



**STRATEGIC FORESIGHT ANALYSIS  
REGIONAL PERSPECTIVES REPORT ON  
NORTH AFRICA AND THE SAHEL**

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## FOREWORD

The Strategic Foresight Analysis (SFA) Regional Perspectives Report on North Africa and the Sahel aims to support NATO leadership's visualization of the future security environment and development of the next version of the SFA report and its companion follow-on report, the Framework for Future Alliance Operations (FFAO). Together, the SFA and FFAO provide military advice and inform the NATO Defence Planning Process (NDPP), as well as other NATO and national processes that require an understanding of the long-term future.

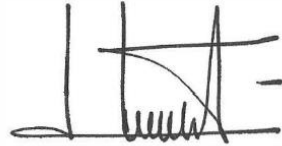
As NATO's warfare development command, Allied Command Transformation (ACT) defines the future military context, identifying challenges and opportunities in order to maintain a warfighting edge. To achieve this, ACT analyses the trends that shape our security environment, assesses the inherent risks, threats and opportunities, and investigates alternatives. By doing that, ACT improves the awareness, understanding and unity of effort among the members of the Alliance in order to strengthen NATO's capabilities to address the challenges of today and tomorrow.

The Regional Perspectives Report on North Africa and the Sahel suggests that, despite several positive trends in the region economically, socially, and technologically, these trends will not be sufficient to overcome the inertia of more challenging and longer-term problems. Far from uniform and homogeneous, the region as a whole will likely continue to struggle with instability and the inertia of these challenges over the next two decades. While some of the global trends from the SFA 2017 apply to the region, the most significant trends in North Africa and the Sahel are expected population growth, climate change, and challenges in politics and governance. The confluence of these trends may significantly challenge governments, economies, societies, and food and water resources, contributing to instability and uncertainty in some countries in the region. Because of these trends, North Africa and the Sahel will require continuing focus and attention from Europe and NATO for the foreseeable future.

Nations and institutions such as NATO and the EU may benefit from the information provided in this document to help develop coordinated strategies to respond to potential risks and take advantage of opportunities that arise from this neighbouring region. Innovation and rapid technological advances may also offer opportunities to address these challenges. This report does not seek to predict the future, but instead provides potential trajectories for several not met with consensus, this report offers alternative views where available to maintain objectivity.

The rapidly changing, complex security environment will continue to be the main driver for NATO's adaptation and warfare development efforts. These efforts focus on the transformation of NATO's military to ensure the Alliance remains relevant and credible, now and in the future, and can accomplish its core tasks: collective defence, cooperative security, and crisis management. The findings of this report help the Alliance understand today as well as visualize the potential future, establishing a bridge between the two, enabling NATO to adapt and remain fit for purpose.

This report is the result of a collaborative effort drawing extensively on expertise from Nations, our partners, other international organisations, think tanks, industry, and academia. I greatly appreciate their support, involvement, and active engagement throughout the process in establishing a shared perspective for the Alliance.  
“ACT – Improving Today, Shaping Tomorrow, Bridging the Two”

A handwritten signature in black ink, appearing to read 'A. Lanata', with a stylized flourish at the end.

André Lanata  
General, French Air Force  
Supreme Allied Commander Transformation

## POST COVID-19 PUBLICATION NOTE

Please be aware that the underpinning collaboration and research, writing, review, and SACT approval of this SFA Regional Perspectives Report on North Africa and the Sahel were all completed before the global manifestation of the COVID-19 pandemic. Consequently, this report does not take into account the impact of the pandemic and the resulting changes in the global strategic environment or specifically in North Africa and the Sahel. While the pandemic is likely to accelerate or accentuate many previously observed trends and their related implications, ACT did not update and revise this report due to the delay it would take to complete such an assessment and revision. ACT is preparing to release other parallel regional reports that will take into account the impact of COVID-19 on those regions. Additionally, ACT is planning to publish an updated version of the SFA that will also account for the COVID-19 pandemic on the global strategic environment.

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## EXECUTIVE SUMMARY

1. North Africa and the Sahel, increasingly recognised as a crucial region influencing the current and future security perspective of Europe and the NATO Alliance as a whole, have demonstrated the potential to alter the political and economic status quo of the European continent. While there are positive trends in North Africa and the Sahel economically, socially, and technologically, they will not overcome the inertia of more challenging and longer term problems, leaving the region struggling with instability and stagnation over the next two decades. Not only are there significant differences between each country across the region, there are significant differences between North Africa and the Sahel, which makes forming collective conclusions about the two sub-regions difficult. North Africa will likely continue its current trajectory of closer integration with more developed countries. In most areas, the Sahel will continue to lag behind the countries in North Africa in terms of modernisation, integration, security and stability, and economic development. However, as a whole and not entirely driven by negative circumstances or events, North Africa and the Sahel will require continuing focus and attention from Europe and NATO for the next 20 years and beyond.

2. Overall, the most significant trends affecting all other trends in North Africa and the Sahel are expected population growth, climate change, and challenges in politics and governance. The confluence of these trends could significantly challenge governments, economies, societies, and food and water resources, contributing to instability and uncertainty in certain countries in the region for at least the next two decades. Regarding the future of migration, the nexus of

numerous trends points to significant migration flows, regular and episodic, fuelling regional instability in North Africa, impacting European peace and political stability, and potentially the cohesion of the NATO Alliance.

The increasing involvement and associated competition of Russia and China politically, economically, and socially in the region could result in greater potential for

conflict, impact freedom of

movement/ freedom of navigation, contest Western influence, and potentially challenge NATO security. Though this situation is unlikely to cause any events related to collective defence for NATO, it will require careful consideration and attention. Additionally, the increased potential for crisis and conflict in the region, especially grey zone/irregular warfare and acts of terrorism, will further threaten stability and endanger civilian populations. NATO will need to maintain awareness of the regional dynamics and be prepared to respond, if politically determined, to potential crisis management scenarios in or emanating from the region. Moreover, some NATO Nations will be compelled to continue to project security and stability in North Africa and the Sahel through cooperative security programs and partnerships.

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*“North Africa is more highly integrated with the rest of the world than other parts of the continent, something which is likely to endure and even increase. There have been high levels of socio-economic development in the region, but this has not been matched by political development, and a focus on security issues in the short term may hinder its ability to counter the root causes.” (DCDC - Africa Out to 2045)*

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3. In the Political theme, this report finds that:

- a. The increasing presence, activity, and associated competition of external state and non-state actors will result in greater potential for conflict, threatening stability and endangering civilian populations.



- b. Increased presence of Russian and Chinese military capabilities in North Africa and the Sahel could impact freedom of movement/freedom of navigation, potentially challenging NATO security and escalating regional and international tensions.
  - c. Countries in North Africa and the Sahel may more closely align with Russia and China, resulting in a relative decline of influence of Western powers not only in the region but also potentially in international bodies such as the United Nations.
4. In the Human theme, this report finds that:
- a. Rapid population growth, especially in the Sahel, will compound poverty, lack of economic opportunity, and increase pressure on already scarce resources (e.g. water, food, and housing). This will contribute to increased risk of social instability and migration.
  - b. Absorbing increasing migration flows commensurate with population growth within North Africa will impact stability and security, imposing additional challenges on governments already facing rising levels of public discontent over numerous socio-economic shortcomings.
5. In the Technology theme, this report finds that:
- a. Technological advances will not be sufficient to overcome the inertia of numerous other challenges faced by the region such as rapid population growth and climate change.
  - b. Countries in North Africa and the Sahel will continue to rely on external entities to fund and develop technologically advanced infrastructure, increasing further their reliance on external actors such as Russia and China.
  - c. The increasing availability of technologies such as 3D printing, advanced weapons, artificial intelligence (AI), and unmanned aerial vehicles (UAV) will increasingly empower non-state actors.
6. In the Economic/Resources theme, this report finds that:
- a. Economic growth in North Africa and the Sahel will remain challenged by corruption, socio-political tensions, and a complex security environment.
  - b. Without sufficient economic progress, the growing population will be subject to greater social instability and migratory pressures.
  - c. China and Russia's increasing economic involvement in the region will likely manifest in greater political influence, both regionally and internationally.
7. In the Environment theme, this report finds that:
- a. North Africa and the Sahel will see temperatures rise greater than the global average and experience increased water scarcity, resulting in a worsening potential for agricultural yields.

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*“Sahel is the poorest region of Africa but will also see the highest population growth out to 2045. Taken together with the likely effects of climate change, it is likely to remain one of the most unstable areas of the continent out to 2045. This is likely to lead to increased migration, causing international attention on the region to endure.”*  
*(DCDC - Africa Out to 2045)*

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- b. Mitigation and adaptation initiatives will compete for scarce funding among development, modernisation, and social programs.
  - c. The resulting impacts of climate change are compounded by the region’s population growth and will pose increasing challenges to governance while contributing to increased migration, instability, and potential for conflict.
8. The consequences of this impending ‘perfect storm’ in North Africa and the Sahel are wide ranging and will continue to impact Europe and NATO over the next 20 years.

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*“The combination of chronic insecurity and poor governance helps to explain the region’s economic difficulties. The G5 [Sahel] countries feature poorly functioning economies characterized by questionable government intervention, a weak private sector, limited welfare provision and considerable currency and price instability. As a result, the Sahel region is characterized by low levels of development in almost every aspect. The five countries regularly receive some of the lowest scores on the Human Development Index, while Niger currently sits last in the ranking.”*  
*(Understanding The G5: Governance, Development and Security in the Sahel, NATO ACT Open Publications)*

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## INTRODUCTION

### AIM

1. The aim of this Regional Perspectives Report is to identify the key trends and their implications that will likely shape the future security environment in North Africa and the Sahel for NATO out to 2040 and beyond. The importance of the North Africa and Sahel region is determined both by geographic proximity to Europe and by cultural, social, economic, post-colonial, and migratory ties. Over the last decade, developments in the region led to an increased flow of migrants that overly taxed some European countries and created security concerns, especially for southern European countries. This led to increased attention by NATO and contributed to the decision to produce this report.
2. This report presents the general consensus of perspectives on the region based on a collaborative effort leveraging expertise from Nations, NATO partners, international organisations, think tanks, industry, and academia. It is based on a wide variety of recent national/international studies and an array of literature, articles, academic work, engagements, and findings from the Allied Command Transformation (ACT) Regional Perspectives Workshop held in Madrid, Spain, in April 2019.
3. Although contributions to this report from within the region did not match initial expectations, where possible, this report includes where available alternative perspectives that differ from the consensus view to offer a variety of perspectives. The implications presented in this report are derived from trend analysis using professional judgement, academic expertise, and the summary findings of the workshops. They are not intended to be prescriptive or linked to specific capabilities.

### BACKGROUND

4. NATO ACT in Norfolk, Virginia, in the United States, promotes and leads many initiatives designed to prepare NATO's military structure, forces, capabilities, and doctrine for future opportunities and challenges. To provide a foundation for this work, every four years ACT conducts a comprehensive assessment of the global security environment for the next 20 years and beyond, identifying global trends and their potential implications for the Alliance. The results are described in two forward-looking documents, the Strategic Foresight Analysis (SFA) and the Framework for Future Alliance Operations (FFAO).
5. The SFA Reports focus on trends and associated implications at a global level while Regional Perspectives Reports focus on specific regions that are pertinent to Euro-Atlantic security, such as this one on North Africa and the Sahel, Russia, the Arctic and the High North, and Asia-Pacific. Like the SFA, Regional Perspectives Reports do not attempt to predict the future, for the future is neither predictable nor predetermined, but provide insight about what the future security environment might look like to inform decision makers today. The findings of the regional reports will inform the SFA 2021.
6. NATO will continue defending Alliance territory and populations against attack, as set out in Article 5 of the Washington Treaty.<sup>1</sup> The trend analysis and resultant defence and security implications in the SFA 2017 help NATO determine how the Alliance could accomplish several key actions: establish and apply a unifying vision, adapt and transform to fulfil its core tasks (collective defence, cooperative security, and crisis management), address a full range of security challenges, and advance a conceptual framework for forces and abilities required to succeed beyond the mid-term planning horizon. These actions will

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<sup>1</sup> North Atlantic Treaty Organization, "Collective Defence - Article 5", 22 Mar 16, [http://www.nato.int/cps/en/natohq/topics\\_110496.htm](http://www.nato.int/cps/en/natohq/topics_110496.htm).

also allow NATO to address a set of security challenges and provide the means for deterrence and defence, and serve to protect common values and project stability beyond the Euro-Atlantic region.

## TERMINOLOGY

7. As a nested document in the SFA series of documents, this regional report uses essentially the same definitions of terms as used in the SFA 2017. However, the only exception is the definition of implication is expanded appropriately.

- Theme. A collection of similar or related trends.
- Trend. A discernible pattern or a specified direction of change.
- Implication. A significant effect on the defence, security, and stability of one or more of the nations or the region as a whole addressed in this report that results from one or more trends. Implications for this regional report also include things that will have a significant effect on the defence and security of one or more NATO Nations that results from one or more particular trends.

## REGIONAL REPORT STRUCTURE

8. Also, as a nested document in the SFA series of documents, this report employs the same general structure as the SFA, analysing trends and implications in the framework of the five themes of Political, Human, Technology, Economics/Resources, and Environment. However, since this is a regional report and the trends identified vary from those identified at a global level, the definitions are different as follows:

1. Political. The analysis of trends and implications related to governance, the relationships between governments and the people they govern, political stability, the roles and functions of governments, the impact of ideologies on politics and governance, and the roles of key political actors at national and regional levels.
2. Human. The analysis of trends and implications related to people and their lives as humans, how they interact, where they live, societal norms and values, and demographic and social patterns.
3. Technology. The analysis of trends and implications related to how rapidly technology is advancing, how accessible is it, what are the key technologies in the region with the most significant impact, and the roles of key technology players in the region.
4. Economics/Resources. The analysis of trends and implications related to the significant aspects of national and regional economies including economic growth, employment, poverty, the role of formal versus informal economies, the engines of economic growth, the key players, and the major natural and/or human resources that fuel national and/or regional economies.
5. Environment. The analysis of trends and implications related to significant aspects of the local and regional climates, weather patterns, and the impacts of climate change.

## SCOPE

9. **Introduction to North Africa and the Sahel:** North Africa and the Sahel, increasingly recognised as a crucial region influencing the current and future security of Europe and the NATO Alliance as a whole, have demonstrated the potential to influence the political and economic status quo of the European continent. The region's rapid population growth and its associated effects on migration flows, chronically weak governmental institutions, and the growing presence and influence of foreign powers are just some of the factors to consider in developing a better understanding of the future security environment in the region and the effects on Europe and NATO.

10. Globally, there are several key trends that will affect the region and how the international community addresses the challenges within and presented by the region. One of the most significant trends is that unilateralism is becoming more common while multilateral institutions struggle to develop suitable, commonly agreed upon solutions. The next 20 years will see the continued redistribution of geostrategic power and a redefinition of international relationships. This will have a significant impact on the future of North Africa and the Sahel. Another key global trend that will have an obvious and significant impact to North Africa and the Sahel is climate change. The impacts from climate change globally will be more severely and disproportionately experienced in North Africa and the Sahel.

11. Overall, the most significant trends impacting all other trends in North Africa and the Sahel are expected population growth, climate change, and challenges in politics and governance. The confluence of these trends could significantly challenge governments, economies, societies, and food and water resources, contributing to instability and uncertainty for the next several decades.

12. In general, there is a lack of standardised and commonly accepted definitions of the terms North Africa and the Sahel. Consequently, the data available for this report occasionally did not directly align with the formulation of specific trends and implications specifically related to the 10 countries covered in this report. For example, many organisations broadly include discussions of North Africa with the Middle East under the heading of Middle East North Africa (MENA). Overall, information that generally applied to MENA as a region was not used as data for this report given the sometimes extreme variances in specific data points between most North African countries and Middle Eastern Countries (e.g. political systems, economies, relative stability, etc.). Similarly for the Sahel, information that generally applied to more broad scope definitions of the Sahel (e.g. including Senegal, Nigeria, Sudan, or others) was not used for this report unless specific details or information was directly associated with only some or all of the G5 Sahel countries discussed in this report.

13. **Geographical and Historical Context:** North Africa is the area that stretches from the Atlantic shores of Morocco in the west to Egypt's Suez Canal and the Red Sea in the east. For the purposes of this report, the use of the term North Africa includes the countries of Morocco, Algeria, Tunisia, Libya, and Egypt. The Sahel is the physical and cultural zone of transition in Africa between the Sahara Desert to the north and the more fertile tropical regions to the south (see Figure 1). It stretches from the Atlantic Ocean to the Red Sea. For the purposes of this report, the use of the term Sahel includes the countries of Mauritania,

Mali, Burkina Faso, Niger, and Chad (the G5 Sahel countries).



**Figure 1: Map of North Africa and the Sahel**

Source: International Crisis Group (<https://www.crisisgroup.org/africa/west-africa/mali/sahel-malis-crumbing-peace-process-and-spreading-jihadist-threat#map-5368->)

14. Africa is the second largest continent and is bigger than the combined territory of China, India, the United States and most of Europe. Collectively, the ten countries that are the subject of this report contain nearly 10.8 million square kilometres (or 4.17 million square miles) which is more than one third of the land mass of the entire African continent, larger than the United States, and slightly larger than continental Europe (from the Atlantic Ocean to the Ural Mountains).<sup>2</sup>

15. North Africa has three main geographical features: the Atlas Mountains in the west, the Nile River and its delta in the east, and the Sahara Desert in the south. The Atlas Mountains extend across northern Algeria, Morocco, and Tunisia and recede to the south and east, transitioning to a steppe landscape before meeting the Sahara Desert. The Sahara Desert itself covers more than 75% of the region and is the largest sand desert in the world. It covers the southern part of Algeria, Morocco and Tunisia, and most of Libya (see Figure 1). With the exception of the Nile River Valley, most of Egypt is also desert.

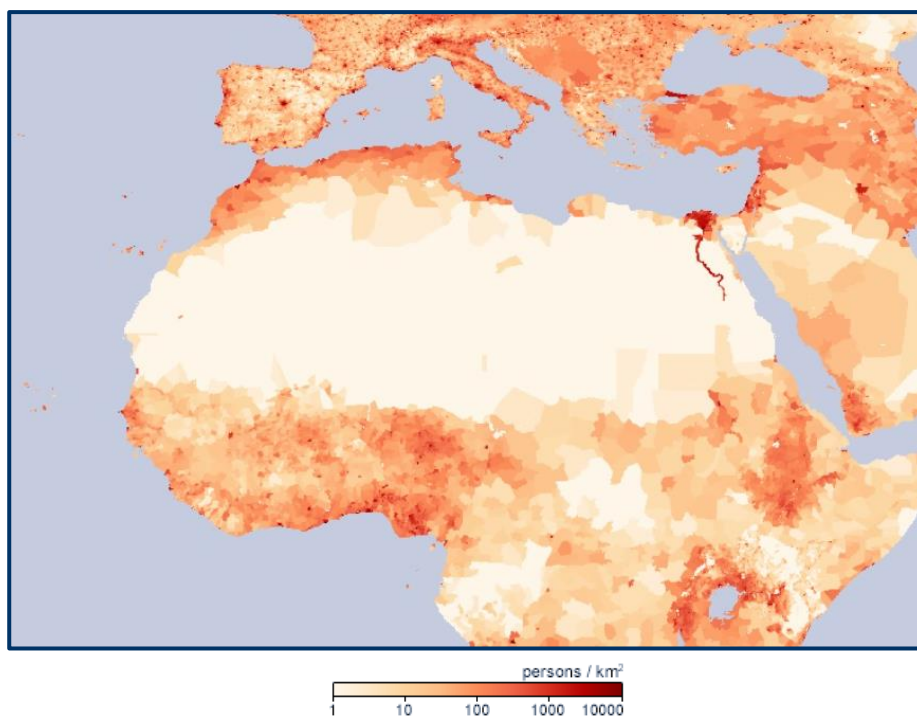
16. The Sahel is the climatological zone of transition between the hot and extreme dry climate of the Sahara Desert to its north and the more humid and wooded savannah climate to its south. It spans the breadth of the African continent from east to west at its widest point and is characterised by a semi-arid (steppe) climate with irregular precipitation, mainly concentrated during a short rain season (see Figure 1).

17. The majority of the population of North Africa lives predominantly in the regions that contain fertile land (i.e. the valleys of the Atlas Mountains, the Nile Valley and Delta, and along the Mediterranean coast). There are 199.5 million people that live in the five North Africa countries covered in this report, of which 65.3% live in urban areas exceeding the global urban population rate of 55.7% and the African urban population rate of 43.4% (see Figure 2).<sup>3</sup>

<sup>2</sup> Worldometers data and website as of 14 Nov 19, <https://www.worldometers.info/population>.

<sup>3</sup> Worldometers data and website as of 14 Nov 19, <https://www.worldometers.info/population/africa/>.

18. Traditionally, most of the people in the Sahel are nomadic, farming and raising livestock in a system of seasonal movements, unhindered by political borders. The



**Figure 2: North Africa and the Sahel Population Density Map**

Source: NASA Earth Observations ([https://neo.sci.gsfc.nasa.gov/view.php?datasetId=SEDAC\\_POP](https://neo.sci.gsfc.nasa.gov/view.php?datasetId=SEDAC_POP))

desertification and transformation of a large portion of the Sahel into barren land has affected the traditional movements of these nomadic people, causing an increase in conflicts between farmers and pastoralists. Rapidly growing urban population centres are mainly located in the southern parts of the countries. The five Sahel countries covered in this report have a combined population of 84.7 million people. Notably, only 33.8% of them live in urban areas, appreciably lower than the previously mentioned statistics of global and African urban population rates (see Figure 2).<sup>4</sup>

19. The modern history of the North Africa and the Sahel region is significantly shaped by the influence of and past decisions made by former colonial powers. One of the most significant historical issues that affects the present and future of the region was that boundaries were drawn with little to no regard for the many and varied tribal, ethnic, or religious identities of the people living there. In some cases, this led to establishment of states with weak or sometimes divided national identities, lacking common histories, societal norms, and vision.

