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Africa's Dynamics: History and Possible Futures*

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Abstract

This article presents forecasts for the emergence of large-scale political and demographic collapses and for the economic growth of some countries in Sub-Saharan Africa (SSA) where the likelihood of armed civil conflicts and population impoverishment is the highest in the coming decades. The authors apply several advanced mathematical models: (1) to forecast the risks of armed conflict, where population, median age, and education are the main explanatory factors; and (2) to forecast economic growth, which is a function of the same variables and risks of large-scale armed civil conflicts. It is important to note that mathematical models consider the interaction of explanatory factors with each other, thereby creating feedback effects. Using these methods, the authors calculate three possible development scenarios for each of the countries under consideration in the 21st century: (1) a pessimistic one, (2) an inertial one and (3) an optimistic one assuming the achievement of sustainable development goals (SDGs) by 2030. The modeling results suggest that the Sahel could become the most disadvantaged region. The four countries of this region are characterized by: (1) a negligible difference between the inertial scenario and the pessimistic scenario; (2) extremely high risks of full-scale civil wars in the close future; and (3) reaching the level of middle-income countries only by the end of this century, even under the most optimistic scenario. The authors conclude that the main way of mitigating the risks of sociodemographic collapses is rapid progress towards achieving the SDGs in the very near future, which seems impossible without an adequate support of the world community.

Keywords: *Sub-Saharan Africa, mathematical modeling, socio-demographic future, development scenario.*

1. Modeling the Socio-Demographic Futures of Africa

1.1. An Overview

Currently, Tropical Africa is still characterized by very high fertility rates, which distinguish it from all the other regions of the world (see Fig. 1, see also Zinkina and Korotayev 2014a, 2014b; Korotayev *et al.* 2016; Nzimande and Mugwendere 2018; Kebede *et al.* 2019; Schoumaker 2019; May and Rotenberg 2020).

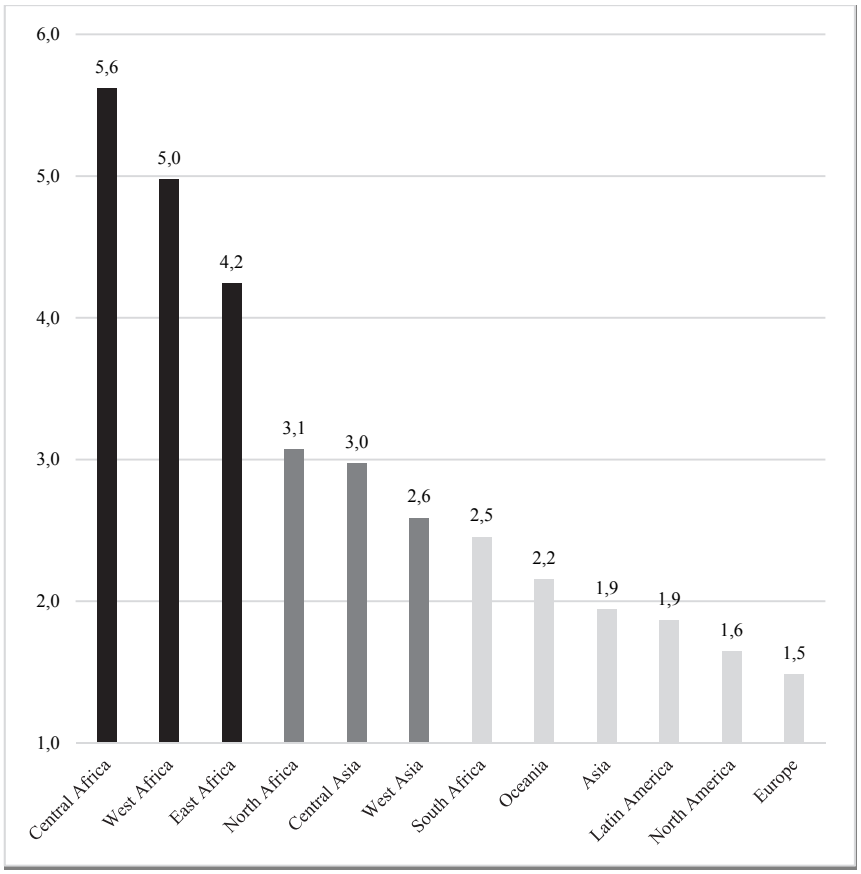

Fig. 1. Total fertility rates in various regions of the world in 2021
Source: UN Population Division Database 2022.

Given the very slow decline in fertility rates against the background of rather remarkable decline in mortality rates, it is hardly surprising that even the medium UN population forecasts imply impressive population growth in this region. For example, according to medium UN forecasts, the population of Kenya will catch up with the population of Russia by the end of this century, and the population of Uganda will even surpass it (see Fig. 2). The population of Tanzania will exceed the population of Russia by the mid-21st century, and Ethiopia's population will do this already by the 2030s; by the late 21st century, Tanzania and Ethiopia are projected to overtake Russia in terms of population size by almost two and three times, respectively.

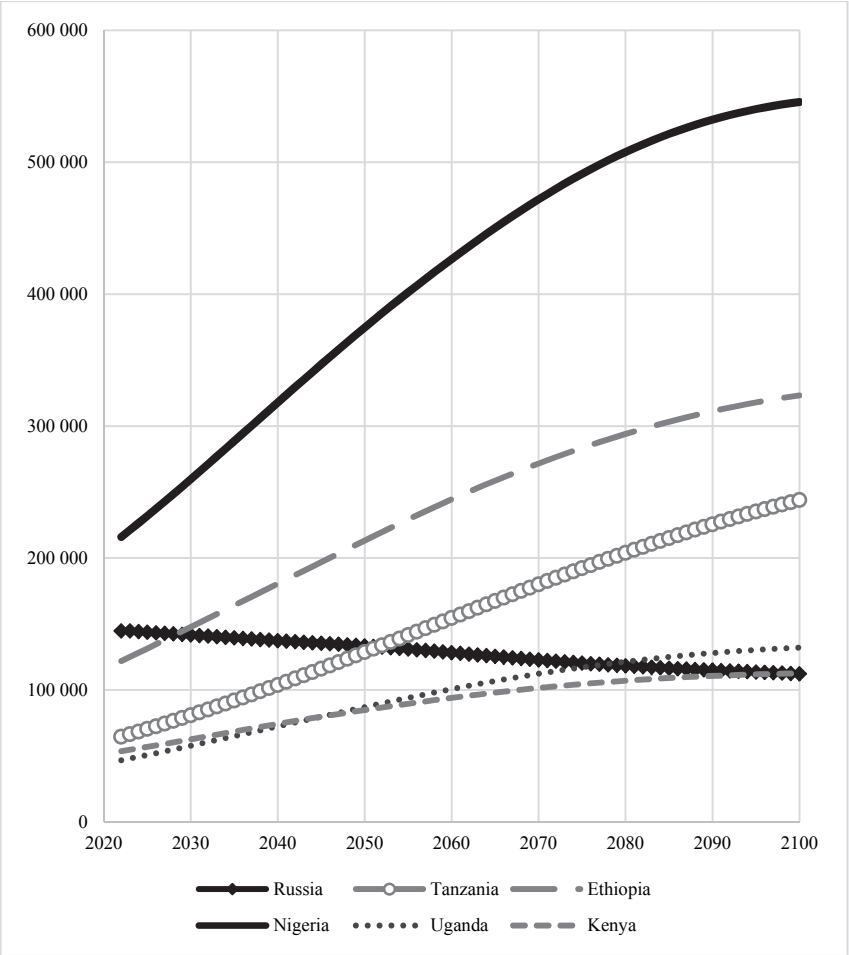

Fig. 2. Population projections for some African countries in comparison with Russia, UN forecasts from 2020 to 2100 (thousands)

Source: UN Population Division Database 2022.

The easiest way to compare the expected populations of two countries is to compare the sizes of child age groups within the structures of their current populations. Thus, Ethiopia can be expected to overtake Russia in terms of population size very soon, as the number of children under five years old in Russia is currently less than eight million, while Ethiopia has nearly 18 million of children under five (see Fig. 3).

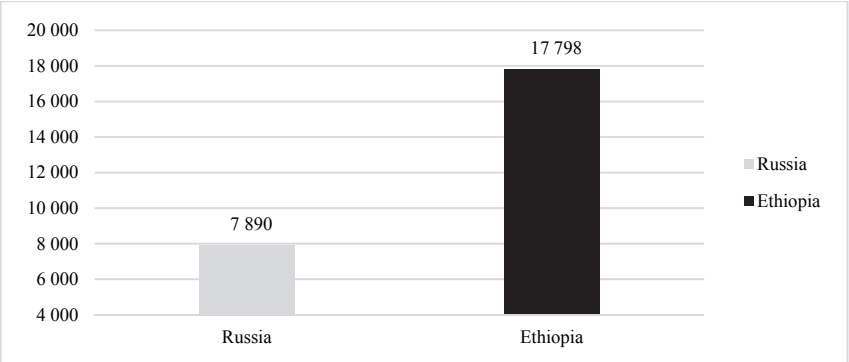

Fig. 3. The number of children under five in Russia and Ethiopia in 2021 (thousands)

Source: UN Population Division Database 2022.

