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Reducing poverty in Africa

Realistic targets for the post-2015 MDGs and Agenda 2063

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Summary

The eradication of extreme poverty is a key component of the post-2015 MDG process and the African Union's Agenda 2063. This paper uses the International Futures forecasting system to explore this goal and finds that many African states are unlikely to make this target by 2030. In addition to the use of country-level targets, this paper argues in favour of a goal that would see Africa as a whole reducing extreme poverty to below 20% by 2030 (15% using 2011 purchasing power parity), and to below 3% by 2063.

IN 1990 THE INTERNATIONAL community agreed to halve the rate of extreme poverty by 2015. Specifically, target 1.A in the Millennium Development Goals (MDGs) called for cutting in half 'the proportion of people whose income is less than [US]$1,25 a day'[1] – the widely recognised definition of 'extreme' poverty. This target was met in 2010, five years ahead of the deadline, largely (but not exclusively) through the remarkable progress made in China.[2] Although 700 million fewer people lived in extreme poverty, the UN estimated that 1,2 billion people still lived on less than US$1,25 a day in 2013, although more recent recalculations could see that figure reduced by about one-quarter.[3]

As part of the process leading up to the finalisation of the post-2015 MDGs, attention has now turned to defining suitable targets for 2030, with the proposed goal of 'leaving no-one behind' and eliminating (extreme) poverty. The international community, including organisations such as the World Bank, appear to be coalescing around an ambitious goal to bring extreme poverty to below 3% and boost incomes for the bottom 40% of the population *in every country* by 2030 (emphasis added).[4]

Parallel to the post-2015 MDG process, the African Union (AU) launched its Agenda 2063 in 2013 as a 'call for action to all segments of African society to work together to build a prosperous and united Africa'.[5] Agenda 2063 purposefully looks much further ahead, to a date 100 years from the establishment of the Organization of African Unity (OAU) in 1963. In doing so, the AU (the successor to the OAU) admits that '[f]ifty years is, undoubtedly, an extremely long development planning horizon'[6] and notes that it will be rolling out plans for 10 and 25 years, and include various short-term action plans. After the scheduled adoption of the specifics of Agenda 2063 at the mid-year AU Summit in June 2014, the first 10-year implementation plan is scheduled for approval in January 2015 and will be accompanied by a comprehensive monitoring and evaluation framework.[7]

In many senses Agenda 2063 is rooted in a different development philosophy than that of the MDGs, finding its inspiration in the Lagos Plan of Action, the Abuja Treaty and the New Partnership for Africa's Development (NEPAD). It reflects an ambitious effort by Africans to accept greater ownership and chart a new direction for the future that has inclusive growth and the elimination of extreme

poverty as key components. In private conversations, NEPAD officials consider the MDGs as setting a minimum 'floor' (particularly for the elimination of poverty), with Agenda 2063 a more ambitious and aspirational vision.

It is essential that both the MDG 2030 and Agenda 2063 processes succeed if the world is to sustain the momentum of the past 20 years in the face of serious global uncertainty. A focus on Africa is essential to this mission, because the degree and severity of poverty in many African countries are among the most significant on the planet. Other regions have made progress in the last 20 years due to a benign global context and sustained high levels of national growth in key countries such as China. It is far less certain that African countries will enjoy a similar favourable economic climate, that the collective economies of the continent's 55 countries can sustain the same levels of growth year on year, or that growth will translate into the same degree of poverty reduction.

The authors have used the International Futures (IFs) forecasting system (version 7,05) to analyse the prospects for poverty reduction in Africa up to 2063. The IFs base case forecast suggests that even though African countries should see steady improvements, the majority will fail to meet the 3% extreme poverty goal by 2030 if current dynamics remain unchanged. After explaining our approach, modelling the same within IFs and comparing the results with others, we conclude that this extreme poverty target is not a reasonable goal for many African states, and that it is insensitive to the varying initial conditions African countries face. Setting aggressive targets is an admirable goal, but these targets need to be reasonable and achievable.

We therefore argue in favour of setting a goal that would see African states on average reducing extreme poverty (income below US$1,25) to below 10% by 2045, and reducing extreme poverty to below 3% by 2063. By 2030, African countries are likely to be at very different levels in terms of extreme poverty. Because of these significant country-level differences, and the different policy measures needed to effectively reduce poverty in different country contexts, we further recommend that the AU consider setting additional country-level targets to meet the specific needs of member countries. In particular, we advocate paying attention to chronic poverty (defined as income below US$0,70), since the majority of extremely poor Africans in sub-Saharan Africa find themselves significantly below even the US$1,25 level.

> This goal would see African states reducing extreme poverty to below 10% by 2045, and 3% by 2063

Background and measurement

Research continues to struggle with definitional and measurement questions that confound attempts to assess the dynamics of poverty and inequality. Developments over the last decade, including improvements in national data and the adoption of standard definitions, have eased but not eliminated these burdens. This is particularly true for Africa, where data limitations remain significant and affect accurate estimates of current trends. The recent rebasing of the Nigerian economy (now formally acknowledged as the largest in Africa), which saw an increase in the size of its gross domestic product (GDP) by 89%, illustrates the challenges in using current data for forecasts.[8]

INCOME BELOW

$1,25

BELOW 20% BY 2030
BELOW 10% BY 2045
BELOW 3% BY 2063

In April 2014 the International Comparison Program (ICP) at the World Bank released the summary results from its revised estimates that produce internationally comparable price and volume measures for GDP and its component expenditures.[9] The measures are based on purchasing power parity (PPP), now using 2011 as reference year. The results have had a profound impact on estimates of global poverty, including for Africa. Previous GDP estimates were based on 2005 as reference year. The Center for Global Development (CGP) and the Brookings Institution, using different methodologies, were among the first organisations to release new poverty estimates. These new estimates and their potential impact on our forecasts are discussed below (see section headed 'World Bank PPP calculations'). Elsewhere we retain the use of the 2005 economic data.

Estimates of poverty are based on two pieces of information: the average level of income or (better) consumption in a country, and the distribution of the population around that mean. The former can be estimated on the basis of reported income or consumption from data acquired through either national accounts or surveys. Survey estimates of income and consumption tend to yield lower estimates than do national accounts data. There is little consensus on which basis is superior. As a result, initial estimates of poverty may vary widely. IFs bases its estimates of poverty on survey data drawn from the PovcalNet data hosted by the World Bank, adjusting the model's own national accounts-based estimates to match estimates produced by the survey methodologies. These estimates form the initialisation point for our forecasts of poverty, which are driven by the model's forecasts of change in national accounts and distribution of income. Although the model currently initialises from 2010 data, we have chosen to use 2013 as a first marker for the forecasts set out below, given that that year is the Agenda 2063 start date. As a result, all our values for 2013 are estimates drawn from the model (rooted in the PovcalNet survey data) rather than taken directly from the data of international organisations.

Estimates of poverty are commonly expressed as the percentage of a population below a certain standard of living, typically US$1,25 per day at 2005 PPP. This measure is attractive because it allows for cross-country comparisons. Using other general or nation-specific poverty lines may be more relevant for discussing poverty within countries, since these can take into account local levels of income. For example, as large numbers of people in China and India begin to escape poverty, alternative poverty lines are gaining popularity. These include US$2 and even US$5 a day. Other lines have been developed to capture those who have moved out of poverty but could still fall back into it, and for certain regions of the world.[10]

Extreme and chronic poverty are both reasonable concepts to frame discussions of poverty in the poorest country contexts. The former is useful because it is widely understood and used in poverty literature, while the latter captures concepts that are particularly relevant to the African context.

While many people in low-income countries may be poor, only some are affected by overlapping, dynamic challenges that prevent them from escaping poverty even in times of economic growth. Those who remain poor over long periods of time and who frequently transmit poverty between generations are termed 'chronically poor'.[11] Evidence suggests that even as countries are making progress in reducing overall poverty rates, significant numbers of people still qualify as chronically poor.[12] We return to this distinction later in this paper.

The Chronic Poverty Research Center (CPRC) uses severe poverty as a proxy for chronic poverty in the absence of better measures. This paper does so as well, both to maintain consistency with the chronic poverty framework described below and because the US$0,70 line remains particularly relevant when discussing the poor in sub-Saharan Africa. The line of US$0,70 a day, also referred to as severe poverty, is relevant as it represents the average consumption of poor people (those in the bottom decile) on the continent.[13] However, severe poverty most likely understates the extent of chronic poverty because the chronically poor exist both at higher income levels and below the severe poverty line.[14] For this reason it is important not to overemphasise the role of severe poverty in Africa. Chronic poverty may exist across consumption levels, and it is the conceptual attraction of a framework that emphasises national policy efforts to reduce poverty that drives our use of it in this paper.

Just as there are many uncertainties and definitional issues surrounding poverty, similar challenges exist in discussions of inequality. There is a variety of ways to measure income inequality within a population. One of the most frequently used is the Gini index, which expresses the inequality of income distribution from 0 to 1, with 0 corresponding to complete equality and 1 to complete inequality. The strength of this measure is that it is easy to understand: higher values indicate increasing levels of inequality within a population. Unfortunately, the measure is relatively insensitive to the specifics of how income is distributed within a population. This means that multiple income distributions may produce the same overall Gini coefficient. (Other measures of inequality, such as the

Atkinson and Theil indices, are better able to express where inequality exists within a population but have less intuitive interpretations.) Another strength of the Gini index is that it can be used in log-normal representations of income as the standard deviation of the distribution, as it is used within IFs.

Conceptual variety is another issue encountered when discussing the dynamics of poverty globally. When one looks at the difference between extreme poverty, severe poverty, chronic poverty and poverty vulnerability, it is important to bear in mind that, while there is overlap among these terms, each captures a slightly different facet of poverty. Each of these indicators may thus have a different relevance in different settings.

