296800.7	142377.6		73650.2	66626.5
Other	(145,372.5)	(15,166.6)	(29,945.5)		(28,958.2)	(23,943.5)
	[730694.7;1301236.3]	[267038.5;326562.9]	[83614.2;201141]		[16824.2;130476.2]	[19641.2;113611.8]
	2355075.6	1394936.1	1050178.4	115618		102271.1
Armed Forces	(339,376.4)	(574,593.1)	(536,011.2)	(17,659.3)		(25,402.8)
		[267386.9;2522485.3				
	[1689102.3;3021048.8]	]	[-1659.8;2102016.6]	[80964.4;150271.6]		[52422.2;152120.1]
	4500730	1093793.8	88550.6	6250		10158518.2
Managers	(540,028.9)	(288,192.5)	(36,790.6)			(2,942,112.6)

		[528261.1;1659326.6]				[4385081.8;15931954.7]
	[3441007.6;5560452.4]	]	[16354.7;160746.5]		[625;625]	7]
	4398200.7	1119308.3	580773.1		62416.70	6391095.6
Professionals	(1,117,806.3)	(139,608.8)	(275,441.6)			(2,219,245.7)
		[845347.7;1393268.8]				[2036172.4;10746018.8]
	[2204680.4;6591721.1]	]	[40262;1121284.2]		[62416.7;62416.7]	8]
	5954277.8	1781049.9	1161909.2	128833.30	72916.70	280366.1
Technicians	(2,326,496.2)	(865,729.4)	(721,516.1)			(149,407.3)
	[1388892.4;10519663.2]		[-	[128833.3;128833.3]		
	]	[82191.1;3479908.7]	253953.5;2577771.9]	]	[72916.7;72916.7]	[-12822.5;573554.7]
	1684775.1	881828.9	70000		136458.30	302734.5
Clerks	(128,913.8)	(259,401.0)				(139,296.8)
		[372794.9;1390862.9]				
	[1431802;1937748.3]	]	[7000;7000]		[136458.3;136458.3]	[29386.2;576082.8]
	776705.5	366544	104338.7	86467.7	33021	104042.1
Service & Sales Workers	(44,076.4)	(45,055.8)	(11,130.2)	(26,404.0)	(13,724.8)	(29,904.2)
	[690212.5;863198.5]	[278129.1;454958.9]	[82497.5;126179.9]	[34654.1;138281.4]	[6088.3;59953.8]	[45359.8;162724.4]
Skilled agricultural and fishery workers	546706.7	252408.7	97167.5	61111.9	75567.6	72105.6
	(86,681.8)	(60,144.5)	(14,475.1)	(3,065.4)	(11,662.1)	(5,690.2)
	[376607.3;716806.1]	[134384.6;370432.8]	[68762.4;125572.6]	[55096.4;67127.3]	[52682.5;98452.6]	[60939.4;83271.8]
	1324662.1	470839	76137	24879.1	44553.9	69013.1
Craft & Trade Workers	(110,545.1)	(58,883.4)	(12,593.5)	(15,549.7)	(14,969.6)	(42,425.4)
	[1107734.6;1541589.5]	[355289.5;586388.5]	[51424.3;100849.7]	[-5634.8;55393]	[15178.4;73929.4]	[-14240.1;152266.3]
	1331125.6	674984.5	182893.2	150445.3	62312.1	147170.8
Operators & Assemblers	(89,002.7)	(62,067.5)	(50,302.4)	(111,754.6)	(23,283.2)	(67,497.0)
	[1156471.7;1505779.4]	[553186.8;796782.2]	[84182.6;281603.8]	[-68855.6;369746.2]	[16622.5;108001.7]	[14718.5;279623]
	561699.7	309706.6	147995.6	42083.3	49749.7	53437
Elementary Occupations	(50,816.3)	(28,249.7)	(16,321.1)	(14,253.4)	(14,597.1)	(5,298.5)
	[461980.5;661418.8]	[254270.9;365142.3]	[115968.1;180023.2]	[14113.2;70053.5]	[21105.2;78394.2]	[43039.5;63834.5]
<b>Total Mean Income</b>	<b>2473623</b>	<b>473642.7</b>	<b>135989.1</b>	<b>61258.5</b>	<b>58760.1</b>	<b>75664.1</b>
	<b>(370,869.1)</b>	<b>(38,437.2)</b>	<b>(18,733.0)</b>	<b>(3,018.9)</b>	<b>(4,050.0)</b>	<b>(5,602.8)</b>
	<b>[1745851.1;3201394.9]</b>	<b>[398215.8;549069.7]</b>	<b>[99228.7;172749.6]</b>	<b>[55334.4;67182.6]</b>	<b>[50812.6;66707.6]</b>	<b>[64669.4;86658.8]</b>

Source: Own Calculations from Living Conditions Monitoring Survey 2010

Notes: Standard Errors in parentheses  
95 percent confidence intervals in brackets

**Table D11: Median income for all segments, by various cohorts**

	Formal Sector	Urban Informal	Rural Informal	Agriculture	Household Enterprises	Multiple Activities	Total
	Total ('000s)	Total ('000s)	Total ('000s)	Total ('000s)	Total ('000s)	Total ('000s)	Total ('000s)
<b>Total</b>	1 097	260	36	25	20	25	40
<b>By Gender</b>							
Male	1 000	327	40	26	19	24	55
Female	1 312	200	32	23	21	25	32
<b>By Area Type</b>							
	0						
Rural	670	0	36	25	22	25	28
Urban	1 200	260	0	0	17	29	500
<b>By Age group</b>							
15-24	400	200	59	21	18	21	25
25-34	1 000	300	32	25	23	28	54
35-44	1 300	300	37	28	26	29	55
45-54	1 600	250	36	24	17	29	43
55-65	1 200	200	20	23	42	35	31
<b>By Education</b>							
Grd 1-8	300	200	30	23	20	24	27
Grd 9-11	540	257	50	32	22	35	56
CGE O level	850	400	84	52	27	36	300
CGE A level	1 600	57	525	14	142	17	800
Diploma/Certificate	1 800	600	151	56	83	112	1 700
Degree	3 500	2 000	7 483	33	93	83	3 500
Masters	6 650		4	100		146	6 650
<b>By Province</b>							
Central	700	200	57	41	52	35	63
Copperbelt	1 200	260	64	23	16	29	300
Eastern	850	167	60	32	29	27	33
Luapula	1 100	11	17	12	13	10	13
Lusaka	1 000	350	95	19	19	24	500
Northern	1 200	50	36	26	21	34	30
North Western	1 500	300	27	27	14	23	29
Southern	900	250	28	24	17	20	33
Western	1 500	100	14	14	21	18	19
<b>By Stratum</b>							
Small Scale Agri	702		32	23	21	23	25
Medium Scale Agri	1 808		87	133	97	92	119
Large Scale Agri	2 210		3 499	1 010	1 062	1 105	1 105
Non Agri Rural	560		200	16	12	35	300
Low Cost Urban	800	250			14	25	400
Medium Cost Urban	1 600	300			29	60	1 200
High Cost Urban	2 400	300			45	83	1 546
<b>By Indus</b>							
Agriculture, forestry and fishing	323	150	42	24	30	25	26
Mining and quarrying	2 103	800	4	24	0	14	1 983