The largest increase in population is forecasted for Nigeria; by 2100 it is projected to overtake the whole of Europe (including Russia), its population is rocketing to reach more than 540 million people (see Fig. 4). Fig. 4 presents the population projections for Sub-Saharan countries with the largest expected population increase in absolute terms that can result in catastrophic consequences for the development of these countries. Projections of the population of Russia are presented for the sake of comparison.

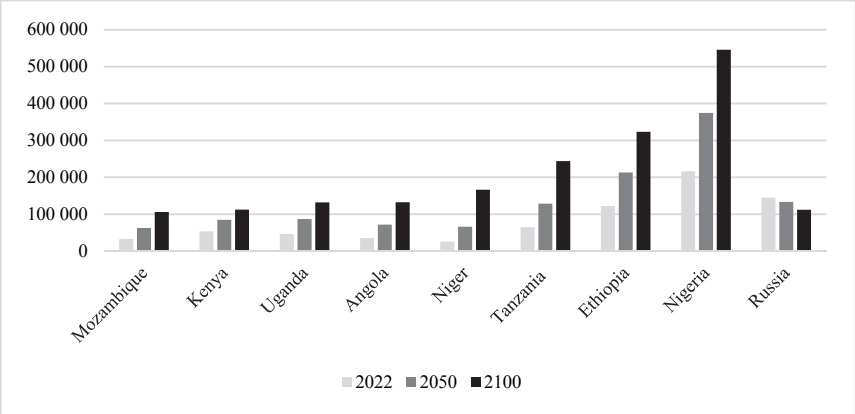

Fig. 4. Population projections for Sub-Saharan countries with the largest expected population increase in absolute terms and population projections for Russia

Source: UN Population Division Database 2022.

Below we will consider several scenarios of the socio-demographic development of the countries of Tropical Africa, corresponding to different scenarios for modernization processes in this part of our planet. A mathematical model with the following cognitive scheme is used to simulate the demographic future of African countries (see Fig. 5).

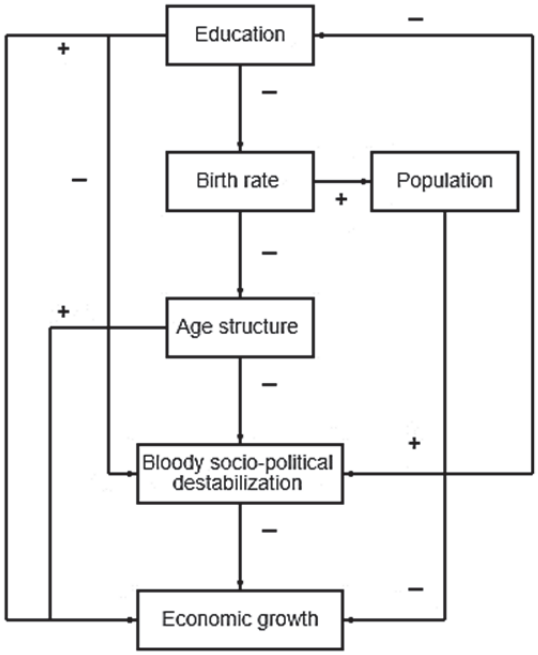

Fig. 5. Cognitive scheme of the influence of various factors on economic growth and their interaction with each other

The expansion of formal education in the low-income and middle-income countries leads to a significant decrease in the birth rate (see, *e.g.,* Zinkina and Korotayev 2017; Kebede *et al.* 2019). In turn, fertility decline leads to an increase in the share of the working-age groups in the total population, creating the effect of the so-called 'demographic bonus' (see, *e.g.,* Bloom *et al.* 2003; Bloom and Williamson 1998; Bloom *et al.* 2000; Omoruyi 2021; Korotayev, Shulgin *et al.* 2022). Fertility decrease brings down the youth bulges and leads to population aging (an increase in the median age), which, in turn, leads to a decrease in the risks of armed socio-political destabilization.[1] The spread of education

[1] See, *e.g.*, Moller 1968; Choucri 1974; Mesquida and Wiener 1996, 1999; Goldstone 1991, 2001, 2002; Urdal 2004, 2006, 2008; Staveteig 2005; Korotayev *et al.* 2011, 2014; Goldstone, Kaufmann, and Toft 2012; Farzanegan and Witthuhn 2017; Weber 2019; Cincotta and Weber 2021;

reduces risks of armed socio-political destabilization[2] and directly and positively affects economic growth (see, *e.g.,* Mankiw *et al.* 1992; Lucas 2002; Bonnal and Yaya 2015; Mamoon and Murshed 2009). At the same time, rapid population growth coupled with insufficient economic growth causes an increase in the risks of armed destabilization. High population itself strongly and positively influences the risks of destabilization (Urdal 2008; Besançon 2005; Wimmer and Cederman 2009; Hegre and Sambanis 2006; Raleigh 2015). Armed political destabilization is strongly and negatively associated with economic growth (see, *e.g.,* Aisen and Veiga 2013; Fosu 1992; Gates *et al.* 2012; Alesina *et al.* 1996). There is also a strong negative relationship between education and armed destabilization, which is supported empirically (see, *e.g.,* Justino 2006; Østby *et al.* 2019; Ustyuzhanin and Korotayev 2023; Ustyuzhanin *et al.* 2022, 2023a, 2023b).

These theoretical assumptions are modelled using mathematical equations that are calculated for a certain country in a certain year: (1) the probability of an armed destabilization (a modified version of Cincotta and Weber 2021 model) and (2) economic development, taking into account this probability (based on the model by Aisen and Veiga 2013). Such models can be presented in the following form:

For armed destabilization:

$$g(c_{it}) = \beta_0 + \beta_1 * \ln(P_{it}) + \beta_2 * M_{it} + \beta_3 * E_{it} + \beta_4 * \mu_t + \varepsilon_{it} \qquad \text{(Eq. 1)}$$

$$i = 1,\ldots, Nt = 2020,\ldots,2100,$$

where $g(c_{it})$ – logit function of the dependent variable c_{it} (1 = armed uprising/civil war, 0 = its absence) for observation i at time t;

P_{it}, M_{it} and E_{it} – explaining variables of i observation at time t (population, median age, and education, respectively);

β_{it} – estimated coefficients for the explanatory variables;

μ_t – specific time effect;

ε_{it} – the random errors of each observation i at time t.

Romanov *et al.* 2021; Korotayev, Sawyer, Gladyshev *et al.* 2021; Korotayev, Romanov *et al.* 2023; Sawyer *et al.* 2022.

[2] The diffusion of formal education in low- and middle-income countries simultaneously leads to an increase in the risks of unarmed destabilization (*e.g.,* Korotayev, Bilyuga, and Shishkina 2017b, 2018; Korotayev, Sawyer, Grinin *et al.* 2020; Korotayev, Sawyer, and Romanov 2021; Sawyer and Korotayev 2022; Ustyuzhanin and Korotayev 2023; Ustyuzhanin *et al.* 2022, 2023a, 2023b) while reducing the risks of armed revolutions/civil wars (Urdal 2008; Østby *et al.* 2019; Ustyuzhanin and Korotayev 2023; Ustyuzhanin *et al.* 2022, 2023a, 2023b). However, these are armed insurgencies/civil wars that have a really strong negative impact on economic growth. Thus, education reduces namely those risks that negatively affect economic growth. Therefore, the impact of the spread of formal education through this channel on economic growth is rather positive, which is also confirmed in models of neoclassical economic growth.

To calculate the probability from the estimated $g(c_{it})$, it is necessary to transform it into exponential form. Then the equation of the estimated probability of event c_{it} will be:

$$P(c_{it}=1)=\frac{e^{\beta_0+\beta_1*\ln(P_{it})+\beta_2*M_{it}+\beta_3*E_{it}+\mu_t+\varepsilon_{it}}}{1+e^{\beta_0+\beta_1*\ln(P_{it})+\beta_2*M_{it}+\beta_3*E_{it}+\mu_t+\varepsilon_{it}}} \text{ or } \frac{e^{g(c_{it})}}{1+e^{g(c_{it})}} \quad \text{(Eq. 2)}$$
$$i=1,\ldots,Nt=2020,\ldots,2100$$

To evaluate economic growth, it makes sense to model first the overall level of economic development:

$$\ln(y_{it})=\gamma_0+\gamma_2*\ln(y_{i,t-1})+\gamma_3*\Delta P_{it}+\gamma_4*M_{it}+\gamma_5*E_{it}+\varphi\left(\frac{e^{g(c_{it})}}{1+e^{g(c_{it})}}\right)+\varepsilon_{it} \quad \text{(Eq. 3)}$$
$$i=1,\ldots,Nt=2020,\ldots,2100$$

where y_{it} – GDP per capita of observation i at time t;

β_i – estimated coefficients for the explanatory variables;

$y_{i,t-1}$ – GDP per capita of observation i at time $t-1$ (lagged);

$\Delta P_{it}=\frac{P_{it}-P_{i,t-1}}{P_{i,t-1}}$ – population delta,

where P_{it} – population of observation i at time t, and $P_{i,t-1}$ – population of observation i at time $t-1$ (lagged);

M_{it} – median age of observation i at time t;

E_{it} – education of observation i at time t;

ε_{it} – random errors of each observation i at time t;

$\varphi\left(\frac{e^{g(c_{it})}}{1+e^{g(c_{it})}}\right)$ – probability function of armed destabilization of observation i at time t, which has the following form:

$$\varphi\left(\frac{e^{g(c_{it})}}{1+e^{g(c_{it})}}\right)=\begin{cases}\gamma_4*P(c_{it}),\ P(c_{it})\le 0,25\\ 2\gamma_4*P(c_{it}),\ P(c_{it})>0,25\ and\ P(c_{it})\le 0,5\\ 3\gamma_4*P(c_{it}),\ P(c_{it})>0,5\ and\ P(c_{it})\le 0,75\\ 4,5\gamma_4*P(c_{it}),\ P(c_{it})>0,75\end{cases} \quad \text{(Eq. 4)}$$
$$i=1,\ldots,Nt=2020,\ldots,2100$$

where $P(c_{it})$ is estimated probability of armed destabilization for observation i at time t.