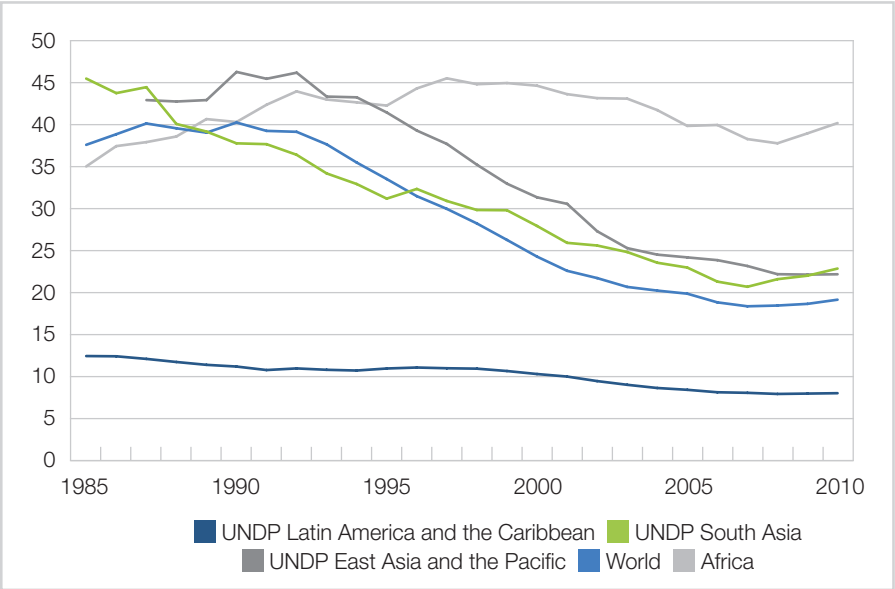
In the following section we discuss the drivers of poverty that have been identified in literature and that form the conceptual frame for this analysis.

Current levels of poverty in Africa

The world has achieved tremendous declines in poverty in recent decades. This progress has occurred unevenly, with China and the rest of East Asia experiencing declines in excess of two percentage points a year.[15] India and the rest of South Asia have also made progress, with poverty rates declining at a rate of approximately one percentage point a year. Latin America and Africa have done least well in the last 20 years, with rates of absolute poverty declining quite slowly if at all (see Figure 1). Latin America and Africa have, on average, experienced slower rates of economic growth and shown higher levels of inequality than other regions.

The IFs base case estimate (using the data and thresholds that predate the ICP revision to 2011 as reference year) is that, in 2013, about 14,7% of the world's population (1,04 billion people) still lived below the threshold for extreme poverty, of which 33% (400 million people) lived in Africa. This makes Africa the region with the second largest number of people living in absolute poverty and with the highest rate of poverty as a percentage of its population.[16] While South Asia had more people living in absolute poverty,

Figure 1: Percentage of population in extreme poverty (<US$1,25 a day PPP, 15-year moving average)



Source: International Futures version 7,05

when adjusted for population size the burden of poverty in Africa is more severe than in South Asia.[17] While 36,3% of the population in Africa live on less than US$1,25 a day, about 24,2% do so in South Asia.

If we consider the line for severe poverty (US$0,70 a day), about 207 million Africans live below it, constituting on average half of those living in extreme poverty. This is significant because it implies that the extreme poverty gap in Africa is large (that is, many live far below US$1,25), making it harder to achieve reductions in extreme poverty. Additionally, based on the CPRC's use of US$0,70 as a proxy for chronic poverty, it means that a large proportion of the poor in Africa are likely to be chronically poor.

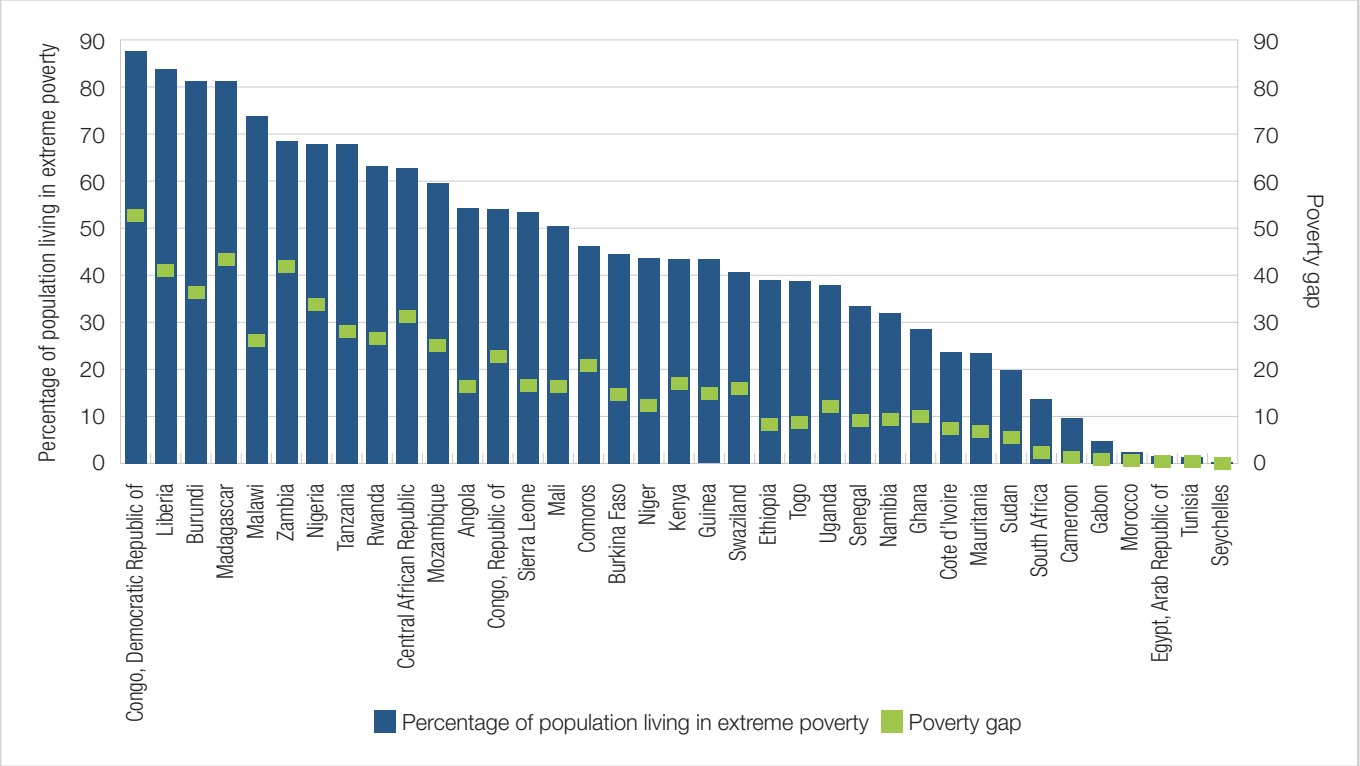
While the continental picture may appear bleak, some countries have already met the World Bank target. These include all the North African countries, as well as Gabon, Mauritius and the Seychelles. In general, however, countries in sub-Saharan Africa have not fared as well. This is not always because of a lack of growth. Some countries (such as the extreme case of Equatorial Guinea, but also a country such as Botswana) have experienced very rapid rates of growth, but have been unable to efficiently translate growth into poverty reduction. On the other hand, Cameroon, Egypt, Ghana, Kenya, Mali, Mauritania, Senegal, Swaziland, Tunisia and Uganda have all been relatively efficient in transmitting income growth into poverty reduction.[18]

In percentage terms, the highest concentrations of severe poverty (<US$0,7 a day) are located in Madagascar, the Democratic Republic of the Congo (DRC), Liberia, Burundi, Malawi, the Central African Republic (CAR), Zimbabwe, Zambia, Rwanda and Somalia. The highest concentrations of extreme poverty (<US$1,25 a day) as percentage of the population are in the DRC, Liberia, Burundi, Madagascar, Malawi, Zambia, Zimbabwe, the CAR, Somalia, Rwanda and Tanzania.

The 10 countries with the largest populations of severely poor are Nigeria, the DRC, Madagascar, Tanzania, Kenya, Malawi, Mozambique, Zimbabwe, Zambia and Ethiopia. In terms of absolute numbers living in extreme poverty (<US$1,25 a day), Nigeria, the DRC, Tanzania, Ethiopia, Madagascar, Kenya, Mozambique, Uganda and Malawi all have populations of greater than 10 million living in extreme poverty, with a total of 278 million in these nine countries alone.

African countries vary widely in the extent and depth of extreme poverty and the degree of income inequality.

Figure 2: Poverty rate <US$1,25 a day, poverty gap, and ratio of income share held by 90th percentile to income share held by 10th percentile (most recent data, variable years)[19]



Source: World Bank, PovCalNet database, International Futures v. 7,05, Tableau Public version 8,1

The percentage of the population living in extreme poverty ranges from 0,3% to 87,7%. Poverty gaps across the continent are generally high, although they vary widely as well.[20] The income share held by the top-earning decile of the population is between 6,7 and 60,6 times greater than the income share held by the bottom-earning decile, with a mean of 17, which is near the global average.[21] Measures of inequality based on the Gini index taken from IFs show levels of income inequality that are lower than in Latin America, but still remain slightly above other world regions despite the rise in inequality in East Asia over the past decade.[22]

> Countries such as the DRC and Madagascar have high levels of extreme poverty and large poverty gaps, but exhibit relatively low levels of income inequality

Although higher poverty gaps are usually associated with higher percentages of the population in poverty, there are significant variations from this pattern. For instance, countries such as the DRC and Madagascar have high levels of extreme poverty and large poverty gaps, but exhibit relatively low levels of income inequality. By contrast, countries such as Zambia and the CAR display relatively high levels of income inequality and a large poverty gap.

How much progress against poverty is likely?