Manufacturing	700	300	26	8	29	33	400
Electricity, gas and water	2 000	1 000				962	1 800
Construction	500	350	61	6	6	1	450
Wholesale and retail trade	600	140	25	34	104	36	84
Transport, storage and communication	750	500	200	363	0	500	600
Financial and business services	3 000	700	240	250	0	0	3 000
Community, social and personal (CSP) services	1 600	400	250	29	62	3 500	1 505
Professional Services	1 600	3	350	0	3	15	1 500
Accommodation & Info Services	700	300	115	136	4	85	400
Other	450	250	100	0	85	13	250

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**By Occupation**

Armed Forces	1 800	2 000	1 838	102	0	102	207
Managers	3 000	800	38	0	1	9 000	2 500
Professionals	1 900	800	41	0	62	3 500	1 851
Technicians	1 800	700	286	129	73	219	1 600
Clerks	1 200	500	7	0	136	435	1 100
Service & Sales Workers	500	200	28	34	7	82	300
Skilled agricultural and fishery workers	300	113	32	24	35	25	25
Craft & Trade Workers	700	300	21	8	24	3	402
Operators & Assemblers	825	500	101	25	95	115	600
Elementary Occupations	330	250	84	20	12	22	126

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Source: Own Calculations from Living Conditions Monitoring Survey 2010

**Table D12: Within-group and between-group contributions to total inequality**

	Formal Sector	Urban Informal	Rural Informal	Agriculture	Household Enterprises	Multiple Activities	Total
<b>By Gender</b>							
Total	1.70072 100.00%	0.99778 100.00%	1.25312 100.00%	0.99142 100.00%	1.11945 100.00%	1.64623 100.00%	2.69868 100.00%
Within Group	1.69441 99.63%	0.99307 99.53%	1.25225 99.93%	0.98842 99.70%	1.11833 99.90%	1.63147 99.10%	2.60108 96.38%
Between Group	0.00631 0.37%	0.00471 0.47%	0.00087 0.07%	0.003 0.30%	0.00112 0.10%	0.01476 0.90%	0.0976 3.62%
<b>By Location</b>							
Total	1.70072 100.00%				1.11945 100.00%	1.64623 100.00%	2.69802 100.00%
Within Group	1.66309 97.79%				1.1137 99.49%	1.61967 98.39%	2.47524 91.74%
Between Group	0.03699 2.17%				0.0066 0.59%	0.02634 1.60%	0.22278 8.26%
<b>By Age (Youth vs Non-youth)</b>							
Total	1.70072 100.00%	0.99778 100.00%	1.25312 100.00%	0.99142 100.00%	1.11945 100.00%	1.64623 100.00%	2.69802 100.00%
Within Group	1.66415 97.85%	0.99324 99.54%	1.24871 99.65%	0.98538 99.39%	1.11577 99.67%	1.60032 97.21%	2.57051 95.27%
Between Group	0.03593 2.11%	0.00454 0.46%	0.0046 0.37%	0.00582 0.59%	0.00452 0.40%	0.04569 2.78%	0.1275 4.73%
<b>By Education (up to GCE O-level vs GCE A-level/Post)</b>							
Total	1.70072 100.00%	0.99778 100.00%	1.25312 100.00%	0.99142 100.00%	1.11945 100.00%	1.64623 100.00%	2.69802 100.00%
Within Group	1.49399 87.84%	0.91505 91.71%	1.18167 94.30%	0.99035 99.89%	1.11899 99.96%	1.63668 99.42%	2.17545 80.63%
Between Group	0.20609 12.12%	0.08273 8.29%	0.07164 5.72%	0.00084 0.08%	0.00131 0.12%	0.00934 0.57%	0.52257 19.37%

Source: Own Calculations from Living Conditions Monitoring Survey 2010

Notes: Results are not presented by location for the urban formal, rural informal and agriculture segments, since the first segment is exclusively urban, while the latter two are exclusively rural.