Then economic growth can be modeled by following equitation:

$$growth_{it}=\frac{y_{it}-y_{i,t-1}}{y_{i,t-1}}*100\% \quad \text{(Eq. 5)}$$
$$i=1,\ldots,Nt=2020,\ldots,2100$$

Based on this, the following scenarios are modeled:

1. The inertial scenario is based on the assumption that the trends of recent years will continue at the same pace in the respective countries (and in Sub-Saharan Africa [SSA] as a whole).

2. Pessimistic scenario of delayed modernization in SSA cannot be ruled out as there have already been precedents when, after a period of fairly rapid modernization (declining fertility rate, rapid expansion of formal education), many countries of the region experienced a noticeable slowdown. Thus, the attempts to save on education within the framework of structural adjustment programs in the 1990s caused delay in its spread that, in turn, led to remarkable slowdowns or, not infrequently, complete stalls of fertility decline (Schoumaker 2019; Zinkina and Korotayev 2017; Kebede *et al.* 2019).

3. Scenario of full achievement of the sustainable development goals (SDGs). When analyzing the impact of achieving the SDGs on fertility decline in Sub-Saharan countries, we rely on the calculations of the Institute of Health Metrics and Evaluation (IHME) (Vollset *et al.* 2020).

In terms of demographic characteristics, our inertial scenario corresponds to the reference scenario, and the pessimistic scenario corresponds to the scenario of slow achievement of the SDGs by the Institute for Health Metrics and Assessment (*Ibid*.). These scenarios produce the following projections of population dynamics in Sub-Saharan Africa (see Fig. 6).

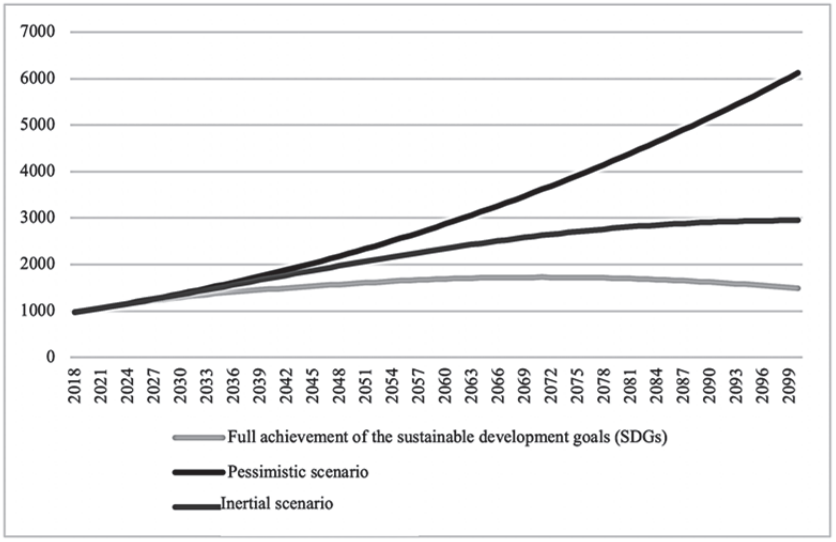

Fig. 6. Population growth scenarios (in millions) in Sub-Saharan Africa in the 21st century

Note that the pessimistic scenario (the upper black line in Fig. 6) is rather speculative. This scenario (as will be shown below) is fraught with the highest risks of socio-demographic and political-economic collapses in the not-too-distant future. Inertial scenario (the intermediate line), though less threatening, also bears rather serious risks of collapses, although in the noticeably more distant future. The only scenario that can secure stable development of the SSA countries withstanding the risks of socio-demographic and political-economic collapses is the scenario of a fairly rapid and full achievement of the SDGs.[3]

1.2. Forecast Scenarios for Countries

Let us now consider the results of modeling the demographic, economic and political future of some of the most important countries in Tropical Africa. We will start with presenting our results for Angola. To begin with, one should consider scenarios for the dynamics of the risks of armed destabilization/civil wars (see Fig. 7).

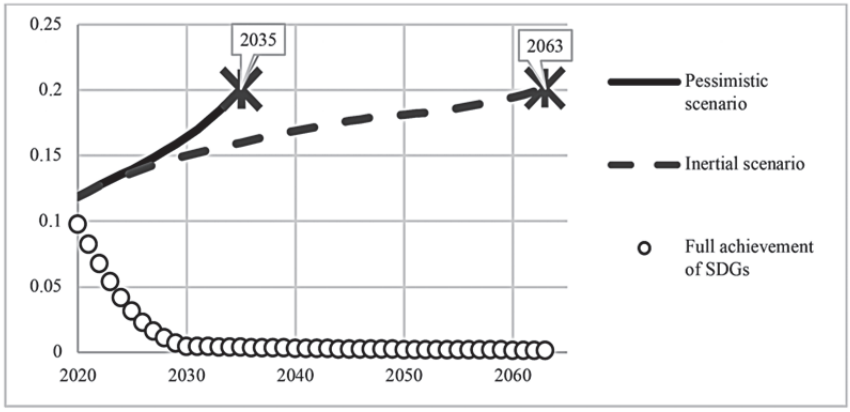

Fig. 7. Scenarios of risk dynamics of armed destabilization/civil wars in Angola

As will become clear from comparison with other analyzed countries of Tropical Africa, Angola is characterized by rather low risks of the outbreak of large-scale civil wars. Even if the inertial scenario is followed, noticeable risks of catastrophic civil wars in the country will appear only in the second

[3] Taking into account the fact that under any demographic scenario these countries follow the path of modernization, and this period is always more prone to processes of destabilization and revolutions, as well as due to immature statehood, the growth of nationalism (often in the form of ethnic tribalism), the risks of socio-political destabilization in SSA countries remain very high (Korotayev *et al.* 2011; Goldstone *et al.* 2022; Grinin 2022b; Grinin and Grinin 2022).

half of this century. Only a significant delay in moving towards the achievement of the SDGs (primarily in the spread of modern education) can lead to the emergence of such risks in the next decade (a pessimistic scenario). At the same time, Angola will be able to reach the level of modern China in per capita GDP by 2058 even if it follows the inertial scenario (see Fig. 8).

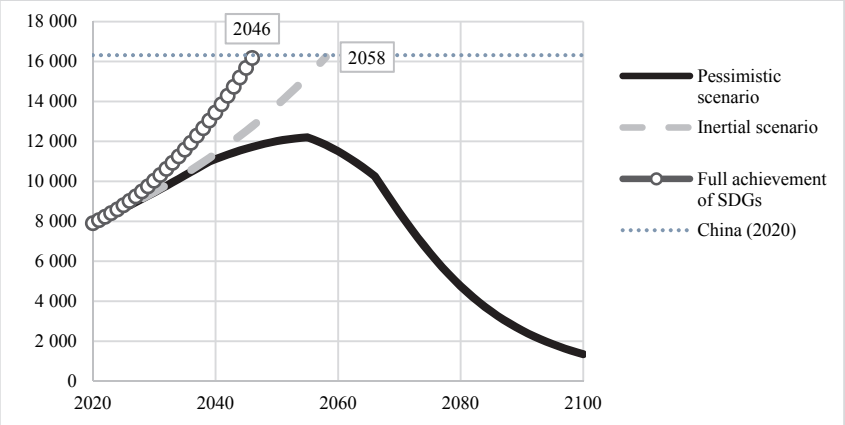

Fig. 8. Scenarios for GDP per capita dynamics in Angola. Here and throughout GDP per capita is estimated in constant 2011 international dollars at purchasing power parities

However, if Angola follows the scenario of achieving the SDGs, it will be able to reach the level of modern China even before 2050. It should be noted that we refrain from predicting the further economic development of both Angola and other countries of Tropical Africa after reaching the level of modern China, since there is reason to expect that, after this, the development of the countries of Tropical Africa will most likely slow down due to the effect of the middle-income trap (on this trap, see, *e.g.*, Glawe and Wagner 2016; Kharas and Kohli 2011; Matsuyama 2008; Azariadis and Stachurski 2005). Thus, for modeling the further development of the countries of Tropical Africa, the above mathematical model is no longer sufficient.

It should be noted that if the process of achieving the SDGs is completely disrupted, even if destructive civil wars do not start in Angola, we should expect a slowdown in economic development up to the negative economic growth rates, followed by the impoverishment of the population of Angola. However, even if this scenario is followed, per capita GDP in Angola will drop to only US$ 1,350 by 2100, which is still noticeably higher than this indicator, for example, in modern Niger (US$ 985). This shows that Angola has a sufficient

margin of safety, a good economic base and relatively low risks of armed destabilization and impoverishment of the population.