In order to assess the likelihood of countries making the World Bank's target, we first consider the IFs base case forecast, which is best understood as a reasonable dynamic approximation of current patterns and trends.[23] Using IFs, it is possible not only to estimate the extent of global poverty but also to forecast changes in poverty. IFs is a structure-based, agent-class driven, dynamic modelling tool. With a database of nearly 2 700 historical data series, it incorporates and links standard modelling approaches across a wide variety of disciplines, including population, economics, education, politics, agriculture and the environment. In terms of poverty modelling, IFs forecasts of poverty are driven by the assumption of a log-normal distribution of income around an average level of consumption per capita and estimates of the Gini coefficient. Consumption is driven by income, which is in turn a function of labour, production capital accumulation and productivity. Changes in the key productivity term are driven by human (e.g. education and health), social (e.g. governance quality), physical (e.g. infrastructure) and knowledge capital (e.g. that provided by high levels of trade).[24] The model generates a compound annual growth rate of GDP between 2013 and 2050 of 5,8% and a growth rate for household consumption of 6,0% (both fairly aggressive figures).

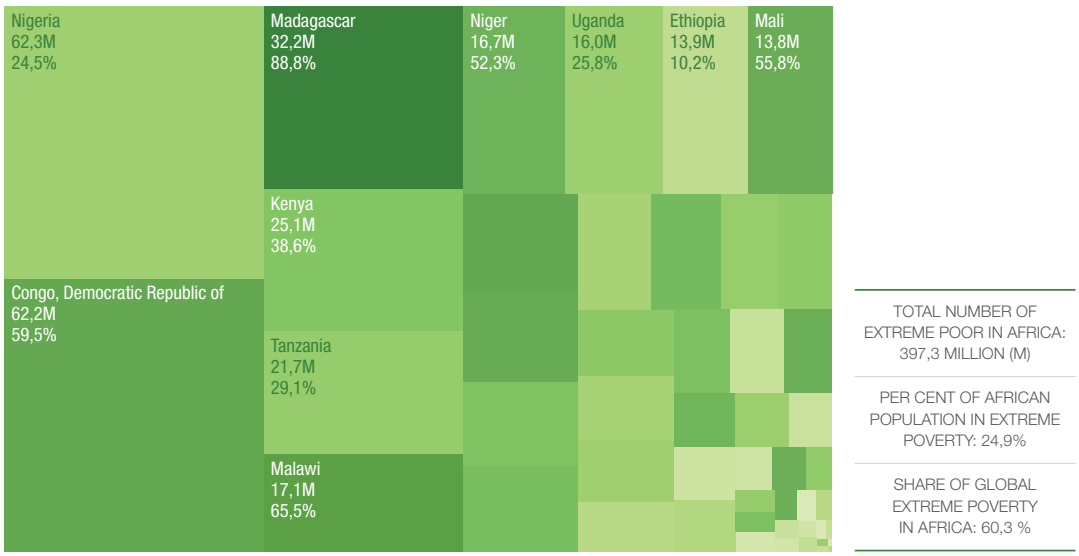
Figures 3, 4 and 5 provide a proportional visual representation of the number of people in Africa forecast to be extremely poor in 2030, 2045 and 2063, with darker colours reflecting higher percentages of the population living in extreme poverty and lighter colours smaller percentages.[25] The overall plot size for each figure is scaled to the number of people living in extreme poverty in each country. The number of people in extreme poverty in each country determines the size of each box.

Ten African nations in our base case forecast are likely to meet the World Bank target of less than 3% of their people living below US$1,25 a day by 2030 without additional support or policy interventions. Of these, only two have not already done so. A number of other countries are likely to get close to meeting the target, with less than 10% of their populations living below US$1,25 a day by 2030.[29] Overall, however, 24,9% of Africa's population, or 397,3 million people, may still live under the US$1,25-a-day line by 2030.

Even though many countries make progress in reducing poverty in percentage terms (and the rate for the continent could fall to 16,6% by 2045), in many instances this still translates into increases in the absolute number of people living in poverty over the intermediate horizon of 2030 and 2045. These are countries that have high population growth rates due to high total fertility rates. In most cases, however, population growth will have dropped off by 2063 and the remainder of African states will have begun to make progress in reducing the absolute number of people living in poverty, as well as the percentage of the population living in poverty.

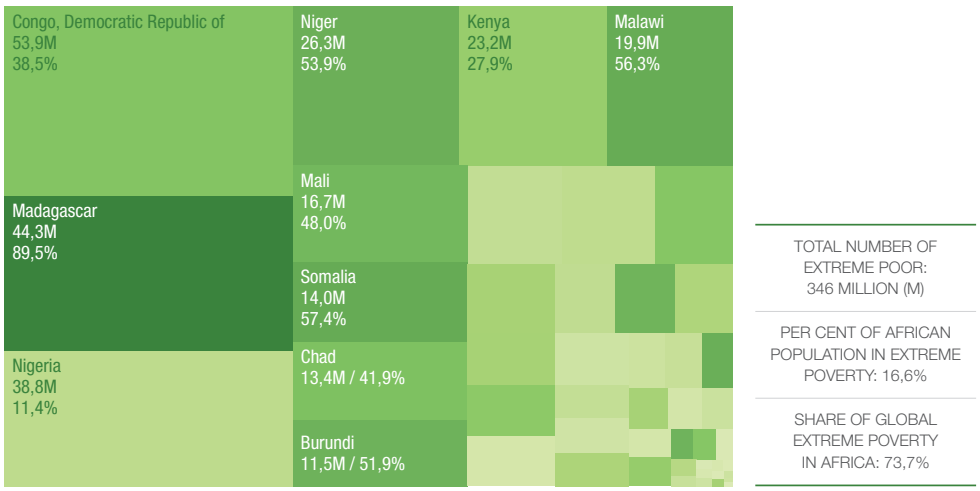
By 2063, if current trends continue, most countries in Africa should have made significant progress on poverty alleviation. At a continental level, the forecast extreme poverty rate is expected to have declined considerably, but still hovers around 10,0% of the population. This means that over 309,5 million Africans may remain in extreme poverty. About 29 million people (1,4% of the population) are likely to remain in severe poverty (see Tables 2 and 3 for numbers). Our forecast suggests that as most countries make progress against severe and extreme poverty, these individuals will increasingly be concentrated in a handful of countries. By 2030, 70,7% of the burden of extreme poverty on the continent is likely to be concentrated in just 10 countries (see Figure 3). By 2063 this will have increased to 75,7% (see Figure 5).

Figure 3: 2030 area diagram – population and per cent of population in extreme poverty in Africa[26]



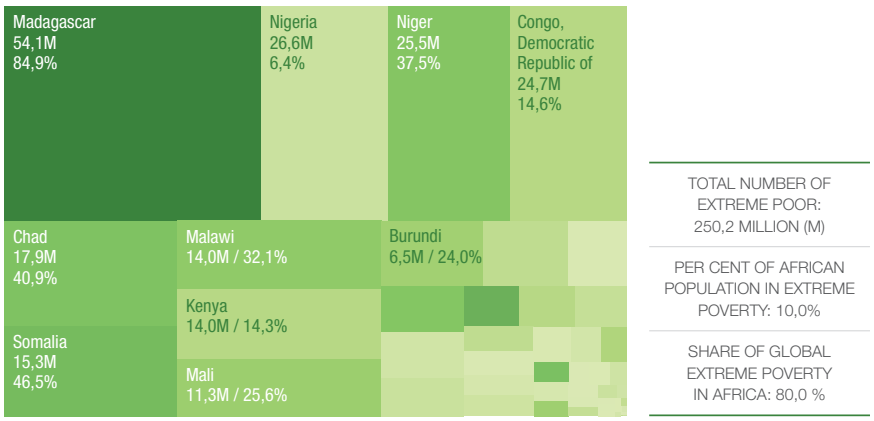
Source: International Futures version 7,05, Tableau Public version 8,1

Figure 4: 2045 area diagram – population and per cent of population in extreme poverty in Africa[27]



Source: International Futures version 7,05, Tableau Public version 8,1

Figure 5: 2063 area diagram – population and per cent of population in extreme poverty in Africa[28]



Source: International Futures version 7,05, Tableau Public version 8,1

Drivers of change in poverty

The drivers of change in poverty can be framed in a number of ways. At a macroeconomic level there are two proximate drivers of poverty rate reduction: economic growth and reductions in inequality. Economic growth, if relatively evenly distributed across a society, tends to raise individual income, drawing people out of poverty.[30] Distribution-neutral economic growth will thus reduce the percentage of people living in poverty, although the absolute numbers may remain constant or even grow. Similarly, reductions in inequality over time have a significant impact on poverty.[31]

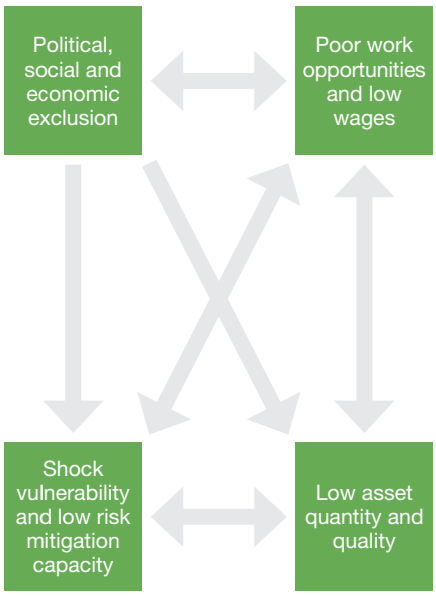
Economic growth in Asia, and China in particular, has driven much of the remarkable reductions in poverty over the last decade. China has reduced its extreme poverty rate from over 60% in 1990 to less than 10% in 2010 (even with a substantial deterioration in income distribution). This translates to 566 million fewer people living in extreme poverty in 2010 than in 1990.[32] No other country has come close to achieving a similar rate of progress on poverty, raising questions about other countries' chances of achieving similar gains.

