Projecting Mozambique's Demographic Futures

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Abstract

The "medium" population projection series by the UN Population Division forecasts near-catastrophic population increase for a whole number of Tropical African countries, especially East African ones. However, the projections for Mozambique, appearing somewhat less ominous than those for the neighboring Zambia, Tanzania, and Malawi, do not account for the recent fertility dynamics in Mozambique. Indeed, the projection implies a rather rapid fertility decline, while in reality it has been not just stalled, but even growing during the latest decade. We present our own population projection for Mozambique based on the UN version, but taking into account the recent fertility dynamics. We also model two more demographic scenarios, the "inertial" one (continuation of the current trends) and the "optimistic" one (acceleration to the Iranian pace of fertility transition). We evaluate the difference in terms of total population and various age cohort numbers between these scenarios, and reveal some of their crucial implications for Mozambican development prospects.

Keywords: Mozambique, Tropical Africa, fertility, population projections, demographic forecast.

Introduction

The recent decade has witnessed remarkable successes in various aspects of socioeconomic development in Tropical Africa. However, contrary to the "development is the best contraceptive" expectations, fertility in many countries remains stalled, frequently at very high levels of 5 or more children per woman. This actualizes the risk of population explosions, which is particularly sharp, and can truly bear dramatic consequences for national development and even regional development when including the larger countries. In order to foresee such risks, valid population projections are necessary. The only widely recognized comprehensive

series of such forecasts is currently developed by the UN Population Division; however, the method underlying their forecast has a number of limitations. We offer a different method for modelling the scenarios of the demographic future of a given country. We apply this method to the case of Mozambique and reveal that the population projections calculated for Mozambique by the UN Population Division in 2012 – 2013 seem to be overly optimistic.

Sub-Saharan laggardness in demographic transition

Sub-Saharan Africa currently remains the only major region in the world which has not yet completed its demographic transition. All other regions have gone through their mortality transitions and have completed (or are very close to doing so) their fertility transitions as well, with their fertility rates approaching the population replacement level of 2.1 children per woman or even falling below that; some exceptions only remain at the level of a few particular countries, e.g. Afghanistan in Asia and Yemen in MENA region.

In contrast, the whole region of Tropical Africa[1] (with the notable exception of Rwanda, which we will further mention below) is stuck at the early stages of fertility transition, and is proceeding very slowly: "the recent pace of fertility decline in Africa is slower than the pace observed in Asia and Latin America in the 1970s … the median pace of change in sub-Saharan Africa (0.03 per year) is less than one-third the pace in the other regions (0.12 and 0.13, respectively)" (Bongaarts, Casterline, 2012, p.155).

Moreover, in a large proportion of Tropical African countries fertility got stalled (at levels commonly higher than 5 children per woman) and saw no decline since the mid-1990s until at least the mid-2000s. The phenomenon was quite widespread: thus, Bongaarts (2008) revealed 16 cases of fertility stalls within a set of 29 sub-Saharan African countries (Shapiro, Gebreselassie, 2008; Kreider, Shapiro et al., 2009; Ezeh, Mberu, Emina, 2009). In many countries of the region, fertility is still stalled or even rising: "the estimated TFR[2] was unchanged or rose between the two most recent surveys in 9 of the 20 African countries where fertility had already fallen by at least 10 percent" (Bongaarts, Casterline, 2012, p.155).

The decade-long (or even longer) absence of fertility decline with TFR stalled at 5 or more children per woman engendered a colossal demographic inertia, which led the UN Population Division to significantly increase their population projections for many African countries (see Fig. 1).

Here it is appropriate to describe in more detail the method used by the UN Population Division for producing population projections. Basically, it is a deterministic method based on the cohort component projection or the "classic" Leslie matrix method in demographic forecasting. As regards to projecting the fertility dynamics, the experts presume that all countries follow the same general pattern of fertility transition, with the pace of decline reaching its peak about half way through the transition; the TFR is held constant once it reaches 1.85 children. The specific parameters to be used for each given country (such as the exact pace of transition) are chosen by the UN analyst for that particular country from a list of three pre-determined patterns. High and low variants are produced by increasing or decreasing the total fertility rate in each future period by 0.5 children per woman (for a full description see Raftery, Alkema, Gerland, 2014).

According to the 2013 series of "medium" population projections by the UN

Population Division, the population of such relatively middle-sized East African countries as Kenya and Uganda will exceed the population of Russia in the second half of the century. Tanzania will reach Russia in terms of population by 2050 and is projected to have twice the Russian population by 2100. Nigeria's population will be five times bigger than the current population of Russia by the end of the century (UN Population Division, 2013). Population increase from the current level forecasted by the UN Population Division in Sub-Saharan countries by 2050 and 2100 is presented in Figs 2 and 3. It should be emphasized that medium UN forecast is in no way inertial – in other words, it is not based on a simple continuation of the current demographic trends. On the contrary, it implies a very significant acceleration in fertility decline as compared to the recent years.