# Appendix E

## Education and Healthcare

**Figure E1: Diagram of the Zambian Educational System**

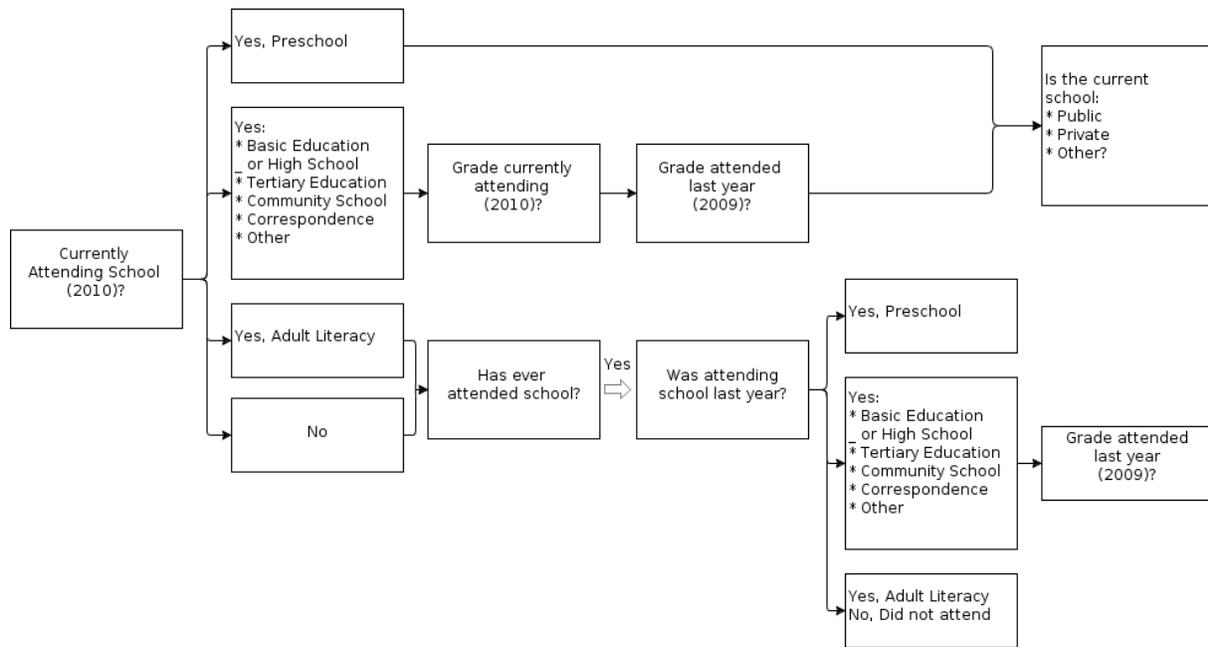
Age	School Year	Type of schooling		Other	
30	24	University Education  (Doctorate, Masters and Bachelors Degrees)		C O N T I N U I N G	
29	23				
28	22				
27	21				
26	20				
25	19				
24	18				
23	17				
22	16				
21	15				
20	14		Various Training Programs		
19	13				
18	12	High School (Grade 10-12)		E D U C A T I O N	
17	11				Various Vocational Training Programs
16	10				
15	9	B A S I C	Upper Basic (Grade 8-9)		
14	8		Middle Basic (Grade 5-7)		
13	7				
12	6				
11	5		Lower Basic (Grade 1-4)		
10	4				
9	3				
8	2				
7	1				
6		Pre-school Education			
5					
4					
3					

Source: Ministry of Education. As seen in (IOB, 2008)

### Educational Data Collection in the LCMS

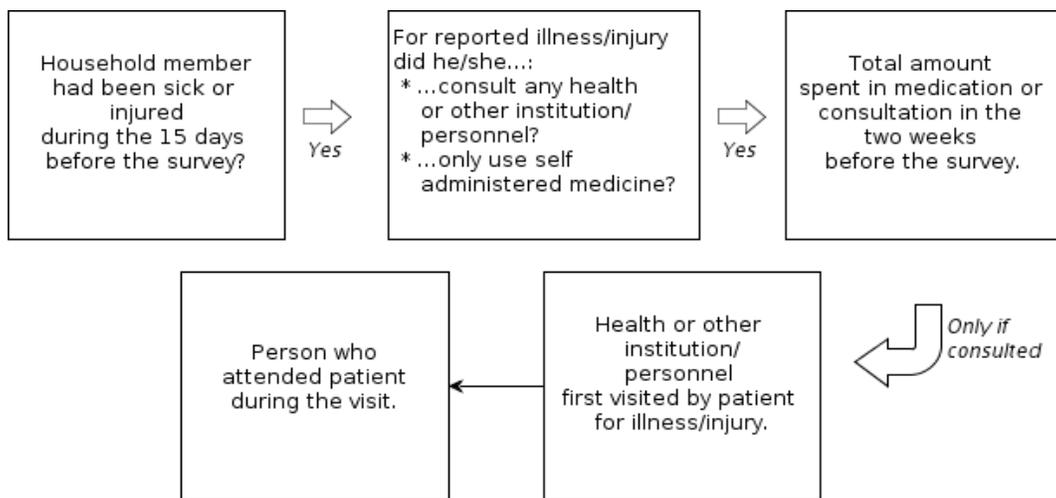
The LCMS VI has information on school enrollment for all households both for 2010 (the year the data were collected) and 2009. Additionally, it reports household's total expenditures on education in 2009. In 2010, survey participants were asked about each household member's attendance at school between February and March of that year. For each household member attending school, he or she was asked for the specific level, grade year and type of school, and whether it was a public or private institution. The survey also asked for the same data for 2009. Furthermore, household members not enrolled in school at the time of the survey were asked if they had ever attended school, and what was the highest education level they had reached. No other information was collected for those enrolled in 2009 but not in 2010. The education data flow can be observed in **Error! Reference source not found.4**.

**Figure E2: Education data flow**



Source: Authors

**Figure E3: Healthcare Dataflow**



Source: Authors

## Methods to Calculate the Distribution of Health Benefits

The main challenge to calculate the distribution of health care benefits is the different definitions of beneficiary across official administrative data and LCMS VI (household survey). In the official data each visit to a health facility made by a single person is considered a beneficiary; therefore, if a person visits a hospital 5 times, those visits count as 5 beneficiaries. In contrast, LCMS asked each person -who had been ill during the past 15 days- about the first health facility he/she visited because of the illness but numbers of visits were not collected. If a person had visited a hospital 5 times for an illness, then he/she is considered a single beneficiary. In the LCMS the number of patients is the number of beneficiaries; in the official data the number of visits determines the number of beneficiaries.

Furthermore, LCMS VI asks about the first health facility visited because of a specific illness suffered during the last 15 days. A first problem is that if a person had gone, for example, to a hospital and a clinic, but went to the clinic first, she should report going to a clinic and the visit to the hospital is left undeclared. In the official data these two episodes would count as two visits, one to the hospital, and one to the clinic. The second problem is that the question about visits does not specify a time span for which the first visit occurred. If a person is facing a chronic disease, which started before the 15 days period but continued during that fortnight, and visited a hospital a month ago, she might wrongly report the visit in the survey.

In order to account for these differences in definition, two methods are used in order to calculate the distribution of health care benefits. The first method is a traditional BIA, where an average expenditure per beneficiary is obtained from the official data and assigned to every “visitor” reported in the survey. The second method takes the share of visitors from the survey, and uses it to distribute the official expenditure in each province among quintiles. A big assumption used in the second method is that the annual expenditure is distributed uniformly and we can find the fortnight expenditure by dividing it by 24.

Below we show the steps used to calculate the distribution of health expenditures in clinics and health posts with each method (we will later show the steps for expenditure in hospitals, which have an additional issue)

### **Method 1**

- a) Calculate the expenditure per beneficiary ( $EB$ ) on each department  $j$  using fiscal data and official data of the number of beneficiaries:

$$EB_j = \frac{AE_j}{AB_j} \quad (1.1)$$

where  $AE_j$  is the total annual expenditure on health and  $AB_j$  is the total annual number of beneficiaries, both for district  $j$ .