Distributional patterns can, of course, mediate the impact of growth. High initial levels of inequality can form a significant barrier to both reductions in poverty (in part because they can increase poverty gaps) and future growth rates (in part because they undercut social consensus), and reductions in inequality can increase the effect that economic growth has on poverty reduction.[33] While growth is shown to help in poverty reduction, the strength of this relationship varies widely across countries.[34] Some of the significant differences in poverty reduction in countries such as Botswana, which saw very high growth rates but relatively modest levels of poverty reduction, and Ghana, which experienced much more modest growth but relatively more poverty reduction, are partly attributable to differences in initial income distribution.[35] Analysis by Fosu, and a separate analysis by Ali and Thorbecke, suggests that income distribution may be an important component of efforts to reduce poverty in sub-Saharan Africa.[36] Globally, sub-Saharan Africa is second only to Latin America and the Caribbean in having a high average Gini coefficient. All other regions have substantially lower levels of inequality. This implies that the impact of economic growth may be muted in Africa, raising the relative importance of redistributive growth policies for poverty reduction.

Microeconomic work is useful as an additional frame from which to consider the dynamics of poverty and the ways in which national policy choices can support the poor.[37] While work in this area is on-going, one useful construct emphasises the ways in which individuals and households move into and out of severe poverty as a result of life events that harm a person's ability to earn income and accumulate assets. In this framework, poverty is a condition that people may move into and out of multiple times during their lifetimes, and national or subnational policies may have significant impacts on these processes. We noted previously that those who remain poor over long periods of time and who frequently transmit poverty between generations are termed 'chronically poor'.[38] Significantly, as many African states begin to see accelerated growth (which can support permanent escapes from poverty for many people), those who are left behind will suffer increasingly from the kinds of dynamic, integrated challenges emphasised in the chronic poverty literature.[39]

The CPRC has produced important work on the dynamics of poverty, focusing on

Figure 6: Simplified model of the interactions that drive and sustain chronic poverty[44]



Source: Authors' synthesis based on Andrew Shepherd et al., *The geography of poverty, disasters and climate extremes in 2030*, London: Overseas Development Institute, 2013, http://www.odi.org.uk/sites/odi.org.uk/files/odi-assets/publications-opinion-files/8637.pdf; Andrew Shepherd, *Tackling chronic poverty: the policy implications of research on chronic poverty and poverty dynamics*, London: Chronic Poverty Research Centre, 2011

those factors that condemn people to poverty and the interventions that could allow them to escape this condition. Its studies identify five primary, frequently overlapping, chronic poverty traps: insecurity and poor health, limited citizenship, spatial disadvantage, social discrimination, and poor work opportunities.[40] The chronically poor are distinguished by three primary features that differentiate them from other people living in poverty: they typically have a small number of assets, low returns to these assets, and high vulnerability to external shocks.[41]

The reasons for these circumstances are manifold and interlinked. This high vulnerability, low resource state is driven by the exclusion of the chronically poor from the political, social and economic systems that might allow them to begin to acquire assets. This exclusion makes them more vulnerable to shocks, while their low starting asset/capability position leaves them few resources with which to respond to shocks. The occurrence of shocks can erode assets and wage income, and worsen exclusion from systems of social protection. Figure 6 provides a schematic representation of the approach to understanding chronic poverty developed by the CPRC that we adopted for the purposes of this paper.

The most recent report on chronic poverty by the Overseas Development Institute (ODI) lays out a road map to reducing the number of chronically poor people – ensuring quality basic education, providing social assistance and including the marginalised in the economy on equitable terms.[42] Preventing impoverishment requires policymakers and practitioners to develop and stick to appropriate policy frameworks. A sustained escape from chronic poverty means that governments (and others) need to provide quality and market-relevant education, offer basic health care, promote insurance programmes to bolster resilience, and work to reduce conflict and mitigate environmental disaster risks.[43]

While earlier literature emphasised the need to help the poor accumulate assets, improve the returns on those assets, and develop resilience to exogenous shocks, more recent literature from both the IMF and the CPRC emphasise not only these challenges but also the political, social and economic structures that keep people trapped in conditions of poverty.[45] Adverse geography, and sometimes caste, race, gender and ethnicity, have also been identified as causes of poverty.[46]

Chronically poor people have a very limited ability to absorb negative shocks. These shocks may be agronomic, economic, health, legal, political or social, and affect individuals or communities.[47] More often than not, it is the co-occurrence, or the rapid successive occurrence, of multiple shocks that drives people back into severe poverty rather than any individual shock.[48] Education and the establishment of successful non-farm businesses can help people escape from poverty.[49] Education has been suggested as being particularly important because it can serve as a basis for resilience even for people living in conflict situations.[50]

Shocks drive people and households into poverty by eroding assets and preventing them from building on existing assets. These assets may include physical (housing, technology), natural (land), human (knowledge, skills, health, education), financial (cash, bank deposits, other stores of wealth), social (networks and informal institutions that support cooperation), and labour capital (the resource that the poor are most likely to possess).[51] In some contexts, land and livestock ownership can also help reduce the incidence of chronic poverty. Frequently it is younger households that succeed in escaping poverty.[52] The impact of conflict, natural disasters and epidemics, occurring in contexts where asset accumulation was already low, help to explain the persistence of high rates of poverty in sub-Saharan African countries.[53]

In order to tackle these overlapping challenges, the CPRC recommends four key groups of interventions: providing social protection, driving inclusive economic growth, improving levels of human development, and supporting progressive social change.[54] These interventions aim to address the dynamics that keep the chronically poor from escaping poverty. Social protection schemes provide protection to the most vulnerable and bolster resilience in the face of external shocks. Inclusive economic growth helps the chronically poor derive income from their asset base, while human development improves the quality of the human capital that forms the bulk of the poor's asset base. Progressive social change seeks to eliminate the political, social and spatial barriers that prevent the poor from leveraging their assets for income. In studying the interventions that work to reduce poverty, Ravallion discusses Brazil's success in reducing poverty despite relatively low rates of economic growth by targeting the poorest with social transfer programmes that not only bolster incomes but also incentivise investments in social development that help the poor to increase their asset base.[55]

As countries become wealthier, concern will naturally shift to those places that are not making progress. While this may mean focusing on countries that face greater challenges to poverty reduction (such as fragile states and countries that are more vulnerable to climate change-induced poverty shocks), the focus should also increasingly fall on the poorest of the poor within countries. These people suffer from the most pervasive and extensive types

of exclusion, adverse inclusion and exploitation. They remain poor because social compacts between governments and these sectors of society are not functioning. State action is the only way to reach these people, and reaching them is crucial in meeting income goals for severe and extreme poverty elimination, as well as for meeting broader health and development goals

> These interventions aim to address the dynamics that keep the chronically poor from escaping poverty

missed in the last round of the MDGs. These people disproportionately represent the world's under-nourished, under-educated and excluded.[56]

How can we eliminate poverty?

Building on the analysis presented earlier, there are several reasons why we frame our interventions using a micro-dynamic, chronic poverty-centred approach to poverty reduction. Firstly, while rapid economic growth was enough to move large numbers of people out of extreme poverty in China, the same may not be true of African countries; several decades of economic growth near 10% annually is highly unlikely for an entire continent. Gearing our approach to the drivers that create and sustain poverty traps places more emphasis on the structures that create and sustain poverty and that can be affected by national policy. This approach is in line with literature on relationships between growth, inequality and redistributive policy by emphasising investments in health, education, infrastructure and agriculture for poverty reduction.[57] Additionally, by focusing on those who are severely poor, we capture a large proportion of those who are chronically poor. This is important, because sub-Saharan Africa is one of the major contributors to the global population of the chronically poor.[58] Finally, by gearing our approach to poverty reduction to address the dynamics that drive people into poverty and keep them there, we place ourselves on a better footing to cope with future uncertainties such as climate change.[59]

Conceptually, our approach builds on the recent work of the CPRC to tackle chronic poverty. While the CPRC paper used IFs to present baseline, optimistic and pessimistic scenarios for poverty reduction, our analysis adds to this work in two key ways.[60] First, it seeks to discuss African regions and countries in greater detail. Second, regarding the intervention analysis, we strive to consider the four different components of its policy proposals and their interactions in more detail. The interventions themselves also build upon prior work by the Frederick S Pardee Center for International Futures for the World Bank, as well as work conducted for the African Futures Project insofar as these interventions fall within the scope of the CPRC's policy concerns.[61]

The first pillar of chronic poverty reduction in the CPRC's framework is social assistance, and this has been central to the CPRC's research work for some time. In its most recent work it calls for packages of social assistance, social insurance and social protection targeting different sources of vulnerability. Social assistance in the form of conditional and unconditional cash transfers, and income supplements in cash or in kind, has been shown to help create conditions that support people to move out of poverty.[62] Social insurance can be used to help the vulnerable to adapt to shocks without suffering the kinds of losses that drive or keep them in poverty. Many countries

EDUCATION HAS BEEN SUGGESTED AS BEING PARTICULARLY IMPORTANT, BECAUSE IT CAN SERVE AS A BASIS FOR RESILIENCE EVEN FOR PEOPLE LIVING IN CONFLICT SITUATIONS

already have programmes like these, but they are fragmented and not typically part of a broader package of social protection schemes.

Social assistance, insurance and protection programmes are very finely grained policy instruments, and our ability to model these in IFs remains somewhat limited. To simulate the kind of programme expansions and streamlining that would allow the development of more comprehensive social support programmes, we model this package of interventions by increasing government expenditure on welfare and pension transfers while increasing government revenue and external financial assistance in support of the processes of scale-up and streamlining to simplify the structure and number of social assistance programmes in place in many of these countries. Interventions involving foreign assistance are taken from the work with the World Bank and echo its commitments to funding. Increases in social assistance are targeted so that African nations achieve a similar rate of social welfare spending as the average in Latin America and Southeast Asia.