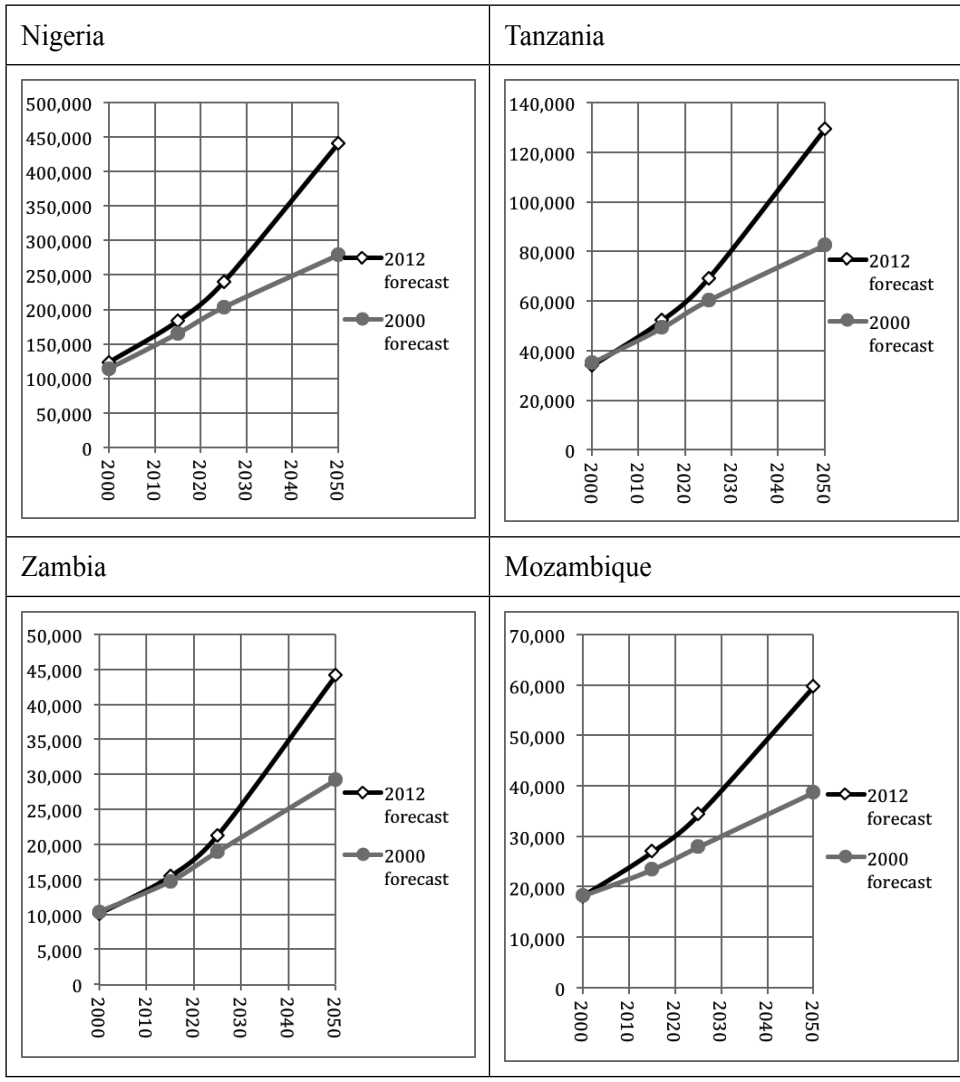

Figure 1. Comparison of the population projections (as calculated by UN Population Division in 2000 and 2012) for some African countries (thousands of people)
Data source: UN Population Division 2000, 2013.

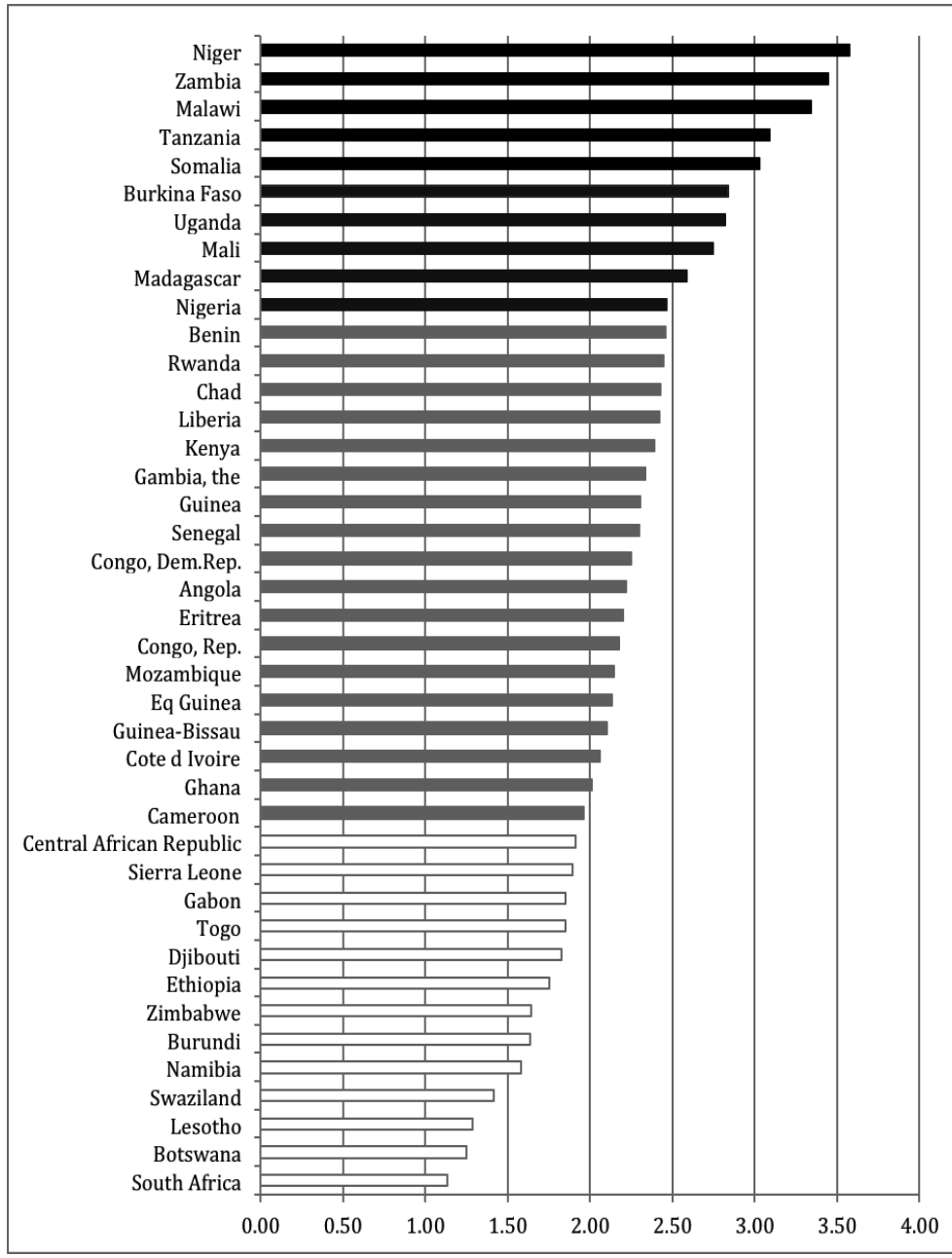

Figure 2. Population increase in Sub-Saharan countries forecasted by 2050 according to the medium UN scenario, compared to the current level (= 1,00)
Data source: UN Population Division 2013.