Tanzania is characterized by a noticeably higher level of risks, although it looks quite safe against the general background of the countries of Tropical Africa (see Fig. 9).

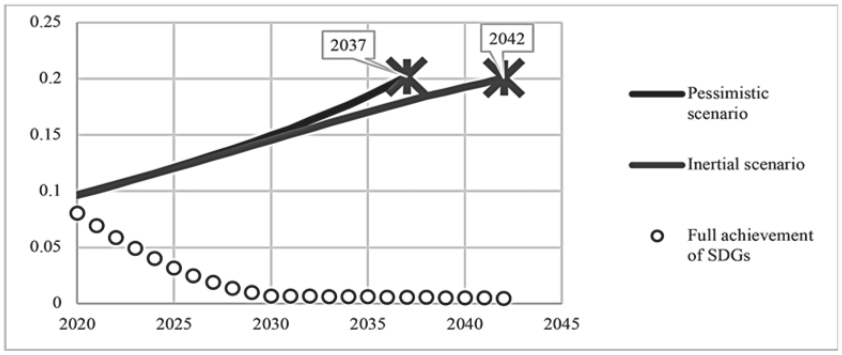

Fig. 9. Scenarios of risk dynamics of armed destabilization/civil wars in Tanzania

With the development according to the inertial scenario, serious risks of full-scale civil wars in this country will appear only in 2040. And with a significant delay in achieving the SDGs, ending or reducing the coverage of the population with formal education, Tanzania may face the risks of full-scale armed destabilization as early as 2030.

Under the SDG Fast Scenario, GDP per capita in Tanzania will reach the level of modern China in 2070 (see Fig. 10).

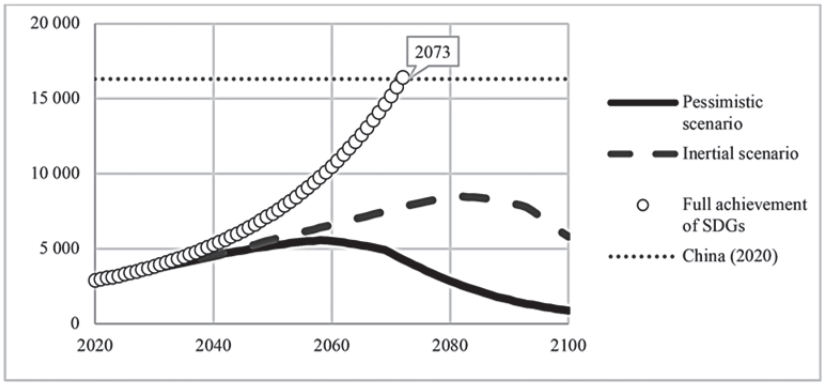

Fig. 10. GDP per capita scenarios in Tanzania

In the inertial scenario, Tanzania will not be able to exceed the US$ 9,000 level, and at the same time, at the end of the century, a systematic decline in the average levels of income of the country's population may begin. Under the scenario of significant underachievement of the SDGs, by the end of the century, even if Tanzania manages to avoid a large-scale political and demographic collapse, there will be a catastrophic impoverishment of the country's population with a drop in per capita GDP below US$ 1,000, which is less than the initial values in 2020.

Quite similar scenarios can be traced for Uganda, where the risks of a full-scale civil war with an inertia scenario are expected in the second half of this century, and, with a significant lag in achieving the SDGs, in the 2030s (see Fig. 11).

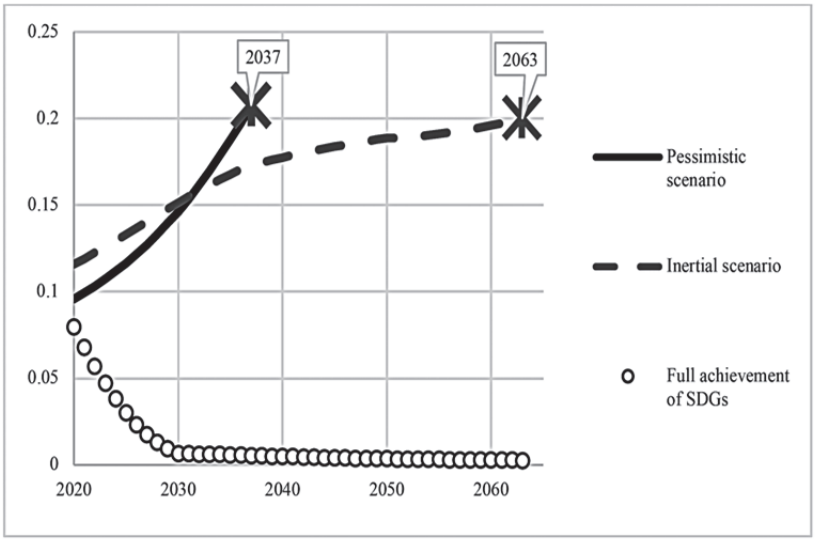

Fig. 11. Scenarios of risk dynamics of armed destabilization/civil wars in Uganda

Uganda is expected to reach the level of the PRC in terms of per capita GDP under the scenario of rapid achievement of the SDGs in the second half of this century. It performs slightly better under the inertial scenario than Tanzania, but under a particularly significant SDG delay scenario, it is projected to be even more impoverished, with GDP per capita falling below US$ 500 (see Fig. 12).

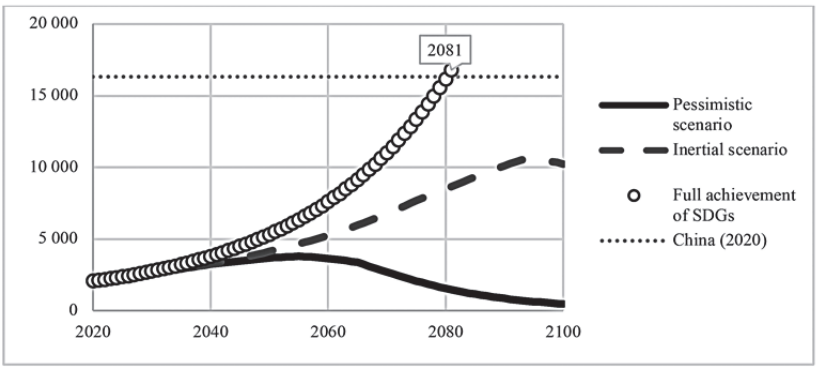

Fig. 12. GDP per capita scenarios in Uganda

Ethiopia is characterized by extremely high risks of armed destabilization, full-scale civil wars and political and demographic collapses in the very coming years. At the same time, such risks are extremely high even in the case of development under the inertial scenario. To prevent them, a noticeable acceleration in the achievement of the SDGs is necessary (see Fig. 13).

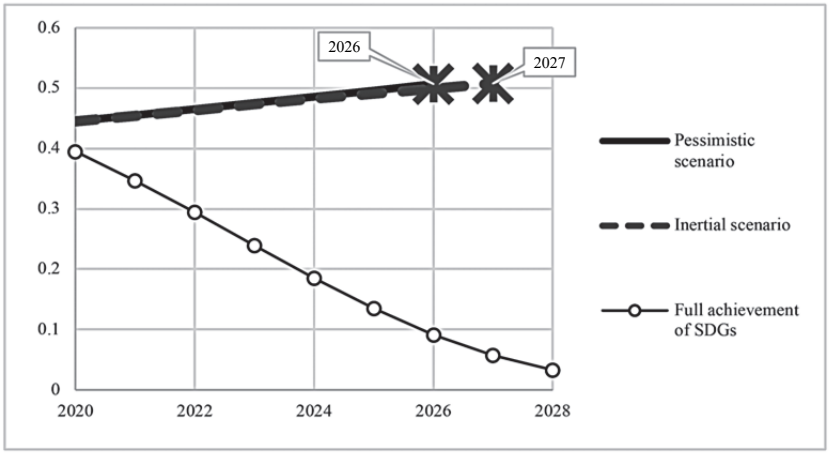

Fig. 13. Scenarios of risk dynamics of armed destabilization/civil wars in Ethiopia

Accordingly, even the development according to the inertial scenario assumes a significant impoverishment of the Ethiopian population in the coming decades. However, an accelerated path to achieving the SDGs could allow

Ethiopia to reach the level of modern China in the second half of this century (see Fig. 14).

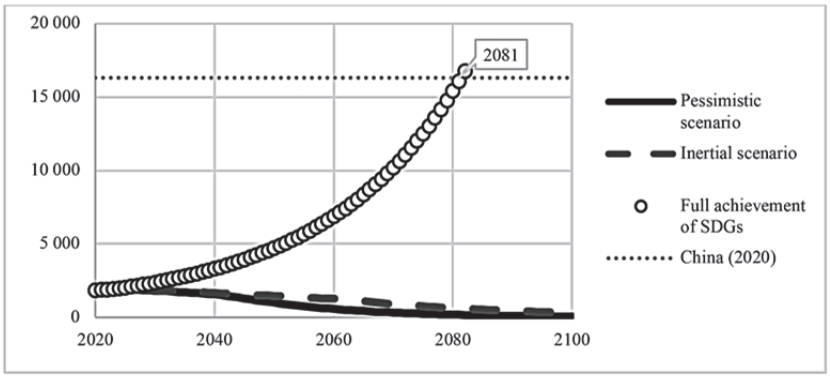

Fig. 14. GDP per capita scenarios in Ethiopia

Somewhat lower, but still very high, are the risks of political-demographic collapses in Nigeria as well (see Fig. 15).

