LUISS

Master's Degree in **International Relations**

Chair of **Geopolitics, Population, and Technology**

Ports, mining and digital investments in sub-Saharan Africa: a Gulf's technological solution to address the upcoming challenges of both regions

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Academic Year **2023/2024**

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Introduction

The international scenario is changing. Its rapid shifts are reshaping countries’ frameworks and therefore international relations. New international players are emerging gradually abandoning the status of middle powers in their struggle to complement the traditional and hegemonic ones. In such fast-moving context the countries of the Gulf, known as Gulf countries, are reorganizing themselves to better address future challenges and to position themselves centrally in the global arena. Such troubles stem mainly from the planned decarbonization as a transnational path that should drive the world out of fossil fuels, impacting, however severely, on those countries, like those of the cited region, heavily reliant on them. The drawbacks should be not only economic, but also political and social. The economic robustness granted by hydrocarbons has also favored stability and strength inside and outside these countries. Such natural resources, that fill their territories, have been able to ensure a prosperous system for the local population preventing any possible and serious problem. Moreover, the condition of near monopoly in the supplies of fossil fuels, has guaranteed them a leading role in the international scenario controlling or rather influencing an important segment of the global economy. On such bases, to adapt to the planned transformation, large investments have been made especially by the Kingdom of Saudi Arabia, the United Arab Emirates and Qatar (the largest investors in the Continent) with others which have been planned under the daring denominations Visions. Among them an increasing portion is directed toward sub-Saharan Africa region, focusing on ports, mining for critical materials, and digital infrastructures. Such technological solutions are the outcome of a precise strategy draw up in different ways by the three countries to penetrate in sub-Saharan Africa. The region is, in fact, a promising area in economic and political terms. Hosting the fastest growing population of the

world, sub-Saharan Africa should become one of the largest global markets offering bright economic solutions. It is, also, rich in critical materials, essential for the upcoming digital era, thus confirming its cruciality. Moreover, the considerable human and physical resources should generate a huge digital potential that could be flourishing in the next decades.

There are, however, problems. Despite the ambitious Visions' targets, which range from the whole decarbonization to the purposes of becoming a global financial hub, the current situation is still far away to achieve them. These are, in fact, attractive objectives which do not reflect in most cases reality being a component of the Gulf strategy to draw foreign, particularly western, interests reshaping themselves in a more contemporary way. More specifically, abandoning fossil fuels will have a severe and tremendous effect not only from an economic angle, but also from a political and social one. This process will affect the economy of such states driven mostly by oil and gas revenues contributing to their political and social stability. These have created, in fact, an inefficient public sector unable to provide alternative sources of revenues for their economies. In addition, these economic systems have contributed to the stabilization of the social and political requests of their citizens preventing revolutionaries' outcomes as occurred in other Arab countries. Thus, the overcoming and replacement of fossils with other sources could affect dangerously their systems making things harder than announced. For such reasons, most objectives, particularly those related to hydrocarbons, have not yet been implemented. This is confirmed by data. As will be shown in the dissertation, fossils fuels are still the most consistent side of the Gulf economies endorsing what said. There are complications also from the sub-Saharan Africa flank. Without considering the endemic difficulties which affect the region's countries, first and foremost the expected demographic explosion, the Gulf interest could worsen such fragile conditions. Deepening economic and commercial ties with these countries could have a twofold effect. On the one hand it could bring helpful consequences, on the other, conversely, it could resemble the predatory approach adopted by the other international players so far. This latter aspect is another problem that the strategy has. The region, in fact, has already draw the attention of the major players of the world. From the west of the US, and of

European countries, to the east of Russia and China, but not only, sub-Saharan Africa's countries are their objects of interest. Such framework, as will be showed, could complicate Gulf's plans blocking their strategies. However, this could be also an opportunity if properly grasped by the three states. In this sense a different and participatory approach could arouse goodwill of the African partners. This could be strengthened by the middle power status of Saudi Arabia, UAE, and Qatar offering new opportunities for a new and different "South".

Academics have analyzed such issues from different perspectives, investigating many aspects of the Gulf solutions to overcome the transition's challenges and of the relation between the Gulf and sub-Saharan Africa. As a matter of fact, the contributions given differ according to the country analyzed. However, to locate this work in its proper academic debate, it will be sufficient, generally, to analyze these sources from a sole standpoint without distinguishing between countries. Some authors have investigated the effects of the energy transition in the Gulf. In this sense the role of oil and gas and the ambitious objectives set have been the focus of such analysis. In fact, despite such great steps, more are required to harness the benefits of this challenge[1]. More specifically, hydrocarbons seem keeping a pivotal role for the economies of such countries particularly those under development like the sub-Saharan African ones. This should confirm as the main tool of the three states remain the classical fossil one[2]. Such possible unconstructive impact has been also analyzed in terms of the role that the region is playing in Africa in that of freewheeling financial hub. Especially, the UAE present themselves as ideal ecosystem offering those blue-chip world-class services, essentially western, lawless enough to be a free for all, thus attracting companies from Africa. In fact, many of the African companies registered in the UAE are "letterbox companies", allowing Africans to keep dollars away from their local economies. Wealthy Africans, also find a safe harbor in the UAE where they can buy properties and enjoy a world-class lifestyle. Overall, such outlook, existing mainly in the UAE but

[1] Aisha Al-Sarihi, "COP28 Controversy and the Challenge of Energy Transition in the Gulf," Chatham House, November 7, 2019, https://www.chathamhouse.org/.

[2] The Financial Times, "The UAE's Rising Influence in Africa," www.ft.com, May 30, 2024, https://www.ft.com/content/388e1690-223f-41a8-a5f2-0c971dbfe6f0.

also in Saudi Arabia and Qatar, has been considered dangerous not only for local economies, but also for the western world. They are considered as challenging actors investing in sub-Saharan Africa both in positive ways and acting in destabilizing ways at the same time[3].

From a more optimistic point of view other scholars have emphasized the opportunities that the Gulf could provide to sub-Saharan Africa. In this sense Gulf investments, particularly, in the digital sphere, could bring, not only opportunities for private entrepreneurships but could also "boost the potential to create homegrown solutions as well as South-South collaboration, rather than just importing ideas from the West"[4]. Overall, the core idea refers to the positive impact that the different approaches, brought by the Gulf, could provide to the African region. Along the same path, other scholars stressed the energy contributions that these countries could provide to Africa. The economic development of the region should surge the energy demand that currently and in the coming decades should still rely on fossils. According to data, oil and gas account for 35% of Africans' final energy consumption, meaning that over one-third of all the energy consumed by end users such as individuals and businesses to, for instance, cool buildings, run lights, or power vehicles, comes from these two sources. Generators (largely oil-fueled) account for 9% of electricity consumption in sub-Saharan Africa and natural gas alone makes up about 42% of the electricity mix on the continent. Therefore, Gulf countries are ready to reap the benefits from the likely, cited, increase in demand for oil and gas[5]. Although, such investments are complemented by renewables capital expenditures, oil and gas should remain the primary economic driver of their strategy. Another popular field is the security one. In this case the countries of the Gulf consider Africa, specifically its sub region, pivotal for their

[3] Ibidem.

[4] Melanie Noronha, "Next-Generation Africa-GCC Business Ties in a Digital Economy," Economist Impact - Perspectives, 2017, https://impact.economist.com/perspectives/economic-development/next-generation-africa-gcc-business-ties-digital-economy-0.

[5] Maddalena Procopio Corrado Čok, "Beyond Competition: How Europe Can Harness the UAE's Energy Ambitions in Africa," ECFR, June 20, 2024, https://ecfr.eu/publication/beyond-competition-how-europe-can-harness-the-uaes-energy-ambitions-in-africa/.

security interests. From food to military interests, these countries are investing in Africa to protect themselves and to enhance their internal and external position. From an agricultural perspective, sub-Saharan Africa holds 60% of the world's total uncultivated arable lands a profitable source for dry gulf countries in search of food alternatives. On the other hand, from a military perspective, the closeness of sub-Saharan Africa to the Gulf explains clearly the reasons of interests[6]. Such position, however, as will be explained in this work, should have ambiguous effects without solving the African problems and problematizing the current one[7]. An extra area of study is surely that related to the labor sector. Sharing roughly the same demographic and economic trends, Gulf countries have adopted common population strategies, showing a real demographic unbalance. This issue stems from the high rates of migration (male low skilled working dominated) that are still affecting the region since the 1970s accounting, also, for its biggest part. This process should continue in the upcoming years increasing the absolute Gulf's working age population more than the local one by 2050 and consequently impacting on its ageing that is becoming relevant also in the region. Among such labor migrants an important segment comes from Africa creating a sort of migrant corridor. The problem, as in the other cases, stays in the passage from an oil dependent economy to a diversified one and in the consequent privatization efforts which have been planned. In this case the labor force might change impacting severely on the cited corridor[8]. Overall, as showed, the contribution of the academic's world has been directed towards multiple ways. The relation between these two regions is, in fact, full of opportunities in several fields.

Despite the numerous areas explored, some aspects seem needing a deeper investigation. The largest portion of the academic studies has focused on the Gulf's plans for the transition and on its effects. Moreover, from such scenario another

[6] Will Todman, "The Gulf Scramble for Africa: GCC States' Foreign Policy Laboratory," Csis.org, 2018, https://www.csis.org/analysis/gulf-scramble-africa-gcc-states-foreign-policy-laboratory.

[7] Ibidem.

[8] Eddy Akpomera, "Sub-Sahara Africa – Arab States Labour Migration Corridor: Exploitation Crisis and Emerging Trends of Protection for Migrant Workers," Ife Social Sciences Review 30, no. 1, June 2, 2022: 51–59, https://issr.oauife.edu.ng/index.php/issr/article/view/165.

field of study is their interest in sub-Saharan Africa. In this sense, lots of studies have analyzed the profitable areas, even though just a few have investigated the twofold solutions that both regions could offer to each other. On such bases, linking jointly these issues, the post oil future of the Gulf, specifically of Saudi Arabia, United Arab Emirates, and Qatar, the greatest actors the area, poses a hard question to answer. At the same time, lots of investments, as said, have been directed towards sub-Saharan Africa countries. This area rich of opportunities should face, meanwhile, several economic and social challenges engraving their stability. In this scenario, the investments made for ports, mining and digital technologies should be part of a Gulf strategy to overcome the oil dependent status presenting themselves in a different, innovative and comprehensive way. Controlling or rather influencing such a vibrant region should be profitable surely for the Gulf, eager to get over its middle power oil dependent status. Some benefits could be obtained also by the African countries interacting with possible different players from the classic predatory ones. In such situation the strategy carried forward by the Gulf in the three cited fields, even though with differences among the countries, could be a solution to address these challenges. Primarily, it could tackle the cited economic transformation of the Gulf region contributing also to the stability of the sub-Saharan territory. Despite the differences between the areas investigated, ports, mining for critical materials, and digital technologies, a common trait is shared. Indeed, they position themselves as conduits through which the commercial, economic and political strategies of the three Gulf countries unfold.

Secondly, these strategies could lay the foundations for a new pivotal role of such countries in the international order overcoming that, mentioned, intermediate status between consolidated powers and emerging ones.

Given this general framework a general question, which this dissertation will attempt to answer arise. It regards, generally, the possible effectiveness of such programs. In addition, others, complementary to the general one, appear. Whether they could bring Saudi Arabia, UAE and Qatar into a new national, regional, and international dimension. And finally, whether they could be sufficient to grant the stability and the development of the sub-Saharan Africa region.

Despite the huge investments accomplished by the three countries seems suggesting a successful and positive outcome, the situation is different and vague. These countries usually act in a non-very transparent way being problematic to understand their movements. In addition, other complexities stem from the difficulty to distinguish between what has been officially declared and what has been effectively obtained.