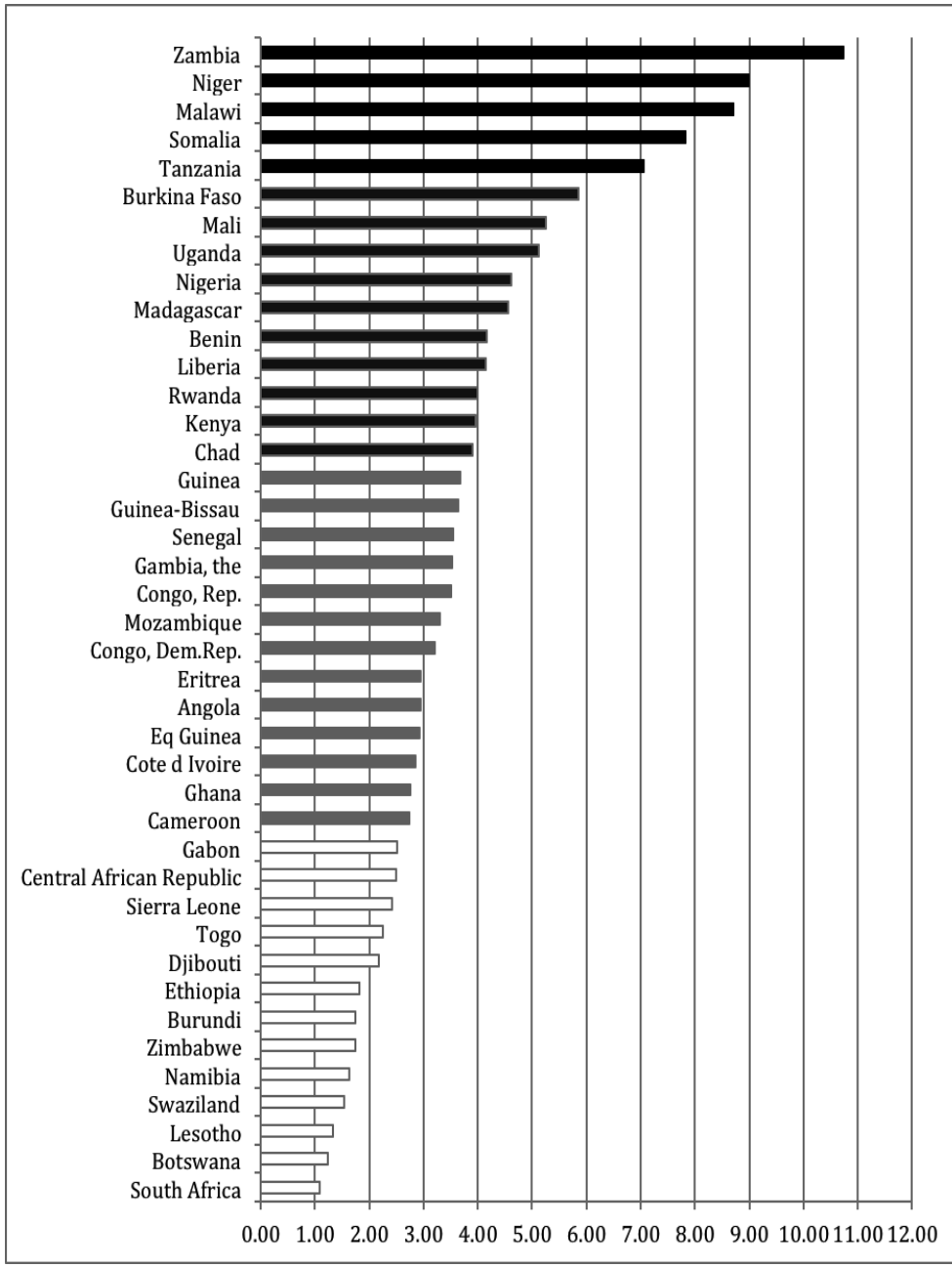

Figure 3. Population increase in Sub-Saharan countries forecasted by 2100 according to the medium UN scenario, compared to the current level (= 1,00)
Data source: UN Population Division 2013.

Is Mozambique's risk of population explosion really lower than among its northern neighbors?

Figs 2 and 3 reveal that explosive population growth is forecasted for the majority of Sub-Saharan countries; in some countries it may well be deemed a looming demographic catastrophe, as their population is bound to grow by a whole order of magnitude by the end of the century – this is observed for Zambia, Niger, Malawi, Somalia, and Tanzania.

In this regard Mozambique draws particular attention, as its forecast greatly differs from its northern and north-western neighbors. Indeed, three countries bordering Mozambique, namely Zambia, Malawi, and Tanzania, are in the highest risk group among all Sub-Saharan countries in terms of forecasted population increases, and their population is projected to more than triple by 2050 and increase by 7 to 9 times by 2100 (by 11 times in Zambia!). Meanwhile, Mozambique is placed among the medium-risk group consisting mainly of West African countries, and its population increase projections (population doubling by 2050 and tripling by 2100) is much more modest[3] than those for its three neighbors.

This difference is caused by the fact that the UN Population Division regards Mozambique as a country much further advanced in terms of fertility decline than the three other countries. Indeed, the UN estimates the TFR in Mozambique at 4.7 children per woman in 2010 – 2015 compared with 5.5 in Tanzania, 5.97 in Malawi, and 6.3 in Zambia. Moreover, fertility decline in Mozambique is projected to proceed at a faster rate than in the three other countries. Thus, according to the UN total fertility forecast, Mozambique is bound to reach the population replacement level of fertility (2.1 children per woman) by the late 2070s. None of its three neighbors will be able to reach this result even by the end of the century: the UN forecasts the TFR to reach 2.8 in Zambia, 2.55 in Malawi, and 2.3 in Tanzania by 2100 (see fig. 4).