20. Over the last 10 years, the region experienced a significant series of events and, in some instances, dramatic changes in a relatively short period of time. In 2011, the world watched the outbreak of the ‘Arab Spring’ in Tunisia. This brought about the end of the dictatorships of Ben Ali in Tunisia, Mubarak in Egypt, and Qaddafi in Libya. Libya remains in a state of ongoing civil war and fragmentation. The changes and turbulence did not end there, causing continuing ripples and effects felt across North Africa, the Sahel, and beyond the continent to the present day.

<sup>4</sup> Worldometers data and website as of 14 Nov 19, <https://www.worldometers.info/population/africa/>.

## CHAPTER 1 - POLITICAL

1. There are several significant trends and related implications within the political theme that are and will continue to affect the future and stability of North Africa and the Sahel for many decades to come. Beyond significant trends and dynamics internal to the region, fundamental changes in the international security environment and shifts in the global geostrategic order are playing out across the region and affecting national and regional security, politics, and economies. The roles of external actors in North Africa and the Sahel are becoming increasingly important and interwoven at local, national, and regional levels. Underneath this activity and adding another dimension to an already complex environment, numerous and long-standing endemic and systemic challenges continue to pose obstacles to effective governance along with increasing political voice in certain areas and sectors. These compounding challenges will continue to adversely affect socio-economic development, security, and governments' capacity to control territory and to meet the expectations of the people.

### 1.1 External Actors

1. Numerous external actors are increasingly engaged in North Africa and the Sahel, each for different reasons and with different approaches and implications. The motivations for this vary from the search for resources and access to markets, safeguarding national interests, fighting against the spread of violent extremist organisations, or attempting to control migration. Although there are numerous external actors operating in North Africa and the Sahel, some important external actors are China, Russia, the United States, European Union, and several Middle Eastern and Central Asian countries. Over the next two decades, external actors' interest and influence in the region is likely to continue to increase, especially in North Africa more so than the Sahel. Consequently, competition between these actors will increase over the next several decades, presenting alternative political and economic models, for better or worse.

2. **China:** China's intent is to complete a program of "national rejuvenation" to "restore China to its rightful great power status by 2049," 100 years after the birth of the Peoples Republic of China.<sup>5,6,7</sup> To achieve this goal, China will employ all of the fundamental elements of national power. Accordingly, China is increasingly active in North Africa and the Sahel in alignment with its national, economic, and foreign policy objectives.<sup>8</sup> China's need for natural resources is a driver for its increased interest in the continent of Africa, which is rich in natural resources. Also, with the expected population growth in Africa, China is seeking access to the growing market for its consumer products.

3. Over the last several years, China's investments in North Africa are steadily increasing. China's investments in Africa, including Belt and Road Initiative related projects, enable access to an abundance of strategic resources and markets for its goods. Although China's investments in Africa seem to be economically driven, they also provide opportunity for political influence. As a result, China will be able to federate more nations around its

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<sup>5</sup> Tuan N. Pham, "China in 2018: What to Expect," *The Diplomat*, 11 Jan 18, <https://thediplomat.com/2018/01/china-in-2018-what-to-expect/>.

<sup>6</sup> Rush Doshi, "Xi Jinping Just Made it Clear Where China's Foreign Policy is Headed," *Washington Post*, 25 Oct 17, <https://www.washingtonpost.com/news/monkey-cage/wp/2017/10/25/xi-jinping-just-made-it-clear-where-chinas-foreign-policy-is-headed/>.

<sup>7</sup> Xi Jinping, "Xi Jinping's Report at 19th CPC National Congress," 03 Jul 17, [http://www.xinhuanet.com/english/download/Xi\\_Jinping's\\_report\\_at\\_19th\\_CPC\\_National\\_Congress.pdf](http://www.xinhuanet.com/english/download/Xi_Jinping's_report_at_19th_CPC_National_Congress.pdf).

<sup>8</sup> NATO Allied Command Transformation (ACT) Open Publications, "Understanding The G5: Governance, Development And Security In The Sahel," Volume 3, Number 2, Spring 2019, 9.



“vision for the future” and shape the international order to its own benefit. This may be particularly important in the United Nations (UN), where each vote could be important to China’s national interests. Moreover, China’s model of “capitalism without democracy” may become an attractive alternative to the “liberal economy with democracy” model.

4. China is actively pursuing opportunities for increased trade, tourism, and cooperation with countries across North Africa.<sup>9,10,11,12,13,14</sup> China’s investments in Africa also include funding and construction of significant projects in Egypt, Algeria, and Morocco.<sup>15,16,17,18,19,20</sup> Beyond infrastructure projects, Algeria has become one of China’s top trading partners in the region, though still well behind the European Union’s (EU) trade with Algeria.<sup>21</sup> Algeria is the top destination for Chinese car exports globally. In the wake of dropping oil exports to the U.S., Algeria’s oil exports to China are steadily increasing. In Libya, where China had been active prior to the fall of Qaddafi, Chinese and Libyan officials discussed future bilateral relations, resuming former projects, and jointly expressed their mutual interest in future economic, infrastructure, and energy initiatives in Libya.<sup>22</sup>

5. To protect China’s interest and to contribute to the long-term vision, the People’s Liberation Army (PLA) will likely continue to increase its involvement in the region. Over the last five years, military arms sales to several African countries significantly increased. Algeria alone accounts for 10% of China’s total arms exports globally, is the fifth largest weapon’s

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<sup>9</sup> Muhammad Zulfikar Rakhmat, “China and Tunisia: A Quiet Partnership,” *The Diplomat*, 28 Jun 14, <https://thediplomat.com/2014/06/china-and-tunisia-a-quiet-partnership/>.

<sup>10</sup> Sarah Souli, “Tunisia Hopes Boost in Chinese Investment Can Ease Economic Woes,” *AL Monitor*, 19 Mar 18, <https://www.al-monitor.com/pulse/originals/2018/03/boost-china-investment-tunisia-europe-trade.html>.

<sup>11</sup> Joseph Hammond, “Morocco: China’s Gateway to Africa?,” *The Diplomat*, 01 Mar 17, <https://thediplomat.com/2017/03/morocco-chinas-gateway-to-africa/>.

<sup>12</sup> Mohammed Amine Benabou, “Morocco to Collaborate with China on Water Management,” *Morocco World News*, 17 May 19, <https://www.morocroworldnews.com/2019/05/273401/morocco-china-water-management/>.

<sup>13</sup> Adnane Bennis, “Foreign Minister Nasser Bourita in Beijing to Sign Memorandum on Silk Road,” *Morocco World News*, 16 Nov 17, <https://www.morocroworldnews.com/2017/11/234056/nasser-bourita-beijing-silk-road/>.

<sup>14</sup> Amira El Masaiti, “Morocco Breaking Ground for Chinese Investors in Africa,” *Morocco World News*, 28 Nov 17, <https://www.morocroworldnews.com/2017/11/235058/morocco-breaking-ground-chinese-investors-africa/>.

<sup>15</sup> Robert Barnes, “Chinese Funded Infrastructure Projects Have Passed the US \$7BN Mark in Egypt,” *Construction Review*, 11 Dec 18, <https://constructionreviewonline.com/2018/12/chinese-funded-infrastructure-projects-have-passed-the-us-7bn-mark-in-egypt/>.

<sup>16</sup> “China’s BRI Boosts Egypt’s Development Via Massive Infrastructure Projects: Xinhua,” *Egypt Today*, 07 Apr 19, <http://www.egypttoday.com/Article/1/68016/China-s-BRI-boosts-Egypt-s-development-via-massive-infrastructure>.

<sup>17</sup> Dr. Naser al-Tamimi, “China-Algeria Relations: Growing Slowly but Surely,” 18 Aug 18, [https://www.academia.edu/6552492/China-Algeria\\_relations\\_growing\\_slowly\\_but\\_surely](https://www.academia.edu/6552492/China-Algeria_relations_growing_slowly_but_surely).

<sup>18</sup> John Calabrese, “Sino-Algerian Relations: On a Path to Realizing Their Full Potential?,” Middle East Institute, 31 Oct 17, <https://www.mei.edu/publications/sino-algerian-relations-path-realizing-their-full-potential>.

<sup>19</sup> Djamilia Ould Khettab, “Algeria’s First Opera House is a Welcome Gift from China,” 10 Aug 16, <https://www.middleeasteye.net/features/algerias-first-opera-house-welcome-gift-china>.

<sup>20</sup> Hammond, “Morocco: China’s Gateway to Africa?”

<sup>21</sup> al-Tamimi, “China-Algeria Relations: Growing Slowly but Surely.”

<sup>22</sup> Abdelsattar Ibrahim, “China Looking to Future Opportunities in Libya,” 17 Feb 19, <https://7dnews.com/news/china-looking-to-future-opportunities-in-libya>.

importer globally, and is the number one recipient of China's arms sales in Africa.<sup>23</sup> China's increased contributions to UN missions in the Sahel and military power projection in the region are indications of China's increased involvement. Africa, and especially the Sahel, offers the PLA a great opportunity to validate its doctrine, organisation, and training for its expeditionary abilities and power projection.

6. **Russia:** Russia's renewed and increasing involvement across Africa economically and militarily, primarily with traditional partners, is driven by broader strategic aims. Russia's overarching strategic goal is to restore its importance within the international community and its global political influence.<sup>24,25</sup> Accordingly, along with activity in many countries in Africa, North Africa in particular plays a key role in Russia's grand strategy.<sup>26,27</sup> Over the last few years, Russia opportunistically assumed a renewed active political-diplomatic and military posture in the region, applying a holistic approach aligned with several objectives. First, Russia seeks to actively develop economic relations in military and energy sectors. Second, by consolidating its presence in the region, partnering with and gaining influence in nations on NATO's southern flank, primarily Egypt, Algeria, and Libya, Russia seeks to strategically contest or rival the influence of the EU, NATO, the United States, and even China in North Africa.<sup>28,29,30,31,32</sup> Russia also stands to benefit from the influence in North African countries by gaining support for issues within Russia's national interests that come before international bodies such as the UN.<sup>33,34,35</sup> Lastly, Russia has long sought direct access to the Mediterranean. Russia's efforts and improved cooperative relationships with North African countries may finally yield this access. In very real terms, access in the Mediterranean will enable Russia to position its anti-access area denial (A2AD) capabilities disconcertingly close to what has traditionally been a NATO safe haven in the Mediterranean.<sup>36</sup>

7. In another vein, with respect to its relationship with NATO, Russia may seek to maintain a measure of instability in North Africa and the Sahel to distract or fragment the efforts of the EU, NATO, and the United States. Additionally, Russia seeks to be the primary weapons exporter to the region for economic as well as political reasons.<sup>37</sup> Already a key

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<sup>23</sup> Pieter Wezeman, Aude Fleurant, Alexandra Kuimova, Nan Tian, and Siemon Wezeman, "Trends in International Arms Transfers, 2018," Stockholm International Peace Research Institute (SIPRI) Fact Sheet, March 2019, [https://www.sipri.org/sites/default/files/2019-03/fs\\_1903\\_at\\_2018.pdf](https://www.sipri.org/sites/default/files/2019-03/fs_1903_at_2018.pdf).

<sup>24</sup> Anna Borshchevskaya, "Russia's Growing Influence in North Africa," Atlantic Community, 26 Feb 19, <https://atlantic-community.org/russias-growing-influence-in-north-africa/>.

<sup>25</sup> Peter Brookes, "Russia's Africa Ambitions," Heritage Foundation, 11 Mar 19, <https://www.heritage.org/europe/commentary/russias-africa-ambitions>.

<sup>26</sup> TASS Russian News Agency, "Lavrov to visit Algeria, Morocco, Tunisia on January 23-26," 23 Jan 19, <http://tass.com/politics/1041391>.

<sup>27</sup> Borshchevskaya, "Russia's Growing Influence in North Africa."

<sup>28</sup> Jamal Laadam, "The Russian Strategy Towards North Africa," Modern Diplomacy, 15 May 18, <https://moderndiplomacy.eu/2018/05/15/the-russian-strategy-towards-north-africa/>.

<sup>29</sup> Brookes, "Russia's Africa Ambitions."

<sup>30</sup> Borshchevskaya, "Russia's Growing Influence in North Africa."

<sup>31</sup> Anna Borshchevskaya, "The Tactical Side of Russia's Arms Sales to the Middle East," The Heritage Foundation, 20 Dec 17, <https://jamestown.org/program/tactical-side-russias-arms-sales-middle-east/>.

<sup>32</sup> Nataliya Bugayova, Jack Ulses, and Chase Johnson, "The Kremlin's Campaign in Africa," Institute for the Study of War, 18 Oct 18, [http://iswresearch.blogspot.com/2018/10/the-kremlins-campaign-in-africa\\_18.html](http://iswresearch.blogspot.com/2018/10/the-kremlins-campaign-in-africa_18.html).

<sup>33</sup> Brookes, "Russia's Africa Ambitions."

<sup>34</sup> Eric Schmitt, "Russia's Military Mission Creep Advances to a New Front: Africa," *New York Times*, 31 Mar 19, <https://www.nytimes.com/2019/03/31/world/africa/russia-military-africa.html>.

<sup>35</sup> Bugayova, Ulses, and Johnson, "The Kremlin's Campaign in Africa."

<sup>36</sup> Borshchevskaya, "Russia's Growing Influence in North Africa."

<sup>37</sup> Borshchevskaya, "The Tactical Side of Russia's Arms Sales to the Middle East."

player in the region in terms of military weapons sales, Russia provides relatively high quality weapons without conditions for their use and employment. Perhaps more importantly for Russia, a secure position of influence in North Africa will serve as a forward platform and gateway from which Russia will be able to further become involved in and influence the rest of the African continent.<sup>38,39,40</sup>

8. Over the last several years, Russia has made a concerted effort to increase its economic and military ties with several countries in the region including Egypt, Libya, and Algeria, as well as with Morocco and Tunisia.<sup>41,42,43,44,45,46,47,48,49,50</sup> Of note in Algeria, a long time Russian partner in the region, weapons sales from Russia dwarf sales to any other country in Africa – nearly 80% of Russia’s military sales in Africa are sales of weapons to Algeria. This includes major weapons systems and platforms such as tanks, helicopters, and submarines. Arms deals with Russia also include modernisation and training programs for the Algerian armed forces. This relationship has grown to include intelligence sharing.<sup>51,52,53,54</sup>

9. Russia’s increased activity and strengthening bilateral relationships is also occurring in the Sahel. Over the last few years, Russia committed to supporting and working with the G5 Sahel and G5 Sahel countries on their counterterrorism/security efforts and supporting

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<sup>38</sup> Sarah Feuer and Anna Borshchevskaya, “Russia Makes Inroads in North Africa,” The Washington Institute, 02 Nov 17, <https://www.washingtoninstitute.org/policy-analysis/view/russia-makes-inroads-in-north-africa>.

<sup>39</sup> Borshchevskaya, “Russia’s Growing Influence in North Africa.”

<sup>40</sup> Bugayova, Ulses, and Johnson, “The Kremlin’s Campaign in Africa.”

<sup>41</sup> Agnieszka de Sousa and Anatoly Medetsky, “Europe Has Most to Lose From Russia’s Expanding Wheat Empire,” 02 Oct 18, <https://www.bloombergquint.com/onweb/europe-has-most-to-lose-from-russia-s-expanding-wheat-empire>.

<sup>42</sup> Bugayova, Ulses, and Johnson, “The Kremlin’s Campaign in Africa.”

<sup>43</sup> “All You Need to Know about the Russian Industrial Zone,” *Egypt Today*, 07 Feb 18, <https://www.egypttoday.com/Article/3/42165/All-you-need-to-know-about-the-Russian-Industrial-Zone>.

<sup>44</sup> Schmitt, “Russia’s Military Mission Creep Advances to a New Front: Africa.”

<sup>45</sup> Boris Zilberman and Romany Shaker, “Russia and Egypt are Growing Closer,” *The American Interest*, 06 Jun 18, <https://www.the-american-interest.com/2018/06/06/russia-and-egypt-are-growing-closer/>.

<sup>46</sup> Ramy Aziz, “Russia’s Alarming Attempts to Establish Influence in Egypt,” The Washington Institute, 24 May 18, <https://www.washingtoninstitute.org/fikraforum/view/russias-alarming-attempts-to-establish-influence-in-egypt>.

<sup>47</sup> “Nuclear Power in Egypt,” World Nuclear Association, 24 May 19, <https://www.world-nuclear.org/information-library/country-profiles/countries-a-f/egypt.aspx>.

<sup>48</sup> Andrew McGregor, “How Does Russia Fit into Egypt’s Strategic Plan?,” *Eurasia Daily Monitor* Volume 15, no. 23 (14 Feb 18), <https://jamestown.org/program/russia-fit-egypts-strategic-plan/>.

<sup>49</sup> Oren Kessler and Boris Zilberman, “Russia’s Charm Offensive in North Africa: Its Growing Economic and Military Influence in the Region,” *Foreign Affairs*, 03 Apr 17, <https://www.foreignaffairs.com/articles/north-africa/2017-04-03/russia-s-charm-offensive-north-africa>.

<sup>50</sup> Wezeman, Fleurant, Kuimova, Tian, and Wezeman, “Trends in International Arms Transfers 2018.”

<sup>51</sup> Schmitt, “Russia’s Military Mission Creep Advances to a New Front: Africa.”

<sup>52</sup> Kessler and Zilberman, “Russia’s Charm Offensive in North Africa.”

<sup>53</sup> Feuer and Borshchevskaya, “Russia Makes Inroads in North Africa.”

<sup>54</sup> Borshchevskaya, “Russia’s Growing Influence in North Africa.”

UN assistance efforts in the region.<sup>55,56,57</sup> In addition, Russia signed a military cooperation agreement with Burkina Faso for counterterrorism support and military training, indicating their mutual intent to build a lasting relationship.<sup>58,59</sup> Beyond cooperation in military and security issues, Russia's Nordgold mining company, operating in Burkina Faso since 2013, expanded operations by opening a new gold mining site in 2016.<sup>60,61</sup>

10. **United States (US):** The US is a significant external actor in the region across all instruments of national power. The US is the largest private foreign investor in Africa overall – private investments increased from \$9 billion to \$50 billion (USD) between 2001 and 2017.<sup>62</sup> US government foreign aid in the 10 North Africa and Sahel countries generally increased over the same period. Excluding Egypt (where US aid declined significantly from \$2.9 billion in 2001 to \$1.1 billion in 2018) and Libya (which did not begin receiving US foreign aid until 2004), the remaining eight countries in North Africa and the Sahel saw an increase from an average of \$18.5 million in 2001 to \$92 million (USD) in 2018.<sup>63</sup> Additionally, the current US policy for Africa is to “advance trade and commercial ties” with Africa, “counter threats to American and African security,” and support “stability, good governance, and self-reliance” while ensuring that US aid is well spent.<sup>64,65</sup> However, an unspoken objective of the new Africa policy is to counter China's increasing activity and influence in the region.<sup>66</sup> If in fact the US will continue to oppose China's increasing involvement in North Africa and the Sahel over the coming 20 years as a national strategic objective, the US will need to be more actively involved in the region to offer a Western alternative.

11. Militarily, the US maintains a relatively small presence in North Africa and the Sahel in comparison with other locations in the world where US forces are based. This is especially significant given the sheer geographic size and scope of the region. While specific numbers

<sup>55</sup> Schmitt, “Russia's Military Mission Creep Advances to a New Front: Africa.”

<sup>56</sup> The Ministry of Foreign Affairs of the Russian Federation, “Press Release on Deputy Foreign Minister Mikhail Bogdanov's Consultations with Permanent Secretary of the Group of Five for the Sahel, Maman Sambo Sidikou,” 11 Apr 18, [http://www.mid.ru/en/web/guest/foreign\\_policy/news/-/asset\\_publisher/cKNonkJE02Bw/content/id/3164378](http://www.mid.ru/en/web/guest/foreign_policy/news/-/asset_publisher/cKNonkJE02Bw/content/id/3164378).

<sup>57</sup> TASS Russian News Agency, “Russia Begins to Assist Sahel Region States in Fighting Terrorism,” 31 Oct 17, <http://tass.com/politics/973296>.

<sup>58</sup> Bugayova, Ulses, and Johnson, “The Kremlin's Campaign in Africa.”

<sup>59</sup> Mohammad Ali, “Defense Ministers Of Russia, Burkina Faso Sign Military Cooperation Agreement,” *UrduPoint News*, 21 Aug 18, <https://www.urdupoint.com/en/world/defense-ministers-of-russia-burkina-faso-sig-415315.html>.

<sup>60</sup> Bugayova, Ulses, and Johnson, “The Kremlin's Campaign in Africa.”

<sup>61</sup> Nordgold Corporation, “Development Projects,” accessed 30 May 19, <http://www.nordgold.com/operations/development-projects/>.

<sup>62</sup> John J. Sullivan, Deputy Secretary of State, “U.S.-Africa Strategy Speech at Trade and Investment Luncheon,” accessed 07 Nov 19, <https://www.state.gov/u-s-africa-strategy-speech-at-trade-and-investment-luncheon/>.