The second pillar of the CPRC framework is pro-poor economic growth. This pillar relies on promoting growth in a balanced form, which incorporates the poor on good terms. This means pursuing economic diversification; a focus on those sectors that can support the poor, including the development of small- and medium-sized enterprises; and efforts to develop underserved regions. This entails increases in investment in infrastructure to offset the impact of those parts of countries that have inadequate connections to commercial centres. This package of interventions also includes significant investments in agriculture, increasing the poor's access to improved agricultural inputs, and increasing the adoption of modern and traditional technologies that support farming.

We model this pillar using a combination of agricultural improvements developed for an earlier publication on a green revolution in Africa and designed to increase not only agricultural yields but also domestic demand for food through programmes such as cash transfers.[63] We also include improvements to infrastructure, especially rural roads, water and sanitation, information and communications technology, and electricity. We also include increases in government regulatory quality to address the inefficiencies that keep poor people from participating effectively in markets. This set of interventions models increases in security through decreases in the risk of conflict. This could be generated by increasing the effectiveness and scope of domestic or AU peacekeeping forces and investments in conflict prevention.[64]

The third pillar involves the human development of those who are the hardest to reach. This pillar focuses on the provision of education through secondary schools, and on improving quality and access. It also emphasises the need for universal primary healthcare. To model these, we include improvements in spending on education, intake, survival and transition; simulating a system that is more efficient at not just getting students into the educational system but also keeping them enrolled and training secondary school graduates. To some extent, the improvements in survival serve as a proxy for improvements in educational quality. Our health interventions emphasise the reduction of diseases that can easily be treated by a functioning health care system and that have a disproportionate impact on the poor, especially malaria, respiratory infections, diarrheal diseases and other communicable diseases. They also emphasise the declines in fertility that could be gained from the effective provision of universal healthcare. Because of the disproportionate impact of malaria on mortality and productivity in sub-Saharan Africa, we place particular emphasis on the role that malaria eradication could play in supporting human development in Africa.

The final pillar of the CPRC framework is progressive social change. This requires addressing the inequalities that keep people in poverty even when others are making progress. These barriers can be spatial, gender, caste, religion or ethnicity related, among many others, but have a significant impact on trajectories of poverty reduction. This intervention focuses on creating an understanding among policymakers that the chronically poor are constrained by structural factors rather than individual characteristics, and on taking steps to address those factors. We mainly focus on gender inequality, improving gender empowerment and reducing the time to achieve gender parity in education.

A summary of the intervention clusters within IFs is presented in Table 1. The technical detail on the interventions done within IFs is provided in a separate annex.

Impact of efforts to reduce poverty

Overall findings are summarised in Table 2 and include the base case forecast, the impact of each of the four intervention clusters, and the combined impact of all four on the percentage of the population living in poverty. Table 3 summarises the intervention impact on the number of people living in poverty up to 2063.

The combined effect of our interventions has a significant impact on both severe and extreme poverty in Africa. In our combined intervention we see the percentage of the population in severe poverty declining by 4,2 percentage points over the base case by 2030, while extreme poverty declines by 6,5 percentage points. This translates to

73,2 million fewer people living in severe poverty and 117,9 million fewer living in extreme poverty on the continent by 2030 (Table 3). However, despite the improvements in poverty levels, these figures still represent 7,2% and 18,4% of the total population (Table 2). This suggests that even with a concerted effort to reduce poverty, Africa is unlikely to achieve 2030 target to eliminate extreme poverty. In fact, only three additional countries make the goal.[66]

results in Gini remaining 0,43 up to 2030 and reaching only 0,44 by 2063. When it comes to economic growth, this approach leads to early benefits over the base case, but following 2030 we see a decline in the growth rate, until this intervention package performs no better than the base case by 2063. The compound annual growth rate for GDP in our combined intervention is 7,1% up to 2050 and 7,3% for household consumption. This suggests that our

> Progressive social change requires addressing the inequalities that keep people in poverty even when others are making progress

It isn't until 2063 in our combined scenario that we see extreme poverty approaching the level suggested as a target by the World Bank and others.

With regard to inequality and economic growth, this intervention framework provides benefits to both, constraining the slight rise of inequality on the continent in our base case out to mid-century. While in our base case, domestic Gini rises from 0,43 to 0,44 by 2030 and 0,46 by 2063, our combined intervention interventions do have significant impacts on the economic growth prospects for the continent, boosting growth by about 1,3% per year relative to the base case. It also suggests that even though our forecasts on poverty reduction appear extremely conservative, the impact of our assumptions leads to quite aggressive forecasts for economic growth going forward.

The greatest poverty reduction by 2030 comes from pro-poor economic

Table 1: Summary of intervention clusters[65]

Intervention cluster	Description	Components used in IFs
Social assistance	Non-contributory (i.e. does not depend on ability to pay) social protection that is designed to prevent destitution or the intergenerational transmission of poverty	• Increase in government spending on welfare • Funding support from international agencies for scale-up • Increases in government revenue • Increases in government effectiveness to tax and redistribute and modest declines in corruption
Pro-poor economic growth	Economic growth designed to support incorporation of the poor on good terms and to provide benefits across sectors of society	• Investments in infrastructure • Investments in agriculture • Stimulation of agricultural demand • Improvements in government regulatory quality • Decreases in conflict
Human development for the hard-to-reach	Provision of high-quality education that is linked to labour market needs and universal healthcare that is free at the point of delivery	• Improvements in education and education expenditure • Provision of universal healthcare, especially targeting communicable disease
Progressive social change	Changes to the social institutions that permit discrimination and unequal power relationships	• Improvements in gender empowerment • Decreased time to achieve gender parity in education • Improvement in female labour force participation

growth, reflecting the rapid impact of efforts to improve agricultural production and domestic demand. The benefits of human development do not really begin to help the severely poor until 2063, but they do begin accruing earlier for the extremely poor. Social assistance has an increasing effect across our time frame. This may be related to the upfront costs of setting up and administrating a functioning national social assistance system and the taxation system to fund it. Our scenario for progressive social change is relatively pessimistic about the possibilities that this has for bringing large numbers of people out of poverty using these interventions alone. This may be partly attributed to the fact that we were only really able to represent one aspect of discrimination (gender) in our scenario analysis.

Comparison to other forecasts

Comparing our interventions to other forecasts, we find that the impacts of our interventions line up relatively well with those of other researchers. The CPRC has done scenario analysis of possibilities for severe poverty reduction globally, and Burt, Hughes and Milante have also conducted scenario analysis of extreme poverty reduction possibilities in the so-called fragile states.[67] While neither of these is a perfect corollary of our analysis in terms of geography or intervention focus, there is significant overlap. In order to facilitate comparison, we have rebuilt the scenarios developed by Burt et al. to cover all African states, and we have done our best to replicate the work of the CPRC in an updated version of IFs.[68]

What we find is that the impacts of our interventions closely approximate those of the CPRC's optimistic scenario on the basis of our reconstruction of its method. Compared to the work of Burt et al., we see that up to 2036 the intervention package developed to echo the chronic poverty framework has up to a 2,9 percentage point greater impact on the per cent of people living below US$0,70 a day (a difference of nearly 40 million people).[69] Starting in the 2030s, however, the World Bank interventions have a greater impact on poverty than do those based on the chronic poverty literature.

The interventions used by Burt et al. include a greater emphasis on reducing protectionism, increasing inward flows of capital, increasing investment, and boosting tertiary spending and enrolment, in addition to other interventions similar

Table 2: Percentage of the population in Africa in poverty (15-year moving average) in the base case and intervention cluster scenarios

	US$0,70 a day			US$1,25 a day		
	2030	2045	2063	2030	2045	2063
Base	11,4	7,4	4,4	24,9	16,6	10,0
Social	10,5	5,7	2,8	23,4	13,5	6,8
Pro-poor	8,5	4,5	2,8	20,8	11,8	6,7
Human	10,6	5,6	2,8	23,6	13,4	6,9
Progressive	11,2	6,9	3,8	24,5	15,8	9,1
Combined	**7,2**	**2,9**	**1,4**	**18,4**	**7,7**	**3,4**

Source: International Futures version 7,05

Table 3: Number of people in poverty in millions (15-year moving average) in the base case and intervention cluster scenarios

	US$0,70 a day			US$1,25 a day		
	2030	2045	2063	2030	2045	2063
Base	182,4	152,6	110,1	397,3	346,0	250,2
Social	167,8	117,7	70,3	372,9	276,6	166,8
Pro-poor	133,8	91,6	68,3	329,9	240,9	166,3
Human	163,6	104,6	59,2	363,8	249,8	145,8
Progressive	178,7	142,2	95,7	391,4	327,6	226,3
Combined	**109,2**	**52,1**	**29,0**	**279,4**	**141,2**	**70,8**

Source: International Futures version 7,05

to those used in this paper. This paper also includes a much stronger emphasis on agricultural improvements that provide good traction against poverty in the short term. Over the longer time horizon, the World Bank interventions may result in greater acceleration of poverty reduction than do our interventions.

Country comparisons

Continental targets are appealing because they measure progress against the same goal, and provide a simple heuristic that policymakers can hold in their minds. However, they may not be appropriate for every context. To assess the appropriateness of continental targets we consider the likelihood of progress and responsiveness to interventions to reduce poverty in two groups of countries.

The first group consists of countries with large number of people living in extreme poverty (but low rates out of the total population) and includes Ethiopia, Kenya and Nigeria. The second group consists of countries with both high extreme poverty headcounts and high rates of extreme poverty. This group includes Burundi, the DRC and Madagascar.