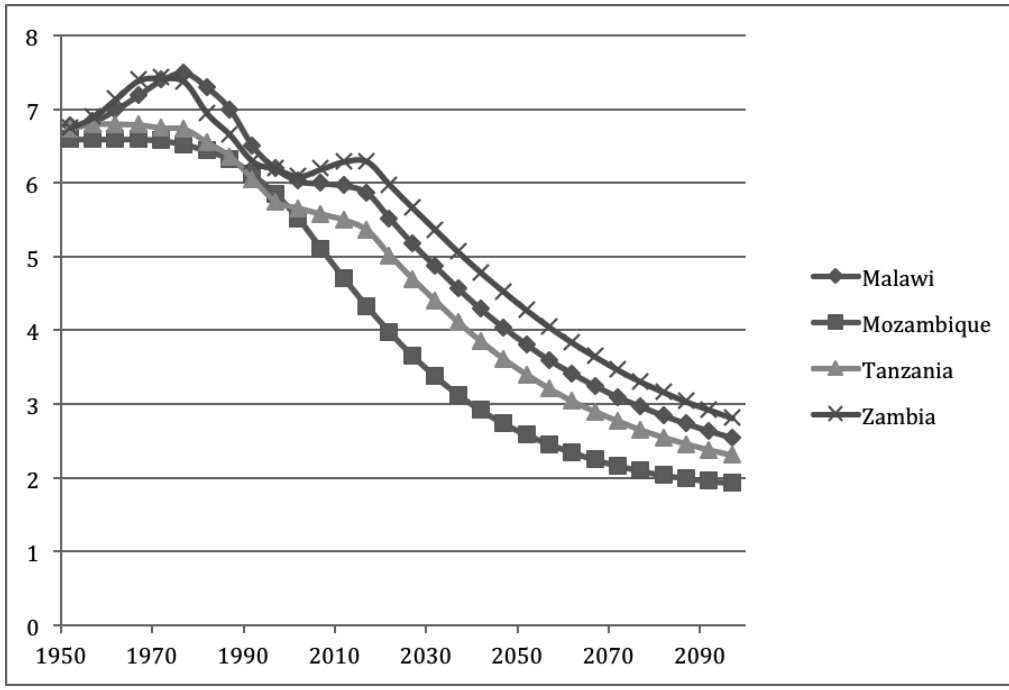

Figure 4. Total fertility forecast for Mozambique, Malawi, Tanzania, and Zambia according to the UN medium scenario
Data source: UN Population Division 2013.

However, our analysis reveals the necessity for the Mozambique fertility forecast and population projections to be reconsidered, as the UN medium scenario does not account for the important recent changes in the demographic dynamics of Mozambique. Indeed, several data sources indicate that the real fertility rate dynamics in recent years was substantially different from that projected by the UN model, and the difference was in no way optimistic.

Recent fertility dynamics in Mozambique

Let us first regard the general trends of fertility dynamics in Mozambique in the recent decades. The second phase of demographic transition started here around the mid-1970s (according to the UN estimations) from a very high fertility level of 6.6 births per woman. However, fertility decline proceeded very slowly, and TFR only went down by less than 1 birth per woman during 20 years, reaching 5.6 – 5.8 birth per woman by the late 1990s. At this point Mozambique along with the majority of East African countries encountered a rather lengthy period of fertility stall (Bongaarts, 2008; Shapiro, Gebreselassie, 2008; Kreider, Shapiro et al., 2009).

The most important features of the fertility stall phenomenon to be noted in the Mozambican case are as follows. First, fertility stalled at an exceptionally high level (close to 6 children per woman); at the very beginning of the second phase of the demographic transition. Second, only a small number of countries managed to restore fast fertility decline rates after the stall; in the majority of stalled countries fertility either has recently been declining much slower than before the stall or still remains stalled. The latter turns out to be true for Mozambique, where fertility

decline has not resolved yet. We checked this assumption on the data from two population censuses carried out in 1997 and 2007, as well as from the three latest Demographic and Health Surveys carried out in 1997, 2003, and 2011. For the convenience of analysis, we compiled data on the total fertility rate presented in these sources into a single table, along with the UN projections data (see Table 1). This made it possible to reveal a very important discrepancy.

Table 1. *Mozambique TFR values as projected by the UN medium scenario and stated in Population and Housing Census 2007 and three latest DHS, number of children per woman*

Years	Projected TFR value, UN medium scenario	Real TFR value, whole population	Real TFR value, urban population	Real TFR value, rural population
1995–2000	5.85	5.6 (DHS 1997)	5.1 (DHS 1997) 5.2 (Census 1997)	5.8 (DHS 1997) 6.2(Census 1997)
2000–2005	5.52	5.5 (DHS 2003)	4.4 (DHS 2003)	6.1 (DHS 2003)
2005–2010	5.11	*5.7* (Census 2007)	4.3 (Census 2007)	6.3(Census 2007)
2010–2015	4.71	5.9 (DHS 2011)	4.5 (DHS 2011)	6.6 (DHS 2011)

Data sources: Census 1997 and Census 2007 r. quoted as presented in Maunze 2009; for TFR forecast values in the medium UN scenario see UN Population Division 2013; DHS 1997 – da Costa Gaspar et al. 1998; DHS 2003 – Instituto Nacional de Estatística, Ministério da Saúde 2005; DHS 2011 – Instituto Nacional de Estatística, Ministério da Saúde 2012.

When comparing data presented in Table 1 we can draw two important conclusions. First, the real TFR dynamics observed in Mozambique in the 2000s was **contrary** to the UN projections: the medium UN Population Division scenario implied a fast and continuous fertility decline, while in reality fertility stall continued, and a slight fertility **increase** was even observed! Second, due to such significant discrepancy between the projected and the real fertility dynamics, the projected TFR for 2010 is different from the real TFR by more than 1 child per woman (4.7 versus 5.9 children per woman accordingly).

Such considerable difference stipulates the necessity to revise the population projections for Mozambique with regard to new data on actual TFR level and dynamics.

Adjusting the population projections to account for the latest data on total fertility level and dynamics

We used a standard method of demographic forecasting essentially identical with the one employed by the UN Population Division. Projections are calculated on a year-to-year basis. On the first step, the number of deaths is calculated as the number of people in each 1-year age cohort multiplied by corresponding age cohort mortality rates. The age structure for the subsequent year is modified according to the number of deaths in each cohort (migration flow was ignored in our forecast). On the second step, the number of births is calculated. Based on the current age structure, the number of women in each 5-year age cohort is calculated. Age-specific fertility rates are applied to each age cohort in order to obtain the number of births; the number of births in all cohorts is summed up (it is taken that 105 boys are born per 100 girls). After that, the age structure is "shifted down" by 1 year, and the number of newborns is put into the basic line of the age structure (the "aged

0" line). Time scale is shifted by 1 year, and the whole algorithm (steps 1 and 2) is repeated.

We used UN Population Division data for 2005 in the basic age structure for our calculations. The year 2005 was chosen as the basic year for our forecast because real and projected TFR dynamics started to obviously diverge around that year.