<sup>63</sup> Amounts presented in constant 2016 U.S. dollars. United States Agency for International Development (USAID) “Foreign Aid Explorer” data, accessed 07 Nov 19, <https://explorer.usaid.gov/data>.

<sup>64</sup> White House Fact Sheet, “President Donald J. Trump's Africa Strategy Advances Prosperity, Security, and Stability,” 13 Dec 18, <https://www.whitehouse.gov/briefings-statements/president-donald-j-trumps-africa-strategy-advances-prosperity-security-stability/>.

<sup>65</sup> John R. Bolton, “Remarks by National Security Advisor Ambassador John R. Bolton on the The Trump Administration's New Africa Strategy,” Presented at the Heritage Foundation, Washington, D.C., 13 Dec 18, <https://www.whitehouse.gov/briefings-statements/remarks-national-security-advisor-ambassador-john-r-bolton-trump-administrations-new-africa-strategy/>.

<sup>66</sup> Grant T. Harris, “Trump's Africa Policy Is Destined for Failure: The Wrong Way to Counter China,” *Foreign Affairs*, 21 Dec 18, <https://www.foreignaffairs.com/articles/africa/2018-12-21/trumps-africa-policy-destined-failure>.

and locations are difficult to obtain, there were approximately 1,000 US military personnel in Niger, Mali and Nigeria in April 2018 and around 7,000 US military personnel in total on the continent.<sup>67</sup> However, since that time, the US announced plans to reduce its number of military personnel operating in Africa as a whole by 10% over several years.<sup>68</sup> In terms of weapons sales, the US, the world's largest weapons exporter, increased weapons exports to African nations by 26% between 2009 and 2018.<sup>69</sup> In general, however, sales of weapons from the US in North Africa and the Sahel countries decreased. Of all the weapons exports to Africa, the two nations that imported the most from the US in 2018 were Egypt and Morocco. Egypt, the third largest weapons importer in the world, received 19% of its weapons imports from the US in 2018 (with 30% from Russia and 37% from France). However, this is a significant decline from 2001 when the US was the de facto arms supplier to Egypt. Morocco, with declining weapons imports overall in recent years and 24th largest weapons importer in the world in 2018, received 62% of its weapons imports from the US (36% from France and less than 1% from the UK). This is also a decline in weapons sales from the US following a peak in sales in 2011.<sup>70</sup> However, despite the declines in military presence and in weapons sales, it is unlikely this indicates a withdrawal from the region. Given the trend of increasing US investments, the need to continue its counterterrorism efforts, and the desire to counter China, the US is likely to continue to increase, or at least maintain, its overall level of interest and activity in North Africa and the Sahel.

12. **European Union (EU):** The EU has a vested interest in the future of North Africa and the Sahel and the successes and/or failures of the governments of the respective countries in the region and regional organisations such as the G5 Sahel. In the wake of the 'Arab Spring' and the ensuing instability, threats from terrorism, and issues rising from migration, the EU's interest in North Africa and the Sahel increased.<sup>71</sup> The EU will continue to focus on strengthening its relationships with countries and organisations in the region over the next several decades. It is the EU's stated intent to "encourage political and economic reform in each individual country" while respecting their differences and unique qualities.<sup>72,73</sup> EU cooperation with countries in North Africa is based on the framework of its European Neighbourhood Policy (ENP), which includes Algeria, Egypt, Libya, Morocco, and Tunisia along with Middle Eastern countries. The ENP is carried out through numerous programmes in a wide range of sectors including democratic and economic development, rule of law, and migration.<sup>74</sup>

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<sup>67</sup> Estimated numbers provided by the then-U.S. Secretary of Defense, James Mattis. Greg Myre, "The Military Doesn't Advertise it, but U.S. Troops are all over Africa," 28 Apr 18, <https://www.npr.org/sections/parallels/2018/04/28/605662771/the-military-doesnt-advertise-it-but-u-s-troops-are-all-over-africa>.

<sup>68</sup> Ryan Browne, "US to Reduce Number of Troops in Africa," CNN, 15 Nov 18, <https://edition.cnn.com/2018/11/15/politics/us-reduce-troops-africa/index.html>.

<sup>69</sup> Wezeman, Fleurant, Kuimova, Tian, and Wezeman, "Trends in International Arms Transfers 2018."

<sup>70</sup> Stockholm International Peace Research Institute (SIPRI) Importer/Exporter Trend Indicator Values Tables Tool, accessed 18 Nov 19, <http://armstrade.sipri.org/armstrade/page/values.php>.

<sup>71</sup> NATO ACT Open Publications, "Understanding the G5," 8.

<sup>72</sup> European Union, "Middle East and North Africa," 15 Jun 16, [https://eeas.europa.eu/regions/middle-east-north-africa-mena/336/middle-east-and-north-africa-mena\\_en](https://eeas.europa.eu/regions/middle-east-north-africa-mena/336/middle-east-and-north-africa-mena_en).

<sup>73</sup> European Union, "The European Union's Partnership With the G5 Sahel Countries," 18 Jun 18, [https://eeas.europa.eu/headquarters/headquarters-homepage\\_en/46674/The%20European%20Union's%20partnership%20with%20the%20G5%20Sahel%20countries](https://eeas.europa.eu/headquarters/headquarters-homepage_en/46674/The%20European%20Union's%20partnership%20with%20the%20G5%20Sahel%20countries).

<sup>74</sup> European Union, "Middle East and North Africa."

13. Related to the Sahel, the Council of the EU recently emphasised that “the Sahel is a strategic priority for the EU and its member states.”<sup>75</sup> The EU is engaging the Sahel countries through three lines of effort: political partnership, development assistance, and security and stability support. In the area of development alone, the EU is providing eight billion euros between 2014 and 2020, 100 million euros for the establishment of the G5 Sahel military force, while donating more than 250 million euros in the form of humanitarian aid. Under the EU’s Common Security and Defence Policy, there are three active missions aimed at training and building police and security force capacity in Niger and Mali, along with a military training mission in Mali. In addition to these efforts and investments, the EU, with the assistance of France and Germany, launched the Sahel Alliance in 2017. It has 10 members with the intent to serve as a mechanism to efficiently coordinate and deliver aid to the region.<sup>76</sup>

14. North Africa and the Sahel constitute an area of major interest for the EU and it will likely be so for the long term. The cohesiveness of the EU will be crucial to maintaining its strategy in the region. Southern EU countries on the Mediterranean may have greater political and economic interests in North Africa than other EU members located farther north. If the EU’s efforts in the region are hampered by political disunity, EU nations may choose to act alone and adopt initiatives tailored to their own specific set of national interests or the most prevailing popular opinions of each country’s respective populations. This has potential to threaten the cohesion and unity of the EU over the long term.

15. **Other Nation States:** Over the next several decades, competition will continue among some nation states seeking to increase their influence and standing within the global Muslim community. Due to its economic power and strong socio-political networks, Saudi Arabia will be one of the most active Muslim powers in North Africa and the Sahel.<sup>77,78</sup> As guardians of two of Islam’s most revered sites, Mecca and Medina, and as the birthplace of Islam, Saudi Arabia sees itself as the legitimate Sunni leader and will continue to promote its specific vision of Islam, Wahhabism, and its concurrent political implementation.<sup>79,80,81</sup> This attempt to create a new pan-Arabism will be challenged and disrupted by the United Arab Emirates (UAE) and Qatar with the support of their anti-Saudi allies. These Middle Eastern petrol-monarchies will deploy an active policy to influence the people in the North Africa and Sahel region through non-governmental organisations, economic support, and socio-political networks (education and social welfare).<sup>82</sup> They will attempt to shape and influence the

<sup>75</sup> European Union Press Release, “The Sahel is a Strategic Priority for the EU and its Member States: Council Adopts Conclusions,” 13 May 19, <https://www.consilium.europa.eu/en/press/press-releases/2019/05/13/the-sahel-is-a-strategic-priority-for-the-eu-and-its-member-states-council-adopts-conclusions/>.

<sup>76</sup> European Union, “The European Union’s Partnership With the G5 Sahel Countries.”

<sup>77</sup> Manuel Lafont Rapnouil, “Alone in the Desert? How France can lead Europe in the Middle East,” European Council of Foreign Relations, 10 Apr 18, [https://www.ecfr.eu/publications/summary/alone\\_in\\_the\\_desert\\_how\\_france\\_can\\_lead\\_europe\\_in\\_the\\_middle\\_east](https://www.ecfr.eu/publications/summary/alone_in_the_desert_how_france_can_lead_europe_in_the_middle_east).

<sup>78</sup> P. Gunet, “Les Emirats et L’islam Politique ou le Syndrome des Montagnes Russes,” *Les Emirats Arabes Unis*, Fondation pour la Recherche Strategique, Observatoire du Monde Arabo-Musulman et du Sahel, 5 May 17, 27-33, <https://www.frstrategie.org/web/documents/programmes/observatoire-du-monde-arabo-musulman-et-du-sahel/publications/9.pdf>.

<sup>79</sup> Hala Al-Dosari, “Saudi Arabia’s Struggle for Sunni Leadership,” Carnegie Endowment for International Peace, 07 Sep 16, <https://carnegieendowment.org/sada/64501>.

<sup>80</sup> Jonathan Marcus, “Why Saudi Arabia and Iran are Bitter Rivals,” BBC News, 16 Sep 19, <https://www.bbc.com/news/world-middle-east-42008809>.

<sup>81</sup> Bakary Sambe, “Radicalisation Islamique et Enjeux Securitaires au Sahel: de L’influence Wahhabite au Terrorisme,” European Foundation for Democracy, Oct 2013, 3-5, [https://europeandemocracy.eu/wp-content/uploads/2014/03/radicalisation\\_in\\_africa.pdf](https://europeandemocracy.eu/wp-content/uploads/2014/03/radicalisation_in_africa.pdf).

<sup>82</sup> Bakary Sambe, “Radicalisation Islamique et Enjeux Securitaires au Sahel.”

mind-set of the people of North Africa and the Sahel.<sup>83</sup> There are two possible, not exclusive outcomes of note from the efforts of these external powers: one is that Sharia law will be increasingly incorporated into politics and governance of North Africa and Sahel nations; and the second is the growth of sympathetic or like-minded groups or organisations in the remote and ungoverned spaces across the region. This competition of interests could cause increased internal instability, migration flows, or terrorist activity in the region or in NATO countries and is likely to continue for the period of this report.

## 1.2 Non-State Actors

1. Much like a political trend in the SFA 2017, non-state actors operating in North Africa and the Sahel will exert greater influence across the region. For the purposes of this report, non-state actors includes non-governmental organisations (NGOs), multi-national corporations (MNCs), super-empowered or rogue individuals, and transnational violent extremist, terrorist, and criminal organisations. In numerous ways, each of these non-state actors will continue to expand over the next two decades, contributing to instability and threatening progress and growth across North Africa and the Sahel.

2. **Transnational Violent Extremist Organisations:** Groups like Boko Haram, Islamic State of Iraq and Syria (ISIS) (or *al-dowla al-islamiyya fii-il-i'raaq wa-ash-shaam* (DAESH) in Arabic), al Qaeda, their respective affiliated groups, and/or new transnational or regional violent extremist organisations will continue to expand their footprints and influence across North Africa and the Sahel, posing challenges to security and stability over the next 20 years. As ongoing operations against violent extremist organisations prove to be successful in other parts of the world, the reverse flow of terrorists is already occurring and will continue to occur in the coming years.<sup>84</sup> Their impact on the stability of the region could be felt for decades. This will especially be true over the next 20 years if the present conditions continue to exist in Libya and ungoverned spaces continue to fall outside the will and ability of governments in the region to secure and control.

3. **Transnational Criminal Organisations:** The use of ancient trans-Saharan trade routes by criminals and criminal organisations is certainly not a new phenomenon. However, the growth of trafficking in drugs, illegal weapons, and humans over the last decade and the linkages to state institutions, or at least its tolerance by representatives of governments over the past decade, has and will likely continue. Transnational criminal organisations often operate with near impunity in the region and benefit from maritime links to other criminal organisations operating in Europe, North, Central, and South America. Particularly disconcerting is the nexus of organised crime networks with terrorist organisations who use criminal ventures as a means of obtaining financial support along with some level of state complicity in some countries in the region.<sup>85,86,87</sup> Given trends in governance and security, this will continue to fuel instability and delegitimise governments across North Africa and the Sahel. There are pervasive regional trafficking routes and transit points used by militant

<sup>83</sup> Bakary Sambe, "Sahel: Diplomatie Religieuse Tous Azimuts," *Jeune Afrique*, 10 Oct 18, <https://www.jeuneafrique.com/mag/640399/politique/tribune-sahel-diplomatie-religieuse-tous-azimuts/>.

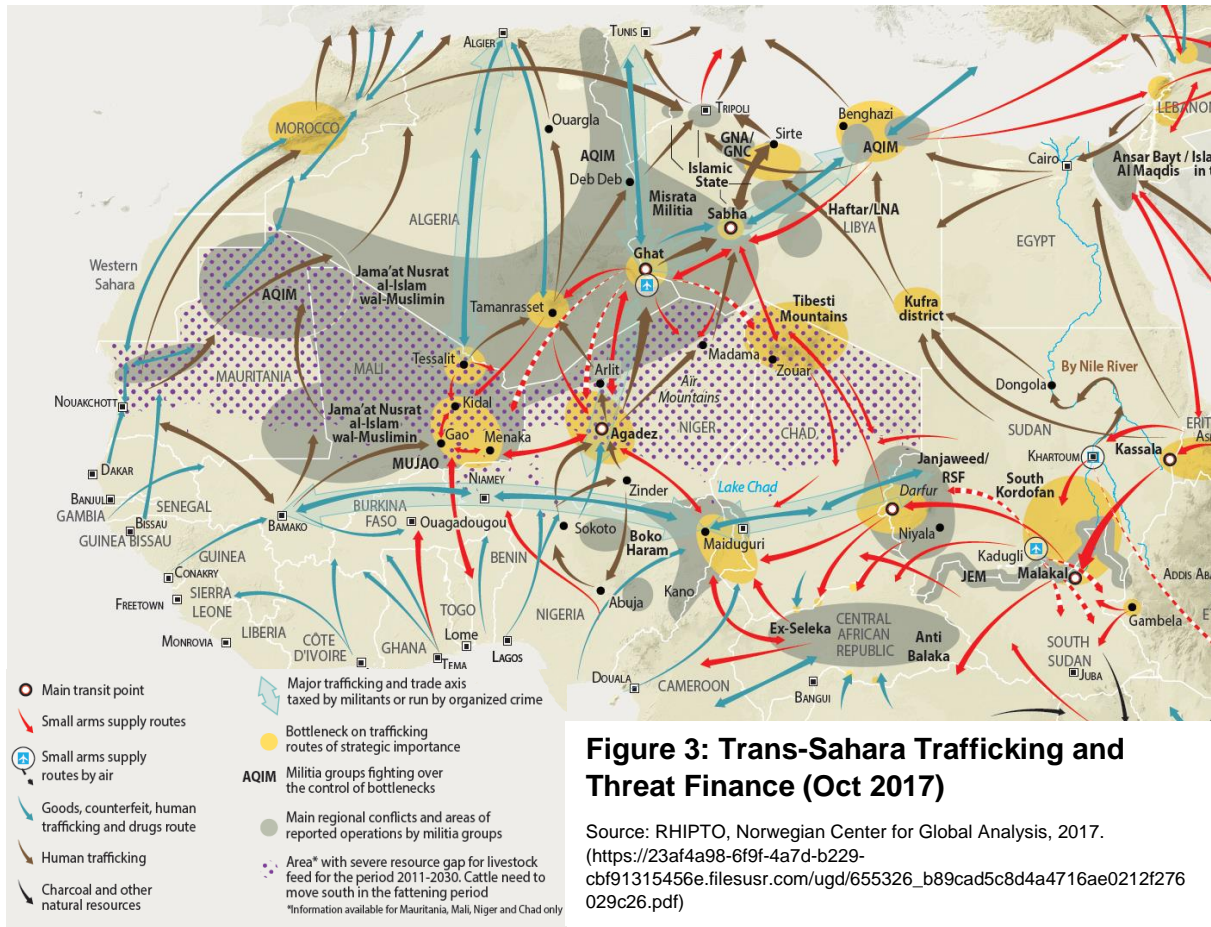
<sup>84</sup> Joseph Siegle, "ISIS in Africa: Implications from Syria and Iraq," Africa Center for Strategic Studies, 17 Mar 17, <https://africacenter.org/spotlight/islamic-state-isis-africa-implications-syria-iraq-boko-haram-aqim-shabaab/>.

<sup>85</sup> Tuesday Reitano and Mark Micallef, "Transnational Crime in North Africa," The Atlantic Initiative, 10 Apr 19, <https://atlantic-community.org/transnational-crime-in-north-africa/>.

<sup>86</sup> "The Illicit Superhighway: Transnational Organized Crime in Africa," Africa Center for Strategic Studies, 22 May 17, <https://africacenter.org/spotlight/the-illicit-superhighway-transnational-organized-crime-in-africa/>.

<sup>87</sup> Wolfram Lacher, "Organized Crime and Conflict in the Sahel-Sahara Region," The Carnegie Papers, Middle East, Sep 2012, <https://carnegieendowment.org/2012/09/13/organized-crime-and-conflict-in-sahel-sahara-region-pub-49360>.

and/or criminal organisations that directly impact NATO through its southern periphery (see Figure 3).



4. **Multi-National Corporations (MNC):** Despite the relative volatility and risk inherent with operating a business in North Africa and the Sahel, MNCs have been and will continue to operate and expand their businesses in the region due to the sheer size and projected growth of the population, along with the rather positive projected economic growth generally across the region.<sup>88</sup> However, there is a view that MNCs are merely a new wave of exploitation and neo-colonialism fuelling instability in the region. While some MNCs genuinely contribute to growth and development in the region, some MNCs are often complicit with government officials in corrupt schemes to maximise profit at the expense of common people and local businesses, who operate at a distinct disadvantage. Certainly not all MNCs operate in this manner. However, these types of MNC operations in North Africa and the Sahel over the next 20 years will continue to subvert development, democratisation, and anti-corruption efforts while worsening conditions of income inequality and poverty.<sup>89,90</sup>

5. **Private Military/Security Companies and Non-State Militant Groups:** One trend that has been increasing and will likely continue over the next 20 years in North Africa and

<sup>88</sup> Martina Bozadzhieva, "How Multinationals Can Grow in the Middle East and Africa," *Harvard Business Review*, 20 Apr 17, <https://hbr.org/2017/04/how-multinationals-can-grow-in-the-middle-east-and-africa>.

<sup>89</sup> Oxfam International Press Release, "Multinational Companies Cheat Africa Out of Billions of Dollars," 01 Jun 15, <https://www.oxfam.org/en/pressroom/pressreleases/2015-06-02/multinational-companies-cheat-africa-out-billions-dollars>.

<sup>90</sup> Lord Aikins Adusei, "Multinational Corporations: The New Colonisers in Africa," 04 Jun 09, *Pambazuka News*, <https://www.pambazuka.org/governance/multinational-corporations-new-colonisers-africa>.



the Sahel is the employment and use of private military and security companies. Various governments and agencies operating in North Africa and the Sahel are employing private military and security companies in support of military/counterterrorism operations, security, and border control programs, including the UN, US, and Russia.<sup>91,92</sup> Beyond these more formal private military and security organisations, other informal ad hoc security organisations are forming. In the face of violent extremist groups operating in North Africa and the Sahel, the vacuum created by weak national governments and military forces has led to the rise of non-state militant organisations and groups.<sup>93</sup> Both formal private and informal security organisations often operate on the edge of legality and accountability, undermining legitimate state military and security organisations and perpetuating violence and instability.<sup>94</sup> The existence of these groups also makes an already complex operating environment that much more complex and dangerous, strengthening autocratic governments and rulers and potentially increasing risk of conflict.<sup>95</sup>

### 1.3 Challenges to Governance

1. Similar to a political trend in the SFA 2017, governments and regional governance institutions in North Africa and the Sahel are facing a complex array of challenges and obstacles to effective governance. As a result, in many instances, they struggle to sufficiently satisfy the basic needs and wishes of their populations. This trend is likely to continue for at least the next 20 years.

2. To varying degrees depending on the country and issue, some of the challenges faced by governments across North Africa and the Sahel include: the lack of representative forms of government, lack of political voice, weak government institutions, failures to deliver basic services, failures to secure borders and remote regions, lack of popular support for centralised governments, corruption, rapid population growth, lack of economic opportunity, weak economies that lack diversification, failures to deliver basic services, significant presence of criminal networks and smuggling/trafficking, and violent extremism. This report includes discussions of many of these challenges elsewhere and they are only briefly mentioned in this section with respect to this specific trend. Data from the World Bank shows that most countries in North Africa and the Sahel consistently are in the bottom 50% of all nations (or worse in some instances) in the areas of government effectiveness, corruption, political stability, rule of law, and accountability.<sup>96</sup>

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<sup>91</sup> Daria Davitti, “The Rise of Private Military and Security Companies in European Union Migration Policies: Implications under the UNGPs,” *Business and Human Rights Journal*, Cambridge University Press, Volume 4, Issue 01 Jan 19.

<sup>92</sup> Schmitt, “Russia’s Military Mission Creep Advances to a New Front: Africa.”