High headcounts, low rates

Ethiopia, Kenya and Nigeria are significant contributors to the number of people living in extreme poverty in our initial year, but they have comparatively low rates of extreme poverty, in the range of 25% to 50% of the population in 2013 estimates. In Ethiopia and Nigeria the number and the percentage of the population living in extreme poverty are forecast to decline in our base case. In Kenya, the absolute number of people living in extreme poverty is forecast to increase to just over 25 million by 2035 before beginning to decline, while the percentage of the population in poverty stagnates until approximately 2030 before also beginning to drop. Ethiopia is the only country forecast to make the 3% extreme poverty target before 2063 without intervention.

> We find that the impacts of our interventions line up relatively well with those of other researchers

Under our combined intervention scenario, Ethiopia achieves the World Bank goal by 2036, about seven years sooner than in our base case (see Figure 7), driven primarily by pro-poor economic growth.

Kenya makes the most significant gains in this group in our combined intervention scenario, but does not quite achieve a

Table 4: Reductions in millions of people in poverty due to different intervention clusters (15-year moving average) relative to the base case

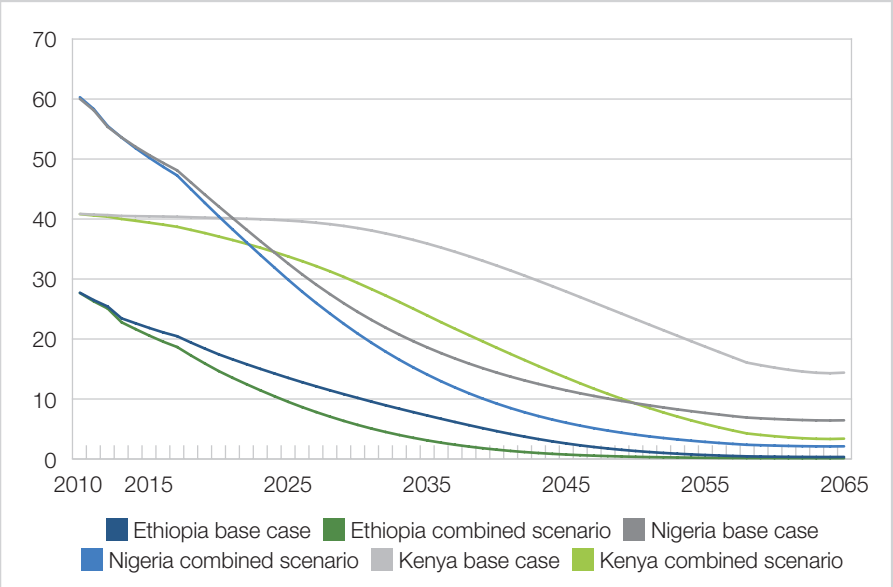
	US$0,70 a day			US$1,25 a day		
	2030	2045	2063	2030	2045	2063
Base	–	–	–	–	–	–
Social	14,6	34,9	39,8	24,4	69,4	83,4
Pro-poor	48,6	61,0	41,8	67,4	105,1	83,9
Human	18,8	48,0	50,9	33,5	96,2	104,4
Progressive	3,7	10,4	14,4	5,9	18,4	23,9
Combined	**73,2**	**100,5**	**81,1**	**117,9**	**204,8**	**179,3**

Source: International Futures version 7,05

3% poverty target during the forecast period, although it comes close (Figure 7). It also achieves a compound annual GDP growth rate of 6,1% and avoids a rise in the Gini until after 2030. Even by 2063, Kenya's Gini coefficient remains approximately a half point lower than in our base case scenario. Significant components of these gains are driven by the pro-poor economic growth intervention and later by the impact of social assistance.

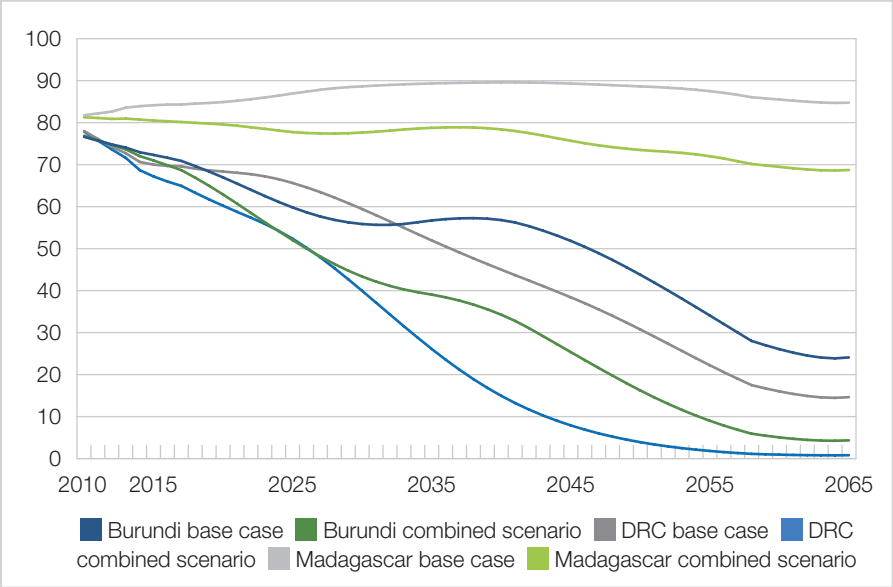
Nigeria is already on a positive track and the additional intervention has little headroom to augment the trend. Under our combined intervention, Nigeria may achieve a less than 3% extreme poverty rate between 2045 and 2063, whereas in our base case poverty rates decline slowly after 2045 and do not quite achieve the 3% benchmark (Figure 7). While estimates of extreme poverty in Nigeria remain a major source of uncertainty due to national and international data revisions, our forecasts indicate continued declines in the percentage of the poor living in extreme poverty in Nigeria.

Figure 7: Extreme poverty in base and combined scenarios for Nigeria, Kenya and Ethiopia (percentage of population)



Source: International Futures version 7,05

Figure 8: Extreme poverty in base and combined scenarios for Burundi, the DRC and Madagascar (percentage of population)



Source: International Futures version 7,05

The significant variety in trends in the base case among these three large contributors to poverty suggests not only that sustained focus on these countries is warranted but also that policies need to be tailored to the unique circumstances of each country. In the case of Ethiopia, additional gains to poverty reduction were largely the result of accelerating inclusive growth, while in Kenya, a combination of policy approaches worked together to drive gains.

High headcounts, high rates

Burundi, the DRC and Madagascar have some of the largest numbers of people living in poverty in Africa across our forecast horizon, as well as some of the highest rates of extreme poverty. All three countries see around 80% of their population living in extreme poverty in 2013, although the number of people this represents varies due to the different sizes of the populations.

In our base case, the number of people living in extreme poverty in all three countries is forecast to increase. Burundi and the DRC experience declines in the percentage of the population living below US$1,25 a day, while Madagascar does so only after 2050, as shown in Figure 8. Although both the DRC and Burundi substantially reduce the percentage of their population living in poverty, approximately 15% of the DRC's

population remain in extreme poverty up to 2063, while in Burundi nearly 25% of the population remain in extreme poverty.

Under our interventions, both Burundi and the DRC see significant improvements in progress against extreme poverty, which allows the DRC to achieve a 3% poverty target by the early 2050s (Figure 8). Although Burundi doesn't quite make the target, it gets close as well. Both countries derive most of these gains from economic growth, but in the DRC, social assistance and human development provide additional strong sources of gain. Madagascar, whose poverty rate is high and forecast to remain so through 2064, is only able to achieve slight declines in the percentage of the population living in extreme poverty.

Policies need to be tailored to the unique circumstances of each country

What drives these differences?

Table 5 represents some of the factors that drive the speed and depth of poverty reduction and helps explain why some countries make significant progress against poverty in our base case and are more responsive to poverty reduction efforts. This is not a complete listing, and other factors may also have significant impacts. Understanding how these interact on a country basis is key to setting appropriate targets for future poverty reduction and deducing the plausible impact of efforts to speed poverty reduction.

When looking at the first group of countries (those with high headcounts and relatively low poverty rates), Ethiopia's progress in both the base case and the combined scenario is partly the product of its relatively high rate of expected economic growth, relatively low level of inequality, smaller poverty gap, and relatively low population growth rate. In Kenya and Nigeria, initial inequality is higher and expected economic growth is lower. However, in our interventions, Kenya derives the greatest reductions in Gini and the greatest boost to its GDP growth rate (the compound annual growth rate [CAGR] is 6,1% up to 2063, while it increases less than 0,75 percentage points relative to the base case for Nigeria and Ethiopia to 6,0% and 7,3% respectively).

Considering the second group of countries, we find that they have

BURUNDI, THE DRC AND MADAGASCAR HAVE SOME OF THE LARGEST NUMBERS OF PEOPLE LIVING IN POVERTY IN AFRICA ACROSS OUR FORECAST HORIZON

Table 5: Factors driving poverty reduction progress

	GDP growth rate 2013–2063 (CAGR)	Population growth rate 2013–2063 (CAGR)	Initial Gini index (2013)	Initial poverty gap (2013)
Ethiopia	6,58	1,91	0,35	7,6
Kenya	5,01	1,7	0,48	17,18
Nigeria	5,26	1,88	0,5	30,5
Burundi	5,42	2,15	0,35	35,2
DRC	6,33	2,03	0,44	43,43
Madagascar	1,8	2,16	0,43	44,79

Source: International Futures version 7,05; authors' calculations

significantly higher poverty gaps and somewhat higher population growth rates than the first. In Madagascar, the double burden of low economic growth and high population growth means that the absolute number of people living in poverty is expected to increase, while the percentage remains high. Unfortunately, we also find that under our interventions, Madagascar fails to significantly improve its already low GDP growth rate (the CAGR is 2,5% up to 2063 as compared to 1,8% in our base case), even though the distribution improves across our forecast horizon as a result of our interventions. Both Burundi and the DRC do relatively well in our base case, in part because they experience high levels of economic growth. Even though population growth is high in these countries, this is partially offset by the rapid forecast growth. Under our combined intervention, economic growth increases significantly for both Burundi and the DRC. The CAGR for Burundi is 6,7% up to 2063 and 7,9% for the DRC.