These aspects complicate matters and consequently the possibility to answer directly the cited interrogations. Nonetheless, this dissertation will try to answer these questions. Different methods will be run. Firstly, benefitting from the scientific contributions given on the matter. Numerous academic papers, as showed, have studied such situation, highlighting distinct aspects and interpretations. Secondly, studying and analyzing the several movements made by the public and private companies of the Gulf, in the three areas of interests. Particularly, this part should be quite complex, being tricky to untangle due to the unclear activities of such private but also often public companies. For this reason, a massive use of diverse sources ranging from local, global newspapers, and official declarations to social network declarations is required. Thirdly, such sources will be acknowledged using accessible data which should furnish a clear representation of the demographic and economic situation. On such bases, through an acute evaluation of such sources, it should be possible to reach a proper and personal assessment of the topic.

Through such methods addressing the original questions should be feasible. The dissertation, in fact, will be divided in three main parts following the problems, solutions scheme.

Thus, the first section will give a brief outline of the conditions of both regions. The current challenges will be highlighted, particularly from an economic, and social point of view. Despite the differences, both regions, as said, are going to deal with dramatic changes which should alter the current situation. In such scenario technological investments appear as a twofold answer.

On such bases, the second section will focus on some of those solutions proposed by the three countries. As said, ports, mining and digital investments represent some of these technological answers to find alternative ways for the economic damages

that the decarbonization should inflame. Considering the distinct approaches, this section should bring a clear framework of the situation.

As a closing section, the third and final one will draw the conclusions assessing the issues from a Gulf and sub-Saharan standpoint. This should be essential to try to answer the original research question. In addition, a European and Italian evaluation will be given. It seems necessary, indeed, to observe the implications that such movements could have on the closest players of both regions.

"Ports, mining and digital investments in sub-Saharan Africa: a Gulf's technological solution to address the upcoming challenges of both regions".

CHAPTER I

Gulf and sub-Saharan regions' need for technology

Starting with the first chapter of this thesis, it is necessary to provide a general overview of the conditions of both regions highlighting their need for technological investments. In fact, even though their purposes are completely different, these two broad regions (covering several different countries) required huge technological investments to address those challenges that should arise in the future. On the one hand, indeed, Gulf countries (mainly Saudi Arabia, United Arab Emirates and Qatar) should face those challenges posed by the upcoming energy transition. Such a process should alter that order granted, so far, by oil revenues pushing them towards economic and social challenges which will be analyzed after. On the other hand, sub-Saharan Africa countries, albeit covering a wide range of different countries, should face those challenges triggered by the rapid population growth in the next decades[9]. As will be explained in the subsequent sections, that demographic process should create a huge pressure on the political, economic, and social asset of these countries which are already in a difficult situation. Overall, what emerges is a common challenging scenario that will be analyzed in its respective aspects in the following sections.

[9] Andrea Lapegna, "The Massive Demographic Challenges in Sub-Saharan Africa," Aspenia Online, March 9, 2023, https://aspeniaonline.it/the-massive-demographic-challenges-in-sub-saharan-africa/#:~:text=Rapid%20population%20growth%2C%20high%20fertility.

1.1. Gulf countries' technological need against economic and social challenges in the post oil scenario

Introducing the Gulf situation, it is important, first, to note as the control of fossil fuels supplies and distributions has been and still is central in the international arena shaping the global scenario and the allocation of powers among states. In this context those countries of the Gulf (mostly part of the OPEC and OPEC+ organizations representing the major supplier of oil), as rich in resources in oil and gas have driven part of the international community through the allocation of the prices and production quotes for more than fifty years. This practice has granted them, over time, on the one hand, a remarkable amount of global power and, on the other, the possibility to fund their economic and political orders mainly on oil and gas revenues. For this reason, these countries are defined as rentier states as based on large natural resource endowments that allow them "to not be reliant on taxing their people, but instead to allocate or distribute the resulting revenues, creating a large unnecessary bureaucracy while reducing the incentives for hard work and government accountability"[10]. Overall, this framework has enabled Gulf countries to live in a relatively quiet situation outside (the international arena) and inside (the national context) their boundaries. However, times have passed as well as new standards modifying those traditional patterns highlighted. These are now directed towards the so-called energy transition defined as "a gradual and steady shift of global energy production towards a zero-carbon system"[11]. Overall, what this process implies is a complete shift from a fossil-based system of energy production and consumption to renewable energy sources[12]. According to the International Monetary Fund, the global oil demand should peak around 2041 and in general,

[10] Robin Mills, "A Fine Balance: The Geopolitics of the Global Energy Transition in MENA," The Geopolitics of the Global Energy Transition 73 (2020): 115–50, https://doi.org/10.1007/978-3-030-39066-2_6.

[11] Enel X, "Energy Transition: Definition and Benefits," Enel X, 2020, https://corporate.enelx.com/en/question-and-answers/what-is-energy-transition.

[12] S&P Global," S&P Global, 2024, https://www.spglobal.com/en/research-insights/market-insights/what-is-energy-transition.

even though projections vary, they predict a significant deceleration in the growth of oil demand throughout the projection period[13]. The resulted outcomes should affect those countries heavily dependent on fossil fuels like those of the Gulf. In fact, oil and gas rents of these countries (in terms of their GDPs) account and range from the 23.7% of KSA for oil and the 12% of Qatar for natural gas in 2021, well above the world's level standing at 1%[14]. The consequent burden should severely strike their economies jeopardizing the international ranking of the region, affecting its international power influence, its internal stability and its rentier systems that should be prevented to function effectively. In this context it is important to consider both the economic and the social situation of these countries. Gulf countries, in fact, as "petro-states" are largely based and dependent on oil and in general fossil fuels industries, that, as said, have granted them that more than fifty years prosperity. These fundamental revenues sources have always been under the public control that over years has granted the prosperity of the region. However, this practice has blocked any private investment enterprise thereby preventing the development of any alternative source of revenues. For this reason, in view of the upcoming energy transition an economic diversification strategy is required ensuring the development of a private sector active in new investments scopes.

Moving to the demographic and social situation of the Gulf countries, the region, despite slight national differences, has experienced a huge growth in its population as it is increased fivefold from the 1960s until nowadays (KSA passed from the original 4 million in 1960 to the current 36 million in 2022, UAE from 133426 in 1960 to 9 million in 2022, and Qatar from 36385 of 1960 to 2,6 million in 2022)[15]. This trend should continue soon doubling in 2100 according to the medium variant

[13] International Monetary Fund, "The Future of Oil and Fiscal Sustainability in the GCC Region," IMF, 2020, https://www.imf.org/en/Publications/Departmental-Papers-Policy-Papers/Issues/2020/01/31/The-Future-of-Oil-and-Fiscal-Sustainability-in-the-GCC-Region-48934.

[14] The World Bank, "World Bank Open Data," World Bank Open Data, 2023, https://data.worldbank.org/indicator/IC.BUS.NREG?locations=SA-AE-QA.

[15] The World Bank, "World Bank Open Data," World Bank Open Data, 2022, https://data.worldbank.org/indicator/SP.POP.DPND.YG?locations=ZG.

projections[16]. Overall, these trends can be explained trough the notion of the demographic transition as that "shift from a demographic regime of high and fluctuating mortality and fertility rates (traditional) to a regime of relatively low and stable mortality and fertility rates (modern). Mortality rates decline first, followed by fertility rates; the timing and magnitude of these events affects the subsequent level of population increase"[17]. Concerning these countries of the Gulf, they are in the so-called third stage approaching the fourth stage since death rates are low and birth rates decrease. They, in fact, share a young local population (over 50% of the local population is under 25) with a very low percentage of old population[18]. These countries are fully approaching their demographic window of opportunity in which the proportion of the working age population (15-64 years old as recognized by the International Labor Organization, or by other international organizations) is higher than the non-working one (14 and younger and 65 and older) granting the possibility for a huge growth if properly harnessed. This would require new opportunities for a young, educated and internet provided population to grasp this demographic dividend and to not upset the current rentier state of affairs. This is demonstrated by the so-called dependency ratios as those indicators measuring the non-working population compared to working or economically active population to assess the impact of the youthful and ageing population on the working population. Considering the current values, data are very good since they are low. However, due to the demographic ageing that should characterized the region in the upcoming years because of the declining fertility and mortality rates, the old age dependency ratio as measuring how many older people needed to be supported financially by

[16] UNITED NATIONS - Department of economic and social affairs, "World Population Prospects - Population Division - United Nations," population.un.org, 2022, https://population.un.org/wpp/Graphs/DemographicProfiles/Line/634.

[17] Oxford University Press, "Demographic Transition," Oxfordreference.com, Oxford University Press, 2013, https://www.oxfordreference.com.

[18] ISI, "Demographics of the GCC – Understanding the Changes in the Local Population. | ISI," www.isi-next.org, 2021, https://www.isi-next.org/abstracts/submission/746/view/.

the working age group in an economy, should grow. According to projections those aged above sixty-four years should be the largest age group by 2050[19].

In this context, it is, also, advisable to consider further information that make things difficult. They refer, above all, to the sharp division between natives and not (expatriates), in fact half of these countries is made by this latter category usually employed in the private sector under stringent rules and conditions. They represent all those individuals bearing a nationality of a foreign state other than the GCC state of residence or bearing no proof of nationality from any given state[20]. In fact, these non-nationals make up almost half of the total population in 2023 ranging from the highest level of Qatar where non-nationals account for 87.9% of the total population to Saudi Arabia where they represent the 41.6%[21]. The other side consists of natives whose conditions are completely different. They are employed mainly in the public sector with high wages and excellent conditions granted by the region's oil revenues dependency that had allowed them to enjoy this great status. Overall, this situation is the result of the rentier system of government as explained before. Notwithstanding this the growing population has set several challenges. The main one refers to the high rate of unemployment among nationals with its peak in KSA where Saudis unemployment accounted to 8.5% in the second quarter of 2023, a very high value considering that of the western countries (6% in EU and 3.70% in US during the same period)[22][23]. Even if some countries, like Qatar, stand out for lower percentages (Qatar was one of the nations with the lowest unemployment rate in 2023), this is ensured by the capacity to absorb young nationals into public sector

[19] Musa Mckee et al., "Demographic and Economic Material Factors in The Mena Region," 2017, https://www.iai.it/sites/default/files/menara_wp_3.pdf.

[20] Gulf Labour Markets, Migration, and Population (GLMM), "GLMM - Gulf Labour Markets, Migration and Population," GLMM, 2023, https://gulfmigration.grc.net/.

[21] Ibidem.

[22] General Authority for Statistics, "General Authority for Statistics," General Authority for Statistics, 2023, https://www.stats.gov.sa/en.

[23] Statista, "Unemployment Rate in Selected World Regions," Statista, 2023, https://www.statista.com/statistics/279790/unemployment-rate-in-seclected-world-regions/.

jobs[24][25]. Overall, this is the traditional way used by Gulf countries to reabsorb unemployment providing nationals public job opportunities. However, this practice has created a huge burden on the national budget that should get worse with the abandonment of the oil revenues dependence. For these reasons the demographic aspect is strictly connected with the post oil scenario. In fact, the economic success of the diversification from oil dependency would be essential for the maintenance of the domestic stability and legitimacy of the regime as it was with the oil revenues.

Based on the above, what emerges from this predicted scenario is the need of an economic diversification strategy, investing on new technologies, exploiting digital transformation and digital economy, attracting, and making new investments to remove that dependency on oil revenues that otherwise should collapse the Gulf's order. Such an initiative should determine the economic, political, and social future of this group of countries heavily reliant, as said, on hydrocarbons. Overall, those instances have been summarized and scheduled around the catchphrases Visions. These can be defined as development, economic and social transformation plans set out by each of the region's countries aimed at diversifying their economies facing the outlined challenges[26]. Albeit they differ among Gulf countries, each plan shares similarities in meeting diversification challenges through parallel pathways of investments that will be analyzed in the following sections[27].

[24] The World Bank, "Unemployment, Total (% of Total Labor Force) (Modeled ILO Estimate) - Qatar | Data," data.worldbank.org, 2023, https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS?locations=QA.

[25] Arab News, "Qatar Boasts Lowest Unemployment Rate in the World: Report," Arab News, April 30, 2023, https://www.arabnews.com/node/2295186/business-economy.