Projected life expectancy values (according to which the age-specific death rates were defined) were taken from the UN medium scenario unchanged, as they showed sufficient correspondence with the real data. Thus, the Population and Housing Census 2007 stated life expectancy in Mozambique at 49.4, while UN projections for the 2005–2010 period put this value at 48.8 years. Age-specific fertility rates stated in DHS 2003 and 2011 were used; values for the period between these years were obtained through linear interpolation. For 2012 we used the same values as in 2011. From 2013 onwards we used the total fertility rate and the corresponding age-specific fertility rates from the UN medium scenario. This scenario presents one value for each 5-year period; so we used linear interpolation to obtain the values for each year. However, in order to make adjustments to the continuing fertility stall, for 2013 we did not used the 2013 TFR values from the UN scenario, as it overestimated the fertility decline and would not accord to the real fertility dynamics; instead, we used the value stated in the scenario for 1995–2000 (5.85 children per woman), as it turned out to be the closest to the TFR values indicated in the DHS 2011 and Population and Housing Census 2007.

The projection built according to the following algorithm allows for forecasting the Mozambican population for each year up to 2100 if Mozambique were to resume continuous fertility declines starting in 2014, at the rates implied by the UN medium scenario, but from the current level of total fertility, which is much higher than the UN estimations.

As a result of the modeling, we obtained new population projections which are presented in Fig. 5, in comparison with the UN medium scenario. A decade-long fertility stall at a high level made a pronounced effect on the projected population values; according to our forecast, the population of Mozambique is bound to increase by an "additional" 17 mln people by 2100 as compared to the initial UN forecast (95.4 vs 77.3 mln correspondingly).

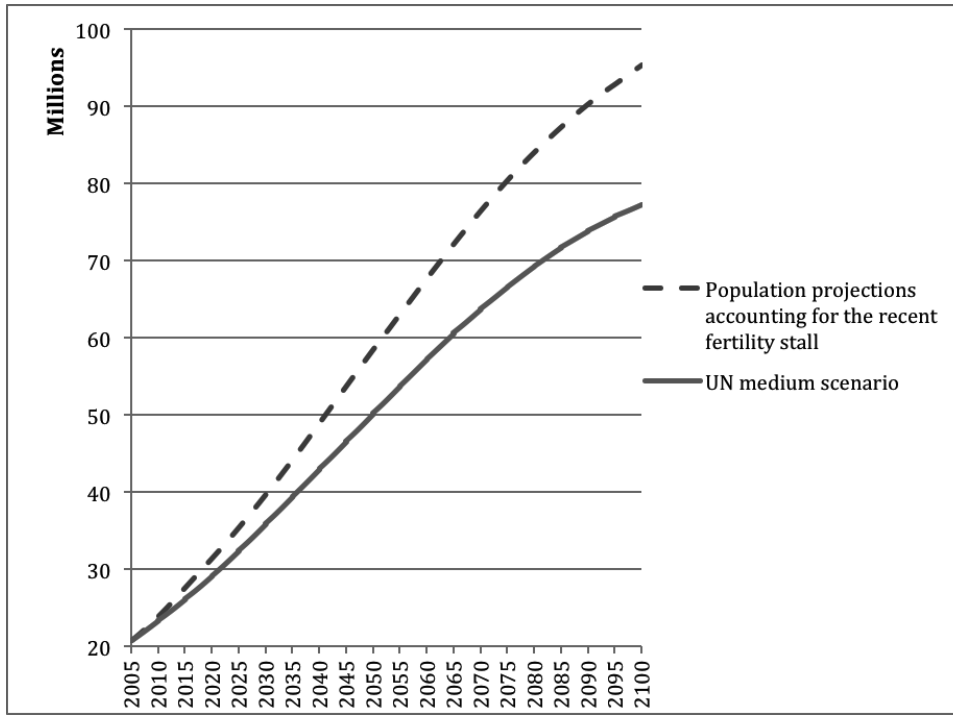

Figure 5. Population projections for Mozambique accounting for the fertility stall compared to the UN medium scenario, up to 2100

Here it seemed logical to closer investigate the projected TFR decline rates stated in the UN medium scenario in order to adjust them to the recent fertility stall, and compare the initially projected and the adjusted TFR dynamics to thoseforecasted for Zambia, Malawi, and Tanzania (see Fig. 5).

A comparison of the projected fertility trends (presented in Fig 6) proves that the continuation of fertility stall in the recent years considerably shifted Mozambique's initial trend forecasted by the UN on the assumption that fertility decline should resume; the divergence somewhat lessens closer to the end of the forecast period. Thus, according to the initial UN estimations, Mozambique was bound to reach the population replacement level of fertility (2.1 children per woman) by the early 2070s. According to our scenario, adjusted to the continuing fertility stall, even in the most optimistic case (if the Mozambican government were to immediately start making considerable efforts to resume the fertility decline at rather fast rates), the population replacement level of fertility will only be achieved by the early 2090, almost 20 years later than in the initial UN projections.

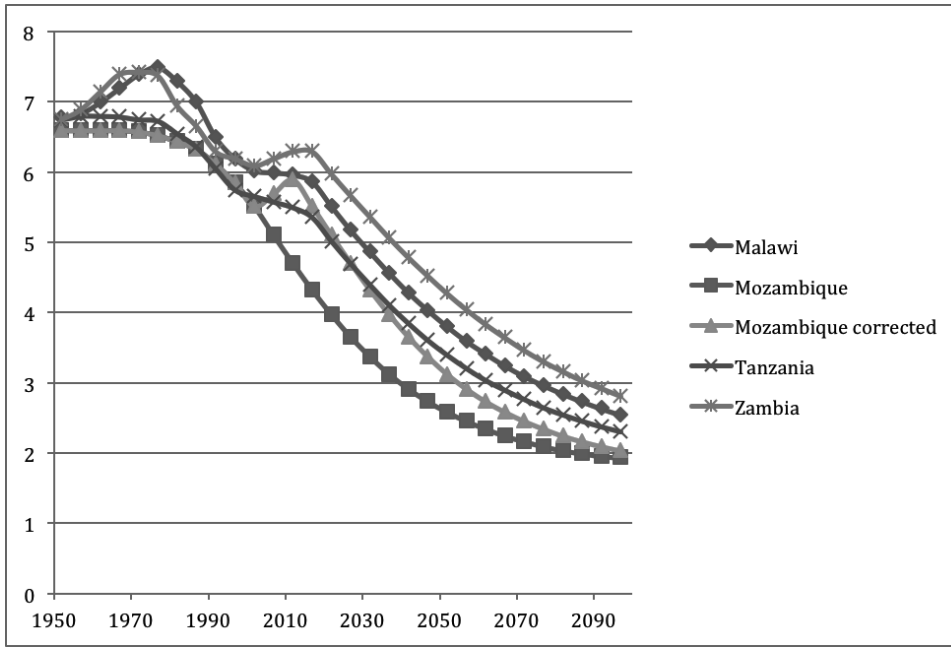

Figure 6. Forecasted TFR dynamics in Mozambique according to UN medium scenario and our stall-adjusted scenario, compared to TFR dynamics projected in Zambia, Malawi, and Tanzania, children per woman, up to 2100