<sup>93</sup> “The Sahel: Mali’s Crumbling Peace Process and the Spreading Jihadist Threat,” International Crisis Group, 01 Mar 17, <https://www.crisisgroup.org/africa/west-africa/mali/sahel-malis-crumbling-peace-process-and-spreading-jihadist-threat>.

<sup>94</sup> “The Sahel: Mali’s Crumbling Peace Process and the Spreading Jihadist Threat.”

<sup>95</sup> Schmitt, “Russia’s Military Mission Creep Advances to a New Front: Africa.”

<sup>96</sup> World Bank Data of Worldwide Governance Indicators, “Control of Corruption, Government Effectiveness, Political Stability and Absence of Violence/Terrorism, Rule of Law, and Voice and Accountability,” accessed 31 May 19, <https://databank.worldbank.org/source/worldwide-governance-indicators>.

3. Although not uniform across the region, corruption coupled with weak state institutions delegitimise governments undermining their authority and ability to provide basic governmental services. This fuels increased competition for power among external state and non-state actors contributing to a cycle of instability.<sup>97</sup> As for violent extremism, the ability for regional and transnational terrorist organisations to operate with near impunity in certain parts of North Africa and particularly the Sahel, threatens not only the stability of countries in the region, but also poses a challenge to Europe and the international community.<sup>98</sup>

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*“Despite an expanding cast of security actors responding to conflicts in Mali, insecurity is escalating and spreading across porous borders throughout the Sahel region.” (Zoe Gorman, “Pursuing Elusive Stability in the Sahel”)*

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## 1.4 Political Voice of Civil Societies

1. With ever increasing access to the internet and social media, the power and pressure of collective action by the people has also expanded. This level of connectedness allows and promotes awareness of legitimacy, governance, and the degree of inclusion afforded to other people globally.<sup>99</sup> This dynamic is particularly notable among youth within the region. Not only do they comprise a rapidly expanding segment of the population, they are increasingly more educated and eagerly embrace information technology. Their heightened awareness in political conditions around the world, coupled with youthful idealism, create strong expectations by the youth for their governments that create a dynamic for change.<sup>100</sup>

2. The resultant trend in the wake of North Africa’s ‘Arab Spring’ is that inclusion contributes greatly to political legitimacy. Both political and economic reforms from the ruling elite must be coupled with measures to connect with a greater swath of their populations in order to build consensus support for the government.<sup>101</sup> In addition to the pressures for meaningful reform, the populace has raised their voice in advancing political transparency, rule of law, and a more encompassing political participation across all elements of society.<sup>102</sup>

3. While it may be naive to believe that increased participation, transparency, and accountability are the logical evolution of governments when faced with these pressures, those in power are right to make note of this dynamic if for no other reason than the undeniable attractiveness of other potentially armed factions by those who feel cast aside and ignored by their government.<sup>103</sup> What remains to be seen is if governments in the North Africa and Sahel region take steps to become more inclusionary and better address the needs of their people in legitimate and earnest attempts at reform. Conversely, there is potential that empowered groups opt only to make enough concessions to avoid the swing of

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<sup>97</sup> Zoe Gorman, “Pursuing Elusive Stability in the Sahel,” Stockholm International Peace Research Institute (SIPRI), 26 Mar 19, <https://www.sipri.org/commentary/topical-backgrounder/2019/pursuing-elusive-stability-sahel>.

<sup>98</sup> Paper submitted to ACT SPP by Ouelhadj Ferdiou, Professor of International Relations at the University of Algiers III, “The Sahel-Sahara Facing Violent Radicalism: Challenges and Resilience,” 12 Feb 19.

<sup>99</sup> “Africa and the Arab Spring: A New Era of Democratic Expectations,” Africa Center for Strategic Studies, Report No. 1 (Nov 2011): 2, <https://africacenter.org/wp-content/uploads/2016/06/ASR01EN-Africa-and-the-Arab-Spring-A-New-Era-of-Democratic-Expectations.pdf>.

<sup>100</sup> “Africa and the Arab Spring: A New Era of Democratic Expectations,” 21.

<sup>101</sup> Mohsin Khan and Karim Mezran, “Aftermath of the Arab Spring in North Africa,” Atlantic Council Rafik Hariri Center for the Middle East, Oct 2016, 12, <https://www.jstor.org/stable/resrep03479>.

<sup>102</sup> “Africa and the Arab Spring: A New Era of Democratic Expectations,” 8.

<sup>103</sup> NATO ACT Open Publications, “Understanding the G5,” 19.

popular support going to rival groups that would challenge, and perhaps displace, control of the nation into new hands.

## 1.5 Implications

1. Over the next two decades, parts of North Africa will likely maintain relative political stability and security while political instability and insecurity will likely continue across the Sahel. Overall, the diverse array of actors and competing efforts and goals at play in the region create an increasingly complex environment. The competition of external actors magnifies that complexity and the interaction between nations. This will likely result in potential confrontations between those external powers, though likely below the threshold of conflict. However, conflicts are likely to continue at local levels or through proxy forces in certain areas. Some groups, potentially local, regional, or transnational, will attempt to leverage nationalistic fervour or the frustrations of civil society with their governments or economic conditions to destabilise ruling regimes and governing authorities. This may manifest itself in attempts to seize territory or power through coups or revolution.

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*“Most armed conflicts [in Africa] in recent years have been clustered in four regions: North Africa, the Sahel and West Africa, the Horn, and the Great Lakes region. These areas are likely to continue to experience conflict over the coming decades, partly because past conflict is one of the best predictors of future conflict.” (“African Futures: Key Trends to 2035,” Institute for Security Studies)*

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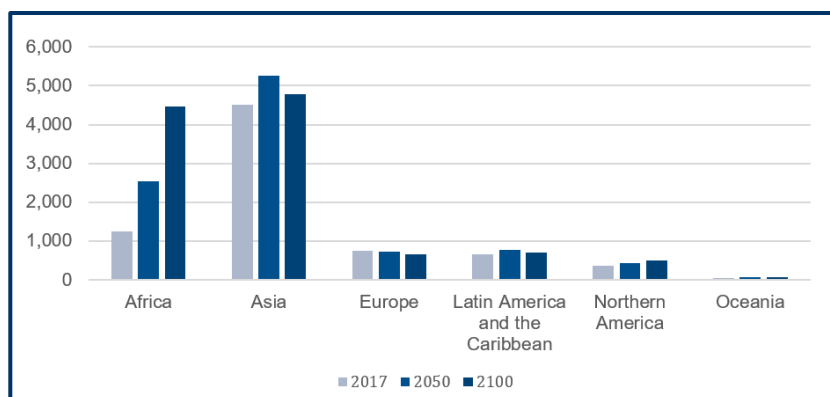
2. Additionally, the increased presence of Russian and Chinese military capabilities in North Africa and the Sahel could impact NATO security and freedom of movement/freedom of navigation and has the potential to escalate regional and international tension. The influence of Western powers will be challenged within the region and globally. If appropriate decisions and actions are not taken over the next two decades, events in North Africa and the Sahel may cause the decline of the influence of Western powers in the region and in international bodies such as the UN. The ongoing struggle between petrol-monarchies/Persian Gulf nations will shape governance in North Africa and the Sahel, resulting in increased likelihood of conflict and terrorism. Overall, the increased potential for crisis and conflict, especially grey zone/irregular warfare and terrorism, will threaten regional stability, and endanger civilian populations in the region and potentially in NATO nations. Questions about legitimacy and lack of trust in governments and regional institutions will likely persist. Governments in the region will be forced to address the demands of civil society and the increased political voice of common people. These responses will likely come in the form of inclusion or oppression.

## CHAPTER 2 - HUMAN

1. Population growth and youth bulges in the developing world compounded by ever-increasing urbanisation, aging populations, rising inequality, fractured and polarised societies, and growing interconnected human networks are the major Human Trends of the SFA 2017 that are likely to present major challenges in the coming decades. Most of these global trends directly affect the North Africa and Sahel region as well, although to a different extent.

### 2.1 Demographic Changes

1. The world population is expected to reach 9.8 billion in 2050, up from the current 7.7 billion. Africa, where the population is expected to double over this time frame, will account for more than half of this growth.<sup>104</sup> By 2050, one out of four people on Earth will be African. Further trajectories, based on current mortality, fertility, and migration rates, show an expected increase of Africa’s population with another two billion during the second half of this century. By 2100, this could mean that four out of 10 people on Earth would be living in Africa (see Figure 4). However, this growth is not evenly distributed throughout the continent, and there will be major differences between North and sub-Saharan Africa.



**Figure 4: World Population Estimates by Region, 2017-2100 (in millions of people).**

Graph by Victoria Rietig, DGAP, 2019  
Data source: UN DESA (2017), World Population Prospects p.1-3

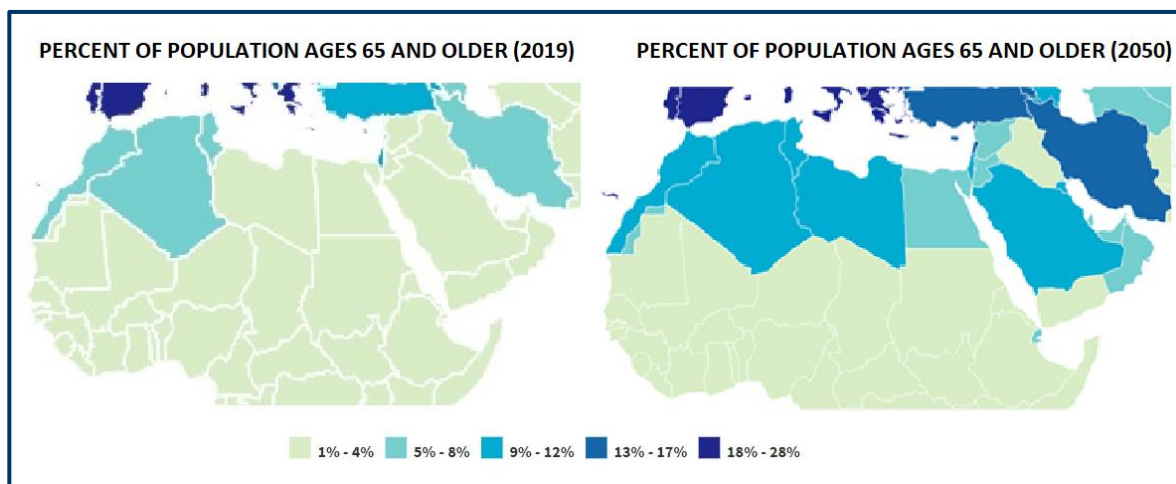
2. In North Africa, the demographic transition - the shift from high to low mortality and from high to low fertility - is well under way, although individual countries are at different stages.<sup>105</sup> All the countries in North Africa will see a further decline in fertility rates over the next decades, but Egypt will likely remain at a higher level (>3) than the replacement rate (2.1), where the other countries are already approaching this rate and even may end up below this level before 2040. Between 2017 and 2050, population growth in North Africa will therefore be relatively moderate and range from an increase with approximately 20% for Tunisia, 28% for Morocco and Libya, to 39% for Algeria and 56% for Egypt. Although these

<sup>104</sup> “World Population Prospects 2017 Revision, Volume I: Comprehensive Tables,” UN Department of Economic and Social Affairs, Population Division, 2017, [https://population.un.org/wpp/Publications/Files/WPP2017\\_Volume-I\\_Comprehensive-Tables.pdf](https://population.un.org/wpp/Publications/Files/WPP2017_Volume-I_Comprehensive-Tables.pdf), Executive Summary, XX.

<sup>105</sup> Julia Bello-Schünemann, Jakkie Cilliers, Zachary Donnenfeld, Ciara Aucoin and Alex Porter, “African Futures: Key Trends to 2035,” Institute for Security Studies (ISS), Aug 2017, <https://issafrica.s3.amazonaws.com/site/uploads/policybrief105.pdf>, 3.

numbers are still considerable, it is moderate compared to the increase of well over 200% in many sub-Saharan countries.<sup>106</sup>

3. By mid-century, projections indicate that 16% of the world population will be ages 65 and older, up from the current 9%. Although aging in the North African countries is still far behind the developed world (e.g. Europe, North America, Japan), the trend is gaining momentum and the population in North Africa of ages 65 and older is projected to nearly quadruple by 2050 (see Figure 5).<sup>107</sup>



**Figure 5: Percent of Population Ages 65 and Older (2019 and 2050)**

Data source: Population Reference Bureau ([www.prb.org](http://www.prb.org))

4. In the Sahel, the populations of Mauritania, Mali, Burkina Faso, and Chad are all expected to more than double before 2050, but the biggest growth in the region is foreseen in Niger, where the population will likely more than triple in that same time period. Most of Africa's increase in population will come from sub-Saharan Africa, with an emphasis on the Sahel region where fertility rates are among the highest in the world. Niger is the world's leading country in terms of fertility rates, with Chad and Mali both in the top five.<sup>108</sup> As a result, the Sahel has a very young population; by 2035, half of its citizens will still be under 21 years old.<sup>109</sup> In combination with the current high fertility rates, this will inevitably lead to explosive population growth. Even if fertility rates would drop to the replacement rate sooner than expected, the population will grow considerably due to the so-called 'population momentum' – the result of an age structure with a large group of younger people who all will enter reproductive age.

5. Over time, a decrease in fertility rates and an increase in life expectancy will improve the ratio between working age individuals and the economically dependent population. A relatively larger labour force can translate into a demographic dividend, boosting productivity and economic growth. This phenomenon is likely to occur in North Africa over the next two decades. However, mostly due to their high fertility rates, the Sahel countries are unlikely to enter this phase until well into the second half of this century.

<sup>106</sup> "World Population Prospects 2017 Revision," 18.

<sup>107</sup> "World Population Prospects 2017 Revision," 233.

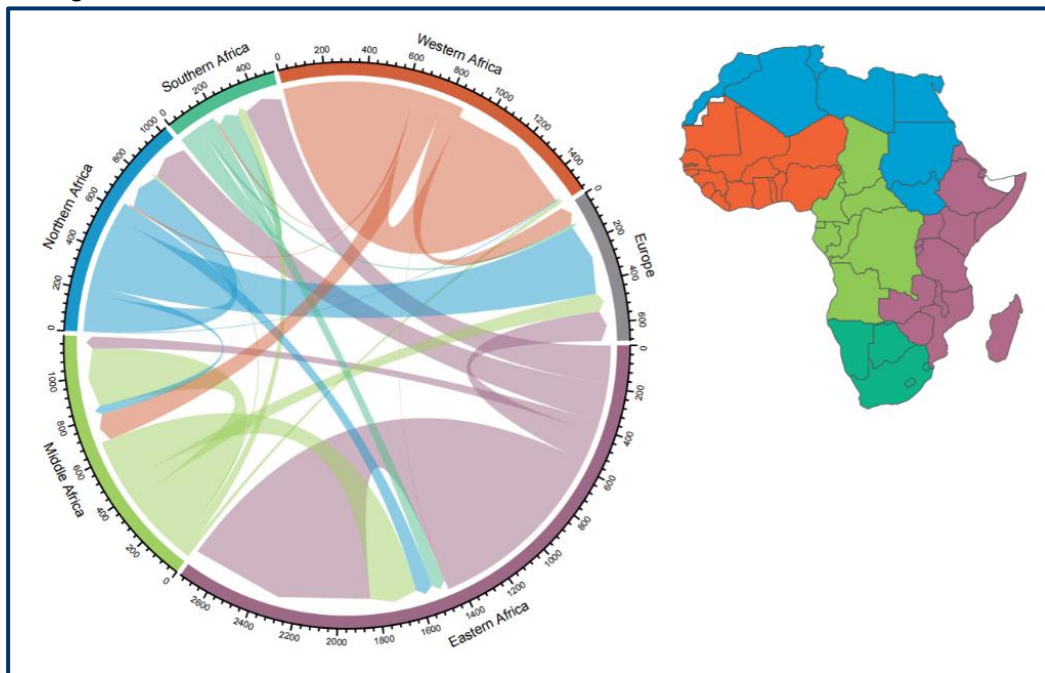
<sup>108</sup> "Total Fertility Rate 2019," World Population Review, accessed 17 May 19, <http://worldpopulationreview.com/countries/total-fertility-rate/>.

<sup>109</sup> Bello-Schünemann, Cilliers, Donnerfeld, Aucoin, and Porter, "African Futures: Key trends to 2035," 2.

6. Of note, this demographic dividend is not a given.<sup>110</sup> The economies of these countries are unlikely to grow fast enough to create enough job opportunities for this expanding workforce. The Egyptian economy, for example, needs to create an additional 800,000 new jobs each year to absorb new entrants into its job market. Moreover, this is on top of current high youth unemployment rates. According to 2018 World Bank Data, this already affects one out of three youth in Tunisia and Egypt, one out of four in Algeria, and one out of six in Morocco. Young women are most vulnerable with an unemployment rate over 40%. In addition to employability issues, rapid population growth will also challenge already strained governments and resources to provide adequate education, healthcare, housing, infrastructure, and other basic services.

## 2.2 Migration

1. Africa is often described as a continent on the move, with millions of people living away from their homes of origin, having migrated or been displaced by an attempt to escape from poverty, violence or environmental stress. Contrary to popular belief, the majority of these migratory movements have been intra-continental, where more than one out of two migrants remain within Africa (see Figure 6). Although the absolute number of extra-continental migrants to Europe, Western Asia or North America has indeed risen over the last few years, so far this migratory pattern has been consistent with Africa’s overall population growth.<sup>111</sup>



**Figure 6: Migration Flows within Africa and to Europe, 2013 (in 1,000s)**

Graph by Mercator Dialogue on Asylum and Migration (MEDAM)  
 Data source: 2018 MEDAM Assessment report on asylum and migration policies in Europe ([https://www.medam-migration.eu/wp-content/uploads/2018/08/MEDAM-assessment-report\\_2018.pdf](https://www.medam-migration.eu/wp-content/uploads/2018/08/MEDAM-assessment-report_2018.pdf))

2. The vast majority of African emigrants to Europe come from Morocco, Tunisia, and Algeria, induced by the proximity to Europe, colonial ties, and an array of variables either compelling migration out of the region or attracting migration into Europe. Regardless of the

<sup>110</sup> Bello-Schünemann, Cilliers, Donnenfeld, Aucoin, and Porter, “African Futures: Key Trends to 2035,” 3.

<sup>111</sup> “Many More to Come? Migration From and Within Africa,” European Commission’s Joint Research Centre (JRC), [https://ec.europa.eu/jrc/sites/jrcsh/files/africa\\_policy\\_report\\_2018\\_final.pdf](https://ec.europa.eu/jrc/sites/jrcsh/files/africa_policy_report_2018_final.pdf), Overview.

causes, migration from North Africa has been persistent since the independence of these countries in the second half of the last century. Over time, however, the number of source countries has grown to include sub-Saharan countries. Simultaneously, the trafficking of migrants has become a lucrative business. In absolute numbers, migration will with certainty increase over the next several decades. Even if the percentage of people that migrate remain the same, the rapid population growth will drive the numbers to new highs. Several factors may influence and even further increase migration, such as the expected widespread poverty and lack of economic opportunity for growing populations, the effects of climate change, conflict and violence, religious extremism, terrorism, and organised crime. All of these factors contribute to an increased risk of social instability and will likely serve as drivers for increased migration.

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*“Available data do not suggest an imminent mass exodus of Africans. However, our scenarios make it clear that socio-economic development, demographic shifts and climate change are likely to increase the number of African migrants. Even at an accelerated speed of socio-economic development, African countries will experience more emigration than immigration during the next 30-40 years. Development will reduce population growth, but it will also increase the ability of young people to migrate.” (“Many More to Come? Migration From and Within Africa,” European Commission’s Joint Research Centre)*

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3. Even if economic development in North Africa and the Sahel exceeds expectations and some of the issues mentioned above are mitigated, it is unlikely to curb migration, as this economic development will only serve to enable more people to migrate.<sup>112</sup> In addition, since African social structures are based on traditional principles of seniority, younger generations may have a bleak outlook on life due to their lower social standing. This larger, younger generation, increasingly networked and with a sense of adventure, may seek new opportunities abroad. Despite increasingly more restrictive migration measures by receiving countries such as new asylum laws and increased border security, African diaspora may have given hope to this group of Africans that migration is an attractive option to obtain a better life.

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<sup>112</sup> “International Migration Drivers: A Quantitative Assessment of the Structural Factors Shaping Migration,” EU Joint Research Centre, 13 Sep 19, <https://op.europa.eu/en/publication-detail/-/publication/34c4e443-b7cc-11e8-99ee-01aa75ed71a1/language-en>, 9.

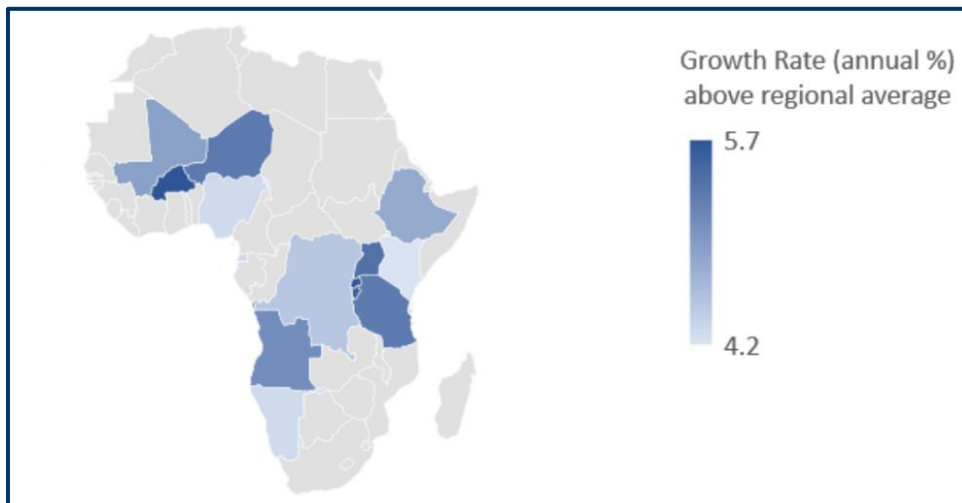
4. Sub-Saharan African migrants seeking to reach Europe but failing, often choose to stay in North Africa making these countries not only transit countries or countries of origin, but destination countries as well. At an increased rate, this will have implications for stability and security in North Africa and will pose difficult challenges for governments. Many of them are already facing rising levels of public discontent over socio-economic shortcomings such as high unemployment and poor government services. The perception of North Africans that these intra-African migrants are taking their jobs and resources, even if unfounded, could fuel instability and anti-government protests.