[26] S Vakil, "Visions, Technocrats, and the Shifting Social Contract in the Gulf Countries," ISPI, May 26, 2022, https://www.ispionline.it/en/publication/visions-technocrats-and-shifting-social-contract-gulf-countries-35194.

[27] Ibidem.

1.2. The Visions

Briefly introducing the Gulf Visions, it is important to note that they will be analyzed focusing mainly on those countries' subjects of the dissertation: Saudi Arabia, United Arab Emirates and Qatar. Moreover, they will be analyzed trying to focus on the technological aspects of these strategies as the core elements of this dissertation.

As said, these Visions could be defined as long term, broad, and flexible reform roadmaps, scheduled by Gulf countries to face those exposed challenges raised mainly by the energy transition. Since these countries, as showed, have similar characteristics the related Visions may appear very similar as having broad and pioneering objectives differing only in their timeframes. In fact, they share the involvement of Foreign Direct Investments (FDI) from private enterprises, the efforts towards the green energy transition, and the focus on the digital private enterprises that would be more economically relevant than the energy sector. However, as will be clarified later, some differences exist both in the countries' conditions and in the consequent Visions. Overall, focusing to the case at hand, the strategies examined will be: Saudi Vision 2030, We the UAE Vision 2031, and Qatar National Vision 2030.

1.2.1. Saudi Vision 2030

Starting with Saudi Arabia, its Saudi Vision 2030 is an ambitious plan set in 2016 by the "Crown Prince and Prime Minister Mohammed bin Salman bin Abdulaziz"[28]. It covers a wide range of action including not only the energy dimension in view of the transition, as one might think, but broad goals that are categorized under three main objectives to be realized, namely an ambitious nation, a thriving economy, and a vibrant society. Overall, this is an innovative blueprint aimed at reforming the

[28] Kingdom of Saudi Arabia, "Saudi Vision 2030," Vision2030.gov.sa, 2023, https://www.vision2030.gov.sa/en.

Saudi's economy and society trying to change the image of the historically oil-dependent and traditionally conservative Kingdom of Saudi Arabia[29]. On these bases, what emerges from the Vision is its wide sphere of activity touching all the branches of the Saudi state. It clearly starts from the energy transition as that necessary tool to drive the country out of its fossil fuels dependence. In fact, this is the cornerstone of the Vision itself. Failing the transition and consequently not achieving the diversification would not grant the future of Saudi Arabia as a "petro-state" and as a rentier country, thus dependent on fossil fuels from an economic and social point of view. More specifically, the oil industry, firmly rooted in the national oil company Saudi Aramco, has been and is still the pivotal element for the existence of the country granting internal and external stability in addition to its rentier asset[30]. Based on these considerations, it becomes clear that moving away from the oil industry without replacing it appropriately would have a destructive impact for the country's existence. For these reasons new investment paths are required to diversify the economy going over the oil revenues dependence. This is one of the main objectives within the cited pillar "thriving economy" having set as goal the increase of non-oil exports in non-oil GDP from 18.7% to 50% by 2030[31]. The maximization of the Saudi's investment capabilities is the complementary part of this noteworthy strategy. This implies the development of the Sovereign wealth fund PIF (Public Investment Fund) attracting foreign investments and helping the private sector in the unlocking of strategic sectors that require intensive capital inputs[32]. In short, what emerges from the Vision is the necessary replacement of the oil revenues dependence with new private investments mainly directed by the State to address the predicted low oil prices caused by the energy transition. On these

[29] Mohammed Nuruzzaman, "Saudi Arabia's 'Vision 2030': Will It Save or Sink the Middle East?" E-International Relations, 2018, https://www.e-ir.info/2018/07/10/saudi-arabias-vision-2030-will-it-save-or-sink-the-middle-east/.

[30] Dominika Kosárová, "Saudi Arabia's Vision 2030," ResearchGate, 2020, https://www.researchgate.net/publication/346531524_SAUDI_ARABIA.

[31] Kingdom of Saudi Arabia, "Saudi Vision 2030," Vision2030.gov.sa, 2023, https://www.vision2030.gov.sa/en.

[32] Ibidem.

bases the final objective of the country is to become a central hub at the worldwide level attracting investments, businesses, and talents from all over the world.

Focusing on some of these specific strategies, there are different investment areas followed by the Kingdom. One of these is directed towards the promising mining sector. This area, as will be explained better in the next chapter, can be considered a pivotal field for the extraction and achievement of those critical mineral elements necessary for the energy transition. Strictly connected are the investments in renewable energy systems since fossil fuels (gas and oil) are relevant not only in terms of exports towards foreign countries, but also in terms of internal energy consumption. Saudi Arabia primary energy consumption, in fact, is one of the highest in the world with an increasing trend in 2022 by 6.9% compared to the 1.1% world average increase[33]. This energy demand is covered mainly by fossil sources of energy and only 1% of electricity stemmed from renewables in 2022[34]. On these bases the Kingdom has planned huge investments in renewables, that however, have not already taken place. Finally, another important technological area covered by the Vision refers to the digital connectivity. This sector (that include technology and digital transformation) should play a pivotal role in the economic diversification strategy according to the Vision 2030 as it is an "integral, conclusive, and pragmatic strategy that aims to enable and accelerate the government transformation efficiently and effectively"[35]. Overall, since data are the new critical infrastructure of current times, it could be considered as that catalyst required by the cornerstone of the plan: the economic diversification[36]. These investments are various and range from those on digital infrastructures, like subsea

[33] Energy Institute, "Statistical Review of World Energy," Statistical review of world energy, 2023, https://www.energyinst.org/statistical-review.

[34] U.S. Energy Information Administration, "Country Analysis Brief: Saudi Arabia," 2024, https://www.eia.gov/international/content/analysis/countries_long/Saudi_Arabia/pdf/saudi_arabia_2023.pdf.

[35] GOV.SA, "Digital Transformation," My.gov.sa, 2023, https://www.my.gov.sa/wps/portal/snp/aboutksa/digitaltransformation/?lang=en.

[36] JOH partners, "High Demand Jobs in Saudi Arabia – Market Trends - JOH Partners," JOH Partners - Specialist UAE and KSA Recruitment Agency in Finance, B2B SaaS and Logistics., January 26, 2024, https://johpartners.com/high-demand-jobs-in-saudi-arabia-market-trends/.

fiber optic cables, as pivotal for the functioning and the expansion of the strategy, passing through the efforts to create a digital economy and concluding with the project of smart cities, like the ambitious Neom project. To conclude this brief discussion about the Saudi Vision 2030, whose technological practical efforts will be analyzed in the second chapter, it is important to remark its close bond with the social environment of Saudi Arabia. Overall, as said before, the Gulf countries analyzed share a common demographic structure as they are experiencing their demographic window of opportunity and need to harness the consequent demographic dividend. Since the inability of the rentier system to function in a post oil scenario the growing available young, well-educated and internet provided population need to be grasped. This could be done improving the private sector and moving native workforce to it (including female workforce). Such a transformation should be the result of that digital transformation explained above. It should improve the domestic human capital to develop new sectors in which young and skilled Saudis might find a job.

1.2.2. We the UAE Vision 2031

Moving to United Arab Emirates, its Vision "We the UAE Vision 2031", is an important, broad, and innovative strategy that follows the precedent "UAE Vision 2021" which was created to accelerate the nation's growth in the healthcare, education, sustainability, and infrastructure sectors[37]. As for the Saudi's one, this strategy is based on some broad pillars. In the case at hand, these are four, namely: a forward society, a forward economy, a forward diplomacy, and a forward ecosystem[38]. Overall, these pillars are intended to guide the country in a post oil scenario, ensuring and possibly even increasing that internal and international status acquired, resembling in part what has been shown trough the Saudi and the other

[37] United Arab Emirates, "'We the UAE 2031' Vision - the Official Portal of the UAE Government," u.ae, September 21, 2023, https://u.ae/en/about-the-uae/strategies-initiatives-and-awards/strategies-plans-and-visions/innovation-and-future-shaping/we-the-uae-2031-vision.

[38] Ibidem.

Visions developed in the region. The country in fact shares quite the same economic and social conditions of the others as being characterized by a high oil economy dependence and by a growing young local population that could not be reabsorb trough the classic public measures. For this reason, also in the UAE there is an increasing unemployment rate.

However, it is worth noting the significant distinct features of the federation and consequently of its Vision. The UAE, in fact, can be considered the most diversified economy of the Gulf region[39]. The Federation started these efforts in the 80s, when half of its GDP was represented by oil revenues, reaching in 2021 the 15.67%[40]. Such a trait remained nowadays as the national objective, as stated in the Visions, refers to the need to achieve "a diversification and liberalization program to reduce reliance on oil and transform its economy from a conventional, labor-intensive economy to one based on knowledge, technology and skilled labor"[41]. Following this path the federal government has, firstly, developed and updated, over the years, investment policies and initiatives to attract foreign investments. These measures have liberalized the system minimizing the precedent anachronistic FDI regime which imposed several limitations on foreign investors. On these bases, the UAE, has attracted more Foreign Direct Investments compared to the rest of Gulf countries combined from 2017 onward[42]. In addition, the country can be considered the current logistic hub of the region as crucial for all the logistic services in the area. Secondly, along this path, it started investing in the Information Communication Technology industry (ICT) for the development of a knowledge-based economy. The objective of the Vision is to guide the so called Fourth

[39] Saima Shadab, "The New Arab Gulf: Evaluating the Success of Economic Diversification in the UAE," Gulf Studies 8, 2023: 415–30, https://doi.org/10.1007/978-981-19-7796-1_25.

[40] The World Bank, "World Bank Open Data," World Bank Open Data, 2023, https://data.worldbank.org/indicator/BX.GSR.CCIS.CD?locations=SA.

[41] UAE - Ministry of Foreign Affairs, "Abdullah Bin Zayed Launches MoFA's 2023-2026 Strategy, Honours Excellence Award Winners," www.mofa.gov.ae, 2023, https://www.mofa.gov.ae/en/mediahub/news/2023/9/6/6-9-2023-uae-mofa.

[42] Osman Antwi-Boateng and Noura Hamad Salim Al Jaberi, "The Post-Oil Strategy of the UAE: An Examination of Diversification Strategies and Challenges," Politics & Policy 50, no. 2, March 7, 2022, https://doi.org/10.1111/polp.12457.

Industrial Revolution as that "revolution that merges the physical, digital and biological technologies in order to deliver unprecedent products and services in new and emerging sectors"[43]. The Federation should become a global and open hub for its realization and application favoring and coordinating internal and external investments[44]. This should ensure huge investments covering several digital areas: from those aimed at developing the cloud computing to those directed towards artificial intelligence and 5G mobile communication. These efforts should drive the country out of its oil dependence promoting also that public-private partnership necessary to harness that demographic dividend that characterize the country and broadly the region. As a last complementary side of the UAE's strategy to be mentioned as regards the purpose of this work, it is important to focus briefly on the Emiratis geostrategic plan. In view of the diversification strategy and of the consequent progressive abandonment of the oil sector dependence, the country has planned to exploit its geographic position becoming a commercial, financial and energy hub at the crossroads of Asia, Africa, and Europe. Exploiting this position, UAE has already and should expand soon diplomatic and economic ties with all the actors of those regions without involving in the competition among great powers and thus maintaining a neutral position. This should be obtained through investments in strategic sectors like ports and largescale infrastructures projects, something already achieved by its national company DP World, one of the sector leaders. Some of these directives, as said, have already been applied, reinforcing its crucial position. Others have been planned as will be shown later, covering those developing countries, like those of the sub-Saharan Africa region as profitable and viable countries.

To sum up, what emerges from the analysis of the UAE and of its Vision is on the one hand the similarity with the Saudi one for those reasons already explained (economic and social ones mainly). On the other hand, the UAE stays in a different situation standing in a better and more advanced condition. The country, in fact, has already achieved some of its objectives requiring improving others.