Fig. 6 makes it clear that the fertility decline rates projected for Mozambique in the UN medium scenario are the fastest and the most "optimistic" among the four countries. Thus, from a given fertility level of 5.5 children per woman during a given number of years (say 10) Mozambique is expected to decline to 4.7 children per woman, while Tanzania is bound to reach only 5.0 children per woman. However, our investigation of the data on recent fertility dynamics in Mozambique hardly gives any grounds for assuming that fertility decline here will be significantly faster in the coming years than in the three other countries. Thus, it seemed logical to make some more adjustments to modeling the population projections for Mozambique – what will the population dynamics be, if the fertility decline proceeds at the same pace as projected for the neighboring Tanzania?

This scenario was modeled through the same algorithm as the previous one. The only difference was that we took projected TFR values and corresponding age-specific fertility rates from the UN medium scenario on Tanzania. Modeling results are presented in Fig. 7 in comparison to the previous scenario and to the initial UN medium scenario.

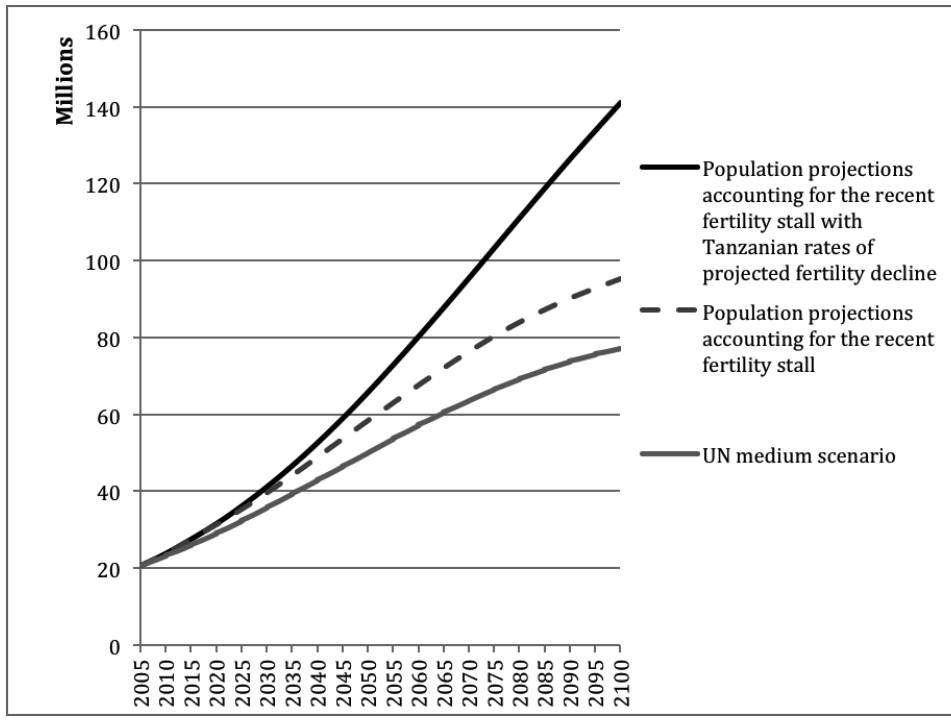

Figure 7. Projected population dynamics for Mozambique up to 2100 as forecasted by the UN medium scenario, our stall-adjusted scenario, and our stall-adjusted scenario with lower (Tanzanian) rates of projected fertility decline.

Fig 7 reveals that the forecast accounting for both, the recent absence of fertility decline and the continuing fertility stall at a high level (much higher than implied by the UN scenario), and lower projected fertility decline rates (similar to those implied by the UN for Tanzania) presents much higher projected population values – exceeding the UN population estimate by 60 mln by 2100.

Projecting the scenarios of Mozambican demographic future

The impact of demographic dynamics on African development performance has been very significant so far, and is likely to get utterly critical in the nearest decades – taking into account the projected population growth. Therefore, in order to understand the prospects of demographic influence upon (and demographic risks to) growth and development in the region, we first need to evaluate (with a sufficient degree of precision) the future dynamics of the population numbers in general and the various groups within the age structure (dependents, young dependents, school-age children, youths, working-age population, etc.) for each particular country.

However, the specific method used for the UN projections limits their applicability for such a task. Most importantly, the universal set of scenarios ("high", "medium", and "low") does not allow to account for the specific demographic features of a particular country, the recent events of its demographic history (such as experiencing a long fertility stall, or having an effective family planning campaign introduced). These projections, therefore, outline the possible diapason within which the African demographic future will most likely reveal itself, but fail to answer

practical questions, which are crucial when trying to account for the demographic trends in development forecasts – e.g., What if the fertility stall ends right now? What if it continues for another 15 years? How large will the population increase be if a country preserves its current rates of fertility decline unchanged? To what extent will the population explosion get curbed if a country manages to reach the Iranian (or Rwandan) pace of fertility decline?

Getting answers to these type of questions is vital for making policy decisions. Indeed, one can then compare the difference between population numbers and age structure (including the numbers of specific age groups), in the inertial scenario (current trends continue at their current pace) versus the fertility decline acceleration scenario (specific policies are introduced, aimed at increasing the availability of family planning, women's education, securing the legal age at marriage, etc.). Once this difference is estimated, it can be easily transferred into all spheres of development. One will be able to calculate the cost of not taking action (inertial scenario) vs. taking action (aimed at accelerating the fertility decline) in terms of population density, population pressure on land, pasturage, water etc., the increase in the absolute numbers of rural-urban migrants, the cost of expanding urban infrastructure and accommodation for these migrants, the increase in government absolute spending on education and health to sustain their universality (or, at least, the current rate of coverage), the necessary number of new workplaces to be created annually for the increasing numbers of young people entering the labor market, and so on.