**Alternative View:**

*Contradicting conventional interpretations of African migration being essentially driven by poverty, violence and underdevelopment, increasing migration out of Africa seems rather to be driven by processes of development and social transformation, which have increased Africans' capabilities and aspirations to migrate, a trend which is likely to continue in the future. (Source: Comparative Migration Studies: African migration: trends, patterns, drivers -- Marie-Laurence Flahaux and Hein De Haas)*

### 2.3 Urbanisation

1. Africa's urban population is the fastest growing globally. Within the next 20 years, 50% of the population in Africa is likely to live in an urban area. By 2030, Africa will host six of the world's 41 megacities, one of which is Cairo, Egypt.<sup>113</sup> Urbanisation rates are particularly high in some of the Sahel countries, as shown in Figure 7.



**Figure 7: Urban Population Growth (Annual %) in sub-Saharan Africa**

Graph by World Bank 2017 indicators: "Sub-Saharan Africa"; "Urban Population Growth Rate."  
 Data source: CSIS, "Urbanization in Sub-Saharan Africa," <https://www.csis.org/analysis/urbanization-sub-saharan-africa>

2. Urbanisation has the appeal to potentially accelerate economic and social standings since cities generally and historically offer better opportunities for access to the labour

<sup>113</sup> Megacities are defined as cities with more than 10 million inhabitants. Bello-Schünemann, Cilliers, Donnenfeld, Aucoin and Porter, "African Futures: Key Trends to 2035," 6.



market, better education, housing, water and electricity, transportation, and other basic services that improve quality of life. However, this depends heavily on the quality of governance. Under the current conditions, it is more likely to compound structural challenges, such as slow economic transformation, poverty, inequality, corruption, and lack of security.

3. Rapid urbanisation over the last several decades has led to the growth of slums, especially in the sub-Saharan African countries, including in the Sahel. Slums are associated with an increased risk of health issues (including pandemics), poverty, inequality, and other governmental and social challenges. According to the World Health Organisation, not even half of the Sahel's urban population has access to sanitation, and only around 85% has access to clean drinking water. For North Africa, these numbers are unsurprisingly higher, above 90% and close to 100%, respectively.<sup>114</sup>

4. The expected population growth in the Sahel countries will compound the urbanisation problem. The African Economic Outlook 2016 predicts that Africa could see its slum population triple by 2050.<sup>115</sup> This growth will likely outpace economic development, and therefore result in increased insecurity, insufficient urban infrastructure, inequality, and growth of the informal sector. More than elsewhere, the rural population of the Sahel may move to urban areas, compounding an already complex array of challenges that will only increase over the next 20 years.

## 2.4 Implications

1. Extremely rapid population growth will compound poverty and lack of economic opportunity, increasing pressure on already scarce resources (e.g. water, food, and housing). This will contribute to increased risk of social instability and migration. Rapid population growth threatens sustainable development as the region faces the most severe water shortage of any region in the world. Given the lack of water resources, agricultural expansion is unlikely over much of the region. This will further increase the region's dependency on world markets for imported food to feed the rapidly growing population. Also, as the total population increases, so does the elderly population and a corresponding health burden that has important implications for the cost and configuration of health systems. On the current trajectory, extremely rapid population growth, especially in the Sahel, will compound poverty and lack of economic opportunity, which means an increased risk of social instability and a major driver of migration. The strategic relevance of the Sahel will likely increase over the next several decades, principally due to the expected population explosion.

2. Urbanisation compounded by the rapid population growth will likely lead to the explosive growth of slums, as infrastructure improvements are not likely to keep pace with the needs of civil society. Rural exodus could lead to urban individualism (vs. community solidarity) – restructuring social relations at the expense of culture and traditions. Increasing migration within North Africa will impact stability and security, imposing additional challenges for governments already facing rising levels of public discontent over socio-economic shortcomings such as high unemployment and poor government services. Instability in

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<sup>114</sup> World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), "Progress on Drinking Water, Sanitation and Hygiene: 2017 Update," accessed 24 Apr 19, <https://www.who.int/mediacentre/news/releases/2017/launch-version-report-jmp-water-sanitation-hygiene.pdf>, Fig.7.

<sup>115</sup> African Development Bank, the OECD Development Centre and the United Nations Development Programme, "African Economic Outlook 2016. Sustainable Cities and Structural Transformation," 23 May 16, [https://www.oecd-ilibrary.org/development/african-economic-outlook-2016\\_aeo-2016-en](https://www.oecd-ilibrary.org/development/african-economic-outlook-2016_aeo-2016-en), 164.

societies will likely increase, which could easily lead to social unrest, chaos, and even violence.

3. Unemployment will likely be the highest among young and educated people, especially women. With little hope of a decent life and the opportunity to start and provide for a family, large flows of educated people may choose to leave the region for Europe, North America, and other parts of the world, resulting in a 'brain drain' from the region. Over the next decade, the demand for change from the millions of young people lacking job opportunities in the region will grow if comprehensive reforms are not adopted. As young unemployed people suffer from a lack of opportunity, they will demand change from the economic and political systems that have repeatedly promised solutions yet failed to deliver satisfactory standards of living. It is predictable that the absence of reforms will fuel protests. With no substantial change, revolution might become the largest employer of youth in North Africa and the Sahel in the coming years.

## CHAPTER 3 - TECHNOLOGY

1. As with nearly every corner of the globe and almost all aspects of life, technology will bring about significant changes in North Africa and the Sahel over the next 20 years and well into the future. New technologies are already being applied across the region, mitigating or providing lasting solutions to numerous pervasive challenges. Other future and currently unknown technological innovations will certainly result in other positive outcomes for North Africa and the Sahel. The ‘greenfield’ conditions found in the region – the lack of existing infrastructure that would delay the incorporation of new technologies – will likely allow for faster adoption of new or ‘leap ahead’ technologies, given the right conditions and investments.

2. Overall, how technology is being applied in North Africa and the Sahel bodes well for the future. However, the story over the next 20 years will not be entirely positive. Despite the technological advances and development that are occurring and are likely to continue, a technology or innovation that is being applied in one country, or even one part of one country, does not equate to an improvement for the entire country, much less the vast area contained within North Africa and the Sahel. North Africa, and especially the Sahel, will continue to lag behind more developed and advanced countries over the next 20 years technologically with a potential to fall even further behind depending on the rates of advance. Additionally and more significantly, the technological advances taking place in the region will not be sufficient to overcome the inertia of the many and varied challenges such as rapid population growth and climate change.

### 3.1 Access to Technology

1. Similar to the global trend identified in the SFA 2017, access to technology such as the internet, cell phones, and software platforms available through them will continue to increase. This is true for individuals and state and non-state actors, more so in North Africa while countries in the Sahel will lag behind this trend.

2. Across North Africa and the Sahel, access to and use of the internet steadily increased since the turn of the century and is likely to continue increasing, bringing with it greater access and exposure to the rest of the world and other web based systems and technologies (news, education, social media, etc.).<sup>116</sup> Similarly, access to and use of mobile cell phones continues to steadily rise across North Africa and to a lesser degree in

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*“With Morocco and Tunisia accelerating their technology transition and economy digitalisation, North Africa is showing all the signs of a region committed to put “smart” at the heart of its government and business long-term strategy. Benefitting from a strong technology infrastructure, a young population, highly influenced by social media but also technology savvy, the region today has all the ingredients to follow the path of the UAE in terms of digital and technology revolution.”*  
*(How Technology is Transforming Business in the Middle East and North Africa,” Euromonitor International)*

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<sup>116</sup> World Bank Data of World Development Indicators, “Individuals Using the Internet (Percent of Population),” accessed 29 Apr 19, <https://databank.worldbank.org/source/world-development-indicators>.

the Sahel.<sup>117</sup> By 2040, if not sooner, access to mobile communication, the internet, and most significantly, social media platforms will be nearly universal across the region. Essential to increased internet access and mobile cell phones, access to electricity has also been steadily increasing across North Africa and the Sahel. However, there is and will continue to be a dramatic deficiency in this category for people living in the Sahel versus people living in the more developed North African countries. Each of the five North African countries achieved the ability to provide access to electricity for 100%, or nearly 100%, of their respective populations by 2015. In the Sahel, Niger and Burkina Faso are at less than 20% and Chad less than 10%.<sup>118</sup>

3. In general, information and communication technology (ICT) across North Africa is growing at a remarkable pace and is forecasted to continue to grow at exponential rates. This is due to ever growing technology infrastructure, a large technologically savvy youth population, ‘greenfield’ conditions where older technologies are not in competition with newer technologies and don’t have to be built over or removed, technology friendly policies and growth programs, and significant investment by foreign investors, public and private.<sup>119,120</sup>

4. Despite this positive forecast, several challenges remain. First is the issue of significant governmental and legal obstacles that hinder starting and growing new businesses. Closely related to this is the issue of corruption endemic across the region. The nexus of these problems often results in situations where businesses from within North Africa or the Sahel that wish to operate in their own country are forced to locate their operational headquarters in locations outside of Africa.<sup>121,122</sup> A second challenge that is linked to migration is the ‘brain drain’ being felt across the region. Given the problems of weak economies, lack of opportunity, and poor governance, countries across North Africa and the Sahel are losing valuable educated and trained people that will be essential to ensuring the Third Industrial Revolution takes root across the region and enables modernisation and growth.<sup>123</sup> Correcting these hindrances to an otherwise positive trajectory will require significant systemic, structural, and sometimes cultural changes, along with major foreign investment.

### 3.2 Net Importers vs. Exporters of Technology

1. Countries in North Africa and the Sahel are and will likely continue to be net importers of technology developed abroad rather than developers and exporters of technology. As with the previous trend, this will most likely be more true for the Sahel for a

<sup>117</sup> World Bank Data of World Development Indicators, “Mobile Cellular Subscriptions (Percent of Population),” accessed 29 Apr 19, <https://databank.worldbank.org/source/world-development-indicators>.

<sup>118</sup> World Bank Data of World Development Indicators, “Access to Electricity (Percent of Population),” accessed 29 Apr 19, <https://databank.worldbank.org/source/world-development-indicators>.

<sup>119</sup> Kinda Chebib, “How Technology is Transforming Business in the Middle East and North Africa,” *Euromonitor International*, 12 Jun 16, <https://go.euromonitor.com/white-paper-how-technology-is-transforming-business-in-MENA.html>.

<sup>120</sup> “ICT Sector Witnesses Double Digit Growth as it Embraces Digital Transformation,” *Middle East Observer*, 05 Dec 18, <https://www.meobserver.org/?p=16414>.

<sup>121</sup> Harrison Jacobs, “Egypt Is Poised to Turn Into Africa’s Hottest Tech Scene, But 2 Industry Veterans Say the Country is Up Against 2 Major Challenges,” *Business Insider*, 13 Mar 19, <https://www.businessinsider.com/egypt-tech-scene-faces-two-major-challenges-say-industry-veterans-2019-3>.

<sup>122</sup> “Policy Reform Needed to Bring the Digital Revolution to Sahelian Africa,” The World Bank, 02 May 17, <http://www.worldbank.org/en/region/afr/publication/policy-reform-needed-to-bring-the-digital-revolution-to-sahelian-africa>.

<sup>123</sup> Jacobs, “Egypt Is Poised.”

significantly longer period of time than for North African countries. This is not to say that innovation is not happening in North Africa and the Sahel. But, in overall comparison with developed and modern countries, innovation and new technology development is not occurring at nearly the same rates.<sup>124</sup> While this trend is understandable given the challenges to governance and relatively smaller economies, it is not likely to change in the next 20 years.

2. One indicator of this trend is the amount of money countries spend annually on research and development. In relative scale compared to more developed countries, countries in North Africa and the Sahel spend little to no capital on research and development.<sup>125</sup> Another indicator of this trend is in the value of a country's high technology exports. When compared with only countries in North Africa and the Sahel, Morocco and Tunisia stand out as consistently exporting high technology goods worth in excess of \$600 million (USD) per year for at least the last decade. However, when the North Africa and Sahel countries are compared with more developed countries, the amount of their high technology exports barely even register since the scales of volume become significantly higher in the range of \$50 billion (USD) and up to China at the top end, which exports high technology products worth approximately \$500 billion (USD).<sup>126</sup>

3. Another indicator of this trend of net importers versus exporters of technology is the actual numbers of people actively engaged in research and development. In this area, Egypt, Morocco, and Tunisia are generally trending up in the numbers of researchers and technicians and are competitive with Italy and even China. However, the remaining countries in North Africa and the Sahel barely register on the chart in comparison.<sup>127</sup>

4. Finally, in terms of understanding a view of the future and the ability for a country to innovate or foster innovation within its territory on a large scale, it is important to consider education trends in general along with investments and emphasis in science and technology education in particular. On a positive note, a report on education and the future of jobs and skills in the MENA region finds that Egypt, Tunisia, Morocco, Algeria, and Mauritania have made significant progress in educating their younger populations, while some are making investments in science, technology, engineering and mathematics (STEM) education programs. However, according to the report, students across the region as a whole achieve low scores on math and science tests, below the global average.<sup>128</sup> As for the quality of secondary and tertiary education systems in general and math and science education in particular for countries in North Africa and the Sahel, they rank consistently lower than half of the countries in the world.<sup>129</sup> One trend worth noting in the area of education is 'off-shore'

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<sup>124</sup> Klaus Schwab, ed., "The Global Competitiveness Report 2018," World Economic Forum, Summary of Key Findings viii-x, <https://www.weforum.org/reports/the-global-competitiveness-report-2017-2018>.

<sup>125</sup> World Bank Data of World Development Indicators, "Research and Development Expenditure (Current US\$ in Millions)," accessed 01 May 19, <https://databank.worldbank.org/source/world-development-indicators>.

<sup>126</sup> World Bank Data of World Development Indicators, "High Technology Exports (Current US\$ in Millions)," accessed 01 May 19, <https://databank.worldbank.org/source/world-development-indicators>.

<sup>127</sup> World Bank Data of World Development Indicators, "Number of Researchers & Technicians Engaged in Research and Development (per million people)," accessed 01 May 19, <https://databank.worldbank.org/source/world-development-indicators>.

<sup>128</sup> World Economic Forum, "The Future of Jobs and Skills in the Middle East and North Africa: Preparing the Region for the Fourth Industrial Revolution," 17 May 17, <https://www.weforum.org/reports/the-future-of-jobs-and-skills-in-the-middle-east-and-north-africa-preparing-the-region-for-the-fourth-industrial-revolution>, 6-7.

<sup>129</sup> Based on data from the World Economic Forum Global Competitiveness Reports for 2006-2007, 2012-2013, and 2017-2018, "Assessment: Quality of Secondary/Tertiary Education System Ranking." Comparisons from older reports were not possible given structural differences in the data and its categorization in earlier reports.

education, where Africans are being offered and obtaining education in China. This trend may aid in advancing the region as a whole technologically, but serves as another link between China and the countries of North Africa and the Sahel.

5. Over the next 20 years, a few countries in North Africa such as Morocco, Tunisia and Egypt will likely increase their ability to manufacture and export high technology products given the integration of new technologies such as 3D printing, AI, and robotics into their industries. However, given the trajectories of these various factors, countries in North Africa and especially the Sahel will likely remain near the bottom of the scale of manufacturing and exporting high technology products, relying more on importing high tech products manufactured in other countries that possess a decided comparative advantage.

### 3.3 Technology Related Development

1. In North Africa and to a lesser degree in the Sahel, there are significant increases in the numbers of businesses, infrastructure projects, and development in general that are wholly technologically based or that seamlessly integrate new technologies. This technology related development will continue to increase despite impediments due to instability, high costs and economic realities within these countries, and the impacts of climate change. This is a very positive trend, especially for North Africa but less so for the Sahel, that portends well for a brighter future for the region. However, despite technologically related infrastructure construction and development taking place in specific locations in some countries, the North Africa and Sahel regions will likely continue to lag behind the rest of the developed world in infrastructure and technological readiness over the next 20 years. Based on data from the World Economic Forum Global Competitiveness Reports over the last twelve years, this pattern is likely to continue for the next 20 years.<sup>130</sup>

2. Similar in nature to a technology trend from the SFA 2017 that stated that the commercial sector will be increasingly dominant in technological development, businesses are currently and will continue to play an important role in incorporating technology into the fabric of daily life in North Africa and the Sahel. While this may not play out as strongly in North Africa and to a lesser degree in the Sahel as in more advanced and developed countries, businesses are playing a key role in technology related development and deployment and technology based solutions. However, the success of technology businesses across the region depend on significant foreign investment, partnerships, and governmental support and involvement. Also, key to this trend is continued ‘business friendly’ structural and policy changes by governments in the region as found in Egypt.<sup>131,132,133,134</sup> Egypt’s “Vision 2030: Sustainable Development Strategy,” published in 2016, is interwoven with investments in and use of technology and innovation.<sup>135</sup> Morocco,

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<sup>130</sup> World Economic Forum’s Global Competitiveness reports for 2006-2007, 2012-2013, and 2017-2018. Comparisons from older reports were not possible given structural differences in the data and its categorization in earlier reports.

<sup>131</sup> Edmon Abdel Nur, “Egypt Embraces New Tech in an Attempt to Future-Proof Itself,” *Across the Middle East Info*, 06 Mar 19, <https://ameinfo.com/industry/technology/egyptian-technology-transformation-2019>.

<sup>132</sup> Jacobs, “Egypt Is Poised.”

<sup>133</sup> Lily Kuo, “Startup Investment is Making a Comeback in North Africa,” *Quartz Africa*, 24 Jan 17, <https://qz.com/africa/892524/startup-investment-is-making-a-comeback-in-north-africa/>.

<sup>134</sup> “ICT Sector Witnesses Double Digit Growth.”

<sup>135</sup> Matshelane Mamabolo, “Egypt’s Vision 2030 Hinges on IT in Education,” *IT Web Africa*, 22 May 17, <http://www.itwebafrica.com/ict-and-governance/254-egypt/237883-egypts-vision-2030-hinges-on-it-in-education>.

not far behind Egypt in startups, and Tunisia are both making notable strides in improving and developing their domestic technology sector business climate.<sup>136</sup>

3. Another area where there is significant effort is in construction of technologically advanced public infrastructure. Several countries in North Africa and the Sahel, along with the World Bank, the Africa Development Bank and numerous other investors, invested significant amount of effort and sums of money in new technologies and major renewable energy projects. This is being done to create economic opportunity, foster growth and modernisation, improve quality of life, enhance energy security (even to the point of potentially being net energy exporters), and contribute to a cleaner global and African environment.<sup>137,138</sup> Examples of this include Egypt's new administrative capital city (which is described as the "first smart city in Egypt"<sup>139,140,141</sup>) and Morocco's technological transformation of Casablanca, neighboring cities, and its major port, Tanger Med, along with the first high-speed rail line on the continent.<sup>142,143,144,145</sup> Not to be excluded, Algeria and even Libya, despite its fractured state and numerous obvious challenges, are planning for significant investments in technologically advanced deep-sea ports.<sup>146,147</sup>

4. Beyond these investments in technologically advanced infrastructure, most of the major investments in new technologies in North Africa and the Sahel have been in the area of renewable energy. Examples of this include Tunisia's TuNur solar project (expected to export electric power to Italy, France, and eventually other European countries as far as the United Kingdom);<sup>148</sup> Egypt's Benban Solar Park, the world's largest solar park of its

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<sup>136</sup> Kuo, "Startup Investment is Making a Comeback in North Africa."

<sup>137</sup> Abdi Latif Dahir, "Sub-Saharan Africa is Still in the Dark but North Africa Will Soon be Selling Power to Europe," *Quartz Africa*, 28 Sep 17, <https://qz.com/africa/1084847/sub-saharan-africa-is-still-in-the-dark-but-north-africa-will-soon-be-selling-power-to-europe/>.

<sup>138</sup> "Major Funds Support Clean Solar Energy in the Sahel," *United Nations Climate News*, 30 May 18, <https://unfccc.int/index.php/news/major-funds-support-clean-solar-energy-in-the-sahel>.

<sup>139</sup> Rachel Elbaum, "Egypt Builds a New Capital City to Replace Cairo," *NBC News*, 10 Aug 18, <https://www.nbcnews.com/news/world/egypt-builds-new-capital-city-replace-cairo-n893606>.

<sup>140</sup> Al-Masry Al-Youm, "Development Plan for Cairo Comes Alongside New Administrative Capital Move: Egypt's PM," *Egypt Independent*, 03 Feb 19, <https://www.egyptindependent.com/development-plan-for-cairo-comes-alongside-new-administrative-capital-move-egypt-pm/>.