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[43] United Arab Emirates, "UAE's Fourth Industrial Revolution Strategy", UAE, 2017, https://u.ae/-/media/About-UAE/Strategies/UAE-4-IR-Strategy/En-UAE-4-IR-Strategy.pdf.

[44] Ibidem.

1.2.3. Qatar National Vision 2030

Concluding this analysis with the "Qatar National Vision 2030", it is an ambitious plan aimed at transforming "Qatar into an advanced country by 2030, capable of sustaining its own development and providing a high standard of living for its population and future population"[45]. As for the other Visions presented, also this one is based on four broad and visionary pillars namely: Human development, Social development, Economic development, and Environmental development. Since the country, as for the others shares economic and social conditions with the rest of the Gulf (high hydrocarbon dependence and consequent rentier system of government), also the Vision exhibits similar characteristics. This strategy proposes, in fact, the development of a diversified economy with diminishing dependence on hydrocarbons, moving investments toward a knowledge-based economy, promoting consequently the private sector. However, Qatar has some distinct features which must be consider in evaluating its strategy. First, the country is one of the main exporters not so much of oil, that even if consistent is not comparable with the other Gulf countries reserves, but of natural gas[46]. Exploiting its huge natural gas reserves that exceed the domestic demand, the country has become the world's third-largest exporter of natural gas and the world's second-largest LNG exporter, accounting for 21% of global Liquefied Natural Gas exports[47]. This should let Qatar continuing to be reliant on gas exports since this energy source, even if a fossil one, is considered the driver of the energy transition, postponing its abandonment after oil. Overall, this should ensure to Qatar a longer reliance on fossil fuels than the other Gulf countries granting it to invest more in other sectors. Moreover, the country is also investing so much on renewables having increased its transitionary efforts by 26% in 2022 compared to the previous

[45] Government Communications Office, "Qatar National Vision 2030," Government Communications Office, 2023, https://www.gco.gov.qa/en/about-qatar/national-vision2030/.

[46] EIA, "International - U.S. Energy Information Administration (EIA)," Eia.gov, March 28, 2023, https://www.eia.gov/international/analysis/country/QAT.

[47] Ibidem.

period[48]. Moving to the other Qatar's features and analyzing the economic diversification strategy as a common regional trait, it is important to focus on the technological investments taken by the country. Qatar, in fact, is one of the most important states in terms of digital investments becoming a sort of digital hub as hosting digital big companies like Microsoft and Google. On these bases, it has experienced a huge growth of its the digital sector by 7.2% in 2023 covering in addition the 99% of the national population[49]. Overall, the country's activity is not only limited to the digital world. In fact, it extends itself towards others distinct sectors like the finance, where the country is a global hub, or media considering the national property of Al Jazeera, the most important communication provider of the East area. This has allowed and is allowing currently to exercise its soft powers in the global stage[50]. Following this path, the other side of this economic diversification strategy that cover digital investments mainly, refers to the international aspect. Qatar, in fact, is trying trough these strategies to affirmed itself as a global leading power in the international arena. Maintaining on the one hand a neutral asset, but on the other exploiting its wide GNL resources (which, as said, will be maintained as transition resource), the country aims to affirm itself as a sort of mediator between the west and the east of the world. Even though also the other countries analyzed share the same ambitious, probably Qatar is currently in a better position since its long-standing mediation tradition[51].

To conclude, what emerges also from Qatar is the similarity of its Vision with the others of the Gulf as strategic, broad, and visionary plans to drive these Gulf countries out of fossil fuels dependence and towards an entirely different era. These are characterized by western standards like liberalization and privatization to create

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[48] Climatescope, "Climatescope 2023 | Qatar," www.global-climatescope.org, 2023, https://www.global-climatescope.org/markets/qa/.

[49] The Peninsula Newspaper, "Qatar's Tech Sector Boosts Dynamic Digital Economy," Thepeninsulaqatar.com, December 12, 2023, https://thepeninsulaqatar.com/article/12/12/2023/qatars-tech-sector-boosts-dynamic-digital-economy.

[50] Emanuele Rossi, "Il Qatar al Centro Della Scena in Medio Oriente," Med-Or, 2023, https://www.med-or.org/news/il-qatar-al-centro-della-scena-in-medio-oriente.

[51] Ibidem.

a sort of investment hub on the heels of the US Silicon Valley. However, as said, it is important to consider firstly the real willingness of the governments, as those measures have been implemented also to dampen the demographic and consequently social and political pressure that was and is coming out. Secondly and related to the previous, the targets explained might be achieved only through a real liberalization of the country in the absence of which the complete fulfillment of the plan would be difficult. Thus, the success and sustainability of the strategies, even if with some distinction, could be positive in the long term only trough deep and sharp interventions, wider than the current ones.

1.3 Sub-Saharan Africa technological need against economic and social challenges

Moving to the analysis of Sub-Saharan Africa region (SSA) and its related challenges, it is important to circumscribe the dissertation to those social and economic ones. These will be presented and explained below highlighting the consequent need for technological investments.

For starters, it is worth noting that Sub-Saharan Africa is an extremely diverse region, that refers to the area that lies below (south of) Sahara Desert including several sub regions like West Africa, Central Africa, East Africa, and South Africa. It covers a very wide region that includes between 48 and 55 national countries varying according to the regional organization's definition. Despite this slight uncertainty, it is composed by different low, lower-middle, upper-middle, and high-income countries, some of which are fragile or conflict-affected, and others small states characterized by a small population, limited human capital, and a confined land area[52]. In addition, distinctions exist also within each country because of their forced formation in the 19th century. In the region, in fact, different religions coexist,

[52] The World Bank, "World Bank Open Data," World Bank Open Data, 2023, https://data.worldbank.org/indicator/BX.GSR.CCIS.CD?locations=SA.

over two hundred languages and roughly two hundred and fifty ethnic groups[53]. Overall, what emerges is that in talking about Sub-Saharan Africa, it might seem inadequate to assess the problem and the challenges of this region in a unitary way. Its vastness and its consequent different features may suggest handling the topic in a different way focusing on some countries only. However, it is worth noting that, even though several fundamental distinctions exist, those countries of this region share some common patterns, mainly social and economic ones, that allow to treat Sub-Saharan Africa in a unified manner. Sub-Saharan Africa, indeed, has the world's youngest and fastest-growing population; these statistics show a great economic potential but also great challenges, as governments and growing cities struggle to keep pace with growth. Migration forced by conflict and environmental changes also contributes to sub-Saharan Africa's rapidly changing demographics. Moreover, the economic situation, despite local and national differences shows a great potential that, however, need to be leveraged.

1.3.1 Demographic aspects

Starting with the demographic and related social aspect of SSA, the importance of Africa's demography in shaping the world's population in the current century can be seen in the estimated and projected world population growth. World population, in fact, grew from 2.5 billion in 1950 to 7.8 billion in 2020, and is projected to reach 10.9 billion by 2100, at which point world population growth is projected to be close to zero[54]. In this context it is important to remark as Asia, which grew from 1.4 billion in 1950 to 4.6 billion in 2020, is projected to peak at 5.3 billion in 2055, and will have only 78 million more people in 2100 than it has in 2020. Sub-Saharan Africa, which grew from 180 million to 1.1 billion between 1950 and 2020, is

[53] CFR Education, "Transcript: An Overview of Sub-Saharan Africa," 2024, https://education.cfr.org/sites/default/files/video-transcripts/2019/11/Transcript%20An%20Overview%20of%20Sub-Saharan%20Africa.pdf.

[54] David Lam, Murray Leibbrandt, and James Allen, "The Demography of the Labor Force in Sub-Saharan Africa: Challenges and Opportunities", GLM, 2019, https://g2lm-lic.iza.org/wp-content/uploads/2019/11/glmlic_sp010.pdf.

projected to add 1.8 billion between 2020 and 2100. Asia accounted for 62% of global population growth between 1950 and 2020, while only 17% was in Sub-Saharan Africa. Asia should play a much smaller role going forward, only accounting for a projected 9% of global population growth between 2020 and 2100, while Sub-Saharan Africa will account for 87% of that growth. Thus, the world population growth in the 21st century will be dominated by Africa, with Sub-Saharan Africa being the only major region with substantial growth in terms of population after 2050. Fifteen African countries are projected to more than double between 2020 and 2050, with Niger projected to increase by 171% in this thirty-year period. The largest absolute population increase in the world will be in Nigeria, which is projected to increase from 206 million in 2020 to 401 million in 2050 and 732 million in 2100[55].

As related to the total population of the Sub-Saharan Africa region, working-age population is another index to consider. As stated before, the term working-age population, refers to the age 15-64 according to the International Labor Organization, or by other international organizations. Related to this rate there is the already cited notion of demographic transition as that cycle, divided in phases, driven by declining mortality and fertility rates with the gap between the two terms causing population growth. Overall, looking at the global scenario the crude death rate had already fallen to around 2% by 1950, while the birth rate was still at 3.8% leading to an annual rate of natural increase of around 1.8% per year. This increased to a peak of about 2.1% per year in the mid-1960s, an historically unprecedented rate of global population growth. Birth rates began falling faster than death rates around 1965, causing the population growth rate to fall substantially since then. The growth rate of world population in 2020 is about 1.05%, projected to fall below 0.5% by 2050 and close to 0% by 2100 the crude death rate for the world is no longer falling, as rising life expectancy has been offset the by impact of population aging[56]. In this context, by 2050 the youngest subgroup (ages 0–14) is projected to double to about 685 million, the working age population (ages 15–64) is projected to triple to 1.25 billion, and the number of elderly (older than 65) is projected to

[55] Ibidem.

[56] Ibidem.

quadruple to 100 million, reflecting improvements in life expectancy[57]. Thus, the global working-age population should grow from 5.1 billion in 2020 to 6.1 billion in 2050 and 6.5 billion in 2100. In this context, the working-age population for Sub-Saharan Africa, which was 600 million in 2020, will more than double to 1.3 billion between 2020 and 2050, and will quadruple to 2.4 billion between 2020 and 2100. A huge value, considering that it will be the only region with a growing working-age population after 2050. In fact, Africa is the only region that is projected to have a larger working-age population in 2100 than it has in 2020. Nevertheless, it should be noted that the pace of the demographic transition is not the same as varying also in such as quite homogeneous region like SSA. Three broad groups, in fact, could be distinguished according on the share of their working age population: advanced, where the transition is largely complete; ongoing, where the transition is underway; and nascent, where little or no transition has yet taken place. In the first group according to the IMF there are countries like: Mauritius, South Africa, and Botswana. The second, as the largest, is composed by states like Namibia, Kenya, Ghana, and Ethiopia. While in the third one there are: Liberia, Niger, Nigeria, and Mozambique. Despite this rough list, what it is important to note is the regional differentiation. The Eastern and the Western part should experience the largest increase, followed by the Central one. By contrast South Africa growth should remain flat for the above reasons.

Continuing with this topic, it is also worth noting that while falling death rates were the major factor driving the population growth of the last 50 years, they will play a minor role in the 21st century, having stabilized at low levels all over the world. It is the speed and magnitude of declining birth rates that will determine how fast population growth falls in Africa. While the crude birth rate (births as a proportion of the population) determines the rate of population growth, it is not a good measure of fertility behavior since it is heavily influenced by the proportion of the population in childbearing ages. A better measure to describe fertility behavior is the total fertility rate (TFR). The TFR is the number of births a woman would have over her lifetime if she experienced the age specific fertility rates in a

[57] Andrew Stanley, "African Century," International Monetary Fund, September 2023, https://www.imf.org/en/Publications/fandd/issues/2023/09/PT-african-century.

given year[58]. A TFR of 2.1 represents replacement fertility. For the world the TFR fell from 5.0 births per woman in 1950 to 2.4 in 2020, a 52% decrease and 88% of the decrease required to reach replacement fertility. Within this framework, Africa has had a considerably later and slower fertility decline. In 2020 Africa's TFR accounted to 4.5 births per woman, more than double the TFR in Asia and Latin America. Despite the highlighted differences between each region and country that followed what showed with the share of the working age population, this trend highlights the singularity of Africa's fertility transition.