What this analysis helps to demonstrate is that, even among countries that appear to share similarities regarding poverty, there are significant differences in how effectively they are able to reduce poverty rates. These differences arise from the combination of a variety of initial factors, as well as others not discussed above, that influence not only the progress of countries in the absence of interventions but also their responsiveness to these interventions. For policymakers the lesson is that even though continental goals have significant appeal in terms of simplicity, they may be ineffective in setting targets that help national policymakers to design poverty reduction strategies. In short, a 3% target may be a good place to start, but it should be revisited after further analysis (like that which we have begun here).

World Bank PPP calculations

We noted earlier that the recently released revision of PPP from 2005 to 2011 as new reference year by the World Bank's ICP is of fundamental importance to the forecasting of global poverty. This release captures very significant changes in prices and PPP across time and countries. Thus far, our forecasts have used 2005 as reference year. The ICP revision has temporarily disrupted the poverty measurement and forecasting communities as analysts sort out its implications for contemporary poverty levels.

Like others, we have made preliminary re-estimates of current poverty levels and preliminary forecasts using 2011 as reference year, but await the reassessment of household purchasing power for every country, based on the new prices and consumption patterns.[70] Thereafter the global poverty line itself will be re-estimated. Collectively these developments should eventually allow for a new global standard as part of the targets to be included in the 2030 MDG process and Agenda 2063.

In general, the new values suggest that global poverty levels are significantly lower than previously understood and that the remaining burden of extreme poverty globally has decisively shifted to sub-Saharan Africa. Although we wait for more settled analysis of the new and rebased estimates before converting our analysis over to them completely, it is important that we compare our preliminary measurement revisions with early revisions in other projects and that we discuss how our revisions affect the base case and alternative scenario forecasts used in this paper.

Impact on initial poverty estimates

The Center for Global Development (CGD) and the Brookings Institution were among the first to publish revised estimates of global poverty in light of the revised PPP estimates from the ICP. The CGD followed the approach used by PovCalNet to adjust income by the change in private consumption per capita from national accounts data. Although it calculates a revised equivalent income value for the US$1,25 poverty line to take account of inflation (US$1,44), it does not use this line to report its country level results.[71]

Brookings authors Laurence Chandy and Homi Kharas used the same initial adjustment of purchasing power estimates but took the analysis several steps further, first calculating a new poverty line for 2011 (US$1,55) that represents the same standard of living as the US$1,25-a-day line in 2005 prices.[72] They then included new estimates of household consumption for Nigeria and India (respectively home to the largest and third largest populations of extreme poverty in the world). Although the final Brookings estimates are most consistent with accepted practice in poverty estimation, we compare Brookings' first-step estimates to those of the CGD and our own estimates, as these are the most closely comparable. The estimates are that extreme global poverty has decreased from a 2010 estimate of 1,2 billion people living below the US$1,25 poverty line in 2005 US dollars to either 872 million (Brookings estimate using an updated poverty line of US$1,55; same authors estimate poverty at 571,3 million using US$1,25 in 2011 PPP), 616 million (the CGD using the updated PPPs but the US$1,25-a-day poverty line) or 771,8 million (IFs using a poverty line of US$1,25 but 2011 GDP figures). This does make our forecast the most conservative of the three, but it is necessary to wait for the dust to settle around the new numbers before making any final assessments. Calculations on poverty, including the forecasts

presented in this paper, therefore need to be interpreted with care.

We first compare our results to those of Brookings at a regional level.

As shown in Table 6, our estimates are higher than those of Brookings in three regions: Asia and Pacific, sub-Saharan Africa, and South and West Asia. Of these, the discrepancies in South and West Asia are the most significant. They are largely due to differences in the estimates of extreme poverty in India (where our estimate for millions in extreme poverty is approximately double that of Brookings; see Table 7). Table 7 also includes the results from Brookings using a recalculated extreme poverty line of US$1,55.

Comparing with the CGD at a country level, we see variation in IFs estimates relative to those of the CGD. IFs estimates are higher in India, Nigeria, Bangladesh and Kenya, and lower than the CGD estimates in China, Brazil and Ghana. It is also possible to directly compare estimates from Brookings for India and Nigeria. In this case IFs estimates are higher than those of Brookings for India, but lower for Nigeria.

As a result of the new PPPs, IFs estimates of extreme poverty globally in 2010 drop from 1,2 billion people to 783,1 million. Declines also register in Africa with our base case estimate for 2010, changing from 430,9 million to 331,2 million. Half of this decline is due to re-estimations of poverty in Nigeria from 99,6 to 57,5 million. Poverty figures were revised upwards in only seven countries within IFs, in all cases by less than one million people, while 16 countries experienced downward revisions of over one million.[73] On average, the new PPP estimates resulted in a 6,9 percentage point drop in estimates of extreme poverty in Africa within IFs for 2010.

Impact on poverty forecasts

In most cases, significant changes in the poverty estimates for 2010 did not translate into significant changes in the base case trend of our poverty estimates. Although our new poverty estimates were significantly lower in the base year, this difference tended to decrease over time until both the new and old estimates reached similar levels at some point in the future. On average, our base case forecasts were approximately four percentage points lower across the forecast horizon as a result of incorporating the 2011 PPP values into our poverty estimates. In the few cases where the difference between the new and old estimate increased, this occurred in countries where the number of individuals in extreme poverty was forecast to increase. These cases included Somalia, Sudan, Burundi, Niger and the DRC. In short, although the revisions to the base year estimates are significant, they are incorporated into the model in a way that moderates their impact.

Under the new estimates, three more countries make the US$1,25 target by 2030 in the base case than under the old estimates (Table 8). This gain is sustained across our other two time horizons of 2045 and 2063, but does not increase much – only four additional countries make a US$1,25 target by 2063. A similar story is seen in our intervention scenarios, where only one additional

> The estimates are that extreme global poverty has decreased to either 872 million, 616 million or 771,8 million

AS A RESULT OF THE NEW PPPs, IFs ESTIMATES OF EXTREME POVERTY GLOBALLY IN 2010 DROP FROM

1,2 BILLION

PEOPLE TO

783,1 MILLION

country makes the target by 2030, and only two more make the target by 2063. Countries that reached a 3% target did so an average of nine years sooner than under the old PPPs, with a median of 4,5 years sooner. In short, although the overall number of countries that achieved a 3% extreme poverty target did not increase significantly, those that made progress did so much faster. The story is similar in our combined intervention scenario, in which countries achieve the goal an average of 3,6 years sooner than they did under the old ICP PPP values.

Conclusions

This paper has sought to accomplish three things. First, it assessed the likelihood of African states achieving a 3% target for extreme poverty by 2030, given their current developmental paths. Second, it modelled a number of aggressive but reasonable interventions, based on chronic poverty literature, to determine the possibilities for increasing poverty reduction. Third, given that even under our combined intervention a large number of African states are unlikely to make the 3% extreme poverty target by 2030, we consider some reasonable alternative targets and goals for African states. We reach this conclusion in spite of robust forecast economic growth for the continent, and an income distribution that becomes only slightly worse over the forecast period.

We found that microeconomic interventions that draw deeply on the work of the CPRC and echo many of the policy prescriptions offered in recent literature, including by the Africa Progress Panel, succeed in driving gains in many places on the continent. The modelling done in this paper appears to show that many countries in Africa could converge on extreme poverty rates of less than 10% by the middle of the century. They do not, however, allow for achieving a 3% poverty rate by 2030.[74] These interventions included modelling the effects of an economic growth plan that specifically targets the inclusion of underserved groups and regions through investments in agriculture and infrastructure. Over the medium to long term, investments in human development and social assistance, including in quality primary and secondary education, universal healthcare and an effectively managed social assistance programme, could also help to reduce poverty in a number of additional countries. These efforts seem broadly applicable across different circumstances, but not all countries respond equally well to them.

Although we find the emerging global target to be unreasonable for many African countries, we do see value in setting a high, aggressive yet reasonable target through which the AU could measure continental progress towards Agenda 2063. We argue in favour of setting a goal that would see African states collectively achieving a target of reducing extreme poverty (income below US$1,25) to below 20% by 2030 (or below 15% using 2011 PPPs), and

Table 6: Comparison of IFs and Brookings 2010 poverty estimates by region (millions of people)

	IFs (UNESCO groups) US$1,25, 2011 PPP	Brookings US$1,25, 2011 PPP	Difference (in millions)
East Asia & the Pacific	136,5	105,9	30,6
Europe and Central Asia	1,2	2,6	-1,4
Latin America & the Caribbean	25,7	26,8	-1,0
Sub-Saharan Africa	325,9	299,8	26,1
Middle East and North Africa	4,7	2,0	2,7
South Asia	278,7	134,2	144,5
Total	**772,8**	**571,3**	**201,5**

Source: Laurence Chandy and Homi Kharas, What do new price data mean for the goal of ending extreme poverty, Brookings Institution, 5 May 2014, http://www.brookings.edu/blogs/up-front/posts/2014/05/05-data-extreme-poverty-chandy-kharas; International Futures version 7,05

Table 7: Comparison of IFs, CGD and Brookings 2010 poverty estimates for selected countries (millions of people)

	IFs US$1,25 a day 2011 PPP	CGD US$1,25 2011 PPP	Brookings US$1,25 2011 PPP	Brookings US$1,55 2011 PPP
India	219,9	102,3	98,0	179,6
China	86,6	99,1		137,6
Nigeria	57,5	50,5	76,3	67,1
Bangladesh	40,6	27,5		48,3
Brazil	6,3	10,1		12,5
Kenya	13,5	5,6		10,4
Ghana	1,9	~5,3		7,7