<sup>141</sup> "Honeywell to Cover Egypt's New Capital With Security Cameras," *Global Construction Review*, 22 Feb 19, <http://www.globalconstructionreview.com/news/honeywell-cover-egypts-new-capital-security-camera/>.

<sup>142</sup> Chebib, "How Technology is Transforming Business in the Middle East and North Africa."

<sup>143</sup> "North Africa Chips Away at its Wishlist," *Mercator Media*, 30 Apr 18, <https://www.portstrategy.com/news101/world/africa/risks,-challenges-and-investment-opportunities>.

<sup>144</sup> Ahmed Eljehtimi, "Morocco Inaugurates Africa's Fastest Train," *Reuters*, 15 Nov 18, <https://www.reuters.com/article/us-morocco-france-train/morocco-inaugurates-africas-fastest-train-idUSKCN1NK2A0>.

<sup>145</sup> Harrison Jacobs, "I Rode Africa's First Superfast Bullet Train That Could Go From New York To Washington, DC, in 90 Minutes, and I Understand Why It's Controversial," *Business Insider*, 27 Jan 19, <https://www.businessinsider.com/bullet-train-africa-morocco-casablanca-tangier-2019-1#i-arrived-at-the-tanger-ville-railway-station-in-the-northern-coastal-city-of-tangier-about-a-half-hour-before-my-train-at-5-pm-1>.

<sup>146</sup> "North Africa Chips Away At Its Wishlist."

<sup>147</sup> Ulf Laessing and Ayman Warfalli, "Libya Dreams of Mega Port in History-Laden East," *Reuters*, 14 Feb 19, <https://uk.reuters.com/article/uk-libya-economy-ports/libya-dreams-of-mega-port-in-history-laden-east-idUKKCN1Q32A9>.

<sup>148</sup> Dahir, "Sub-Saharan Africa is Still in the Dark."

kind;<sup>149,150</sup> and Morocco's Noor Concentrated Solar Power (CSP) Plant complex (also expected to export electric power to Europe).<sup>151,152</sup> Notably in the Sahel, Burkina Faso brought the largest solar power plant in West Africa on line in late November 2017. Burkina Faso's goal is to build enough solar capacity to provide 30% of its energy needs from solar power by 2030.<sup>153</sup>

### 3.4 Implications

1. Each one of these technology trends has numerous implications that will affect North Africa and the Sahel across the spectrum from an individual person's daily lives to regional and national level processes, systems, and organisations.
2. Despite the coming progress in North Africa and the Sahel, technological improvements over the next two decades will not benefit or be accessible to many people in the region, most specifically those in the Sahel, widening the gap internally and with more uniformly developed countries. This is in part due to the relatively high levels of unemployment and poverty, especially in the Sahel, in relation to the higher costs of obtaining access to existing and new technologies. This gap is also due to the differences in development taking place in the coastal regions of North Africa and urban areas verses that in rural communities and vast, much less densely populated regions.
3. The availability and increasingly relatively lower cost of entry for technologies such as 3D printing, advanced weapons and weapons systems, AI, cyber-based tools and weapons, and UAVs will empower non-state actors even greater than presently. These technologies will also significantly limit the ability to attribute illegal trafficking and/or terrorist events to specific organisations or networks. Non-state actors will seek to acquire advanced technologies (e.g. such as autonomous systems, AI, weapons of mass effects, cyber tools and weapons, etc.) to conduct actions designed to disrupt living patterns and undermine governments and economies. This will create greater challenges to centralised governments and international organisations working to counter regional and transnational criminal and violent extremist organisations and the spread of violent extremism/terrorism.
4. Given the fact that much of the major infrastructure and technological development in North Africa and the Sahel is a result of significant external funding and investment and coupled with the chronic challenges across the region, countries in North Africa and the Sahel will continue to foster ties with external organisations and countries. This will magnify the opportunities for involvement and influence by external actors such as Russia, China, UAE, and Saudi Arabia.
5. If governments choose to follow the China or Russia model of information and internet control, authoritarian regimes in the region could employ new technologies to

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<sup>149</sup> "Egypt: Solar Field Of The Hybrid Power Plant In Kuraymat Exceeds Expectations," accessed 05 May 19, <http://helioscsp.com/egypt-solar-field-of-the-hybrid-power-plant-in-kuraymat-exceeds-expectations/>.

<sup>150</sup> Lolwa Reda, "2018 Highlight: Egypt Inaugurates Largest Solar Power Plant Worldwide," *Egypt Today*, 28 Dec 18, <http://www.egypttoday.com/Article/2/62720/2018-Highlight-Egypt-inaugurates-largest-Solar-Power-Plant-worldwide>.

<sup>151</sup> "Solar Plant the Size of San Francisco Powers Morocco's Sunlit Ambitions," *Climate Home News*, 22 Jan 19, <https://www.climatechangenews.com/2019/01/22/solar-plant-size-3500-football-pitches-powers-morocco-sunlit-ambitions/>.

<sup>152</sup> Adam Jezard, "Morocco is Building a Giant Thermosolar Farm in the Sahara Desert," World Economic Forum, 01 May 18, <https://www.weforum.org/agenda/2018/05/morocco-is-building-a-solar-farm-as-big-as-paris-in-the-sahara-desert/>.

<sup>153</sup> Armel Baily, "Burkina Faso Launches Sahel Region's Largest Solar Power Plant," 28 Nov 17, <https://phys.org/news/2017-11-burkina-faso-sahel-region-largest.html>.



manipulate information and limit access to the internet and social media platforms, thereby silencing dissent and contributing to even greater disenfranchisement. Technological advances in communication, monitoring, and tracking will provide authoritarian regimes in North Africa and the Sahel the means to exert greater control over their people and to limit freedoms. Advanced and readily available means of communication will also provide an avenue for disinformation, propaganda, and intelligence collection by African or foreign governments and organisations operating in the region.

6. Technology is and will continue to improve the quality of life in North Africa and the Sahel generally – more so in urban and coastal areas than in remote and rural areas. Advancements in technologies such as climate control systems for buildings and homes will become more available and affordable while also reducing their environmental impact.<sup>154</sup> More importantly and impactful, the democratisation of healthcare by broadening access to more people and in more remote locations will improve the overall health of the population in North Africa and the Sahel. Technology will lower healthcare costs through ubiquitous computing and internet access, AI, nanotechnology and the creation of miniaturised devices (referred to as lab-on-a-chip (LOC) devices), genome engineering, use of UAVs in support of medical testing and treatment, among others. Technological advances will provide better ability and methods to counter and control potential epidemics or Ebola-like events. New universal or rapidly developed vaccines will be important as old and new pathogens interact with human populations.

7. New technologies are already making an impact and will make even greater impact over the next two decades, enabling improvements in agriculture and food security. A new technology called ‘Liquid Nanoclay’ has the potential to convert desert areas or land with high sand content across North Africa and the Sahel into arable, productive farmland.<sup>155</sup> Other technologically driven advances such as the use of UAVs, improved supply chain management tools, improved fertilizers, pest and drought resistant crops, pesticides, along with computer based irrigation systems, crop management, and even improved access to markets, will make farming in North Africa and the Sahel more productive and profitable.<sup>156,157</sup>

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*“Faced with encroaching desertification, the Sahel region is heavily affected by the realities of climate change. To mitigate its effects and combat poverty and pollution in a sustainable way, it is therefore vital to reap the benefits of the abundant source of energy that is the sun. Three million people living in the region have gained access to drinking water thanks to the EU funded installation of solar-powered pumps.” (Access to Drinking Water in the Sahel Region,” African Union)*

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8. Technology will provide increased access and ability to use natural resources such as oil and natural gas while also improving the quality and availability of water. Programs in the Sahel to provide and distribute solar powered water pumps are

<sup>154</sup> Ankit Kalanki and Sneha Sachar, “Revolutionizing the Air Conditioner Industry to Solve the Cooling Challenge,” Rocky Mountain Institute, 12 Nov 18, <https://rmi.org/revolutionizing-the-air-conditioner/>.

<sup>155</sup> Aamir Rafiq Peerzada, “The Innovation Turning Desert Sand Into Farmland,” *BBC News*, 16 May 18, <https://www.bbc.com/news/business-43962688>.

<sup>156</sup> The World Bank, “Policy Reform Needed to Bring the Digital Revolution to Sahelian Africa.”

<sup>157</sup> “Tunisia Trains Drone Pilots for Agricultural Purposes,” *IT News Africa*, 17 Dec 18, <https://www.itnewsafrika.com/2018/12/tunisia-trains-drone-pilots-for-agricultural-purposes/>.

providing improved and increased access to fresh water.<sup>158</sup> Non-governmental and governmental organisations are employing computer based monitoring and control systems that provide information on water availability, usage, recycled water, and rainfall levels, enabling more efficient use of water resources.<sup>159</sup> The International Atomic Energy Agency (IAEA) is employing nuclear-based technologies to conduct hydrological studies to better understand the flow and contamination levels of underground aquifers, which will help ensure humans use and consume safe water.<sup>160,161</sup>

9. Solar and wind generated electricity will play a significant role in the economic development and growth of the region, not to mention improve the daily lives of people throughout North Africa and the Sahel. One likely outcome of converting from fossil fuel based power generation to solar or wind based power generation is reduced demand on already low supplies of water in the region. Water used to cool fossil fuel power plants will be available to use for fresh drinking water or in agriculture to irrigate much needed crops and farmland.<sup>162</sup> The construction of large-scale desalination plants that employ new synthetic materials will reduce operating costs and the resulting costs of potable water while increasing the volume of water produced.<sup>163,164,165,166</sup> Precipitation levels are forecasted to increase simply as a result of the many wind and solar power generation plants being built across the region. Studies have proposed that significant solar and wind plants might result in local increases in temperatures, producing increased rainfall across the region.<sup>167,168</sup>

10. Similar to the impacts on water, technological advances are currently and will continue to provide increased access to and better management of oil and natural gas reserves across the region. Beyond the shale revolution, researchers are developing newer and more advanced methods for extracting and converting natural gas.<sup>169</sup> Additionally,

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<sup>158</sup> African Union, “Access to Drinking Water in the Sahel Region - Harnessing the Power of the Sun,” accessed 23 Apr 19, <https://www.africa-eu-partnership.org/en/success-stories/access-drinking-water-sahel-region-harnessing-power-sun>.

<sup>159</sup> Meena Bhandari, “Water Scarcity in the Sahel,” Pulitzer Center on Crisis Reporting, accessed 23 Apr 19, <http://pulitzercenter.org/content/water-scarcity-sahel>.

<sup>160</sup> Laura Gil, “Scientists Explore Groundwater in the Sahel with Nuclear Technology,” International Atomic Energy Agency, 02 May 17, <https://www.iaea.org/newscenter/news/scientists-explore-groundwater-in-the-sahel-with-nuclear-technology>.

<sup>161</sup> International Atomic Energy Agency, “Groundwater in the Sahel Region,” accessed 23 Apr 19, <https://www.iaea.org/sites/default/files/documents/tc/Sahel.pdf>.

<sup>162</sup> Sebastien Malo, “Solar Power Could Save Water in Thirsty Middle East, North Africa, Analysis Says,” *Reuters*, 14 May 18, <https://www.reuters.com/article/us-global-water-renewables/solar-power-could-save-water-in-thirsty-middle-east-north-africa-analysis-says-idUSKCN1IG02I>.

<sup>163</sup> Leda Zimmerman, “Cheaper, Energy Efficient Ways to Desalinate Water,” *MIT Spectrum* (Summer 2015), <https://spectrum.mit.edu/summer-2015/cheaper-energy-efficient-ways-to-desalinate-water/>.

<sup>164</sup> David Talbot, “Megascale Desalination,” *MIT Technology Review*, 18 Feb 15, <https://www.technologyreview.com/s/534996/megascale-desalination/>.

<sup>165</sup> “Morocco to Build World Largest Desalination Plant,” *North Africa Post*, 07 Aug 17, <http://northafricapost.com/19201-morocco-build-world-largest-desalination-plant.html>.

<sup>166</sup> Patrick Werr, “Egypt Looks To The Sea To Meet Its Need For Water,” *The National*, 14 Jun 17, <https://www.thenational.ae/business/egypt-looks-to-the-sea-to-meet-its-need-for-water-1.58966>.

<sup>167</sup> United Nations, “More Than Just Clean Energy: Wind and Solar in the Sahara Could Increase Rainfall in the Sahel,” UN Environment Programme, 16 Oct 18, <https://www.unenvironment.org/news-and-stories/story/more-just-clean-energy-wind-and-solar-sahara-could-increase-rainfall-sahel>.

<sup>168</sup> Matt McGrath, “Large-Scale Wind and Solar Power 'Could Green the Sahara',” *BBC News*, 07 Sep 18, <https://www.bbc.com/news/science-environment-45435593>.

<sup>169</sup> Kayla Matthews, “Researchers Believe They Can Access a 100-Year Supply of Natural Gas,” *Technology Org*, 17 Apr 19, <https://www.technology.org/2019/04/17/researchers-believe-they-can-access-a-100-year-supply-of-natural-gas/>.

recent discoveries of natural gas fields off Egypt's coast in the Eastern Mediterranean have the potential to make Egypt and some of its Levant neighbors into net natural gas exporters.<sup>170,171</sup> With continued technological advancements in exploration, extraction, and conversion, there is potential for additional similar discoveries elsewhere in the region, resulting in economic development and opportunity. Moreover, new natural gas discoveries would enable North African countries to achieve cleaner and more sustainable energy futures.<sup>172</sup>

11. Technology will continue to influence social and political networks and systems, migration, and governance across the region. Increased access to computers, cell phones, and the internet will result in increased political voice influencing social and political change. Increased access to the internet and social media platforms could contribute to increased migration flows by enabling and encouraging migration. With increased internet and cell phone access and availability, individuals and groups will be better able to plan their migration in terms of routes, timing, anticipating weather factors, avoiding authorities, or communicating with migration facilitators (either legal or illegal). Conversely, technology will provide governments and international organisations with better tools and methods for monitoring and controlling migration. Also enabling governance, technology will provide capabilities and systems for governments and international organisations to control and monitor the vast ungoverned spaces in North Africa and the Sahel and cross-border smuggling and trafficking.

12. Given that countries in North Africa and the Sahel already lag behind most advanced and modernised countries, one of the most significant risks is that the Fourth Industrial Revolution may leave the region even further behind in development and modernisation. Countries across the region are and will continue to invest in technologies from the Third Industrial Revolution and may even begin to realise benefits from the Fourth Industrial Revolution over the next 20 years. However, there is a risk that the Fourth Industrial Revolution may advance exponentially in more developed countries while challenges to governance, rule of law, and social justice may limit advances in North Africa and the Sahel, causing slower modernisation and development rates exponentially increasing the gap.<sup>173</sup>

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*“While the promise of ICTs for productivity is high—and although ICTs can clearly be catalysts for other drivers of productivity, such as innovation and business dynamism—it would be misguided to rely on technology alone to solve all problems, in education, health, governance or transport infrastructure, for example. For many of the least competitive economies, the root causes of slow growth continue to be the ‘old’ developmental issues such as institutions, infrastructure and skills. For technology-based leapfrogging to offer a new path to development for low-income economies, these issues cannot be ignored.”*  
*(“The Global Competitiveness Report 2018,” World Economic Forum)*

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<sup>170</sup> Karim Mezran and Arturo Varvelli eds., *The Arc of Crisis in the MENA Region*, (ISPI and Atlantic Council, 2018), <https://www.ispionline.it/it/pubblicazione/arc-crisis-mena-region-21387>, 15-16.

<sup>171</sup> Gerald Butt, “East Med's Best is yet to Come,” *Petroleum Economist*, 11 Sep 18, <https://www.petroleum-economist.com/articles/politics-economics/europe-eurasia/2018/east-meds-best-is-yet-to-come>.

<sup>172</sup> Butt, “East Med's Best is yet to Come.”

<sup>173</sup> Schwab, ed., “The Global Competitiveness Report 2018,” Summary of Key Findings ix-x.

## CHAPTER 4 - ECONOMICS / RESOURCES

1. While the global economic trends of the SFA 2017 hold true, there are some differences in the North Africa and Sahel region given the unique characteristics of the region and the 10 nations considered in this report. The economy of each country across North Africa and the Sahel is unique and possesses particular characteristics based on the form of government, societal composition, geography, and the blessing (or curse) of specific natural resources. While Morocco's economy is relatively diverse, Tunisia's is more reliant on tourism and Algeria's economy is based on hydrocarbons and state-centred economic management. In Egypt, macroeconomic indicators show recent improvements but state intervention is high. On the other hand, Libya, rich in natural resources, will continue to suffer from nearly a decade of political instability for at least the next several years. In comparison to their northern neighbours, the economies of the Sahel countries face even more daunting challenges and are likely to struggle even more in the coming decades.

### 4.1 Economic Development

1. Overall, the economies in North Africa and the Sahel are steadily growing. However, the continuation of this trend over the next 20 years will face numerous challenges including substantial population growth and climate change. In recent years, North African countries improved their local and national business climates. With the exception of Libya, they have generally recovered from the economic shock of the 'Arab Spring' and experienced sustained economic growth.<sup>174</sup> This is a positive trend that, if sustained, will continue to benefit the lives of people across the region. The Sahel, however, has not seen similar economic development over the last decade.<sup>175</sup> Given the challenges, this trend is likely to continue. For North Africa and the Sahel overall, corruption, terrorism, socio-political unrest, conflict in certain areas, and numerous other challenges are likely to restrain economic growth over the next two decades.

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*“Decreased investment, trade, and productivity, along with human and physical capital destruction (including through forced displacement and devastating effects on education and health care), are some of the key channels through which conflict impedes economic growth. Taken together, these factors lead to a persistent decline in the productive capacity of an economy.” (“Regional Economic Outlook, Sub-Saharan Africa,” International Monetary Fund)*

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2. One challenge for the North Africa and Sahel economies is the scale of the informal economy compared to the formal economy, which substantially reduces state revenues. According to estimates from the International Labour Office, 60% of the total labour force in Egypt and Morocco work in the informal sector.<sup>176</sup> In other North African countries this number may be a bit lower (e.g. Tunisia is around 53%). However, in these countries the informal sector forms a very important part of the economy. Estimates for the Sahel are that at least two third of the

<sup>174</sup> African Development Bank Group, “North Africa Economic Outlook 2018,” <https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/2018AEO/African-Economic-Outlook-2018-North-Africa.pdf>, 3-6.

<sup>175</sup> International Monetary Fund, “Regional Economic Outlook, Sub-Saharan Africa”, April 2019, <https://www.imf.org/en/Publications/REO/SSA/Issues/2019/04/01/sreo0419>, 25-27.

<sup>176</sup> Max Gallien, “Understanding Informal Economies in North Africa,” Friedrich Ebert Stiftung, July 2018, <http://library.fes.de/pdf-files/iez/14573.pdf>, 3.

labour force works in the informal sector. The informal sector is a particularly common source of employment for the younger generations. Given the expected rapid population growth, the expectation is that the informal sector will only continue to grow.

3. Governments in the region are struggling to effectively govern the whole of their territories, which has contributed to the proliferation of terrorist and criminal groups in ungoverned spaces. The resulting instability and insecurity has a negative influence on tourism, foreign investments, and other activities that could otherwise boost economic development. Initiatives like the G5 Sahel aim to improve security and may contribute to improved economic development.

4. Another challenge for governance and economic development is persistent corruption. The corruption perception index shows that corruption is still high and based on the status of anti-corruption measures, it is likely to remain high for the next two decades.

5. Despite efforts to diversify their economies, the countries in the region generally have narrowly focused economies. For example, Algeria and Libya rely heavily on natural resources for their revenues, whereas Egypt, Tunisia, and Morocco rely on tourism and manufacturing. Most Sahel economies are centred on agriculture and natural resource extraction. These narrowly focused economies are susceptible to market fluctuations with a negative impact on economic growth.

6. North Africa has the largest oil and gas resources in Africa. Individually, Libya has the largest oil reserves, followed by Algeria and Egypt.<sup>177</sup> Over time, these countries may attempt to diversify their energy production, developing both renewable energy and nuclear power. However, for the next several decades, the energy sector in North Africa will likely continue to be dominated by oil and natural gas. Europe will likely continue to import oil and natural gas from the region. As a consequence, energy and security in both regions will remain strongly connected.

7. Climate change is and will even more dramatically affect agriculturally based economies. Droughts and major storms may devastate harvests, displacing workers and increasing commodities prices. Many of the region's countries lack the economic capacity and resilience to respond to these challenges. The foreseeable population growth and increased food and water scarcity, added to the vulnerability of the agricultural markets, does nothing but aggravate the expectations for economic growth.