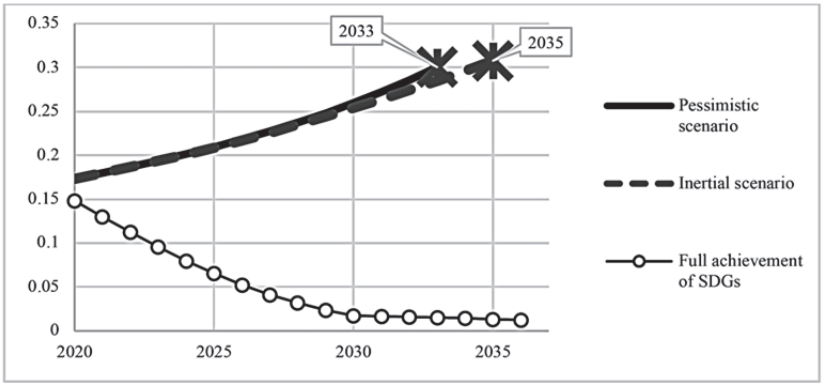

Fig. 15. Scenarios of risk dynamics of armed destabilization/civil wars in Nigeria

However, Nigeria's economic prospect looks somewhat less ominous. Per capita GDP growth in Nigeria may continue until the mid-century (albeit at a rather slow pace) even under the inertial scenario. In the case of the optimistic scenario, Nigeria could approach the level of modern China by the mid-century (see Fig. 16).

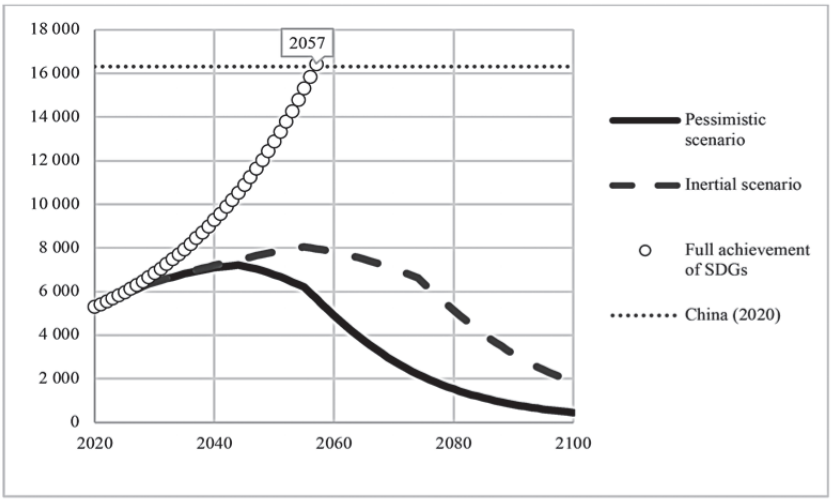

Fig. 16. GDP per capita scenarios in Nigeria

The risks of new full-scale civil wars are also extremely high in the Democratic Republic of the Congo (see Fig. 17).

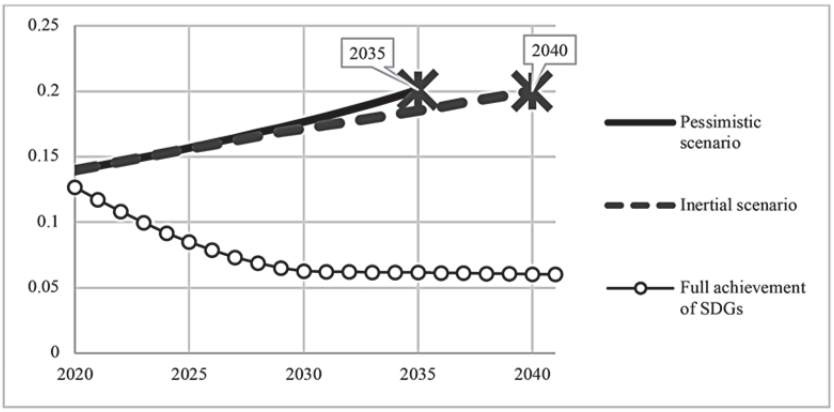

Fig. 17. Scenarios of risk dynamics of armed destabilization/civil wars in the DRC

At the same time, the prospects for the economic development of the DRC seem noticeably worse than those of Nigeria: even with the development under the optimistic scenario, the DRC will be able to catch up with China in terms of its GDP per capita only by the very end of this century (see Fig. 18).

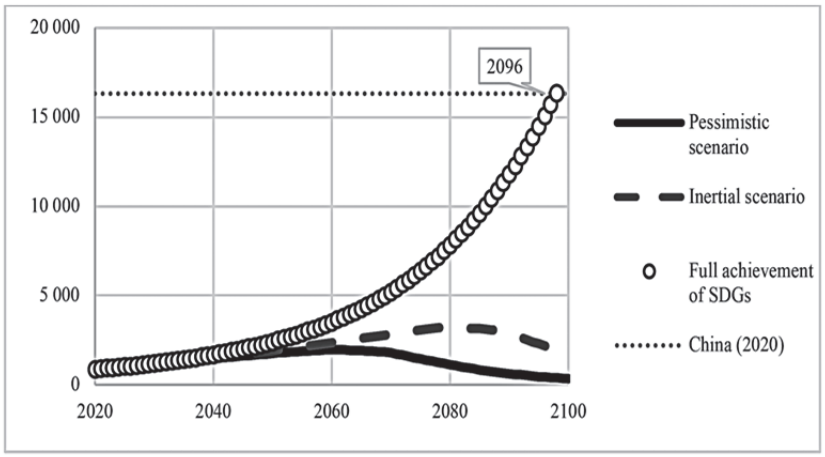

Fig. 18. GDP per capita scenarios in DR Congo

A very similar pattern is observed for Mozambique (see Figs 19 and 20) and Senegal (see Figs 21 and 22).

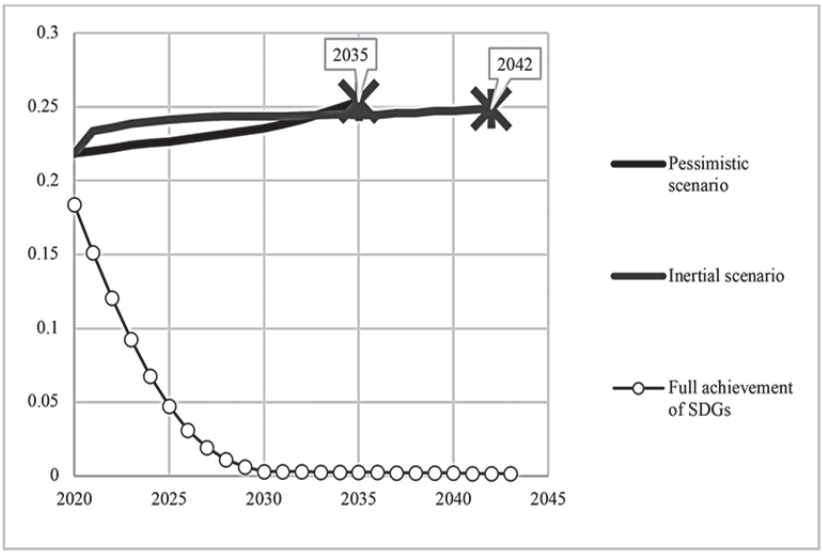

Fig. 19. Scenarios of risk dynamics of armed destabilization/civil wars in Mozambique