Source: Laurence Chandy and Homi Kharas, What do new price data mean for the goal of ending extreme poverty, Brookings Institution, 5 May 2014, http://www.brookings.edu/blogs/up-front/posts/2014/05/05-data-extreme-poverty-chandy-kharas; Sarah Dykstra, Charles Kenny and Justin Sandefur, Global absolute poverty fell by almost half on Tuesday, Center for Global Development, 2 May 2014, http://www.cgdev.org/blog/global-absolute-poverty-fell-almost-half-tuesday; International Futures version 7,05

Table 8: Number of countries making the US$1,25-a-day target under old and new estimates

	2011 PPP estimates			2005 PPP estimates		
	2030	2045	2063	2030	2045	2063
Base case	14	21	29	11	15	25
Intervention	15	30	43	14	26	41

Source: International Futures version 7,05

Table 9: Additional countries achieving 3% poverty target under 2011 PPPs

	2030	2045	2063
Base case	Republic of the Congo Ghana Sudan	Cameroon Cape Verde Mauritania Nigeria Sudan	Eritrea Nigeria Sudan South Sudan
Combined intervention	Republic of the Congo	Namibia Nigeria Rwanda Zambia	Benin Mali

Source: International Futures version 7,05

reducing extreme poverty to below 3% by 2063. Because of the significant differences in current poverty levels and other initial conditions that drive poverty in African states, and therefore in the wide variety of policy measures needed to effectively reduce poverty in these contexts, we further recommend that the AU consider setting individual country level targets. In particular, we advocate increased attention to the issue of chronic poverty, which requires national political will in order to address the overlapping structural challenges that keep the chronically poor trapped in poverty for long periods. We argue for a greater focus on inequality and the structural transformation of African economies.

> Even under our combined intervention a large number of African states are unlikely to make the 3% extreme poverty target by 2030

Our results may seem pessimistic about the prospects for extremely rapid poverty reduction in Africa. However, they remained robust across a number of different assumption tests and formulations of intervention packages (beyond the interventions extensively discussed above), as well as changes in measurement. During the writing of this paper, the ICP released its revisions of global PPP estimates. As others have noted, this is the equivalent of a 'statistical earthquake' and had a correspondingly large effect on our poverty measurements. However, when we checked the impact of those revisions (which include the effect of the Nigerian GDP rebase) we found that although our initial poverty estimates were sharply affected, the overall prospects for achieving the 3% extreme poverty target remained similar for most countries. Prior to the recent ICP update, the consensus among most analysts was that since a large proportion of Africa's extremely poor population live significantly below the US$1,25 level, future progress would

take time. This differs considerably from the situation that allowed China and then India to make such rapid strides recently in alleviating extreme poverty.[75] Many of those concerns remain valid, in spite of the new numbers.

Other factors not modelled here may also contribute to changing the dynamics of poverty reduction. Beyond growth, structure and distribution, external developments may intrude and bend the curve. For example, we have not looked at the role of remittances, nor have we focused on moving heavily towards export-led growth, which has been a major driver of poverty reduction in other regions.[76] We have also not looked at the possibly very negative consequences of climate change. These caveats aside, it has taken 20 years, from 1990 to 2010, to cut the share of the population of the developing world living in extreme poverty by half and much of the low-hanging fruit may be gone, meaning that growth alone may not be sufficient to continue the progress seen thus far. The future is deeply uncertain, and our scenarios represent a limited range of outcomes.

As national leaders and the policy community continue discussions on the appropriate targets for the next round of development goals up to 2030 (for the next round of MDGs) and 2063 (in the case of Agenda 2063), it is clear that a significant part of the remaining burden of extreme poverty is now located in sub-Saharan Africa. Current measurements (such as updated versions of the US$0,70 and US$1,25 poverty lines) remain important here, as much as the introduction of new poverty lines of US$2 and even US$5 may be useful in measuring progress elsewhere.

That said, there is room for African policymakers to develop policies that have the potential to significantly increase the rate at which poverty declines. These policies should be country specific, but thinking about poverty reduction in an integrated, scenario-based way may help policymakers to better frame their thinking going forward.

The World Bank, African Development Bank, UN Economic Commission for Africa, AU and Africa's various Regional Economic Communities need to move beyond broad-brush targets set at high levels of aggregation and focus on supporting the development of national targets. National policymakers must take the lead in determining appropriate development goals and milestones specific to their domestic circumstances, and use scenario planning and intervention analysis such as that set out in this paper to help frame their thinking to support goal-setting at regional, continental and international levels.

Annex: About IFs and interventions

International Futures (IFs) is large-scale, long-term, highly integrated modelling software housed at the Frederick S Pardee Center for International Futures at the Josef Korbel School of International Studies at the University of Denver. The model forecasts hundreds of variables for 186 countries to the year 2100 using more than 2 700 historical series and sophisticated algorithms based on correlations found in academic literature.

IFs is designed to help policymakers and researchers think more concretely about potential futures and then design aggressive yet reasonable policy targets to meet those goals. Although thinking about the future is an inherently uncertain task, that doesn't mean that it is impossible to think about many future possibilities in a structured manner.

IFs facilitates this in three ways. First, it allows users to see past relationships between variables and how they have developed and interacted over time. Second, using these dynamic relationships, we are able to build a base case forecast that incorporates these trends and their interactions. This base case represents where the world seems to be going given our history and current circumstances and policies, and an absence of any major shock to the system (wars, pandemics, etc.). Third, scenario analysis augments the base case by exploring the leverage that policymakers have to push the systems to more desirable outcomes.

The IFs software consists of 11 main modules: population, economics, energy, agriculture, infrastructure, health, education, socio-political, international political, technology and the environment. Each module is tightly connected with the other modules, creating dynamic relationships among variables across the entire system.

The interventions included in each policy are as follows:

Social assistance

Parameter	Degree of change	Timeframe
govhhtrnwelm	100% increase in government transfers to unskilled households	20 years
xwbloanr	Growth rate in World Bank lending doubles	10 years
ximfcreditr	Growth rate in IMF lending doubles	10 years
govrevm	20% increase in government revenues	5 years
goveffectsetar	+1 standard error above expected level of government revenues	–
govcorruptm	66% increase in government transparency (declines in corruption perceptions)	15 years

Pro-poor economic growth

Parameter	Degree of change	Timeframe
govriskm	20% decline in risk of violent conflict	15 years
sfintlwaradd	-1 decline in risk of internal war	15 years
sanitnoconsetar	-1 standard error below expected level of sanitation connectivity	–
watsafenoconsetar	-1 standard error below expected level of water connectivity	–
ylm	76% increase in yields	21 years
ylmax	Set at country level	–
tgrld	0,00902 target for growth in cultivated land	–
agdemm	40% increase in crop demand, 20% increase in meat demand	15 years
aginvm	20% increase in investment in agriculture	15 years
ictbroadmobilsetar	+1 standard error above expected level of broadband connectivity	–
ictmobilsetar	+1 standard error above expected level of mobile connections	–
infraelecaccsetar	+1 standard error above expected level of electricity connections	–
infraroadraisetar	+1 standard error above expected level of rural road access	–
govregqualsetar	+1 standard error above expected level of government regulatory quality	–

Progressive social change

Parameter	Degree of change	Timeframe
edprigndreqintn	Years to gender parity in primary education intake	10 years
edprigndreqsur	Years to gender parity in primary education survival	10 years
edseclowrgndreqtran	Years to gender parity in lower secondary transition	13 years
edseclowrgndreqsurv	Years to gender parity in lower secondary survival	13 years
edsecupprgndreqtran	Years to gender parity in upper secondary transition	20 years
edsecupprgndreqsurv	Years to gender parity in upper secondary survival	20 years
gemm	20% increase in level of gender empowerment	5 years
labshrfemm	50% increase in female participation in the labourforce	45 years

Human development for the hard-to-reach

Parameter	Degree of change	Timeframe
edpriintngr	2,2 growth rate in primary education intake	–
edprisurgr	1,2 growth rate in primary education survival	–
edseclowrtrangr	1 growth rate in lower secondary transition	–
edseclowrsurvgr	0,8 growth rate in lower secondary survival	–
edsecupprtrangr	0,5 growth rate in upper secondary transition	–
edsecupprsurvgr	0,3 growth rate in upper secondary survival	–
edexppconv	Years to expenditure per student on primary schooling convergence with function	20 years
edexpslconv	Years to expenditure per student on lower secondary schooling convergence with function	20 years
edexpsuconv	Years to expenditure per student on upper secondary schooling convergence with function	20 years
edbudgon	Off – no additional priority for education spending	–
hlmodelsw	On	–
hltechshift	1,5 increase in the rate of technological progress against disease (helps low income states converge faster)	–
tfrm	45% decline in total fertility rate	45 years
hivtadvr	0,6% rate of technical advance in control of HIV	–
aidsdrtadvr	1% rate of technical advance in control of AIDs	–
hlmortm	Malaria eradication (95% eradicated by 2065)	60 years
hlmortm	40% decline in diarrheal disease	55 years
hlmortm	40% decline in respiratory infections	55 years
hlmortm	40% decline in other infectious diseases	55 years
hlwatsansw	On	–
hlmlnsw	On	–
hlobsw	On	–
hlsmimpsw	On	–
hlvehsw	On	–
hlmortmodsw	On	–
malnm	50% decline in malnutrition	40 years
hltrpvm	50% decline in traffic deaths	25 years
hlsolfuelsw	On	–
ensolfuelsetar	50% decline in use of solid fuels	–

Notes

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About the African Futures Project

The African Futures Project is a collaboration between the Institute for Security Studies (ISS) and the Frederick S. Pardee Center for International Futures at the Josef Korbel School of International Studies, University of Denver. The African Futures Project uses the International Futures (IFs) model to produce forward-looking, policy-relevant analysis based on exploration of possible trajectories for human development, economic growth and socio-political change in Africa under varying policy environments over the next four decades.

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