It is critically important to understand here that population increase is already inevitable (for some countries, very considerable) due to the colossal demographic inertia gained in the recent decades of very high (stalled) fertility. Taking a closer look at the optimistic scenario (implying an acceleration in fertility decline up to the pace of Iran, with its fastest fertility transition in the world[4]) helps to understand why population increase will happen in any case, even if the most effective fertility-inhibiting measures are taken immediately. It is vital for policy-makers to be aware of this unavoidable population growth, as it should be taken into account in all development forecasts, as well as in major national social and economic policies.

On the other hand, the inertia scenario – or, more exactly, its difference from the optimistic scenario – helps to assess preventable demographic burdens, i.e. how much additional strain can be avoided upon the economy and social infrastructures (and to what extent the risks of socio-political instability can be mitigated) through accelerated fertility transition; and, vice versa, how much additional strain the population explosion will put upon all spheres of development if no urgent and effective policies are introduced to bring down the extremely high fertility rates?

We should emphasize here that scenario forecasts of population dynamics possess considerably high degree of accuracy and reliability; indeed, simply from the current age structure (and the data on age-specific mortality coefficients), we can forecast very reliably the number of school-age children in the next 7 – 10 years, the number of working age people in the next 20 years, etc. – as all these people are already born. Moreover, the advantage of scenario forecasts is that they do not state "it will be like this". Rather, they imply the following: "even if the policy-makers do their best to accelerate the fertility decline in this country, and do it really effectively, the population increase will be no less than this value – and it will have its consequences and implications in all spheres of development. If the policy-

makers let things pass just as they are right now, the population will not simply increase, but rather explode – and its consequences and implications in all spheres of development will be much more serious and can, indeed, become catastrophic".

Below we present a calculation of such basic population dynamics scenarios for Mozambique. For these we used the age-sex population structure as stated by the UN Population Division, and the age-specific mortality rates corresponding to the life expectancy values projected in the UN Population Division "medium" scenario. The values of the current TFR and the age-specific fertility rates were taken from the latest DHS survey. We modeled two basic scenarios:

a). the inertia scenario – here we model the effect of a continuation of the stall for the next 15 years, with subsequent fertility decline at 0.1 children per woman annually (which is the rate of decline currently observed in a number of African countries). Unfortunately, this scenario can not be called overly pessimistic and is, in fact, rather probable if policy-makers continue to regard development as "the best contraceptive", even though the most recent economic achievements (Mozambican where GDP per capita has nearly doubled since the mid-1990s) hardly seem to demonstrate any pronounced fertility-decline-accelerating effect.

b). the optimistic scenario – this implies an immediate acceleration in fertility decline up to the fastest pace known in the developing world (such as that of Iran in the 1980s and 1990s, by about 4 children per woman in 20 years). This scenario helps to reveal the already inevitable population increase – even if fertility decline in Mozambique accelerates to the Iranian pace, the population increase will be huge, as the current generation of children (who will become parents in 20 years) exceeds the current generation of parents by 2 to 3 times. However, reaching this scenario appears for many countries an indispensable condition for avoiding the catastrophic population explosions.

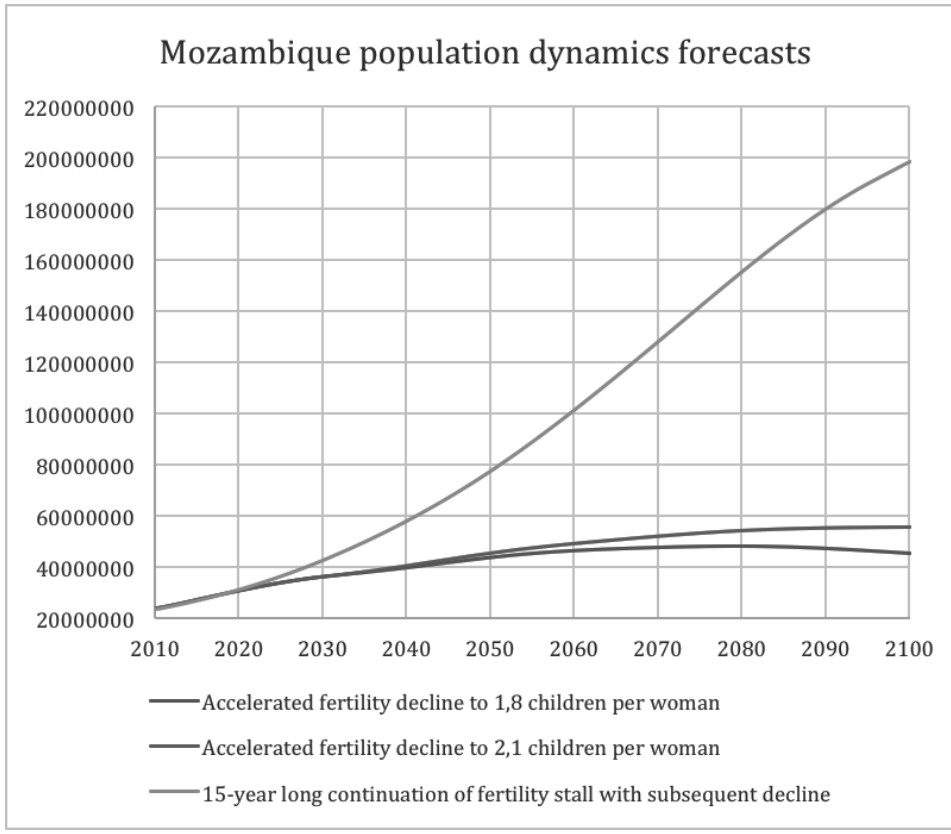

Figure 8. Forecasts scenarios of population dynamics in Mozambique, up to 2100

Table 2. *Absolute population numbers (mln) according to various forecast scenarios for Mozambique*

	Accelerated fertility decline to 1,8 children per woman	Accelerated fertility decline to 2,1 children per woman	15-year long continuation of fertility stall with subsequent decline at 0.1 children per woman annually
2050	44,0	45,6	78,0
2100	45,6	55,8	198,8

In terms of fertility transition dynamics, Mozambique is among the most threatened countries – for more than a decade it has been experiencing not just a stall, but a growth in fertility – from 5.2 in 1997 to 5.5 in 2003 and 5.9 in 2011. If no urgent action is taken to reverse the trend and achieve a fast decline of fertility, the country will encounter a full-scale demographic catastrophe, with population more than tripling from 23 mln to 78 in 2050. So, a dramatic acceleration of fertility transition is necessary for this country to avoid catastrophic scenarios (population doubling by 2050 is already inevitable in any case, which should be taken into account in all development plans and forecasts). A closer look at the numbers of particular age groups and age-dependency ratios (see Table 3) further emphasizes

that the absence of very urgent acceleration in fertility transition will bear colossal risks for sociopolitical stability and will seriously undermine Mozambican prospects for development.