As a last indicator to consider there is the age distribution. It gives the proportion of the population according to its cohort. In 1990, the age structure was very young all over the world, as a typical trait of rapidly growing populations with much larger numbers of children than middle-aged or elderly. In that year there were 2.3 0-4-year-olds in the world for every 40-44-year-old. In 2020 things were different as the number of children has increased only slightly from 1990, while there have been large increases in the numbers in the working ages. The ratio of 0-4-year-olds to 40-44-year-olds for the world fell to 1.4 by 2020 and is projected to fall to 1.1 by 2050. Moving to sub-Saharan Africa its data are very different and unique. Absolute numbers of children and youth increased substantially in Africa from 1990 to 2020 and should continue this trend until 2050. Looking at the specific sub-regions within sub-Saharan Africa the trends followed what cited above. South Africa should experience a very little growth in the youngest age groups and most growth in the older age groups. Eastern, Central, and Western Africa should all have rapid growth in the number of children and youth in the coming decades and should be the main source of additional children and youth for the entire world[59]. Simultaneously, at the global level there should be a shift from a young population in 1990 to an older population in 2050. In this case sub-Saharan Africa should be directed towards an older population, even though the population should continue to be young in 2050.

[58] David Lam, Murray Leibbrandt, and James Allen, "The Demography of the Labor Force in Sub-Saharan Africa: Challenges and Opportunities", GLM, 2019, https://g2lm-lic.iza.org/wp-content/uploads/2019/11/glmlic_sp010.pdf.

[59] Ibidem.

To sum up such data, three indicators must be considered: the dependency ratio in terms of young and old population, and the total dependency ratio. These are fundamental, as said before, to assess the existence and the possibility to harness the resulted demographic dividend.

Considering the child dependency ratio, while worldwide it raised in the 50s and 60s declining from the 70s. Sub-Saharan Africa experienced a continued rising until around 1990, falling since then. In 2020 its child dependency ratio was much higher than in the rest of the world. The child dependency ratio should fall in Africa and in other regions throughout the 21st century, though Africa's ratio will be substantially higher than other regions for several decades. Concerning the elderly dependency ratio, it raised in all regions since 1950, and should continue this trend in the upcoming decades. Concluding with the total dependency ratio, it was dominated by the much larger child dependency ratio in all regions from 1950 to 2000, and as a result was rising until around 1970 outside of Africa and was rising until around 1990 in Africa (89% in 1990)[60]. The elderly dependency ratio had begun to play a much stronger role after 2000, with a rapidly rising elderly dependency ratio pulling up the overall dependency ratio despite the fall in the child dependency ratio. By 2020 the total dependency ratio increased all over the world, falling, however in sub-Saharan Africa (76%) due to the projected large declines in the child dependency ratio and a still low elderly dependency ratio[61]. On these bases it is possible to evaluate the demographic dividend as the concentration of the population in the working ages resulting from falling fertility. By around 2055 the total dependency ratio in Africa should fall below the global dependency continuing this trend throughout the entire century[62].

[60] The World Bank, "World Bank Open Data," World Bank Open Data, 2022, https://data.worldbank.org/indicator/IC.BUS.NREG?locations=SA-AE-QA.

[61] Ibidem.

[62] David Lam, Murray Leibbrandt, and James Allen, "The Demography of the Labor Force in Sub-Saharan Africa: Challenges and Opportunities", GLM, 2019, https://g2lm-lic.iza.org/wp-content/uploads/2019/11/glmlic_sp010.pdf.

1.3.2 Social and economic aspects

Having analyzed the demographic indicators of sub-Saharan Africa is now necessary to evaluate this data in social and economic terms. As explained before, sub-Saharan Africa could benefit from a significant demographic dividend in the upcoming future. This refers to "the economic benefits that can result as a population shifts from a very young age structure to an age structure more concentrated in working ages as a result of declines in fertility due to the projected growth of the working population"[63]. Overall, it could provide several benefits for those countries of the region[64]. As a first one, the rising share of the working age population should increase the per capita income due to the employment of an increasing workforce. Secondly, the expected declining fertility rates should increase the female labor force expanding the national workforce. Thirdly, reduction in the number of children with the concurrent increase in life expectancy should increase private investments in education and health care enhancing the productivity of the workforce. Finally, the increasing number of savings should raise the possibilities for private investments. However, implementing and reaching these visionary objectives capturing the cited dividend is something difficult and not automatic. It requires several measures that currently lack completely in the sub-Saharan territory. These are different and involved primarily as fundamental basis, the necessary acceleration of the decline in infant mortality and fertility and the generation of several new jobs for this growing population. Without them, not only the dividend could not be captured, but also several emerging challenges could emerge affecting the stability of the area. First, fertility rates in many sub-Saharan African countries could remain higher for longer, affecting and reducing the size and the impact of any potential dividend. Second, rising populations will strain public resources and implementation capacities. To provide these growing populations with even the current level of services, sub-Saharan African countries should increase their basic services like infrastructures and education services with

[63] Ibidem.

[64] IMF, "IMF Data," data.imf.org, 2023, https://data.imf.org/regular.aspx?key=61013712.

proper and effective investments. Third, the bulk of sub-Saharan Africa is employed in the informal sector, which is likely to remain the main source of employment in the near term. The lower levels of productivity associated with this sector could result in sub-Saharan Africa having lower-than-average productivity during part of its transition. Overall, what emerge is the forecast that without harnessing the projected demographic dividend by sub-Saharan national governments the stability of the whole area would be affected. Moreover, the consequent negative effects should be suffered by the western and eastern world.

In discussing this important issue, it may be convenient to recall the theories about the so-called youth bulge. This term is used to define the quantitative and proportional increase in the size of a country's youth population, conventionally when at least 30 percent of the population belongs to the 15-29 age bracket. It refers to those developing countries (like those in sub-Saharan Africa) which are in the late second stage of the demographic transition, when fertility rate is still high, and mortality rate is getting lower. In this context there is a huge number of young, often educated people with little or no access to labor market lacking any form of social-political recognition. In addition, it could be triggered by several other issues like the rapid urbanization and the consequent lack of infrastructure and resources, the growing expectations among job seekers and the abundance of manpower, the absence of job opportunities and by the environmental stress. On these bases the youth bulge is considered an important cause of turmoil causing the 80% of global turmoil.

Overall, sub-Saharan Africa countries tend to share, even if with regional and local differences the conditions highlighted. This is true first from a demographic point of view, since as explained before, the region's youth population should grow faster than any other region making up the 33% of the total population by 2050 with also a working age population growing with a pace of 14% every five years[65]. Even from an economic and social point of view the youth bulge's conditions are shared by the region's countries.

[65] Aidar Abdychev et al., "The Future of Work in Sub-Saharan Africa," Departmental Papers / Policy Papers 18, no. 18, 2018: 1, https://doi.org/10.5089/9781484383094.087.

Concerning unemployment rates in sub-Saharan Africa, they stand relatively low, as most of the employable active youth cannot afford not to work. This is a general trend shared by developing countries where generally, youth unemployment rates appear to be higher in relatively more developed than developing regions[66]. However, it is important to consider some issues. First, that this low youth unemployment rate in the less developed regions is also explained by the high level of informality, which masks the extent of unemployment. Second that these youth regularly suffer from under-employment and lack of decent working conditions. Third that, despite the trends observed in upper middle-income countries (western ones mainly) where individuals with advanced education suffer less unemployment rather than those with a lower education, in developing countries things are reversed. In this case, as in sub-Saharan Africa, youth unemployment is higher among the educated than the less educated or uneducated. Thus, with secondary school education or better, most of these youth do not find the informal sector attractive enough. Coupled with limited job opportunities in the formal sector, they have no choice than to wallow in joblessness. On the other hand, youth with basic or no education have the lowest unemployment rate because they have limited or no access to formal employment that often requires at least secondary school education and clearly can only seek refuge in the informal sector which does not require any education[67]. This issue is reinforced on the one hand by the educational progress taken by several countries in the region, while on the other by the difficulties that those countries are facing in economic terms. Beginning with the former, sub-Saharan African countries have improved their educational system making important progress in this field. The duration of the compulsory education has grown considerably in recent years with important peaks reached by Kenya, Ghana, and Senegal[68]. Moreover, the quality of the education system has been

[66] William Baah-Boateng, "The Youth Unemployment Challenge in Africa: What Are the Drivers?" The Economic and Labour Relations Review 27, no. 4, July 7, 2016: 413–31, https://doi.org/10.1177/1035304616645030.

[67] Ibidem.

[68] The World Bank, "World Bank Open Data," World Bank Open Data, 2022, https://data.worldbank.org/indicator/IC.BUS.NREG?locations=SA-AE-QA.

improved trough government investments standing over the world average in some cases (Kenya, Rwanda, Mauritius, and Cote d'Ivoire). The growing internet penetration in the last decade is strengthening the issue providing an important access to these young individuals. However, these aspects, undoubtedly positive for the development of the region, have some drawbacks as showed before by the youth bulge theories. A young, highly educated and internet provided population could pose several threats to the state authorities if they failed to grasp such a dividend. As said, this is currently the sub-Saharan Africa scenario, due to the high unemployment rates, which could get worst in the upcoming future as the total population will grow without any opportunity. Moving to the latter aspect, the economic and financial difficulties of the region's countries, as reported by the IMF the region does not look good[69]. It has the world's lowest GDP, measuring as known what is produced in a defined country or region, and even tough Nigeria and South Africa might seem like exceptions, they relied heavily on resources extractions, something vulnerable currently. In addition to what already cited, four issues could undermine the potential growth of the region in the upcoming years[70]. First, high inflation caused principally by the Covid-19 pandemic towards which several countries have not already recover remaining above their targets in the largest part of the cases. Second, the region continues to face significant exchange rate pressures. Third, debt vulnerabilities are elevated, borrowing rates are still high, and rolling over debt is a challenge. As pressured by debts, the countries of the region face several challenges to sustain their development plan and to attract investments. Finally, while the recovery is underway, economic divergences within the region are widening in particular, per capita incomes in resource intensive economies remain subdued[71]. To sum up, what emerges is a tricky situation for sub-Saharan Africa region's countries. Addressing the social and economic challenges showed would be essential to capture that demographic dividend projected to emerge in the upcoming future. In this sense technology and its related investments could provide a long-term aid to reach such a dividend.

[69] IMF, "IMF Data," data.imf.org, 2023, https://data.imf.org/regular.aspx?key=61013712.

[70] Ibidem.

[71] Ibidem.

1.3.3 Technological need

On the bases of what explained in the previous sub-paragraphs, what emerges, as said before, is the need to grasp the emerging demographic dividend. This should be essential to overcome and address those challenges that should come in the next decades granting the exploitation of the huge sub-Saharan Africa potential. Overall, the region's countries should follow different paths diverging from the traditional ones, thus looking to technological investments in new, promising sectors.

The region could and should take advantage of the 4th industrial revolution (4IR) as that already cited upcoming "phase in the digitization of the manufacturing sector, driven by disruptive trends including the rise of data and connectivity, analytics, human-machine interaction, and improvements in robotics"[72]. Digitalization has, indeed, a great potential. It could influence productivity, employment, and growth. Digital connectivity enables specialization of production and economies of scale, both of which can raise productivity and growth. It could also support structural transformation through the diffusion of knowledge and the development of new products and services[73]. Regarding its sub-Saharan application, despite the continent's low rate of digitization compared to the global trends and despite the lack of infrastructures, electricity, and connectivity in several areas of the region, Africa is considered as having a vast digitization potential. This is sustained by the cited young, interconnected population who has come of age in a globalized world and by several public and private investments that have turned the region into a hub of technological innovation with as many as 400 million-dollar local companies. On these bases it is possible to affirm that the region, despite national differences, is witnessing a momentous transformation thanks to Information and Communication Technology and digitization. Overall, sub-Saharan Africa is emerging as one of the most dynamic places for technological

[72] McKinsey & Company, "The Digital Revolution Is Brewing in the Industrials Sector | McKinsey," www.mckinsey.com, 2022, https://www.mckinsey.com/industries/industrials-and-electronics/our-insights/the-digital-revolution-is-brewing-in-the-industrials-sector.