- b) Assign  $EB_j$  to each visitor recorded in the survey and calculate the expenditure corresponding to people of department  $j$  who belong to the quintile  $q$ :

$$E_{j,q} = EB_j * n_{j,q} \quad (1.2)$$

where  $n_{j,q}$  is the number of people of department  $j$  in quintile  $q$ , it comes from the survey

- c) Aggregate  $E_{j,q}$  by quintile to calculate the total expenditure in quintile  $q$ :

$$E_q = \sum_j E_{j,q} \quad (1.3)$$

- d) To obtain the expenditure per capita in quintile  $q$  we calculate:

$$EB_q = \frac{E_q}{\sum_j n_{j,q}} = \frac{E_q}{N_q} \quad (1.4)$$

The basic unit to calculate the distribution of health expenditure is  $E_q$ , which may be expanded and regrouped as:

$$E_q = \sum_j \left( \frac{AE_j}{AB_j} \cdot n_{j,q} \right) \quad (1.5)$$

## Method 2

- a) Use data from the survey to calculate the share of each quintile on the total number of people who visited a health facility in department  $j$

$$s_{j,q} = \frac{n_{j,q}}{\sum_{q=1}^5 n_{j,q}} = \frac{n_{j,q}}{N_j} \quad (2.1)$$

- b) Find the expenditure corresponding to 15 days in department  $j$  (Fortnight Expenditure), using the assumption that the expenditure is distributed uniformly through the year:

$$FE_j = \frac{AE_j}{24} \quad (2.2)$$

- c) Distribute the total expenditure in district  $j$  between quintiles using the shares of visitors found in (a), and find the expenditure on each quintile. For quintile  $q$ :

$$\tilde{E}_{j,q} = FE_j \cdot s_{j,q} \quad (2.3)$$

- d) Aggregate  $\tilde{E}_{j,q}$  by quintile to calculate the total expenditure in quintile  $q$ :

$$\tilde{E}_q = \sum_j \tilde{E}_{j,q} \quad (2.4)$$

- e) To obtain the expenditure per capita in quintile  $q$  we calculate:

$$\bar{EB}_q = \hat{E}_q / \sum_j n_{j,q} = \hat{E}_q / N_q \quad (2.5)$$

$\hat{E}_q$  may be expanded and regrouped as:

$$\hat{E}_q = \sum_j \left( \frac{AE_j}{24} \cdot \frac{n_{j,q}}{N_j} \right) = \sum_j \left( \frac{AE_j}{24 \cdot N_j} \cdot n_{j,q} \right) \quad (2.6)$$

So we observe that Method 2 ends up being similar to Method 1, but considers  $\frac{AE_j}{24 \cdot N_j}$  as the benefit per visitor, rather than  $\frac{AE_j}{AB_j}$ . The differences between  $AB_j$  and  $(24 \cdot N_j)$  will determine the difference in the results.

## Hospitals

The calculation of the distribution of expenditure in hospitals has an additional caveat: part of the expenditure in hospitals corresponds to the expenditure in third level hospitals (or national referral hospitals), which are at a national level (not disaggregated by province). The way of assigning it to each province changes with each of the methods previously described.

### Method 1

We change the definition of expenditure per beneficiary to add the expenditure in national referral hospitals ( $AE^{NR}$ ) to the expenditure in first and second level hospitals in province  $j$  ( $AE_j^H$ ).

$$EB_j^H = \frac{AE_j^H}{AB_j^H} + \frac{AE^{NR}}{(\sum_j AB_j^H + AB^{NR})} \quad (3.1)$$

The expenditure in first and second level hospitals ( $AE_j^H$ ) is divided between the beneficiaries in each district ( $AB_j^H$ ); while the national referral expenditure ( $AE^{NR}$ ) is divided between all the hospital beneficiaries: from first and second level and from third level ( $AB^{NR}$ )

Following the same steps described above we find the expenditure per quintile  $E_q^H$ :

$$E_q^H = \sum_j \left( \frac{AE_j^H}{AB_j^H} \cdot n_{j,q}^H \right) + \frac{AE^{NR}}{(\sum_j AB_j^H + AB^{NR})} \cdot N_q^H \quad (3.2)$$

### Method 2

Using the same notion of distributing by shares from the survey, we divide the national referral expenditure between provinces using the distribution of hospital patients in each department (from the survey), then we add this amount to  $\bar{FE}_j$  in (2.2).

$$\bar{F}E_j = \frac{AE_j^H}{24} + \frac{N_j^H}{N^H} \cdot \left( \frac{AE^{NR}}{24} \right) \quad (3.3)$$

We replace it in (2.3) and (2.4) to obtain the expenditure per quintile.

$$\bar{E}_q = \sum_j \left( \frac{AE_j}{24 \cdot N_j} \cdot n_{j,q} \right) + \frac{AE^{NR}}{24 \cdot N^H} \cdot N_q^H \quad (3.4)$$

So, comparing (3.2) to (3.4), we find that the differences in the two methods end up coming from the differences between  $AB_j^H$ ,  $(24 \cdot N_j)$ ,  $(\sum_j AB_j^H + AE^{NR})$  and  $(24 \cdot N^H)$ .

The following table shows the differences of these numbers for each province:

**Table E1: Expenditures and beneficiaries: Hospitals**

	<b>Total Annual Expenditure (official data)</b> $AE_j^H$	<b>Total Annual Beneficiaries (official data)</b> $AB_j^H$	<b>Annualized number of visitors, from LCMS</b> $24 \cdot N_j^H$
<b>First and second level hospitals</b>			
<b>Central</b>	29,444,544,224	100,299	956,374
<b>CopperBelt</b>	37,065,381,465	744,228	1,586,474
<b>Eastern</b>	34,261,002,200	219,409	1,398,160
<b>Luapula</b>	19,997,301,581	72,430	793,385
<b>Lusaka</b>	17,526,256,477	40,910	680,951
<b>Northwestern</b>	19,638,295,365	41,730	870,407
<b>Northern</b>	22,140,656,603	83,708	428,981
<b>Southern</b>	56,623,005,821	212,255	1,204,990
<b>Western</b>	21,444,931,733	68,352	787,727
<b>Total</b>	258,141,375,470	1,583,321	8,707,448
<b>Third level hospitals (national referrals)</b>	Expenditure ( $AE^{NR}$ )	Beneficiaries ( $AB^{NR}$ )	Annualized number of beneficiaries
	42,825,989,623	400,470	4,805,040