Table 3. *Absolute sizes of certain age groups according to various forecasts scenarios of population dynamics in Mozambique, by 2050*

	Value in 2010, for comparison	Accelerated fertility decline to 1,8 children per woman	Accelerated fertility decline to 2,1 children per woman	15-year long continuation of fertility stall with subsequent decline at 0.1 children per woman annually
School-age children, mln	7,9	8,1	9,1	24,6
Youths aged 15 – 24, mln	4,6	6,4	6,6	15,6
Youth aged 20 – 29, mln	3,9	7,6	7,6	13,2
Age-dependency ratio (people aged<15 and >60 per working-age person)	1,00	0,46	0,51	0,87
Age-dependency ratio (people aged<20 and >60 per working-age person)	1,53	0,62	0,68	1,34
Youth age-dependency ratio (people aged<15 per working-age person)	0,91	0,33	0,38	0,77
Youth age-dependency ratio (people aged<20 per working-age person)	1,41	0,47	0,53	1,22

Thus, if no urgent action is taken to curb the extremely high fertility, the number of school-age children will more than triple in less than 40 years! Mozambique managed to increase its net primary enrollment from 48% in 2000 to 86% in 2012, but still fails to provide universal primary education (UPE) so. Secondary enrollment lags far behind, with only 17% of this relevant age group being enrolled in secondary schools in 2012. It looks extremely unlikely that Mozambican educational system will be able to absorb the tripled number of pupils in the next three decades. Meanwhile, an acceleration in fertility transition up to Iranian pace

will help keep the number of school-age cohorts at roughly the current level with only some increases.

Youth cohorts (15 – 24) will experience a growth by 1.5 times even with the fastest fertility decline – simply due to the demographic inertia; however, the inertia scenario will lead to their quadrupling – again, in less than 40 years, which extremely enhances the country's risks for severe sociopolitical destabilization. Finally, the age-dependency ratios will remain very unfavorable if no acceleration in fertility decline is achieved – presenting a huge hindrance to economic growth, as has been shown in a number of underperforming World Bank projects in Africa. Indeed, for the inertial *vs*. accelerated fertility transition, the difference in age-dependency ratios will reach 3 times as much by 2050!

Despite more than a decade of bright economic performance paralleled by a rapid improvement in calorie intake (by 400 kcal/capita/day, from 1700 to 2100 in 1995 – 2009), Mozambique has still failed to achieve both the WHO minimal energy requirement and the Malthusian trap food consumption threshold of 2350 kcal/capita/day (for more detail see Clark 2007). Securing further growth in per capita food consumption (or, at least, securely preserving the level achieved by now) will require sustaining not just high GDP growth rates, but high GDP per capita growth which, taking into account the inevitable population doubling in the next 35 years, will be very challenging. However, if fertility transition fails to accelerate, the population will triple – and this can collapse the food supply situation.

Conclusion

In conclusion, we can state that the UN population projections for Mozambique that were made according to the medium scenario have proven to be too optimistic. Projected population increase, in our opinion, is considerably underestimated as the fertility decline implied in the scenario was not observed in real fertility dynamics; on the contrary, according to recent data, fertility stall continues, and fertility rate has even increased. This means that the risks of explosive population growth in Mozambique will become a highly acute problem in the coming decades, which obviously requires urgent, effective measures aimed at bringing down the fertility rates and population growth rates.

Moreover, the impact of demographic dynamics on African development performance has been very significant so far, and is likely to get utterly critical in the next few decades; the issue of demographic forecasting acquires a whole new meaning for understanding the prospects of African development and practical policy making in its various spheres.

The specific method used for the UN projections has been limited in its applicability for such a task. Most importantly, the universal set of scenarios ("high", "medium", and "low") outlines the possible diapason in which the African demographic future will most likely reveal itself; but it fails to answer the practical questions, which are crucial when trying to account for the demographic trends in development forecasts – e.g., What population growth will a country have by 2050 if the fertility stall ends right now? How many more workplaces will be needed annually for the young labor market entrants if the present fertility stall continues for another 15 years? How many more new schools will have to be created for the children if the current rates of fertility decline remain unchanged, as compared to the scenario of reaching the Iranian (or Rwandan) pace of fertility decline? Most

importantly – this population increase (in all age groups, including schoolchildren, youths, working-age, etc.) will be inevitable by the years 2030, 2040 and 2050, because of demographic inertia; will the policy makers embrace the implications of this projected increase in the population and create the infrastructures (the amount of workplaces, schools, hospitals, accommodation etc.) necessary to sustain the increasing population ?

The answers to such questions can hardly be derived from the UN projections (despite their indisputable value and usefulness for a whole range of other purposes), but through scenario demographic modeling which we applied in this paper in the case of Mozambique, the implications of various scenarios of the country's demographic future can be obtained and revealed. In our opinion, further application of this method can significantly contribute to our knowledge of the impact of high-fertility on developing countries, and their demographic situation on their development prospects.

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Notes

1 From now on we will be using this term to denote the region of Sub-Saharan Africa minus the Southern African countries (South Africa, Botswana, Lesotho, Namibia, Swaziland, and Zimbabwe). These countries should be treated as forming a very specific sub-region, which is much more modernized in many aspects, including the demographic dynamics, than the typical Tropical African countries.

2 TFR = total fertility rate represents the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with current age-specific fertility rates (World Bank 2014: SP.DYN. TFRT.IN).

3 Though such population growth is still very fast.

4 Achieving the Iranian pace of fertility decline is a very challenging task, but is still very possible in Tropical Africa – as the latest experience of Rwanda convincingly proves.

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