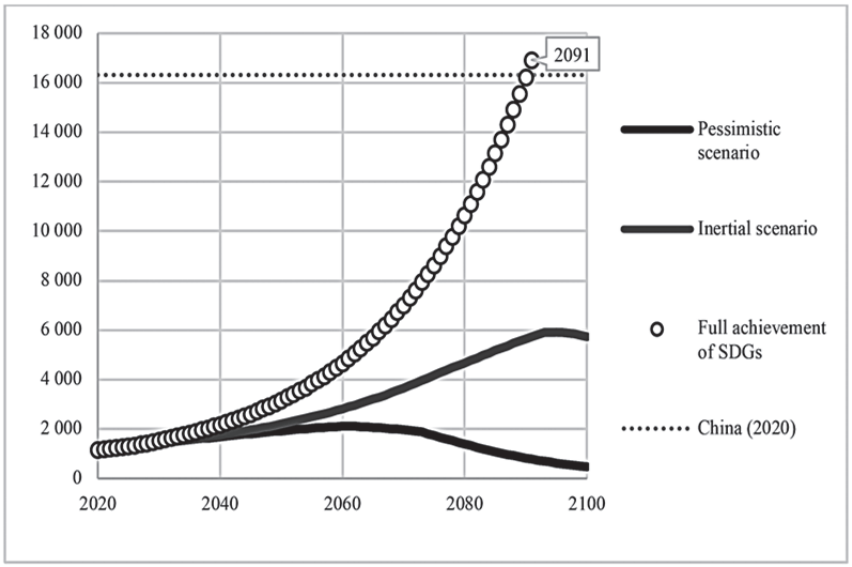

Fig. 20. GDP per capita scenarios in Mozambique

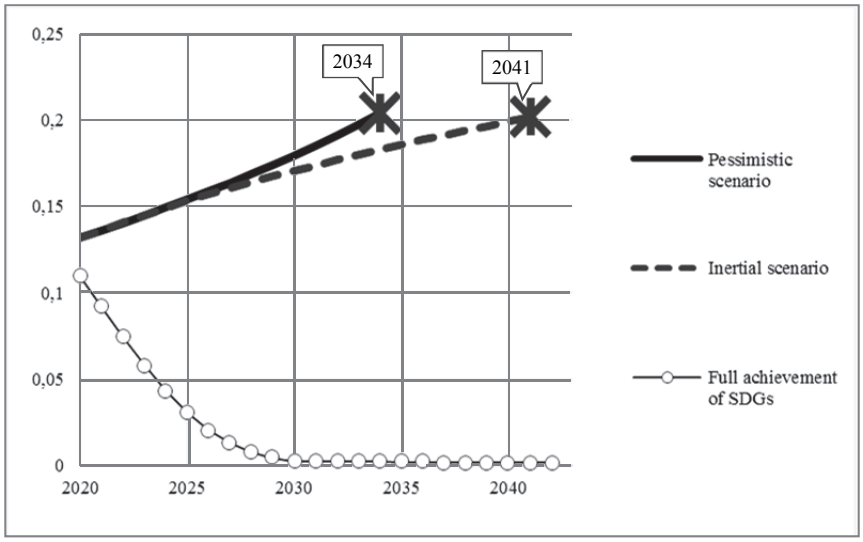

Fig. 21. Scenarios of risk dynamics of armed destabilization/civil wars in Senegal

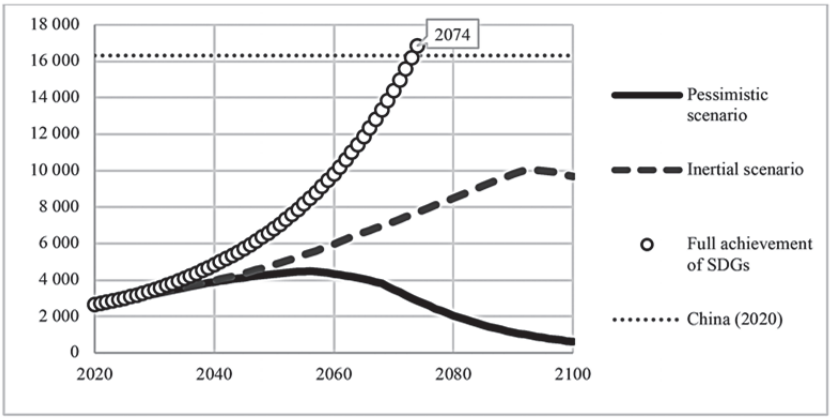

Fig. 22. GDP per capita scenarios in Senegal

Finally, we are dealing with the highest (even by the standards of Tropical Africa) risks of political and demographic collapses in the Sahelian countries (Chad, Mali, Burkina Faso, and Niger, see Figs 23–44). All these countries are characterized by: (1) a very slight difference between the inertial scenario and the pessimistic scenario; (2) extremely high risks of full-scale civil wars in the very coming years; and (3) reaching the level of middle-income countries only by the end of this century, even under the most optimistic scenario.