[73] Emre Alper and Michal Miktus, "Digital Connectivity in Sub-Saharan Africa: A Comparative Perspective," IMF, 2019, https://doi.org/9781513514604/1018-5941.

innovation where the momentum for rapid expansion is sweeping across the region[74]. This digital growth presents real opportunities for Africa's youth which would be the world largest as explained before. Leveraging digital technologies for new jobs in virtually every sector of the economy represent a massive opportunity for growth. The sectors covered range from digital networks, sensors, and artificial intelligence, to automation, which is driving the digital revolution across the continent[75]. Overall, sub-Saharan African workers are involved in all the key emergent and every day digital technologies acting as data janitors standing behind them[76]. For this reasons the sub-Saharan Africa's contribution to the digital revolution is something global that would have worldwide effects. Following this path, the economic impact should be significant, with mobile technologies alone already accounting for 1.7 million jobs and contributing for US$144 billion to the region's economy, or about 8.5% of the region's GDP[77]. What emerges, overall, is that such a new digital dimension should bridge the digital divide that has marginalized sub-Saharan Africa from the rest of world until recently. This means that the digital process cannot be underestimated or overlooked as a frontier of digital transformation. And on that score, the region's priority is not only a matter of connecting the continent's population to digital tools and services in an affordable and inclusive way; it is also about putting the continent on a trajectory that can enable it to adapt to a rapidly evolving geopolitical landscape that has ramifications for technology and the digital economy.

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[74] Joël Cariolle, "International Connectivity and the Digital Divide in Sub-Saharan Africa," Information Economics and Policy 55, December 2020: 100901, https://doi.org/10.1016/j.infoecopol.2020.100901.

[75] Prof S. A. Igbatayo, "Spurring Digital Revolution for Decent Jobs in Sub-Saharan Africa: A Comparative Analysis of Cote D' Ivoire and Kenya," Journal of Namibian Studies: History Politics Culture 35, no. 1, August 10, 2023: 566–91, https://doi.org/10.59670/jns.v35i.3524.

[76] Mohammad Amir Anwar and Mark Graham, "Digital Labour at Economic Margins: African Workers and the Global Information Economy," papers.ssrn.com, Rochester, NY, December 6, 2019, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3499706.

[77] Nathaniel Allen, "The Promises and Perils of Africa's Digital Revolution," Brookings, March 11, 2021, https://www.brookings.edu/articles/the-promises-and-perils-of-africas-digital-revolution/.

However, it is important to note that investing in digital connectivity opening to the 4th industrial revolution, require the development of a digital-friendly policy framework based on four pillars[78]. They concern firstly, investments in infrastructures requiring the full electrification of the region and the extension of subsea and terrestrial fiber optic cables as essential tools to grant the regional connectivity, without them no projects could be realized. Investments in policy frameworks, can be considered the second needed tool, as essential to regulate and ensure private-public investments. This would be necessary to also provide an appropriate business and regulatory environment for new digital investments. As a third pillar, investments in human capital through digital education would be paramount for the leveraging of the digital revolution. In this sense some countries like Kenya and Cote d'Ivoire are promoting investments in digital education. Concluding with the last, fourth pillar, for the development of a prompt and effective African digital framework, it would be necessary to invest in risk management frameworks to prevent digital system from emerging risks and related consequences. In this sense, countries across the region are adopting legislative and other frameworks to address these risks. Mostly have passed laws on cyber-crimes and other cyber risks. According to the ITU framework, Mauritius, Kenya, and Rwanda are the top three performers in sub-Saharan Africa [79]. Moreover, in some cases, legislation is being implemented at the regional level (for example, the Economic Community of West African States and the West African Economic and Monetary Union)[80].

[78] IMF, "Regional Economic Outlook for Sub-Saharan Africa, April 2024 | a Tepid and Pricey Recovery," IMF, April 2024, https://www.imf.org/en/Publications/REO/SSA/Issues/2024/04/19/regional-economic-outlook-for-sub-saharan-africa-april-2024.

[79] ITU, "Measuring the Information Society Report 2018," Itu.int, 2018, https://www.itu.int/en/ITU-D/Statistics/Pages/publications/misr2018.aspx.

[80] IMF, "Regional Economic Outlook for Sub-Saharan Africa, April 2024 | a Tepid and Pricey Recovery," IMF, April 2024, https://www.imf.org/en/Publications/REO/SSA/Issues/2024/04/19/regional-economic-outlook-for-sub-saharan-africa-april-2024.

Another promising technological sector that could be beneficial for addressing the imminent youth bulge is the mining one. It refers to the mining of rare elements as critical elements for both human and national security. As explained before, they are essential both to achieve the so-called energy transition and the above digital revolution. Since the wide not already fully exploited availability of these elements in the sub-Saharan Africa region, those countries part of it could maximize the benefits of critical materials for their economies consequently addressing the upcoming social and economic challenges. In fact, they could maximize revenues collection reducing reliance on external debts and financing core socioeconomic objectives. As other possible ways to be used there is the possibility to leverage the African free trade area enabling countries to enhance value addition within this area before exporting the materials[81]. Finally, the sub-Saharan Africa states should use their availability of critical materials in a strategic way forging long term partnerships with those countries that seek to build a resilient rare earths value chain[82]. Surely this is a promising sector that if leveraged rightly could be beneficial for the subcontinent. Moreover, its enhancement could be greatly simplified by the former digital revolution. In this case new technological devices may ease mineral discoveries and extraction increasing employment in such sector[83]. However, there are several risks stemming from the fact that critical materials scramble could resemble that struggles that had previously characterized gold, diamonds and then fossil fuels affecting badly Africa.

To conclude this section, it is worth noting that most sub-Saharan African countries would experience both a rapidly growing population and a rising share of the working age population over the coming decades. This transition presents an opportunity to capture the consequent demographic dividend, requiring, however,

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[81] Gracelin Baskaran and Sophie Coste, "Achieving Universal Energy Access in Africa amid Global Decarbonization," Www.csis.org, January 31, 2024, https://www.csis.org/analysis/achieving-universal-energy-access-africa-amid-global-decarbonization.

[82] Ibidem.

[83] Landry Signé, "Africa's Mining Potential: Trends, Opportunities, Challenges and Strategies," Policy Center, May 2021, https://www.policycenter.ma/sites/default/files/2022-01/PP-10-21-Landry-Signe.pdf.

the implementation of supportive policies to address the related challenges arising from this rapid growing process. The magnitude of the demographic dividend will largely depend on the speed of the transition and the adoption of such supporting policies. Reducing fertility rates as explained could contribute to a faster transition. But creating jobs to absorb new entrants into the labor force will be critical. To fully capture the dividend, sub-Saharan Africa should create jobs at an extremely rapid pace for decades. In this sense technological investments, as shown, would be essential providing new opportunities and spaces to leverage their demographic and social conditions. Following this path the private sector has a key role to play, both as a source of employment and in furthering economic diversification into new sectors. Enhanced infrastructures and openness to trade will help ensure viable opportunities for businesses to invest and grow. Improved education standards, as already done by some countries, would be essential to ensure that the growing pool of workers has the necessary skills. Flexible labor markets will be crucial to ensure workers' competitiveness, and financial development will help tap savings for enhanced investment. In the near term, it is likely that the bulk of job creation will remain in the informal sector, so efforts to enhance the productivity of the informal sector will be vital. On these bases it could be argued that Sub-Saharan African countries stand at a crossroad. Successful reduction of mortality and fertility rates, combined with effective implementation of supporting policies, could enable these countries to capture a large demographic dividend and improve the quality of life for all their citizens. But failure to seize the opportunity provided by the demographic transition could result in a rapid growth in the number of unemployed citizens, with potentially severe political, social, and economic consequences worsening the already non optimal framework.

CHAPTER II

Gulf's technological investments in Sub-Saharan Africa

Moving to the second chapter of this dissertation, it will go more in depth than the previous one trying to analyze the technological investments taken by the cited Gulf countries (Saudi Arabia, United Arab Emirates and Qatar). The area covered will be circumscribed by those investments adopted in three distinct fields, namely ports, mining, and digital infrastructures, since they are innovative and different from the traditional ones.

Even though the paths followed are several and distinct, Gulf countries share a common idea. They consider the sub–Saharan Africa region as a new and profitable revenue area not already totally exploited by the other powers. In this sense the approaches taken reveal the economic diversification strategy from the fossil fuels dependency in all its nuances. This should ensure not only the autonomy from fossil fuels from an economic and social point of view, as explained before, but it should be essential to affirm a new geopolitical position of the Gulf region as new and strong player in the international scenario. As explained, taking advantage of the resources offered by sub-Saharan Africa should ensure the access to a promising reality in the upcoming years.

In such a framework, as said, the three Gulf countries analyzed have adopted distinct paths, converging, and, at the same time, diverging from each other. They have invested and are investing huge quantities of moneys through public and private funds in technology in such territories pursuing the same cited aim. The United Arab Emirates, as the leading state in the territory, have invested more in ports infrastructures than the others, creating, controlling, and financing the great majority of the African maritime infrastructures. This has ensured the possibility to pose itself as a credible and strong logistic hub for the region since the relevance of such assets posed at the crossroad of the most important economic corridors. Despite KSA and Qatar have not followed the same strategy not achieving the same results in this field, they have chosen different paths focusing on different arrangements in the mining and in the digital sector. Concerning the former, it is

essential to ensure the control of the critical materials as necessary elements for the upcoming future based on the energy transition and on the digital revolution. In this field the Kingdom of Saudi Arabia is one of the most active (even tough UAE is not playing a lesser role) signing several MoU with those countries rich in such resources. Qatar also is showing its role following quite the same path. Moving to the latter aspect, the efforts towards the fourth industrial revolution, it is at the core of these strategies considering the huge potential in economic, political, and social terms. As a real promising area, the three Gulf states are investing a lot to grasp the resulted projected dividends trying to guide the huge digital potential of the sub-Saharan's population. Following such a framework, a common thread emerges since these three aspects are related in a consequential way. The control of port infrastructures and of the related corridors poses the bases for the Gulf penetration opening also to the possibility for mining concessions in landlocked countries. The mineral resources obtained are then fundamental for achieving the cited economic diversification as a necessary step for the Gulf countries' future prosperity. From such connected background these issues showed will be assessed as follow. The first section will focus on ports' infrastructural plans, the second will be more concentrated on the mining sector, while the third one will conclude the chapter with the digital investments. It is also remarkable to note as these issues will be analyzed considering the large differences that each country has set in the pursuance of its own objectives. Such discrepancies will guide the dissertation paving the way for the final, closing evaluation in the last chapter.

2.1. UAE's ports strategy

Starting with the port strategy, this is a field almost entirely occupied in this dissertation about Gulf states, by the UAE. Even tough also Saudi Arabia and Qatar are attempting such strategy, the UAE stays in a prominent position. In fact, they have approached such aforementioned strategy long time ago (around the mid-2000s) and in some cases before the other powers interested in sub-Saharan Africa

(China and Russia mainly)[84]. As a first general element to note there is the significance of ports infrastructures as global gateways. Their control, in fact, is something vital for a country that aims to extend its economic and political power in the international scenario, like the UAE. In this sense controlling ports is essential in economic and political terms and in general in the geopolitics of power.