**Table E2: Expenditures and beneficiaries: Clinics and health posts**

	<b>Total Annual Expenditure (official data)</b> <i>AE<sub>j</sub></i>	<b>Total Annual Beneficiaries (official data)</b> <i>AB<sub>j</sub></i>	<b>Annualized number of visitors, from LCMS</b> <i>N<sub>j</sub></i>
<b>Central</b>	25,161,683,086	1,341,031	835,818
<b>CopperBelt</b>	36,235,935,912	2,154,331	2,592,475
<b>Eastern</b>	31,149,126,669	2,564,068	5,367,996
<b>Luapula</b>	19,721,953,245	1,014,329	1,986,384
<b>Lusaka</b>	30,378,844,561	2,065,301	828,570
<b>Northwestern</b>	16,467,788,745	816,190	1,290,691
<b>Northern</b>	25,447,817,816	1,373,987	551,336
<b>Southern</b>	38,726,705,963	1,852,333	1,676,123
<b>Western</b>	23,167,745,618	1,287,989	990,937
<b>Total</b>	246,457,601,615	14,469,559	16,120,331

**Table E3: Expenditure summary using national-level aggregates**

		Hospitals	Clinics and Posts	Total
Annual Expenditure		300,967,365,093	246,457,601,615	547,424,966,708
Annual per capita		151,713	17,033	33,271
Method 1	Fortnight expenditure	98,688,660,317	11,017,873,149	109,706,533,466
	Per capita expenditure	272,012	16,403	106,049
Method 2	Fortnight expenditure	12,540,306,650	10,269,066,695	22,809,373,345
	Per capita expenditure	34,564	15,289	22,049

## Appendix F

### Agricultural Input Support Programs

The government's fertilizer and seed subsidies are implemented under two separated programs, the Farmer Input Support Program (FISP) operated by the Ministry of Agriculture and Cooperatives (MACO) and the Food Security Pack Program (FSPP) operated by the Ministry of Community Development and Social Services (MCDSS).<sup>53</sup>

#### The Farmer Input Support Program

The Farmer Input Support Program (FISP) was designed in 2002 and was originally called the Fertilizer Support Program. Its aim was to improve small-scale farmers' access to agricultural inputs and to enhance the participation and competitiveness of the private sector in the supply and distribution of inputs (MACO, 2009). The program was originally targeted at providing fertilizer and corn (maize) seed: each farmer was to receive a standard input package—sufficient for cultivation of at least one hectare of maize—consisting of eight 50kg bags of fertilizer and one 20kg bag of maize seed at 50 percent of the market price.<sup>54</sup> Private sector firms were to be brought in to the program through their participation in both the supply of inputs and the marketing of produce, but with little progress obtained thus far the government remains the single largest player in the market. Table F1, below, shows the program's budget and the enrollment targets.

**Table F1: Benefits and Beneficiaries of the FISP**

Season	Budget (ZMK Billion)	Fertilizer (Metric Tons)	Seed (Metric Tons)	Target number of beneficiaries
2002/03	100	48,000	2,400	120,000
2003/04	114.5	60,000	3,000	150,000
2004/05	112.6	50,000	2,500	125,000
2005/06	140	50,000	2,500	125,000
2006/07	252	84,000	4,200	210,000
2007/08	150	50,000	2,500	125,000
2008/09	492	80,000	4,000	200,000
2009/10	430	100,000	5,000	530,000
2010/11	485	178,000	8,800	

*Source: Authors compilation from MACO and budget speeches*

<sup>53</sup> As of September 2011 the Ministry of Agriculture and Cooperatives and the Ministry of Community Development and Social Services have been renamed the Ministry of Agriculture and Livestock and the Ministry of Community Development, Mother and Child Health, respectively.

<sup>54</sup> MACO FISP Implementation manuals: Each package includes 20kg of seeds, 4 50 kg bags of Compound D (basal) and 4 50 kg bags of Urea (top dressing).

The program has been subject to a number of changes over time. During the 2002/2003 agriculture season, the first year of its implementation, 48,000 metric tons (Mt) of fertilizer and 2,400 Mt of maize seed were distributed to 120,000 small farmers. This was done on a 50 percent matching grant basis. Over the next 4 years, the input amounts as well as the farmers covered only grew marginally and in some years even declined. However in 2006/2007 the number of targeted farmers as well as the amounts of fertilizer increased substantially, rising by 60 percent over the previous season. In the same year the fertilizer subsidy increased from 50 percent to 60 percent. The fertilizer subsidy was further increased to 75 percent in 2008/2009 by setting the farmers' contribution at ZMK50,000 (approximately US\$10) per 50kg bag, while the seed subsidy remained at 50 percent.

The 2009/2010 season saw another change when the government increased the total quantity of fertilizer covered by the program but also reduced the size of the input package per beneficiary by half. A complete pack now consists of two 50kg bags of basal dressing fertilizer, two 50kg bags of top dressing fertilizer and a 10kg bag of maize seed.<sup>55</sup> This move was meant to increase the number of program beneficiaries. The program was further extended to cover inputs for crops other than maize in the 2010/2011 season: for example, the government included 30 Mt of rice seed in the program, although, the FISP remains largely a maize-orientated program.

The program-selection criterion requires a farmer to be a member of a registered cooperative or farmers' organization. The farmer is selected by a Camp Agriculture Committee on the recommendation of the cooperative or farmer organization and must meet the following criteria: (i) be a small scale farmer and actively involved in farming within the camp coverage area; (ii) have the capacity to grow at least 0.5 hectares of maize; (iii) have the capacity to pay ZMK50,000 per 50kg bag of fertilizer and ZMK80,000 per 10kg bag of seed; (iv) not concurrently be enrolled in the Food Security Pack Program (FSPP); and (v) not have defaulted on any agriculture credit program.

#### The Food Security Pack Program

The government introduced the FSPP in 2000. It was aimed at empowering potentially successful but vulnerable farmers who had lost asset value due to recurrent adverse weather conditions but still had access to land and basic tools. The FSPP was also designed to act as a social safety net program under the Ministry of Community Development and Social Services (MCDSS) by improving household food security in vulnerable rural communities (MCDSS, undated).

The FSPP program is jointly coordinated by the Ministry of Finance and National Planning (MoFNP) and MACO. The Programme against Malnutrition, an NGO, was contracted to implement the program until 2009, after which all the executing responsibilities were shifted to the MCDSS.