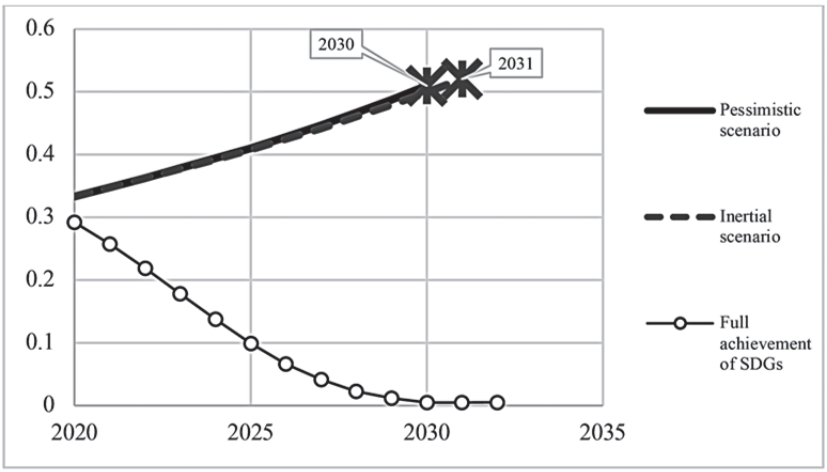

Fig. 23. Scenarios of risk dynamics of armed destabilization/civil wars in Chad

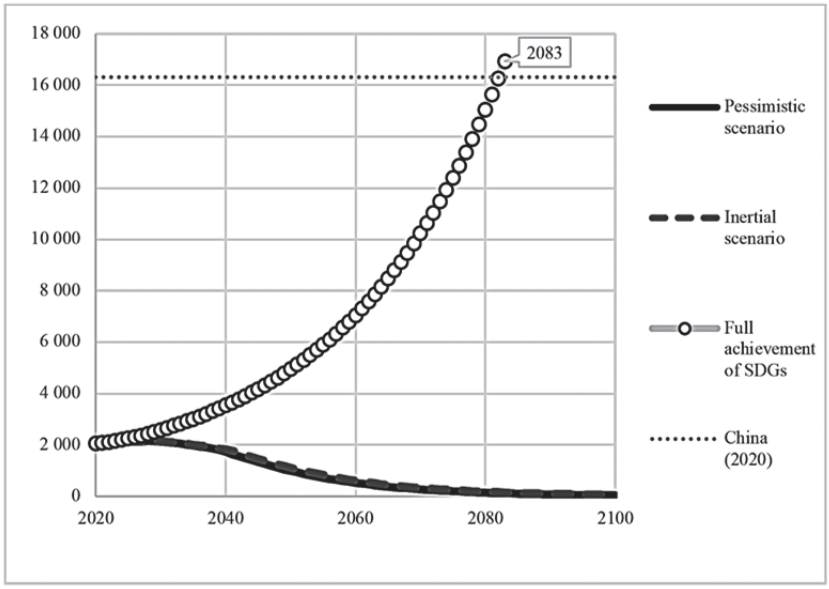

Fig. 24. GDP per capita scenarios in Chad

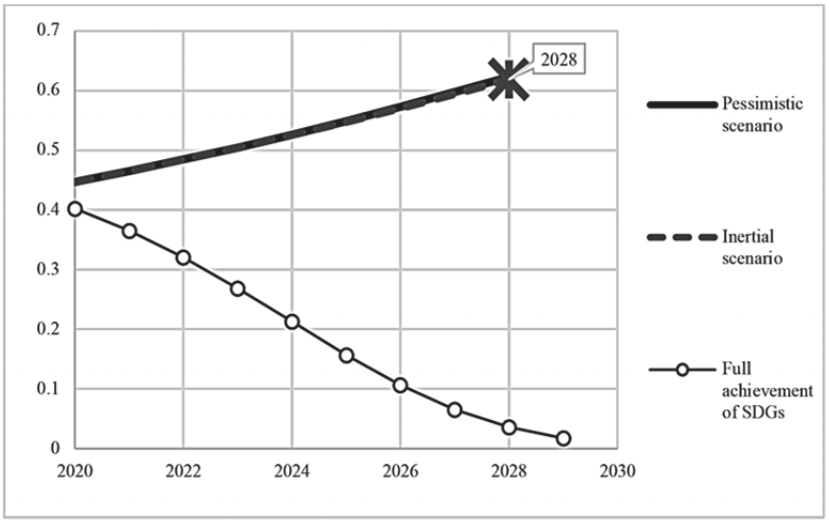

Fig. 25. Scenarios of risk dynamics of armed destabilization/civil wars in Niger

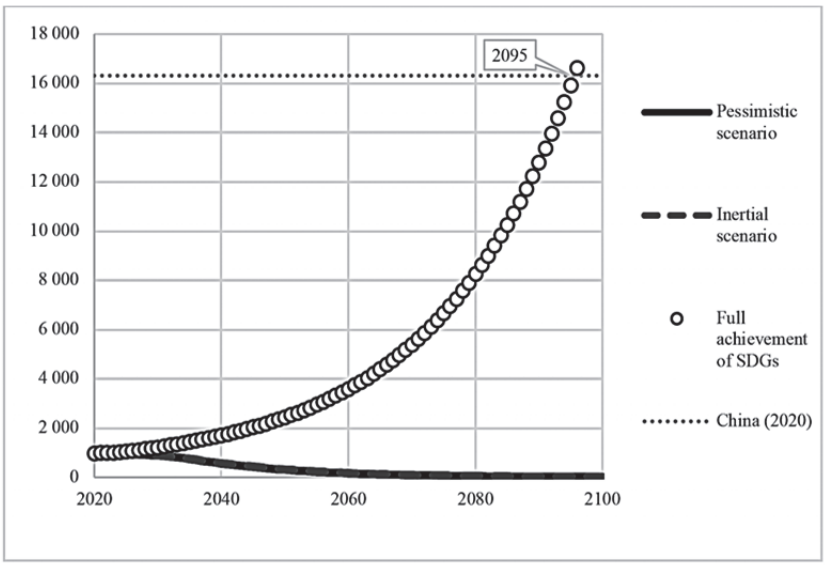

Fig. 26. GDP per capita scenarios in Niger

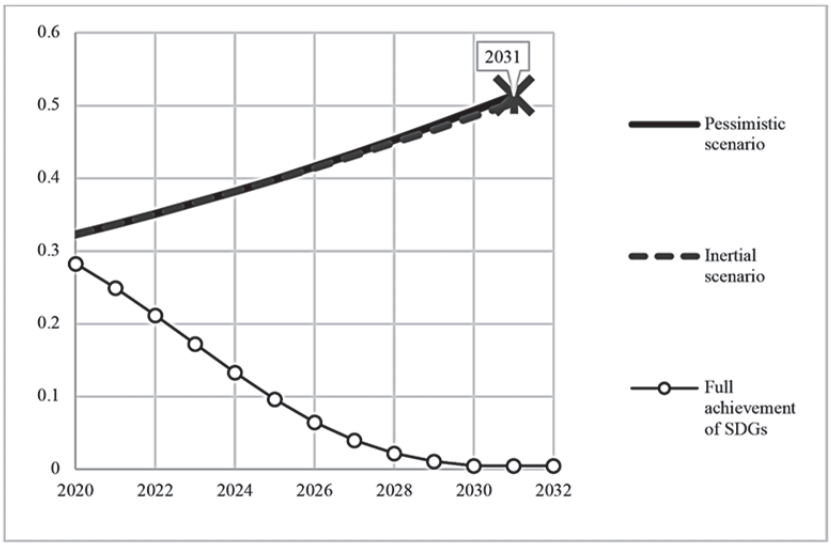

Fig. 27. Scenarios of risk dynamics of armed destabilization/civil wars in Mali

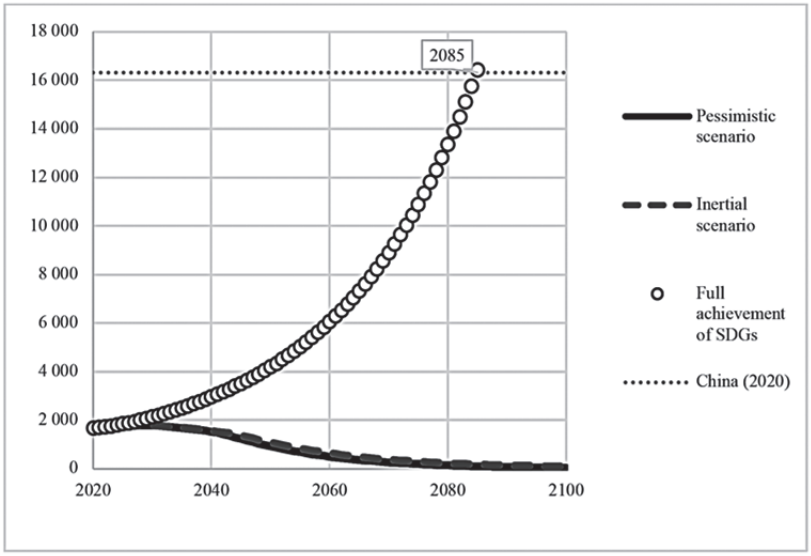

Fig. 28. GDP per capita scenarios in Mali

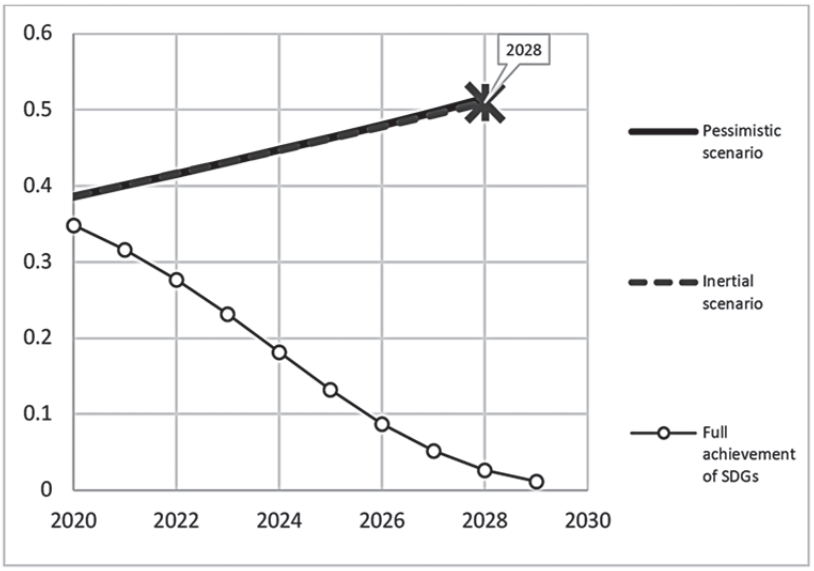

Fig. 29. Scenarios of risk dynamics of armed destabilization/civil wars in Burkina Faso

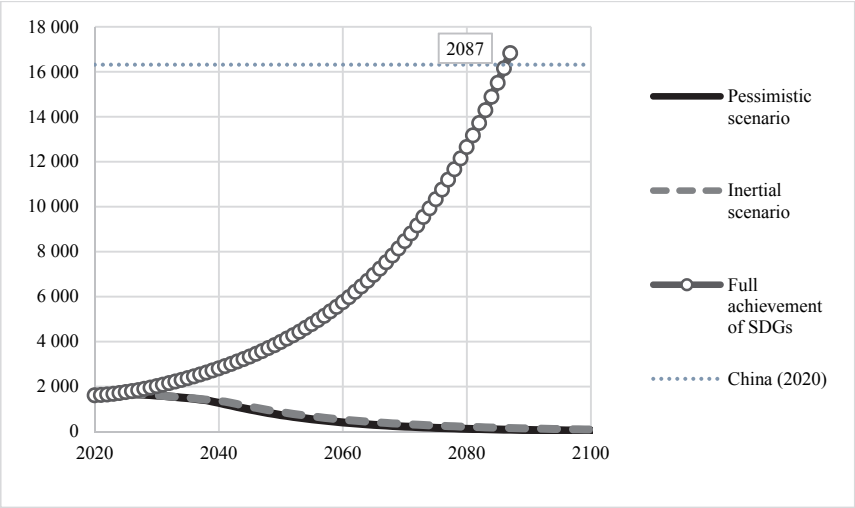

Fig. 30. GDP per capita scenarios for Burkina Faso

This is largely due to the fact that all these four countries occupy the lowest lines in the global ranking of countries in terms of population coverage with modern education (see Fig. 31).

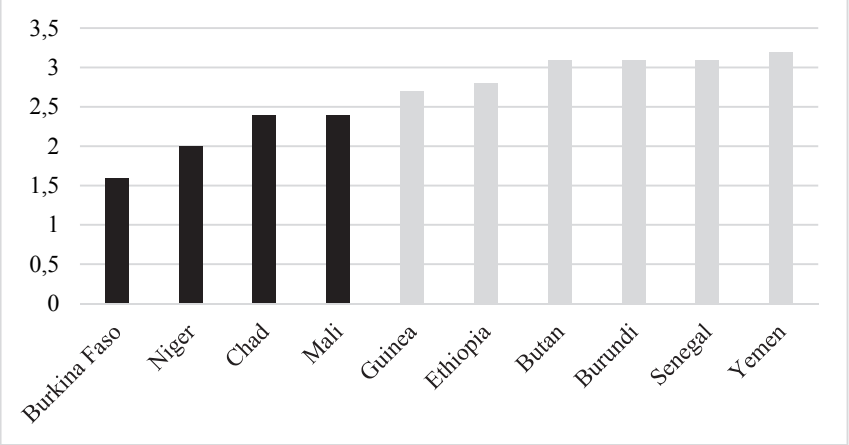

Fig. 31. 10 countries in the world with the lowest mean years of schooling in 2018. Solid black bars indicate the countries of the G5 Sahel

Source: Korotayev and Ustyuzhanin 2021; UNDP database.

Meanwhile, as mentioned above, a very important factor in whether or not revolutionary actions in a country will take an armed form is the coverage of the population with formal education. In other words, armed revolutionary insurgencies / civil wars are most likely in the countries with a high proportion of illiterate or semi-literate population (Grinin and Korotayev 2009, 2014; Korotayev, Bilyuga, and Shishkina 2017a; Korotayev, Sawyer *et al.* 2020; Ustyuzhanin *et al.* 2022; Collier 2004; Barakat and Urdal 2009; Machado *et al.* 2011; Brancati 2014; Butcher and Svensson 2016; Kostelka and Rovny 2019; Korotayev, Sawyer, and Romanov 2021; Sawyer and Korotayev 2022). The Sahelian countries belong to this category.

Of special concern is that the militant formations of Islamist radicals quite intentionally choose schools, teachers, and pupils as one of their main targets, in a deliberate attempt to reduce the coverage of the population with modern education. Thus, speaking about the events of 2020 in Burkina Faso, Rida Lammouri notes that Islamist militant groups

> continued to select schools as important targets for their attacks ... In its May 2020 report, Human Rights Watch (HRW) counted 126 attacks and armed threats against teachers, students, and schools by jihadist groups in 2020, in addition to 222 education workers who were victims of the attacks. Consequently, the Burkinabe government has closed around 2,500 schools, depriving about 350,000 students of education (Lyammouri 2020: 2–3).