On these bases classic geopolitics first, and its legacies after, considered ports and its related aspects as a key topic of discussion. The so-called Sea power theory, drawn up by Alfred Mahan, considered the control of the sea by maritime commerce and naval supremacy as a mean for the world influence predominance. Following this thesis, the US Admiral noted that geopolitical power required access to secure ports that provided safe heavens to merchant and military fleets. A competitive or even hostile context of competing maritime nations led to the creation of colonies as the ultimate form of securing trade and military power projection. Ports and naval bases were the infrastructure to support military and commercial fleets and thereby dominate maritime trade.[85] Despite subsequent theories followed in some cases different paths, the core element of Mahan's theory, centered on the key role played by ports, can be considered accurate in geopolitical terms. In this sense ports are point of convergence between the maritime domain of global trade and the territorial domain of hinterlands, states, and regions. This is reinforced by the geographical location of such infrastructures. Standing at the crossroads of maritime and terrestrial economic routes, they are set to become key chokepoints for the international trade. Being nodes in transportation and commercial networks, they are essential for the economic and political role of a country. This is confirmed by data as ports are responsible for 80% of the global trade by volume and 70% by

[84] Eleonora Ardemagni, "One Port, One Node: The Emirati Geostrategic Road to Africa," ISPI, June 13, 2023, https://www.ispionline.it/en/publication/one-port-one-node-the-emirati-geostrategic-road-to-africa-131893.

[85] Hassan Noorali, Colin Flint, and Seyyed Abbas Ahmadi, "Port Power: Towards a New Geopolitical World Order," Journal of Transport Geography 105, December 2022: 103483, https://doi.org/10.1016/j.jtrangeo.2022.103483.

value acting like drivers of economic growth[86]. Moreover, they can be nodes in networks in military terms. In this case the control of maritime military bases or locations is a projection of military power. Overall, ports can be considered as geographical strategic locations projecting economic, political, and military power[87].

In such a theoretical framework, the United Arab Emirates have implemented a comprehensive port strategy aimed at establishing themselves as a global maritime hub and a key player in international trade. This strategy should pave the way for the economic diversification from fossil fuels opening UAE to new opportunities and resources. Leveraging its geographical strategic location at the crossroads of major trade routes between Europe, Asia, and Africa, the Emirates have developed world-class port infrastructure and services: a real and effective port strategy to obtain the control of such strategic infrastructures and expand the economic and political power of the country. In addition to the mentioned geographical strategic location that gives UAE a significant advantage in global trade connecting markets in Asia, Europe, Africa, there are other factors that exhibit such a strategy. One is related to the infrastructure's investments. UAE has invested heavily in developing state-of-the-art port infrastructure. This includes deep-water ports capable of accommodating the largest container ships, modern terminals equipped with advanced handling equipment, and extensive logistics facilities. They have been developed not only inside the Emirates, but also outside, particularly in Africa, as will be explained below. As a second related factor there have been also huge investments in port expansion. In fact, the major ports in the UAE, such as Jebel Ali Port in Dubai, Khalifa Port in Abu Dhabi, and Port Rashid in Dubai, have undergone extensive expansion and development projects to increase their capacity and efficiency. These expansions aim to meet the growing demand for maritime services and accommodate larger vessels. The UAE has also established numerous free trade zones and special economic zones within its ports, offering businesses

[86] Tilmann Feltes and Annika Schröder, "East African Ports in the Geostrategic Scramble," www.kas.de, Konrad-Adenauer-Stiftung, October 30, 2023, https://www.kas.de/en/analysen-und-argumente/detail/-/content/east-african-ports-in-the-geostrategic-scramble.

[87] Ibidem.

favorable conditions for trade, investment, and manufacturing. These zones provide incentives such as tax exemptions, streamlined customs procedures, and 100% foreign ownership, attracting multinational companies and facilitating trade flows. Moreover, this port strategy emphasizes seamless integration with other transport modes, including road, rail, and air transport (especially in Africa taking advantage of the most profitable corridors of the region). This multimodal connectivity enhances the efficiency of cargo movement and strengthens the country's position as a logistics hub. As concluding elements, it is worth to also note the adoption of automation, digitalization, and smart port technologies, the focus on sustainability, minimizing environmental impact, and finally the international partnerships' aspects. In fact, the UAE actively seeks partnerships with international port operators, shipping lines, and logistics companies to leverage expertise, access new markets, and enhance competitiveness on the global stage. Overall, what emerges from this brief dissertation that will be examined below in details, is that such port strategy reflects the UAE's ambition to become a leading maritime and logistics hub, driving economic diversification, promoting trade growth, and fostering innovation in the sector, addressing as last summarizing issue the highlighted upcoming challenges. Overall, this port strategy has been pursued and is currently carried out through the two leading logistic companies of the UAE: DP World and Abu Dhabi Ports. Through these two logistic companies (the former is among the worldwide leader concerning ports and the related logistic infrastructures) the Emiratis have pursued lots of investments in port infrastructures (ports, dry ports, and logistic platform). These companies have in fact obtained concessions for ports' control and renovation, signed MoU for the same purposes, acquired local companies and developed partnerships with others. Moreover, they have established, in some cases, military ties (defense industry cooperation; defense procurement; military cooperation and training), with the same African countries in which they have run commercial-maritime infrastructures[88]. What emerges, yet again, is the geostrategic presence that the Emirates pursued through port

[88] Eleonora Ardemagni, "One Port, One Node: The Emirati Geostrategic Road to Africa," ISPI, June 13, 2023, https://www.ispionline.it/en/publication/one-port-one-node-the-emirati-geostrategic-road-to-africa-131893.

infrastructures. Establishing such facilities they should ensure themselves the access to those countries highly promising in terms of human and materials resources as explained in the first chapter of this thesis. The ultimate objective falls within the broader Emiratis' strategy of which ports are the most visible part. Starting, in fact, from a different understanding of the world, not bipolar or multipolar but networked, no longer based on ideology or political affinity but simply on economic interest, UAE are pursuing an innovative connectivity strategy[89]. Practicing huge investments in connectivity facilities (from ports to other types of deals), the Emiratis are trying to position themselves as a sort of global gateway into emerging markets. One of the most important examples is clearly Africa since the incredible owned potential. In this case, in fact, the Emiratis have invested a lot in such facilities controlling the most important ports of the region. Moreover, such ports are located on the edges of the most important economic corridors connecting landlocked countries, often rich in natural resources, to the international trade. Financing such infrastructures as well as other facilities (one of the most important national development funds, the Abu Dhabi Fund for Development is particularly active in Africa emitting loans and grants for development projects), the Emiratis have acquired and are acquiring a central location in the region, becoming the principal partner of these countries. They, in fact are trying to position themselves as the global gateway into Africa for Russia, China, and Western countries. Overall, this approach reveals the original intent to depart from fossil fuels dependence using its revenues to reinforce and enlarge its global status vis a vis its rivals (like the other states of the Gulf and especially China), but also towards other powers (Western countries) becoming an economic connector between the East and the West[90].

Going more specifically to sub-Saharan Africa, the Emirates have adopted the strategy outlined up to now. They have invested heavily in sub-Saharan Africa's

[89] M. Baharoon, "The Keys to Reading the UAE's Strategic Map," Middle East Institute, 2022, https://www.mei.edu/publications/keys-reading-uaes-strategic-map.

[90] Bianco, Cinzia. "Rest Meets West: How the UAE Keeps Its Economic Ties Open." ECFR, February 23, 2024. https://ecfr.eu/article/rest-meets-west-how-the-uae-keeps-its-economic-ties-open/.

port infrastructures getting access to the economies and markets of the region thus becoming the second largest investors alongside the US and behind only China[91]. Particularly, between 2022 and 2023 the Gulf state has pledged $97 billion in African investments outpacing China in this timeframe[92]. Such territories, in fact, are, as said, very rich in resources (materials and humans) but also poor in terms of economic and social facilities. In addition, global powers have not yet well positioned granting UAE freedom of movement in the area. On these grounds, the Emiratis have obtained the outlined ranking making considerable investments there. Such invested capital, as said, varies, ranging from ports (the core nodes of the Emiratis' strategy) to other facilities like logistic platforms, economic corridors, or free trade zones. To secure their position in the area also military facilities have been established as will be analyzed below with regard the African Horn. This has ensured the Emiratis' leading presence in the region being very active in its economic and social development. As data below shown, they have managed to cover almost entirely the African continent and the Sub-Saharan region placing their facilities in all the strategic points of sub-Saharan Africa. Overall, what emerges, another time, from the Emiratis strategy in Africa and, more specifically, in its Sub–Saharan region is the need to fortify the UAE position as a gateway to African markets while securing access to its products. So far, the Emiratis strategy seems successful, taking up almost all the Sub-Saharan African territory as shown in the following table. In addition, DP World has not only invested over $ 1.8 billion in Africa but also plans to invest a further $ 3 billion in coming years reinforcing another time the central position held by such port strategy[93]. Such efforts should be positive not only for the Emiratis economic and strategic interests, but also for

[91] Maddalena Procopio Čok Corrado, "Green Synergies: How the EU, the UAE, and Africa Can Cooperate on Energy," ECFR, November 9, 2023, https://ecfr.eu/article/green-synergies-how-the-eu-the-uae-and-africa-can-cooperate-on-energy/.

[92] David Pilling, Chloe Cornish, and Andres Schipani, "The UAE's Rising Influence in Africa," Financial Times, Financial Times, May 30, 2024, https://www.ft.com.

[93] Middle East Briefing, "UAE Dominates GCC Investments in Africa," Middle East Briefing, March 18, 2024, https://www.middleeastbriefing.com/news/uae-dominates-gcc-investments-in-africa-port-infrastructure-renewables-a-key-focus-area/.

the region. Sub-Saharan Africa countries should gain important infrastructures financed by the UAE obtaining access to new important promising markets for their fragile internal assets.

UAE's port strategy in Sub- Saharan Africa		
Country	**DP World**	**Abu Dhabi Ports**
Kenya	Mombasa port, exports coffee, tea, cotton, oilseeds, nuts, kernels, soda ash and cement / imports include crude oil, LPG, fertilizers, steel, grain, and machinery / traffic approx. 1,750 vessels, 19,000,000t of cargo, 620,000TEU and 30,800 passengers handled annually (logistic facility) - Embakasi, Mlolongo, Nairobi (logistic facilities)	No
Mozambique	Maputo port, traffic approx. 6,380,000t of cargo annually / capacity: 300.000 TEUs Beira port, traffic approx. 4,000,000t of cargo handled annually (port facility) - Pemba port imports general cargo, machinery, food stuffs /	No

	exports timber, maize, cotton, seed cotton, petroleum / traffic approx. 30 vessels annually (logistic facility) - Macia, Xai Xai, Chimoio, Tete, Mocuba, Nampula (logistic facilities)	
Nigeria	Aba, Abuja, Benin City, calabar, Enugu; Gombe, Ibadan, Ilorin; Jos, Kaduna, Kano, Katsina, Lagos, Maiduguri, Makurdi, Onitsha; Owerri, Oyo, Port Hacourt, Sapele, Sokoto, Uyo, Warri, Yola (logistic facilities)	No
Sudan	Port Sudan, feeder services / traffic approx. 8,600,000t cargo, and 431,000TEU handled annually.	Abu Anama port, under construction
Somalia	Bosaso port, under expansion	No
Somaliland	Berbera port, imports cotton goods, sugar, rice and dates / exports skins, ghee, gum, sheeps, and goats / traffic approx.	No

	240,000t cargo handled annually.	
Djibouti	Djibouti port, feeder services / traffic approx. 5,816,000t of cargo and 293,000TEU handled annually.	No
Senegal	Dakar port, exports ground nuts, edible oil, oil cake, gum, gold, sisal, shea butter, kapok, hides, phosphates, flour, and cement / imports cotton, metal goods, oil fuel, petrol, wine, coal, sugar, and corn / traffic approx. 2,400 vessels, 10,100,000t of cargo and 425,000TEU handled annually. - Ndayane port / under construction since 2022 / expected capacity: 1.200.000 million TEUs annually.	No
Guinea	No	Kamsar port, export: bauxite transport to China / capacity: 2000 TEUs annually.
Democratic Republic of Congo	Banana / under construction / expected capacity: 450.000 TEUs annually.	Pointe-Noire Abu Dhabi Ports Group, HoT (preliminary to concession) signed in