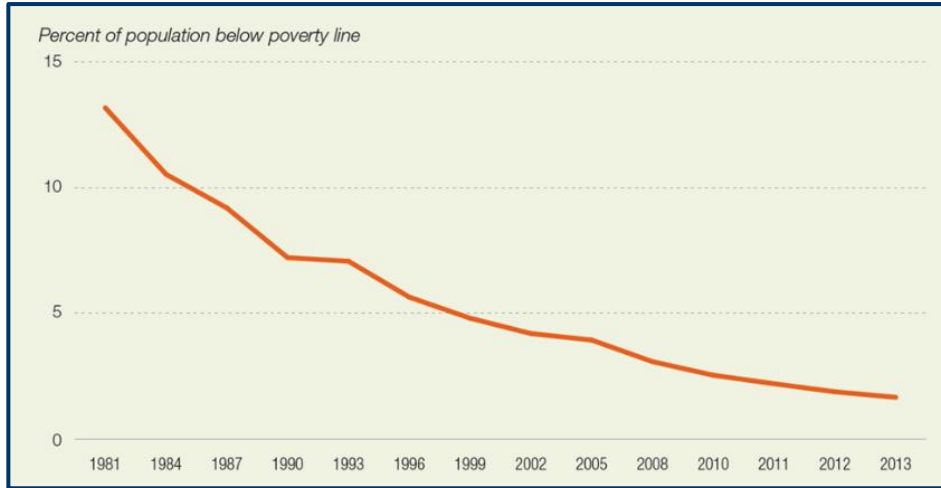
## 4.2 Poverty and Unemployment

1. Almost in opposition to the trend cited in the SFA 2017 of increasing inequality, countries in North Africa and the Sahel are moving in a positive direction in terms of trends in declining poverty and unemployment. However, there are still differences between the 'haves' and 'have-nots' across particular areas of the region that will likely persist for the foreseeable future. Extreme poverty<sup>178</sup> in Sub-Saharan Africa has been in decline over the last several decades. The number of people in extreme poverty in North Africa declined from about 13 million or 13% of the population in 1981, to 3 million or less than 2% by 2013 (see Figure 8).<sup>179</sup>

<sup>177</sup> "The World's Largest Oil Reserves by Country," WorldAtlas, last modified on 08 Jan 19, <https://www.worldatlas.com/articles/the-world-s-largest-oil-reserves-by-country.html>.

<sup>178</sup> Extreme poverty is defined by the World Bank as people who live on less than US \$1.90 a day, in 2011 purchasing power parity terms. World Bank, "Atlas of Sustainable Development Goals," accessed 08 May 18, <http://datatopics.worldbank.org/sdgateatlas/archive/2017/SDG-01-no-poverty.html>.

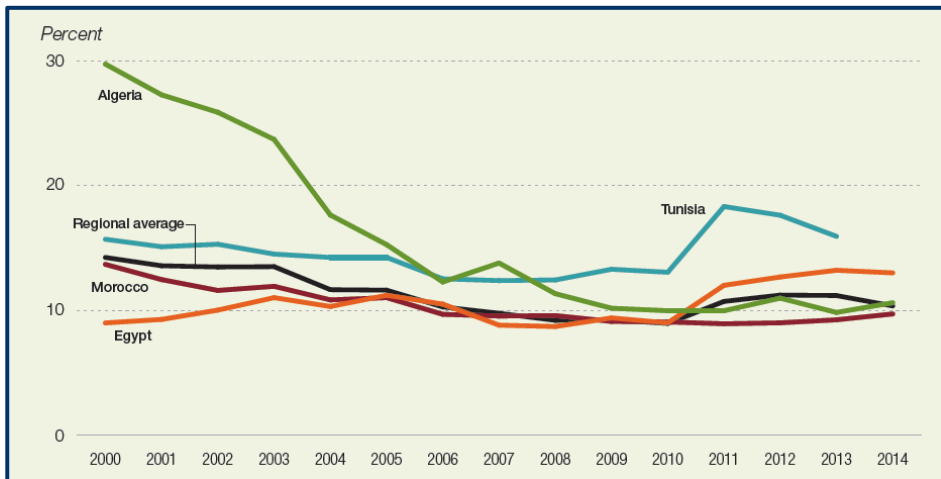
<sup>179</sup> African Development Bank Group, "North Africa Economic Outlook 2018", 21-25.



**Figure 8: Poverty trends in North Africa, 1981-2013**

Source: African Development Bank Group, “North Africa Economic Outlook 2018,” p. 22.

2. Employment rates in the region have steadily improved, only interrupted by the ‘Arab Spring’ revolutions and social unrest that led to a steep rise in unemployment in 2011, especially in Egypt and Tunisia. Although employment has started to recover, unemployment rates in the region are still higher than in other regions in the world, particularly for youth, women, and university graduates (see Figure 9). The youth unemployment rate now stands at nearly 30.5% in the region, twice the global average. Only 17% of young women and 47% of young men are economically active. An estimated 25% of working youth are living in poverty. Female unemployment is at 20%. Unemployment rates among university graduates are particularly high in the region with Egypt at 60% and Tunisia at 31%.<sup>180</sup>



**Figure 9: Unemployment Trends in North African Countries, -14**

Source: African Development Bank Group, “North Africa Economic Outlook 2018,” p. 24.

3. The far more economically challenged Sahel countries have seen significant improvements in extreme poverty levels. The percentage of the Sub-Saharan African population living below the extreme poverty level decreased from over 59% in 1993 to

<sup>180</sup> African Development Bank Group, “North Africa Economic Outlook 2018”, 21-25.

around 41% in 2015.<sup>181</sup> Official unemployment in the Sahel is slightly increasing but remains low at 5.7% in 2018, especially compared to North Africa at 13.1%. This number is most likely influenced by the high number of people working in the informal sector or agricultural sector and who are not actively seeking official employment. Without sufficient corresponding economic growth, the projected population growth is likely to fuel increased inequality and social instability.

### 4.3 External Actors' Economic Interest

1. North Africa and the Sahel are rich with natural resources and are increasingly viewed as significant developing markets for global trade. Population growth and developing economies will add to the importance of the region as partner for global trade. As a result, interest from foreign powers, particularly Russia and China, will increase in North Africa and the Sahel. External foreign investments will likely contribute to economic development but also strengthen the influence of such countries within the region. Their economic support is the result of their respectively unique national geopolitical interests.<sup>182</sup>

2. Russia has a clear economic interest in North Africa's energy sector. For Russia, North African countries are both fossil fuel competitors as well as potential partners in nuclear projects.<sup>183</sup> In addition, some North African countries, namely Egypt and Algeria, are major importers of Russian arms as Moscow is making efforts to be the preferred arms supplier for the entire Middle-East North Africa region.<sup>184,185</sup> After having developed security cooperation agreements with 26 countries in Africa since 2001, including several countries in North Africa and the Sahel,<sup>186,187</sup> Russia will likely continue to focus on the region for any opportunity to strengthen its economic and military relationships.

3. Africa's abundant natural resources are essential to China's economic growth and will likely compel a continued interest and level of economic activity by China in numerous countries across the region. Although not in the primary focus of China's Belt and Road Initiative, Africa has seen growing interest and investments by China.<sup>188</sup> The majority of these investments made in African countries are infrastructure projects which allow greater access to the continent by improving ports and transportation networks. A key point often discussed in relation to these types of investments from China is the fact that if the receiving countries fail to repay their debts, China stands to gain control of such infrastructure creating

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<sup>181</sup> World Bank, Data of Poverty Indicators, "Poverty headcount ratio at \$1.90 a day - Sub-Saharan Africa", accessed 17 May 19, [https://data.worldbank.org/indicator/SI.POV.DDAY?end=2015&locations=ZG&name\\_desc=false&start=1981&view=chart](https://data.worldbank.org/indicator/SI.POV.DDAY?end=2015&locations=ZG&name_desc=false&start=1981&view=chart).

<sup>182</sup> Aline Leboeuf, "La compétition stratégique en Afrique. Approches militaires américaine, chinoise et russe," *Focus stratégiques*, no. 91, The French Institute of International Relations (Ifri), August 2019, 22-25, <https://www.ifri.org/en/publications/etudes-de-lifri/focus-strategique/competition-strategique-afrique-approches-militaires>.

<sup>183</sup> "Nuclear Energy Can Bridge the Skills Gap in Africa," World Nuclear News, 25 Oct 19, <http://www.world-nuclear-news.org/Articles/Nuclear-energy-can-bridge-the-skills-gap-in-Africa>.

<sup>184</sup> Wezeman, Fleurant, Kuimova, Tian, and Wezeman, "Trends in International Arms Transfers 2018."

<sup>185</sup> Borshchevskaya, "Russia's Growing Influence in North Africa."

<sup>186</sup> Leboeuf, "La Compétition Stratégique en Afrique. Approches Militaires Américaine, Chinoise et Russe," 24.

<sup>187</sup> Poline Tchoubar, "La Ouverture Stratégique Russe en Afrique Subsaharienne: Nouveaux Moyens et Nouveaux Acteurs," Fondation pour la Recherche Stratégique, note no. 21/2019, accessed 11 Oct 19, <https://www.frstrategie.org/publications/notes/nouvelle-strategie-russe-afrique-subsaharienne-nouveaux-moyens-nouveaux-acteurs-2019>.

<sup>188</sup> Lina Benabdallah and Winston Robertson, "Xi Jinping Pledged \$60 billion for Africa," *The Washington Post*, 17 Sep 18, <https://www.washingtonpost.com/news/monkey-cage/wp/2018/09/17/xi-jinping-pledged-60-billion-for-africa-where-will-the-money-go/>.

a ‘debt trap.’<sup>189</sup> However, for countries with struggling or weak economies and given limited choices between foreign investors, the offer of Chinese investment, with seemingly with no apparent strings attached, is difficult to refuse. Given China’s stated national objectives to become a major world power, China will continue to be a key player economically in the region for at least the next several decades.

#### 4.4 Implications

1. North Africa and Sahelian economies are likely to improve but high levels of corruption, fragile institutions, and polarised societies will still represent enduring challenges. The nexus of population growth, weak governance, scarcity of resources, and economic competition fuel the risk of conflict. China, or even Russia, might consider those conflicts as an opportunity to intervene to stabilise the region, increasing their access to resources and gaining influence. India may decide to enter the competition for resources and influence in the region to counter China’s investments and influence. As a result of all of the variables and foreign economic involvement, North Africa and the Sahel is currently and will continue to be a region of economic competition where the actors will seek any advantage to increase their influence and economic benefit.
2. The differences between the ‘haves’ and ‘have-nots’ will continue to pose a major social, economic and political challenge. Inequality will be a driver for migration which is likely to increase until countries of origin pass certain economic thresholds. The ‘have-nots’ may not be the only ones to choose migration as an economic solution. As economies in North Africa and the Sahel improve, it is expected that the upward trajectory of economies will compel people in the middle class to explore opportunities in Europe or elsewhere.
3. As migratory movements will likely increase within Africa, particular groups will continue to perceive migrants as a threat to their socio-economic stability. People in lower social tiers will likely continue to be concerned about competition in the informal labour market. Additionally, migration will continue engender the perception that migrants threaten long-standing societal norms and values.
4. Regarding external powers, Russian and Chinese presence in the region will continue to be based on their respective ambitions in both geostrategic positioning and resource extraction. North Africa and Sahel states will likely attempt to seek smarter deals with external powers for economic benefit. In efforts to avoid and mitigate sanctions, Russia will likely continue to deploy tailored political and economic policies in North Africa and the Sahel to secure access to specific strategic resources and to develop increased access to markets. China’s current mercantile approach in North Africa and the Sahel is likely to give way to increasing political involvement, use of soft power, and military expansion.

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<sup>189</sup> Nantulya, “Implications for Africa from China’s One Belt One Road Strategy.”



## CHAPTER 5 - ENVIRONMENT

1. The North Africa and Sahel region is geographically diverse, including the Atlas Mountains reaching over 4,000 meters in elevation, the lush and fertile reaches of the Nile River delta and the expansive Sahara Desert. Despite this varied geography, the universal impacts of climate change are very likely to cause additive stress throughout the region in food and water security, migration, habitability, and more, reaching out to the mid-century and beyond.<sup>190,191</sup> Though at the bottom end of producing greenhouse gas emissions, this region stands to be

disproportionally impacted by the warming effects of climate change.<sup>192</sup> As outlined in the latest Intergovernmental Panel on Climate Change (IPCC) assessment, the region will progressively grow hotter, drier, and experience more droughts. Over time, climate

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*“Climate change, together with other megatrends – population growth, rapid urbanization, food insecurity and water scarcity – increases competition for resources and heightens tensions and instability.”*  
*(“UN Climate Change Annual Report 2017”)*

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change will have a compounding effect on the availability of water in a region that is already experiencing water stress, outstripping its aquifers’ recharge potential. The IPCC further assesses that by 2025, an additional 80 to 100 million people will be impacted by water stress across the larger MENA region.<sup>193</sup> With North Africa and the Sahel already being among the most environmentally degraded regions globally, the projection for temperatures to rise one-and-a-half times greater than the global average will further impede the population’s ongoing struggles to feed their families and secure a livelihood.<sup>194</sup>

“Unfortunately, Africa is among the continent’s most at risk from climate change because of inadequate adaptability, low levels of innovation and technological progress, political deficiencies and ineffective diplomacy.”<sup>195</sup>

### 5.1 Climate Change and Temperature Rise

1. While there has and continues to be varied projections about the rate of climate change among the scientific community, that gap has been narrowing in recent years and converging on an increasingly warm future. As pointed out by the 2017 UN Annual Climate Change Report, the 21<sup>st</sup> century brought about many of the warmest years on record and the three years prior to publication (2014-2017) saw the highest temperatures in documented

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<sup>190</sup> “Strategic Trends Programme: Regional Survey – Africa out to 2045,” UK MoD Development, Concepts and Doctrine Centre, last updated 16 Dec 16, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/578383/20161121-GST\\_Africa\\_out\\_to\\_2045.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/578383/20161121-GST_Africa_out_to_2045.pdf), 69.

<sup>191</sup> “North Africa: The Impact of Climate Change to 2030 (Selected Countries),” National Intelligence Council, published August 2009, [https://www.odni.gov/files/documents/climate2030\\_north\\_africa.pdf](https://www.odni.gov/files/documents/climate2030_north_africa.pdf), 23.

<sup>192</sup> Amadou Sy, “Africa: Financing Adaptation and Mitigation in the World’s Most Vulnerable Region,” accessed 02 May 19, [https://www.brookings.edu/wp-content/uploads/2016/08/global\\_20160818\\_cop21\\_africa.pdf](https://www.brookings.edu/wp-content/uploads/2016/08/global_20160818_cop21_africa.pdf).

<sup>193</sup> “Adaptation to Climate Change in the Middle East and North Africa Region,” The World Bank, accessed 10 May 19, <http://go.worldbank.org/B0G53VPB00>.

<sup>194</sup> “Building Climate Resilience and Peace, Go Hand in Hand for Africa’s Sahel – UN forum,” United Nations, 13 Nov 18, <https://news.un.org/en/node/1025671/building-climate-resilience-and-peace-go-hand-in-hand-for-africas-sahel-un-forum-2>.

<sup>195</sup> Oliver C. Ruppel and Arne Wulff, “Climate Change and Energy Security in the Anthropocene: Africa in the Light of the Paris Climate Protection Agreement,” *Climate, Energy, Security*, ed. Gerhard Wahlers, 01 Jan 16, [www.jstor.org/stable/resrep10102.6](http://www.jstor.org/stable/resrep10102.6), 49.

records.<sup>196</sup> Of the four Representative Concentration Pathway (RCP) modeling scenarios ranging from a near immediate curtailment of greenhouse gas emissions (RCP 2.6) to the continued emissions increase through the end of the century (RCP 8.5), the more conservative RCP 4.5 scenario predicts greenhouse emissions declining after 2050. Under such a RCP 4.5 scenario, “the temperature during summer in the already very hot Middle East and North Africa will increase more than two times faster compared to the average

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*“Our planet is warming. An astonishing 17 of the 18 warmest years on record have occurred in the twenty-first century. The past three years [2014-2017] were the hottest since records began.” (“UN Climate Change Annual Report 2017”)*

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global warming. This means that during hot days, temperatures south of the Mediterranean will reach around 46 degrees Celsius (approximately 114 degrees Fahrenheit) by mid-century” and that the prevalence of extremely hot days is likely to increase five-fold.<sup>197</sup>

2. Increasingly warmer temperatures are more than an unpleasant nuisance that brings discomfort. From a scientific standpoint as temperature and humidity rise, the conditions will eventually exceed the human body’s ability to regulate its normal temperature through perspiration and the resulting evaporative cooling.<sup>198</sup> In more developed areas, this is mitigated by air conditioned living and working spaces. However, this is not the case for a sizeable portion of the population that lives either outside an urbanised area or otherwise lacks access to sufficient energy to power air conditioning. With future climate change potentially warming North Africa at twice the global rate of increase overlaid on populations less equipped to offset these impacts, this is an area of critical concern for the region. “Climate change mitigation will divert resources from programmes to address poverty, unemployment and poor-living conditions and threatens the sustainability of development process. Therefore, seemingly conflicting interests between the development and climate change agendas often arise, especially in regions like North Africa.”<sup>199</sup> Added stresses in already fragile areas may prove too much of a challenge to avoid conflict or crisis.

3. Of particular alarm is that even if aggressively enacted today, mitigation measures would take considerable time to turn back the current trajectory of climate change. Frustrating this call to action is the competition within many African governments to allocate adequate funding toward prudent mitigation strategies where the annual costs for these programs will range from \$2 to \$5 billion (USD) across the MENA region with the costliest portions being to protect the coastal regions and adapt to extreme weather events.<sup>200,201</sup> Not only would the unchecked impacts of rising temperatures induce further difficulties to the populace, either directly to those in the agricultural sector or indirectly to the population at large, through poverty, economic shock or increased instability. The resultant stresses of climate change in North Africa and the Sahel could be leveraged by criminal or other non-state groups to gain support or recruitment by capitalising on shortages of water or other

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<sup>196</sup> “UN Climate Change Annual Report 2017.”

<sup>197</sup> “Climate-Exodus Expected in the Middle East and North Africa,” Max-Planck-Gesellschaft, 02 May 16, <https://www.mpg.de/10481936/climate-change-middle-east-north-africa>.

<sup>198</sup> “Hot Air in the Orient,” Max-Planck-Gesellschaft, accessed 10 May 19, [https://www.mpg.de/10856695/W004\\_Environment\\_climate\\_062-069.pdf](https://www.mpg.de/10856695/W004_Environment_climate_062-069.pdf).

<sup>199</sup> “Climate Change Impacts in North Africa,” EcoMENA, 07 Aug 17, <https://www.ecomena.org/climate-change-north-africa/>.

<sup>200</sup> “Africa’s Adaptation Gap,” Climate Analytics, accessed 15 May 19, [https://climateanalytics.org/media/schaeffer\\_et\\_al\\_2013\\_africao\\_s\\_a\\_daptation\\_gap\\_technical\\_report.pdf](https://climateanalytics.org/media/schaeffer_et_al_2013_africao_s_a_daptation_gap_technical_report.pdf), x.

<sup>201</sup> “Climate Change Impacts in North Africa.”

resources. In other cases, this scenario of scarcity and loss of economic opportunity could fuel migration and/or conflict in these areas lacking the capacity for adequate mitigation.<sup>202</sup>

## 5.2 Water and Food Security

1. The prevailing trends in climate change are not favorable to a region that is already among the Earth's most dry and water scarce regions. Overlaying atop this positioning is the degree of dependency on climate sensitive farming.<sup>203</sup> For North Africa and the Sahel, the resulting outcome of warmer temperatures encompasses both a loss of lands suitable for farming as well as shortened growing seasons. These factors, combined with predicted decreases in rainfall, compound resulting in greatly reduced crop yields.<sup>204</sup> This deals a particularly troublesome blow to nations such as Niger and Mali, which are already struggling with an insufficient food supply.<sup>205</sup> Across the North Africa/Sahel region, the intersection of rising populations and decreasing crop yields illustrates a future concern of how nations will be able to provide sufficient food for their people. This stress from lower yields would compound exponentially in the events of a crop failure or food blight. The challenges encompass adaptation and mitigation of rising temperatures, and decreasing water availability and quality.

2. "Lack of effective governance and management will result in unsustainable use of water in many parts of the world, and combined with the disruptive effects of climate change (particularly where water resources are shared), tensions are likely to increase, possibly leading to conflict."<sup>206</sup> A not so nuanced aspect of taking action to mitigate the lesser agricultural production through fertilizers brings with it another environmental challenge – the runoff of added nutrients (i.e. phosphates and nitrates) making their way into and contaminating water supplies.<sup>207</sup> The region's growing population will increase food and water needs at a time when their supply continues to be challenged, giving rise to a greater potential for migration, conflict and further instability.<sup>208</sup>

## 5.3 Sea Level Rise

1. Not discounting the continuing inland desertification of North Africa, concerns also abound regarding coastal areas in future years for these densely populated areas. Consistently across North African countries, two-thirds or more of the population lives within 100 kilometers of the coast.<sup>209</sup> Sea level rise from greenhouse emissions, the loss of polar ice, and thermal expansion of the seas and oceans will directly impact low-lying coastal regions in the east. Given the population density in these locales, an increase of 1 to 3 degrees Celsius could place up to 25 million people in flooded zones.<sup>210</sup> Aside from the loss of territory and residences, increased saltwater intrusion into ground aquifers will expand the impact to an even larger swath of the population. Additionally, the abundance of transportation and communication infrastructure traversing Africa's Mediterranean shore

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<sup>202</sup> "Global Strategic Trends: The Future Starts Today," UK MoD Development, Concepts and Doctrine Centre, last updated 15 Oct 18, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/771309/Global\\_Strategic\\_Trends\\_-\\_The\\_Future\\_Starts\\_Today.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/771309/Global_Strategic_Trends_-_The_Future_Starts_Today.pdf), 34.

<sup>203</sup> "Adaptation to Climate Change in the Middle East and North Africa Region."

<sup>204</sup> "Climate Change Impacts in North Africa."

<sup>205</sup> Lanessa Cago, "Countries Most Dependent On Others For Food," WorldAtlas, 05 Feb16, <https://www.worldatlas.com/articles/the-countries-importing-the-most-food-in-the-world.html>.

<sup>206</sup> "Global Strategic Trends: The Future Starts Today," 41.