And one of the most important radical Islamist groups in the Sahel, Boko Haram[4], has even used the slogan of combating the spread of modern education as its self-name (see, *e.g.*, Walker 2012).

Thus, a dangerous feedback loop is being formed in the Sahel, leading to a vicious circle and a development trap, when the low coverage of the population with modern education stimulates the growth of armed revolutionary Islamist activity, and the growth of the latter, in turn, leads to a decrease in the coverage of the population with education, which can lead not only to further growth of armed activity of the Islamists, but also to a delay in the decline in the birth rate (or even to some fertility increase[5]), to an increase in the population growth rate, to a slowdown in economic growth, to a fall in per capita GDP, to the preservation or even growth of 'youth bulges', which will lead to an even more pronounced increase in the armed activities of radical Islamists. The countries of the Sahel need to break out of this trap as soon as possible, which, apparently, is no longer possible without the most serious support on the part of the world community.

[4] A terrorist organization banned in Russia.
[5] See, *e.g.,* Zinkina, Korotayev 2014a, 2014b, 2017.

2. Brief Socio-Political Forecasts of the Futures of Africa in a World-Systems Perspective

Thus, on the one hand, the African countries are ahead of the path of active and dynamic development in the demographic, economic, political, cultural and other spheres. But on the other hand, this development path seems to be very thorny, associated with a high risk of destabilization events, possible kickbacks and casualties.

As we see, on the one hand, Africa is a big problem for the modern World System in terms of poorly controlled population growth, which can lead to serious environmental, climatic, social, food and other problems that in one way or another will concern the entire World System. Therefore, the major powers are interested in making Africa's demographic development more manageable. But on the other hand, in the context of globally declining birth rates, it is African labor resources that can partially help solve the problem of labor shortages. Thus, developed countries need to develop a common program of influence on African countries in a direction more acceptable to humanity so that this program does not infringe on the interests of African states. Meanwhile, not enough attention has been paid to Africa so far. In addition, the world community faces the important challenge of trying to use the African resource as efficiently as possible to solve global problems, with the maximum benefit for the Africans themselves.

Rapid demographic growth and an increase in the proportion of young people, taking into account rapid urbanization, as is clear, will inevitably exacerbate the already acute problem of unemployment in African countries. However, in the world-system aspect, this can contribute to the development of both regions with an elderly population and Africa itself. With the rapid development of remote work (see Grinin, Grinin, and Korotayev 2023b), more Africans will be connected with economically developed countries. In this regard, developed countries have a very important task to provide more assistance than is being done today in the development of the education system and the possible recruitment of specialists for remote work. This is a project for decades. And this is one of the ways to reduce unemployment in Africa, raise living standards in these countries, and bring European and African cultures closer together. There are also possible ways to bring European pension systems closer to the governments of African countries (for more details see Grinin and Korotayev 2010, 2016).

Taking into account global aging, which in the coming decades will greatly affect the situation in Europe, East Asia and other regions (see Grinin, Grinin, and Korotayev 2023b, 2024), Africa's young societies – with all their future problems and instability – will positively influence the overall picture of the world's population in a number of aspects.

Rapid population growth in Africa against the background of declining fertility is creating and will continue to create a huge demographic dividend in many African countries (see, *e.g.,* Bloom *et al.* 2013; Groth and May 2017;

Jimenez and Pate 2017; Hasan *et al.* 2019; Korotayev, Shulgin *et al.* 2022). At present, of course, the poorly educated Tropical African working age population (especially females) is of little value to the world economy. However, as the level and quality of education increases, these cohorts can become a very powerful resource for the deficient working-age population of aging developed countries[6] as well as a source of youth for the education systems of these countries. Already today, a large number of African students study in European, American and Asian universities, a large number of specialists from Africa work in one way or another for these economies.

Although aging in African countries will begin to be felt substantially only in the second half of the 21st century, it is nevertheless, necessary to forecast that African countries are likely to meet this process completely unprepared if they do not begin to prepare for it in advance (which is doubtful, given the more acute and numerous problems they face). Meanwhile, although we have noted that almost all societies are severely underprepared for the consequences of global aging (see Grinin, Grinin, and Korotayev 2023b, 2024), African countries are prepared for this to a much lesser extent than, for example, European ones, since in African countries the pension and other social security systems are largely underdeveloped. One can say that they are only being formed. Perhaps, when the problems of aging become more pronounced, there will be already formed models of relations in society that contribute to the institutionalization of aging (for more details see Grinin, Grinin, and Malkov 2023; Grinin and Grinin 2023; Grinin *et al.* 2024).

We would like to conclude this article with a thesis formulation of some conclusions, from which it follows that destabilization processes will continue to take place in African countries in the future (although, of course, the scenario and the course of specific events will greatly depend on a number of circumstances) for many reasons. At the same time, implementing the right policies in the field of demography, education (especially for women), as well as in the ethno-national and economic spheres, as has been emphasized above, can significantly reduce the risks of such destabilizing events and their severity. It is worth noting here that the larger the population in the country, especially the young, the more acute conflicts and problems can be, so reducing the birth rate is the right way to reduce the risks and severity of destabilization problems.

Our general idea, which explains the inevitability under any circumstances of the emergence of destabilization processes both in the near and in the distant future of African countries, is the existence of a close correlation between immaturity / backwardness / underdevelopment and future instability events. And this correlation is as follows. As society matures, ideology, social, national and political forces and conditions for certain processes appear in it, which can simultaneously influence destabilization. We mean the following factors: the desire for a nation state, for democracy and social justice, the desire to get their share

[6] See Grinin, Grinin, and Korotayev 2023a, 2023b.

of benefits and power from certain elites, the struggle for resources and privileges, the strengthening of contradictions between the regions of the country, and many others.[7] All this can lead to internal confrontation and, as a result, to possible destabilization. Modernization continues in the Sahel and many other regions in Africa. As a result, an increasingly complex conglomeration of the modern and the archaic in all spheres of production and life is being formed in these societies. The archaic features will, of course, disappear, but only after some time. And with rapid modernization, a tough conflict arises between the advanced and the archaic, which in itself is a source of instability. Let us now list the reasons for this in more detail.

First, the overall impact of the World System reconfiguration processes will be felt (see Grinin and Korotayev 2012, 2015, 2023; Grinin 2022a). And this impact, other things being equal, is the more noticeable and stronger, the more unstable the socio-political and ethno-confessional situation in a particular region is. Africa is an extremely unstable and conflict zone, so various global processes will inevitably be reflected in it in the form of certain destabilizing events.

Second, Africa, including the Sahel zone and North Africa, as well as its other zones and countries (*e.g.*, the Democratic Republic of the Congo), is becoming a territory of increasing geopolitical rivalry between major powers.

Third, under external pressure, a synergistic effect can arise with an internal weakness and instability of such states and societies.

Fourth, the weakness of society in such cases is very often associated with:

a) the point that in the recent past it was an artificial political formation whose boundaries were drawn for political reasons by external political actors;

b) the fact that there are no strong traditions of statehood; society is not ethnically monolithic, but divided, while conflicts between different ethnic groups, cultures, confessions, territories, tribes or clans are very significant, and also easily flare up.

Fifth, most countries of the Afrasian instability macrozone[8] correspond to one or more of the listed parameters to a greater or lesser extent, not to mention the fact that in the Sahel and other regions of Africa there are so-called failed states (*e.g.,* Korotayev, Medvedev *et al.* 2022) that unable to resist criminal and terrorist groups to protect their own population (see above). Accordingly, it is quite possible to expect various problems in such countries.

Thus, it can be assumed that for a number of global, regional, cultural, religious and country reasons, many African societies will experience increased

[7] See, *e.g.,* Korotayev *et al.* 2011, 2015; Grinin 2012, 2013, 2022a; Korotayev, Malkov, and Grinin 2014; Korotayev, Bilyuga, and Shishkina 2016, 2017a, 2017b, 2018; Korotayev, Vaskin, and Bilyuga 2017; Slinko *et al.* 2017; Korotayev, Vaskin, Bilyuga *et al.* 2018; Vaskin *et al.* 2018; Korotayev and Shishkina 2020; Korotayev, Vaskin, and Tsirel 2021; Slav *et al.* 2021; Korotayev, Grinin *et al.* 2022.

[8] On the Afrasian instability macrozone see, *e.g.,* Korotayev, Issaev *et al.* 2016; Korotayev, Meshcherina *et al.* 2019.

risks of destabilization for quite a long time. At the same time, a set of destabilization phenomena will often be present in societies, that is, several components of destabilization (revolutions, civil wars, confessional confrontations, interventions, terrorism, *etc.*) will simultaneously interact, hybridizing, which, unfortunately, can open unstable eras (like the one that we could observe in the recent decades in the Democratic Republic of the Congo). And the period of overcoming these shortcomings and maturation of societies will also be a period of extremely high risk of destabilization processes.

However, we believe that African societies have a bright future ahead and, in general, Africa will increasingly contribute to the world-system development.

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