The target groups for the program include the following socio-economic groups: (i) female- or child-headed households; (ii) victims of natural disasters; (iii) institutions caring for orphans; (iv) the disabled; (v) unemployed youths; (vi) the elderly; and (vii) households headed by the terminally ill. Community-based committees comprising of leaders from various local authorities and organizations select

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<sup>55</sup> MACO 2010/2011 FISP Implementation Manual.

beneficiaries according to the above criteria. A full FSPP pack consisting of inputs for the cultivation of 0.25 hectares of each of the following: one cereal grain (maize, millet, rice or sorghum), one legume (peanuts, beans, cowpeas or soybeans), and one tuber (cassava or sweet potato).

The pack also includes fertilizer for beneficiaries cultivating maize and may include agricultural lime for beneficiaries in areas affected by soil acidity. The range of crops cultivated under the FSPP is more diverse than that of the FISP and the FSPP has been lauded as the only government program with a crop diversification component targeting needy households.

Unlike the FISP, the FSPP requires repayment in kind by the beneficiaries. According to an MCDSS report, a beneficiary who received one 50kg bag each of basal and top dressing fertilizer and 5kg of maize seed was expected to repay 60kg of maize grain after the harvest, the value of which would equal roughly 20 percent of the cost of inputs.

The FSPP was designed to target 20 percent of the viable but vulnerable small-scale farmers identified by the program in all 72 districts of Zambia. This translated to a target of 200,000 beneficiaries in the first five years, as shown in Table F2, below.

**Table F2: Benefits and Beneficiaries of FSPP**

Season	Budget (ZMK Billion)	Targeted Beneficiaries	Actual spending (ZMK Billion)	New beneficiaries	Total Beneficiaries
2000/01	32	200,000	32	60,000	
2001/02	32	200,000	4	83,902	135,000
2002/03	58	200,000	26	70,141	136,500
2003/04	89	200,000	43	89,859	165,000
2004/05	32	200,000	9	15,123	15,123
2005/06	32	150,000	21	34,942	34,942
2006/07	58	150,000	10	27,641	27,641
2007/08	10	150,000	10	26,843	26,843
2008/09	10	150,000	10	8,804	10,915
2009/10	10	150,000	10	21,500	32,231
2010/11	15		9	11,400	11,400

*Source: MCDSS*

However, due to funding constraints the program never managed to reach 200,000 in any single year of its first five years of operation. Furthermore, the number of beneficiaries fell drastically after its peak in 2003/04. The inadequate funding and unrealistically high beneficiary targets set by the government frequently resulted in the provision of incomplete packs and/or the splitting of packs between farmers. For instance, between 2001 and 2004 beneficiaries received incomplete packs consisting of 0.25 hectares worth of maize seed, 0.125 hectares of legumes and 0.03125 hectares of tubers. For the 2004/2005 season, the input pack size was increased to cover 0.5 hectares of cereal instead of the standard 0.25.

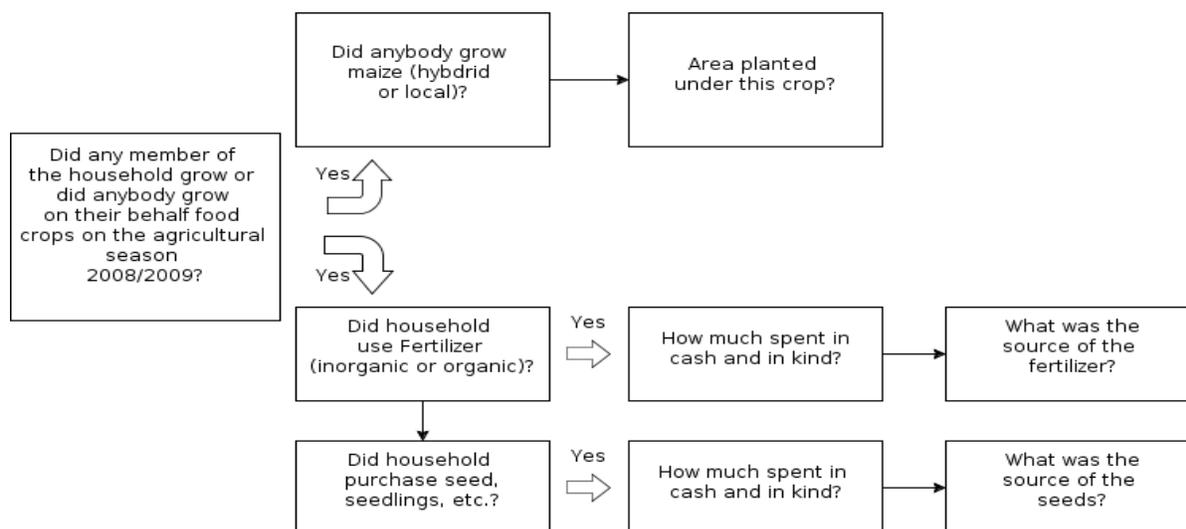
One notable difference between the FSPP and FISP programs is that the former has been able to graduate significant numbers of beneficiaries. Since the 2005/2006 agricultural season the FSPP pack has been largely provided to new beneficiaries only.

### The Allocation of Fertilizer Subsidies

The agricultural information section of the LCMS asked if any member of the household grew food crops (or had someone grow them on their behalf) during the 2008/2009 agricultural period. If they responded positively, the survey asked about the type of crops and the total area under cultivation. Given the characteristics of the FISP and FSPP programs, we focus on households that reported growing maize, or about 45.5 percent of respondents.

The survey also asked the same group of households about their use of various production inputs during the 2008/2009 agricultural period as well as their associated expenses. Among the inputs, the survey asked if the households used fertilizer (organic or inorganic) or purchased seeds, seedlings, or other supplies. If a household reported such expenses, the survey asked how much the household spent in cash (or in kind) and the source of the input (including those publicly provided). Figure F1 shows the sequence of the questions.

**Figure F1: Fertilizer-Use and Input-Purchase Data Flow**



Source: Authors

Ideally, in order to identify the beneficiaries of FISP and the FSPP, the LCMS VI should have included information about which households were participants in each of these programs, the amount of fertilizer and seeds they received from the programs, and the amount they paid in cash or in kind for these inputs. However, the data available are far less comprehensive and a complete reconstruction of participation in and benefits received from these programs is not possible. Table F3 summarizes the operational assumptions that were made.