<sup>207</sup> "Global Strategic Trends: The Future Starts Today," 42.

<sup>208</sup> "Global Strategic Trends: The Future Starts Today," 32.

<sup>209</sup> "Climate Change Impacts in North Africa."

<sup>210</sup> "Adaptation to Climate Change in the Middle East and North Africa Region."

could be lost as well, delivering a devastating economic blow, not only in the assets lost, but in the resulting disruption to trade, commerce and connectivity. Using Alexandria, Egypt, and modelled outcomes within this century as an illustration, “a 0.5 meter rise would leave more than 2 million people displaced, with \$35 billion (USD) in losses in land, property, and infrastructure.”<sup>211</sup> To quantify the scale of impacts from rising sea levels, there are 19 port cities in North Africa with potential for adverse outcomes.<sup>212</sup> With the disproportionate population density along the coast and the millions of people and infrastructure that would be affected, this region could be dealt a destabilising shock by rising sea levels.

## 5.4 Implications

1. Environmental factors in North Africa and the Sahel will indeed directly impact the future trajectories in this region. The fact that its climatology currently imposes significant challenges to basic habitability and agricultural production is only compounded by rising temperatures and even more so by this region outpacing the average global temperature rise. Increasing desertification, loss of land area to sea level rise or its effective loss as productive land due to increased salinity, and growing inhabitability due to higher temperatures are highly likely to cause population displacements. They will also further exacerbate problems providing sufficient quantities of food for the population living in the region.<sup>213</sup>

2. Climate generated factors stand ready to insert indirect and negative pressures on the region. Setbacks from droughts, floods, or other weather events are poised to negate progress from developmental efforts to address unemployment and global economic access.<sup>214</sup> At the further end of this spectrum, the resulting effects of worsening climate multiply the other existing stresses for the region and further the potential for conflict to erupt.<sup>215</sup> “Adaptation and mitigation responses are underpinned by common enabling factors. These include effective institutions and governance, innovation and investments in environmentally sound technologies and infrastructure, sustainable livelihoods and behavioural and lifestyle choices.”<sup>216</sup>

3. With the other existing challenges to governance in North Africa and the Sahel, climate induced stresses erode the balance of stability. The necessitated spending for mitigation and adaptation measures will directly compete for funding needed for development, social and government programs, infrastructure construction and maintenance, and economic modernisation.

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<sup>211</sup> “Adaptation to Climate Change in the Middle East and North Africa Region.”

<sup>212</sup> “Adaptation to Climate Change in the Middle East and North Africa Region.”

<sup>213</sup> “Climate Change 2014: Synthesis Report, “ Intergovernmental Panel on Climate Change, accessed 15 May 19, [https://www.ipcc.ch/site/assets/uploads/2018/02/SYR\\_AR5\\_FINAL\\_full.pdf](https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full.pdf), 16.

<sup>214</sup> “Adaptation to Climate Change in the Middle East and North Africa Region.”

<sup>215</sup> “Climate Change 2014: Synthesis Report,” 16.

<sup>216</sup> “Climate Change 2014: Synthesis Report,” 26.

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*“Climate change exacerbates other threats to social and natural systems, placing additional burdens particularly on the poor (high confidence). Aligning climate policy with sustainable development requires attention to both adaptation and mitigation (high confidence). Delaying global mitigation actions may reduce options for climate-resilient pathways and adaptation in the future. Opportunities to take advantage of positive synergies between adaptation and mitigation may decrease with time, particularly if limits to adaptation are exceeded. Increasing efforts to mitigate and adapt to climate change imply an increasing complexity of interactions, encompassing connections among human health, water, energy, land use and biodiversity (medium evidence, high agreement).” (“Climate Change 2014: Synthesis Report, “The Intergovernmental Panel on Climate Change)*

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## CHAPTER 6 - POSSIBLE FUTURE SCENARIOS

1. Describing future scenarios is not an attempt to predict the future, but provides scenarios that can serve to inform NATO policies and plans with respect to the region. There are an infinite number of ways the future will play out in the region influenced by any number of trends or singular 'spark' events that cannot be foreseen or anticipated.

### Most Likely Scenario

1. Considering the trends laid out in this report in each of the themes of political, human, technology, economic and environmental, the following describes the most likely scenario for North Africa and the Sahel in 2040.

2. As has been described in this report, there are significant differences between the 10 countries considered in this report and between the separate regions of North Africa and the Sahel. This will likely continue to be true in 2040. The region will likely struggle with the effects of climate change and a population explosion. Urbanisation will cause the growth of slums and 'shanty towns,' especially in North Africa. Additionally, rising sea levels will force populations living in coastal regions in Libya and Egypt to displace further away from the Mediterranean coastline. Some infrastructure (ports, railways, and roads) in these areas will be covered or threatened by rising sea levels. In North Africa, some degree of instability is likely to continue in some countries over the next 20 years, though not to the point any of the existing governments collapse. In contrast, it is likely that in Libya a higher degree of stability will develop through the establishment of a new but nascent central government. A new government in Libya will probably incorporate a system with a strong central leader and a degree of regional autonomy. For the rest of North Africa and as a result of the numerous internal pressures and challenges faced by many countries, it is likely that the certain leaders or regimes will no longer hold power. For those remaining in power, they will either grant enough concessions to their people to remain in power, coupled with economic development or, in sharp contrast, will harden their authoritarian position.

3. Islamic concepts will be more widely incorporated into governmental and legal systems along with the adoption of principles from Sharia Law. There will be an ongoing ideological competition for the minds and values of civil society between Western liberal ideals and more fundamentalist Islamic principles. In the Sahel, political instability and threats to security will likely persist. It is likely that an ISIS/DAESH-like organisation or a network of affiliated or sympathetic extremist groups will have control of some territory in the Sahel. Pressures from climate change, food and water insecurity, terrorism, and significant population growth will likely fuel increased regular migration and episodic migration events from the Sahel into North Africa and consequently into Europe. Increased migration from the Sahel into North Africa will contribute to instability in the receiving countries in North Africa due to the increased pressure placed on strained public services, already scarce resources such as food and water, and insufficient/inadequate housing and infrastructure.

4. Economic competition among external powers will likely continue to increase in North Africa as they continue to seek access to markets and resources. However, China will likely be the dominant external power active in North Africa, increasing its control over natural resources and transportation infrastructure and consequently its influence over governments and leaders. Most governments in the region will lean more favourably toward China, at least economically if not politically, while the US and the EU will have less influence in the region. China and Russia will likely continue to increase their military presence and activity in North Africa and, to a lesser degree, in the Sahel. For China, North Africa and the Sahel will be an expeditionary 'test-bed' and proving ground for more of its military forces and capabilities. Russia will leverage opportunities in North Africa to challenge and contest NATO in the

Mediterranean and Red Seas. In the Sahel and more remote areas of North African countries, there will likely be occasional localised, low-level conflict over the control of natural resources such as oil or water. In essence, the trends that are observable today in North Africa and the Sahel are likely to continue on their present trajectory through 2040.

### **Alternative Scenarios and Events That Could Change the Most Likely Scenario**

1. In the above most likely scenario, there are an infinite number of unknowns or events that could change future outcomes. Principle among them is the lack of any way to know the resiliency of the people in the countries of North Africa and the Sahel over the next 20 years. Additionally, it is possible that any of the trajectories of trends discussed in this report or in the above most likely scenario have been either underestimated or overestimated. The following list of alternative scenarios or events accounts for this uncertainty and provides a much wider range of possible future outcomes for North Africa and the Sahel.

2. **Alternative 1:** A more positive possible alternative scenario is that the region as a whole sees significant economic growth and development given the right combination of external investment plus technological advances and applications. The result would be increased economic power and viability for countries in the region to counter or manage population growth and to sufficiently mitigate the impact of climate change while leaving enough economic wealth to invest in infrastructure and housing, grow the middle class, provide improvements and access to education and healthcare and narrow the gap between the ‘haves’ and ‘have-nots.’

3. **Alternative 2:** An ‘Arab Spring’ 2.0 event that causes wide spread social unrest and protest in numerous countries across the region. This could play out in a few different ways:

- a. Significant changes and reforms are made in the governance and economies in each of the affected countries.
- b. Some or just enough reform is made in the affected countries to pacify the demand for change without significant changes to governance.
- c. Uprisings could cause a collapse of governments and ruling authorities bringing about Libya-like scenarios in other countries, fuelling conflict between warring factions or tribes.

4. **Alternative 3:** An ISIS/DAESH-like or a similar violent extremist organisation seizes control of territory and declares a new caliphate. This could result in a few scenarios:

- a. A new ISIS/DAESH-like organisation seizes control (either through revolution or incrementally over time) of the government of a country (or countries) in North Africa and/or the Sahel, obtaining control over military and security forces, natural resources and infrastructure.
- b. A new ISIS/DAESH-like organisation or group of affiliated like-minded organisations declare control of large portions of the Sahel spanning the territories of multiple countries and obtain control over natural resources and infrastructure.

5. **Alternative 4:** A pandemic disease event spreads across North Africa and the Sahel killing hundreds of thousands of people, if not millions, due to the increasing challenges rising from population growth, climate change, urbanisation, the increasing gap between the ‘haves’ and ‘have-nots,’ and migration.

6. **Alternative 5:** Interstate conflict that occurs between two or more countries over territorial encroachments or disputes, likely accompanied by a drive for access to resources such as oil or, more likely, water.

7. **Alternative 6:** Conflict breaks out in the region that is a proxy war between external powers over access to resources and/or markets or driven by other external geopolitical issues. This could take the form of a Yemen-like scenario.
8. **Alternative 7:** Due to gains made by populist movements in the EU and the US causing their de facto abandonment of the region, China secures singular influence over most of the governments in the region. China continues to invest heavily in infrastructure and seizes control of significant natural resource deposits and related processing and transportation infrastructure. In a new form of 'economic colonialisation,' China also invests heavily in developing the manufacturing capabilities of countries across the region, enabling them to become the assembly and manufacturing source of goods and merchandise at even lower costs than can be produced in China. North Africa becomes the new 'China-for-China,' which enables the growth of the middle class and a service based economy in China.
9. **Alternative 8:** A weakened international order where China and Russia have significant influence in the region and where the EU, EU member states and the US, along with international bodies such as the UN, no longer have influence or presence in the region could result in different and not necessarily unrelated scenarios:
  - a. Numerous countries in the region (possibly Libya, Algeria, Mali, Niger, and/or Chad) fracture and subdivide into any number of smaller countries on tribal or resource boundary lines.
  - b. The militarisation of North Africa by Russia and China results in establishment of numerous Russian and Chinese air and naval bases along the coast of the Mediterranean and Red Seas, the deployment of ISR and A2/AD capabilities, along with tactical nuclear weapons.
10. **Alternative 9:** Climate change and the resulting increases in temperature, drought, and rising sea levels are more severe than expected. This significantly exacerbates existing problems due to population growth, urbanisation, food and water scarcity and migration, causing insurmountable pressures on governments in the region and compelling the international community to prevent or respond to a widespread humanitarian crisis.
11. **Alternative 10:** Many of the alternative scenarios or events described above, and especially the combination of alternatives thereof, will likely cause an extreme episodic migration event from North Africa into Europe, potentially on the scale of millions of people over a relatively short span of a few months.



## CONCLUSION

1. The future of North Africa and the Sahel, as with the rest of humanity, is not pre-determined or certain. The decisions and choices made today will affect future outcomes. While this report has described a somewhat dire forecast for North Africa and the Sahel over the next 20 years, this is not necessarily true over the longer term looking into the next century or beyond. Incremental positive changes are taking place and are likely to continue to occur over the long term. Disruptions or negative trends and events that occur over a relatively short term may cloud an understanding of what is taking place over a much longer period of time. There will certainly be shocks over the coming decades, but overall in a larger view, the region is likely to continue to see improvement. However, the long term vision for North Africa and the Sahel exceeds the scope of this report.

2. There is a risk to NATO cohesion that could arise as a result of conflicting policies and approaches to the problems and challenges in North Africa and the Sahel. European nations will continue to be divided on the response to the issues presented by the numerous challenges of North Africa and Sahel. NATO and its member nations must determine if the challenges in North Africa and the Sahel are existential threats to their own stability and cohesion. Then, if so determined, put in place policies and plans in accordance with that assessment.

3. Non-state actors within the region, especially radical or extremist groups in the Sahel, will continue to use the region as a base from which to influence affairs and events in countries around the globe resulting in increasing polarisation of their societies. The growing complexity due to a wide variety of actors and non-state actors operating in the region will require a concerted and coordinated effort to foster security and stability in the region. For NATO and the Western world, trust building, connectivity, interoperability, and sharing strategies, plans, and information are the keys to success and provide mechanisms to cope with the challenges in the region of the future. These will be essential in order to maintain cohesion of the Alliance, protect the Alliance and its member Nations from threats to their homelands, control mass migration, effectively address extreme ideologies, and mitigate or deal with the devastating effects from climate change.

4. The complexity and inter-relation of the trends and implications described in this report can be daunting in terms of developing appropriate policies and strategies in an attempt to counter negative trends or combat threats that emanate from the region. The nexus of the trends in politics and governance, together with the pending storm of population growth, urbanisation, and climate change, lead to a rather dire projection of outcomes over the next two decades. These outcomes will have significant impacts to the security and stability of the region, with ripples cascading across Europe and the international community.

# APPENDIX A

SUMMARY OF 5 THEMES, 16 TRENDS, AND 31 IMPLICATIONS

THEME	TRENDS	IMPLICATIONS
POLITICAL	<p>1. <b>Competition of External Actors in the Region.</b> The competition between external actors will increase in the region, especially in North Africa more so than the Sahel.</p>	<ul style="list-style-type: none"> <li>a. Parts of North Africa will likely maintain relative political stability and security while political instability and insecurity will likely continue across the Sahel.</li> <li>b. The competition of external actors will likely result in potential confrontations between those external actors, though likely below the threshold of conflict.</li> <li>c. Some groups, local, regional, or transnational, will attempt to leverage the nationalistic fervour and frustrations of civil society to destabilise ruling regimes and governing authorities, which may result in attempts to seize territory or power.</li> <li>d. The increased presence of Russian and Chinese military capabilities in North Africa and the Sahel could impact NATO security and freedom of movement/freedom of navigation and has the potential to escalate regional and international tension.</li> <li>e. The growing influence of Russia and China in the region may cause the decline of influence of Western powers in the region and in international bodies such as the UN.</li> <li>f. The ongoing struggle between petrol-monarchies/Persian Gulf nations will shape governance in North Africa and the Sahel, resulting in increased likelihood of conflict and terrorism.</li> <li>g. The increased potential for crisis and conflict, especially grey zone/irregular warfare and terrorism, will threaten regional stability, and endanger civilian populations in the region and potentially NATO nations.</li> <li>h. Questions about legitimacy and lack of trust in governments and regional institutions will likely persist.</li> <li>i. Governments in the region will be forced to address the demands of civil society and the increased political voice of common people choosing greater inclusion or oppression.</li> </ul>
	<p>2. <b>Non-state Actor Influence.</b> Non-state actors will exert greater influence across the region contributing to instability and threatening progress and growth.</p>	
	<p>3. <b>Challenges to Governance.</b> Governments and regional governance institutions in North Africa and the Sahel will continue to face a complex array of challenges and obstacles to effective governance causing continued struggles to satisfy the basic needs and wishes of their respective populations.</p>	
	<p>4. <b>Political Voice of Civil Societies.</b> The ever-increasing connectedness and resultant heightened social and political awareness, particularly among the youth within the region, will continue to exert pressure for inclusion and meaningful governmental reform.</p>	
HUMAN	<p>5. <b>Demographic change.</b> The population growth of North Africa will be relatively moderate over the next twenty years in comparison with significantly higher, potentially explosive population growth in the Sahel.</p>	<ul style="list-style-type: none"> <li>a. Extremely rapid population growth will compound poverty and lack of economic opportunity, increasing pressure on already scarce resources, especially water, and contribute to increased risk of social instability and serve as a major driver of migration.</li> <li>b. Rapid population growth will threaten sustainable development and increase the region's dependency on world markets for adequate food imports.</li> <li>c. Increasing elderly populations in the region will increase the costs and burden on health care systems.</li> <li>d. Urbanisation compounded by rapid population growth will result in an explosive growth in slums.</li> <li>e. Increasing migration to and within North Africa will impact stability and security imposing additional challenges for governments already facing rising levels of public discontent.</li> <li>f. The nexus of the trends in the human theme will contribute to increased unemployment and lack of opportunity that without significant governmental response or reform, will potentially fuel protests or even revolutionary upheavals.</li> </ul>
	<p>6. <b>Migration.</b> Migration, both regular and episodic, will increase at least commensurate with population growth, if not more due to other factors such as lack of economic opportunity, climate change, conflict and violence, religious extremism, terrorism, and organised crime.</p>	
	<p>7. <b>Urbanisation.</b> Similar to the global trend, urbanisation is increasing at different rates in North Africa and the Sahel, with some of the highest urbanisation rates globally expected in the Sahel.</p>	
TECHNOLOGY	<p>8. <b>Access to Technology.</b> The ability of individuals, non-state and state actors to access technology will continue to increase, more so for North Africa while countries in the Sahel will lag behind.</p>	<ul style="list-style-type: none"> <li>a. Technological improvements over the next two decades not available or accessible to many people in the region will widen income and social disparity gaps.</li> <li>b. The availability and lower costs of entry for certain technologies will empower non-state actors even greater than presently contributing to limited attribution of illegal or terrorist activities or related events and creating greater challenges to governmental and international organisations in the region.</li> <li>c. Countries in North Africa and the Sahel will continue to rely on foster relationships with external organisations and countries magnifying opportunities for Russia, China, UAE, and Saudi Arabia.</li> <li>d. Governments in the region may increasingly employ technologies similar to Russia or China to manipulating information and imposing strict controls on access to the internet and social media platforms silencing dissent and contributing to increased disenfranchisement.</li> </ul>
	<p>9. <b>Net Importers vs. Exporters of Technology.</b> Countries in North Africa and the Sahel are and will likely continue to be net importers of technology. This will be more true for the Sahel for significantly longer period of time than for North Africa.</p>	

# APPENDIX A

SUMMARY OF 5 THEMES, 16 TRENDS, AND 31 IMPLICATIONS

THEME	TRENDS	IMPLICATIONS
TECHNOLOGY	<p>10. <b>Technology Related Development.</b> Technology related development will continue to increase in North Africa and to a lesser degree in the Sahel despite impediments due to instability, high costs, economic realities within the respective countries, and the impacts of climate change.</p>	<ul style="list-style-type: none"> <li>f. Technology will improve the quality of life in the region more in urban and coastal areas than remote and rural areas in terms of improved housing, healthcare, agriculture, and food security.</li> <li>g. Technology will provide increased access to and ability to use natural resources such as oil and natural gas while also improving the quality and availability of water.</li> <li>h. Solar and wind generated electricity will play a significant role in the economic development and growth of the region reducing industrial demand for fresh water and potentially increasing regional rainfall amounts.</li> <li>i. Increased access to computers, cell phones, and the internet will result in increased political voice potentially influencing social and political change.</li> <li>j. Slower modernisation and development rates across the region create a risk that the fourth industrial revolution may leave the region even further behind more modernised and developed countries.</li> </ul>
ECONOMICS	<p>11. <b>Economic Development.</b> While the economies in North Africa and the Sahel are steadily growing, this trend will continue to face numerous challenges including substantial population growth and climate change.</p> <p>12. <b>Poverty and Unemployment.</b> Inequality and unemployment levels will continue to improve across the region. However, differences between the 'haves' and 'have-nots' will likely persist for the foreseeable future.</p> <p>13. <b>External Actors' Economic Interest.</b> Interest from foreign powers, particularly Russia and China, will increase in North Africa and the Sahel.</p>	<ul style="list-style-type: none"> <li>a. Despite improving economies, the nexus of population growth, weak governance, scarcity of resources, and economic competition fuel the risk of conflict which may serve as openings for Russia or China to increase involvement in the region.</li> <li>b. The differences between the 'haves' and 'have-nots' will continue to pose major social, economic, and political challenges while inequality will be a driver for migration.</li> <li>c. Migration within North Africa will likely be perceived as posing a threat to local socio-economic stability through unwanted competition for jobs and resources while challenging long-standing societal norms and values.</li> <li>d. Russia and China will continue their presence and involvement in the region based on their respective ambitions seeking to secure access to strategic resources and growing markets which will result in increasing political involvement and military presence.</li> </ul>
ENVIRONMENT	<p>14. <b>Climate Change and Temperature Rise.</b> Over the next 20 years, North Africa and the Sahel will progressively grow hotter, drier, and experience more droughts.</p> <p>15. <b>Water and Food Security.</b> Climate change will contribute to losses of land suitable for farming and shorten growing seasons across the region.</p> <p>16. <b>Sea Level Rise.</b> Sea level rise from greenhouse emissions, the loss of polar ice, and thermal expansion of the seas and oceans will increasingly negatively impact coastal regions of North Africa.</p>	<ul style="list-style-type: none"> <li>a. Increasing desertification, loss of land area to sea level rise or its effective loss as productive land due to increased salinity, and growing inhabitability due to higher temperatures are likely to cause population displacements and will exacerbate challenges to water and food security.</li> <li>b. Setbacks from droughts, floods, or other weather events are poised to negate progress from developmental efforts to address unemployment and global economic access multiplying other existing stresses contributing to increased potential for conflict.</li> <li>c. With other existing challenges to governance in North Africa and the Sahel, climate induced stresses erode the balance of stability.</li> </ul>

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