**Table F3: Fertilizer Data**

	<b>Problems</b>	<b>Solutions/Assumptions</b>
1	The survey asks if a household received inputs from the government or a cooperative, but it does not ask if they were received through the FISP or FSPP program, or if the household participated in these programs.	<p><b>Main Assumption:</b> A household is considered a participant of the FISP or FSPP in the period 2008/2009 if it did all of the following:</p> <ul style="list-style-type: none"> <li>• Grew maize.</li> <li>• Used fertilizer and/or purchased seeds.</li> <li>• Obtained seeds and fertilizer from the government or from a cooperative.</li> </ul>
2	Related to the previous problem, we cannot differentiate households that received benefits from FSPP from those that benefitted from FISP.	<p><b>Main Assumption:</b> Given that households which benefitted from FSP received a smaller package than FISP participants, and that FSPP is targeted to household that grow on smaller areas, scenario 2 described below, partially accounts for this problem.</p>
3	The survey does not allow respondents to record more than one source of fertilizer and seeds.	<p><b>Main Assumption:</b> We assume that the household only received fertilizer and seeds from the government if it reported doing so. All expenditures associated to these inputs were recorded as paid to the government.</p>
4	The survey does not specify the amount of fertilizer and/or seeds that households received from the government or cooperatives.	<p><b>Main assumption for Scenario 1:</b> All households received one full FISP package of seeds and fertilizer.</p> <p><b>Main assumption for Scenario 2:</b> All households with more than 1 hectare of maize received one full FISP package. Households with less than 1 hectare received a proportional amount.</p>
5	Some households reportedly received fertilizer and seeds, but the reported expenditure is too high with respect to the area cultivated and the cost of a FISP package (2.1% of beneficiaries).	<p>We eliminate “outlier” expenditure values from the sample. An outlier is defined as a value outside of the range formed by the mean +/- three times the standard deviation of the expenditure variable (54 cases).</p>

Source: Authors

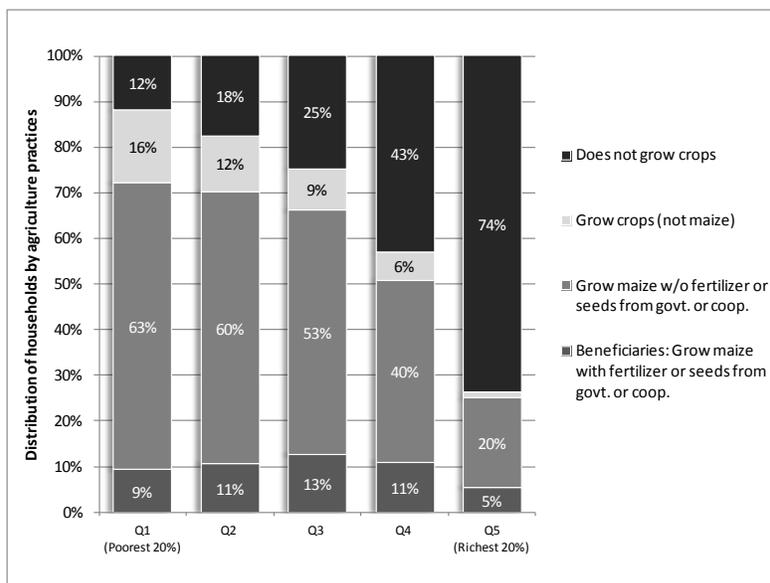
**Beneficiaries of Fertilizer Subsidies**

Beneficiaries of the FISP and FSPP programs—that is, households that cultivate maize using fertilizers and/or seeds provided by the government or agricultural cooperatives—almost evenly distributed across the first four quintiles, with around one in ten agricultural households from each quintile participating in government maize programs. FISP/FSPP participation decreases sharply to just one in twenty for the richest quintile. However, as consumption levels increase the share of agricultural households producing maize decreases markedly (see Figure 12). 72 percent of the poorest respondents identified as maize producers, while only 25 percent of respondents in the richest quintile grew maize.

Consequently, as a share of *maize producers*, respondents in the richest quintile are in fact significantly more likely to receive government support than respondents in the poorest.

This disparity is even more pronounced for all respondents who identified as farmers, whether or not they produced maize. 88 percent of respondents in the poorest quintile engaged in agriculture, while only 26 percent of the richest quintile did. Since 9 percent of the poorest and 5 percent of the richest received FISP/FSPP support, farmers in the richest quintile were almost twice as likely to participate in government maize programs as were farmers in the poorest quintile.

**Figure F2: Distribution of Agricultural Practices among Farming Households**



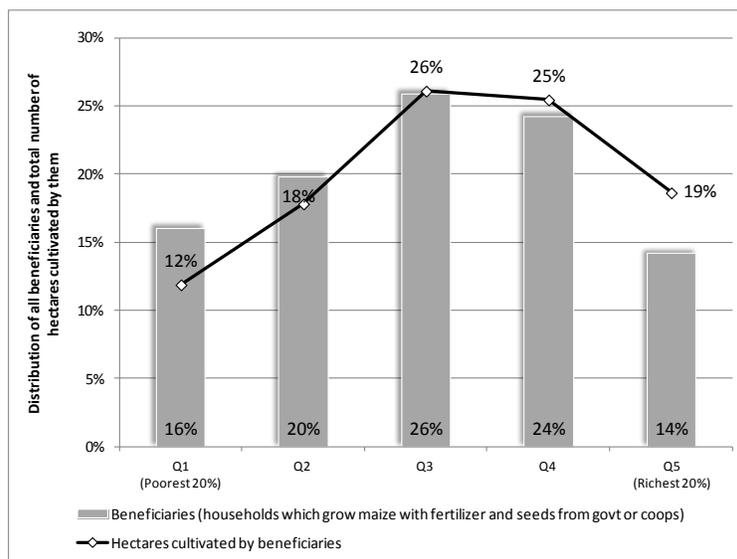
Source: LCMS VI

The area cultivated by the farmer is relevant at the time of distributing benefits since, by regulation, to qualify for public subsidies cultivated plots must be at least one hectare in size. The average area cultivated per beneficiary increases with consumption levels from an average of 1.01 hectares among producers of the bottom quintile to 1.8 hectares for producers in the top quintile.<sup>56</sup>

In addition, when looking at the aggregate distribution of land cultivated for maize, Figure 13 shows that producers belonging to the richest quintile cultivated 14 percent of the total maize hectares using inputs from the program. Producers in the poorest quintile cultivated a very similar share of that type of land, 16 percent. This again calls into question the targeting of the program, which does not seem to concentrate on the most vulnerable producers but rather focuses on producers in the middle quintiles, as they represent the lion’s share of maize production in Zambia.

<sup>56</sup> The average area cultivated for maize with inputs from government programs for the second to fourth quintiles were 1.23, 1.39 and 1.43 hectares, respectively. Average cultivated areas for maize (with or without inputs from public programs) are: 1.05, 1.02, 1.15, 1.39 and 2.17 hectares respectively. Source: Authors’ estimates from LCMS VI.

**Figure F3: Distribution of Maize-Growing Households Benefiting from Public Programs and Number of Hectares Cultivated**



Source: LCMS VI

### The Fertilizer Subsidy Program<sup>57</sup>

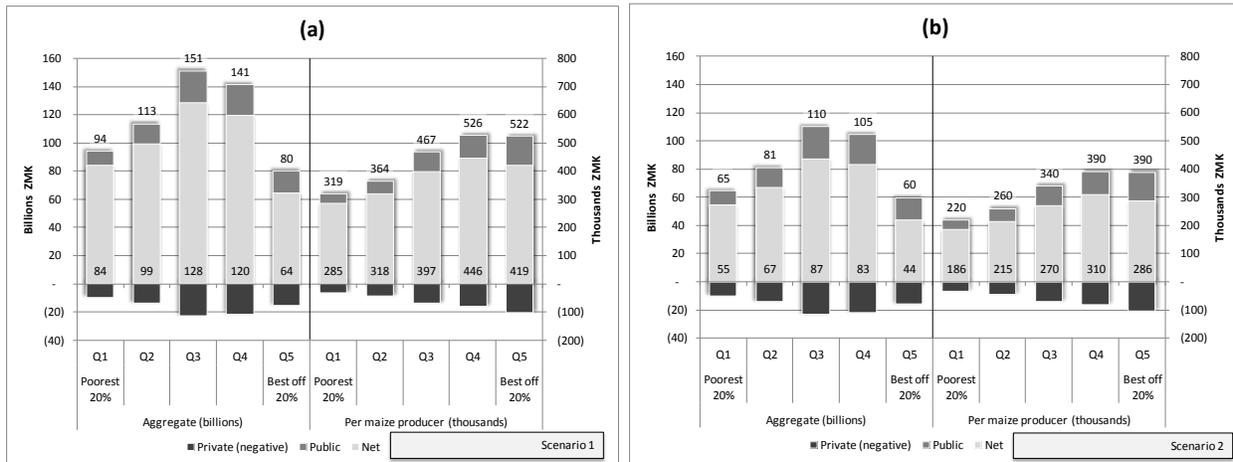
The World Bank (2010) estimates the cost per complete FISP package for the 2008/2009 season at ZMK 2,460,000 (US\$639) based on the official program budget. Under scenario 1, each beneficiary household is assumed to have received a full package with a value equivalent to that amount; under scenario 2, households that cultivated 1 hectare or more received a full package, while those which planted a fraction of a hectare received a proportional package.<sup>58</sup> Total costs incurred by the household are assumed to be as reported in the survey.<sup>59</sup> The results of the BIA can be observed in Figures F4a and F4b.

<sup>57</sup> It is worth emphasizing again that household data do not allow distinguishing if households are receiving fertilizers and/or seeds from FISP or FSP. By assuming that households reporting benefits from the program receive fertilizer, we are assuming that they are beneficiaries of the FISP program. As we also assume in Scenario 1 that they receive the full package, we may be overestimating the true impact of the FISP. However, the FISP is a much larger program than the FSPP (see Tables 5 and 6), for which the assumption of all FISP beneficiaries is reasonable.

<sup>58</sup> For example, we assume that households that planted 0.5 hectare received half a package, while those that planted 0.25 ha received a quarter of a package. Sampling data from World Bank (2010) indicate that 28 percent of beneficiaries grew less than 1 hectare even after receiving the full package and 4.5% grew more than 5 ha. The World Bank (2010) states that “many farmers reported that they requested less than a full input pack and/or engaged in sharing of inputs with neighbors because they could not afford a full pack.”

<sup>59</sup> According to the World Bank (2010) the government provided a subsidy of around 70-80 percent of the official cost of the package to farmers during the 2008/2009 period.

**Figures F4a and F4b: Fertilizer Subsidy Gross and Unitary Benefits**



Source: LCMS VI, WB(2010)

### Conclusion

Zambia’s agricultural input support programs suffer from serious targeting problems. Although the distribution of beneficiaries initially appears to be highly progressive, it is crucial to realize that these programs are designed on paper to benefit the poorest agricultural producers. In relative terms, it becomes clear that these programs are significantly more likely to benefit wealthy farmers than poor farmers, which they reach at a rate of almost two-to-one. Moreover, participant contributions are made on a fixed-cost basis, which is inherently advantageous to wealthier participants. An effective strategy for enhancing the targeting of agricultural-subsidy programs must utilize some form of means-testing, either as a participant criterion or a method to scale contributions, or both. Without better-designed and more conscientiously implemented targeting mechanisms, public spending on health, education and fertilizers will not be able to further the government’s larger objectives for pro-poor and progressive development policy.

As shown in the left hand sides of Figures X8a and X8b, which present the aggregate results, the total benefits of the program are concentrated in the middle quintiles, especially the third and fourth quintiles. This remains the case even when the offsetting effect of private contributions is included. In addition, the distribution of benefits per farmer is regressive. Under both scenarios, maize producers from the poorest quintiles receive a smaller average net transfer than wealthier maize producers. This is largely explained by the fact that participation is regressive, i.e. the share of farmers receiving agricultural inputs from the government increases with consumption level, yet participant contributions do not increase proportionally, as it is the case with fixed statutory benefits and contributions not related to farm size.

The benefits of agricultural-input subsidy programs follow a somewhat progressive pattern but clearly suffer from targeting problems. For each beneficiary in the top quintile there are almost two

beneficiaries in the poorest quintile, but the distribution is far from progressive across all income groups. On an aggregate basis, the results show that despite their intended targeting of very poor and economically vulnerable farmers, the largest benefit shares accrue to farmers in the middle-income quintiles. Moreover, in unitary terms the distribution is regressive, with farmers in the second-richest quintile benefitting slightly more than those in the richest and significantly more than farmers in all other income groups.