		2023 to develop, operate and manage the New Mole Port / export copper, diamonds, and gold.
Congo	No	Pointe Noire port, export copper, diamonds, and gold / traffic: approx. 647 vessels and 2,840,000t of cargo handled annually.
Angola	Luanda port, exports coffee, palm kernels and palm oil, sugar, cotton, diamonds, maize, wax, sisal, salt, manganese and petroleum products / imports motor vehicles, cotton goods, iron and steel, cement, machinery, flour, coal, and oil / capacity 12.000 TEUs annually	No
Botswana	Gaborone (healthcare, consumer services)	No
Ghana	Accra, Kumasi, Takoradi, Tamale, Tema (healthcare, consumer and other services)	No
Namibia	Walvis bay port, exports coffee, palm kernels and palm oil, sugar, cotton,	No

	diamonds, maize, wax, sisal, salt, manganese and petroleum products / imports motor vehicles, cotton goods, iron and steel, cement, machinery, flour, coal, and oil / traffic approx. 3,000 vessels, 5,000,000t of cargo - Keetmanshop, Windhoek, Tsumeb, Ondagwa (consumer and healthcare services)	
Tanzania	Dar es Saalam port	No
Rwanda	Kigali dry port, capacity: 50000 TEUs	No
South Africa	Komatipoort dry port (port facility) - Cape Town port, exports agricultural products / imports machinery, clothing, and tiles / traffic: approx. 4,000 vessels and approx. 8,000,000t of cargo handled annually / capacity: 316,000TEU (logistic facility) - Boksburg, Durban, East London Germiston, Johannesburg, Mandeni, Ngodwana, Polokwane,	No

	Port Elizabeth, Pretoria, Richards Bay, Secunda, Stanger, Uitenhage, Umhlanga, White River, Witbank (logistic facilities)	

Table 1: *UAE's port strategy in Sub-Saharan Africa*

Source: *DP World, "DP World Product Services Map," map.dpworld.com, 2024, https://map.dpworld.com/.*
AD Ports, "Abu Dhabi Ports | Navigate the Future of Trade and Logistics," Abu Dhabi Ports, 2024, https://www.adports.ae/.

These data confirm what has been said until now, showing the large extension of UAE in Sub-Saharan Africa through its national ports' companies DP World and Abu Dhabi Ports. Going more in depth it is relevant to note, briefly, some of most valuable Sub-Saharan key ports, in terms of their capacity (TEUS), controlled by the UAE's companies. One of these is represented by those ports in Senegal, where DP World controls the port of Dakar. Because of its capacity, well below that of the other ports of the region, DP World has planned in 2022 to invest $ 1.1 billion in Ndayane to create one of the largest ports of the area, becoming, also, the largest private investment in West Africa[94]. Exploiting such ports and the related free economic zones, which should be established, the UAE should obtain a fundamental node in international trade. Senegal should improve its strategic position as a gateway for West and Northwest Africa favoring not only UAE but the African country itself. These infrastructures (particularly the new port) should facilitate additional trade by 3% of the country's GDP. In addition, it should contribute to a cumulative increase of $15 billion in national trade by 2035, with the port projected to handle 18% of GDP and 36% of Senegal's trade by that year. Trade facilitated by the port is expected to support 2.3 million jobs in Senegal, with 22,000 of those jobs created through additional trade. The agricultural and fishing

[94] D. Ba, "Construction Begins at DP World's $1.1 Bln Port in Senegal," *Reuters*, 2022, https://www.reuters.com.

sectors, crucial for both local sustenance and export to international markets, too should benefit from such infrastructure. Petrosen, Senegal's national oil company, plans to construct a $ 1.45 billion urea fertilizer production unit at Ndayane with a capacity of 1.2 million tons per year. Scheduled to commence operations concurrently with the port in 2027, this facility aims to reduce fertilizer imports, narrow the trade deficit, and enhance agricultural output[95]. The approach followed by the Emiratis resembles what has been described until now: ports usually pave the way for other projects and investments. As reported by the United Arab Emirates Ministry of Foreign Affairs, in fact, from 2008, the year when Dakar port has been built, several activities started in the region. These include those efforts taken by Emirates Airlines contributing to the Senegalese economy at around $ 35 million per year. A project to build a solar power plant funded by the Government of Abu Dhabi and executed by Masdar Company. A construction project for the Khalifa Bin Zayed Center for professional training in the city of Mbour and finally another construction project for the Mohammed Bin Zayed Center for Innovation and Entrepreneurship in Dakar[96]. Similar and somehow more important is the case of Tanzania and its port located in Dar es Salaam. In 2023 DP World signed a 30-year concession agreement with the Tanzania Ports Authority to operate and modernize the multi-purpose Dar es Salaam Port, connecting Tanzania and the wider region to global markets[97]. Such investment, whose amount ranges between $ 250 million and $ 1 billion, is a strategic move taken by the Emirati's company. It should become a key logistic hub not only for Tanzania, rich in some critical resources, but also for nearby landlocked countries. Spanning from Zambia to Democratic Republic of Congo, the area is rich in critical resources, whose values will be

[95] EnergyCapital&Power, "Ndayane Port: Senegal's Gateway to Economic Growth," energycapitalpower.com, EnergyCapital&Power, March 15, 2024, https://energycapitalpower.com/ndayane-port-senegal-economic-growth/.

[96] United Arab Emirates Ministry of Foreign Affairs, "UAE Embassy in Dakar-Economic Cooperation," www.mofa.gov.ae, 2021, https://www.mofa.gov.ae/en/Missions/Dakar/UAE-Relationships/Economic-Cooperation.

[97] DP World, "DP World Signs 30-Year Concession to Operate Multi-Purpose Dar Es Salaam Port in Tanzania," *DP World*, October 22, 2023, https://www.dpworld.com/news/releases/dp-world-signs-30-year-concession-to-operate-multi-purpose-dar-es-salaam-port-in-tanzania/.

analyzed in the second paragraph. For the time being, it is important to stress such strategic aspect since the port should occupy a central position connecting the UAE with the rest of Africa controlling, consequently, a significant part of its trade.

Another example that followed the same path is represented by Mozambique. In this case DP World controls the port of Maputo (within the tenth largest in term of TEUs) and other logistic facilities strategic for their connection with the East. Its projected expansion, announced in 2022, should increase the port's revenues impacting positively on employment opportunities and in general on the country's well-being. Even in this case such investments pave the way for others in distinct fields like that of energy [98]. There are many other examples regarding the success obtained by UAE in Africa through its port's infrastructures strategy, however, for the purposes of such research it may seem relevant analyzing this approach applied in the African Horn.

2.1.1. The UAE in the Horn of Africa

The Horn of Africa, as a geographic area that includes Ethiopia, Eritrea, Somalia (and its autonomous region Somaliland), Djibouti and partially Sudan and South Sudan, is a particular field to observe the UAE's port strategy. This area, in fact, owing to its crucial geostrategic location (as known it runs along the Red Sea, connecting the Mediterranean region with the Middle East, Eastern Africa, and the Indian Ocean, has been and is currently the object of the expansionistic ambitions of several powers seeking to enlarge their influence and access to trade routes. This is confirmed by the fact that in 2024 the 12% of the global trade and the 25% of digital data runs through the Red Sea. Such geostrategic position influences the stability of the region, which is already one of the most fragile of the world. This is the result of multiple factors stemming from demographic, economic, social, and

[98] United Arab Emirates Ministry of Finance, "Ministry of Finance Signs Agreement on Mutual Promotion and Protection of Investments with Mozambique – Ministry of Finance – United Arab Emirates," UAE Ministry of Finance, 2023, https://mof.gov.ae/ministry-of-finance-signs-agreement-on-mutual-promotion-and-protection-of-investments-with-mozambique/.

political issues. It has one of the highest fertility rates of the world trialing the already cited youth bulge. At the same time, it is currently not able and should not be in the future, according to the current conditions, to harness such demographic dividend since it has, also, one of the lowest GDP per capita worldwide. In addition, the Horn is severely hit by climate change being highly vulnerable to its effects. Considering such issues is quite easy to understand why these countries of the Horn are considered high fragile states ranking in the first twenty positions of the Fragile State Index in 2023[99]. Moreover, on the bases of their strategic location, lots of countries have undertaken economic, political, and military relations (since the cited long-term instability of the region) with the region's countries, controlling and financing distinct projects and infrastructures. Among the states involved there are those of the Gulf whereof the Emiratis play a significant role. As for its neighboring countries, UAE share geographic, cultural, and historic ties with the Horn. This has pushed and is pushing the country towards a multifaceted interest on the region driven by economic opportunities, security concerns, and strategic considerations.

Following the strategy outlined so far, the Emiratis have primarily and foremost invested on port infrastructures. Such investments, taken in a very pragmatic way, as said, are the first steps to deepen the relation with the Horn's countries. UAE's infrastructures cover the entire region (and the related straits) controlling those ports located in Sudan (Port Sudan), Djibouti (Djibouti port), Somalia (Bosaso port) and even over the contested autonomous region of Somaliland (Berbera port). This has ensured UAE the control of such strategic corridor. From such investments they have begun to send increasing inflows of funds in different forms and through distinct channels expanding their presence in the region. This has been reinforced by the Emirates' military presence there (being in Eritrea and Djibouti and taking part also to several mission in the region) to secure such strategic assets. However, the Horn is a very complex area where, besides international rivalries, regional clashes flare the ground. Starting from the north, Sudan is living from 2023 a bloody and destructive civil war between the governmental forces and the military rebels (Rapid Support Forces). Having divided the country in two distinct parts, a short-

[99]The Fund for Peace, "Fragile States Index | the Fund for Peace," fragilestatesindex.org, 2023, https://fragilestatesindex.org/.

term conflict resolution appears hard to get. Moving southward Ethiopia and Eritrea are not currently in good terms arguing over the coveted sea access claimed by Addis Ababa. In such a tricky situation they are also supporting opposite sides in Sudan confirming what has been said. It is also critical to consider as Somalia is plagued by the unrecognized Somaliland's issue. In such a field Somalia is not only arguing over the interest showed by Ethiopia to Somaliland to get access to the sea but is also facing those threats posed by the terrorist organization Al Shabab, and the other separatist issues pushed by the semi-autonomous region of Somalia, particularly Puntland. Overall, what emerges from this brief overview about the African Horn is a very fragile and tricky situation with potentially harmful effects for Europe and global trade in general terms. The Emiratis, as said, are involved in such disputes being present in the region from a commercial and security perspectives. Starting from Sudan, UAE control, as showed not only the strategic Port Sudan through DP World, but also has signed an agreement in 2022, in this case through Abu Dhabi Ports Group, to build and manage the port of Abu Amama in the northern part of the country[100]. Such investment whose value should amount to 6 billion $, should include the creation of an economic zone and other connected projects to reinforce its connection with this crucial area. In the Sudanese context it is also worth noting the Emiratis involvement in the civil war supporting, even though often belied, the RSF[101]. Despite this, the UAE keeps their economic inclination pursuing their strategy by any means. For this reason, such economic interests may push them towards a pivotal broker role for the stabilization of the country. Concerning Ethiopia and Somalia, the Emirates have moved in a particular way to obtain the largest advantages for themselves. They have, in fact, financed the construction, in 2016, of the Berbera port located in the contested region of Somaliland and of the Bosaso port, in 2017, in the Somalia semi-autonomous region

[100] Reuters, "Sudan to Develop Red Sea Port in $6-Bln Initial Pact with Emirati Group," *Reuters*, December 13, 2022, sec. Markets, https://www.reuters.com/markets/sudan-signs-6-bln-agreement-with-emirati-consortium-develop-red-sea-port-2022-12-13/.

[101] Financial Times, "UAE Denies Sending Weapons to Paramilitary Group in Sudan War," www.ft.com, January 24, 2024, https://www.ft.com/content/8e211c5d-0e2e-4e01-b1e6-b13852485b67.

of Puntland. Investing also in other facilities (free-economic zones and airports), the Emiratis gain the access to two crucial choke points for global trade. This has damaged the relations with Somalia, a country in which the UAE have played an important stabilizing work. However, due to the ambiguous positions taken by Somalia and its unstable assets, the Emirates have adopted different stances towards the cited autonomous regions and towards Ethiopia. In this landlocked country the UAE have financed huge projects amounting to 24 billion $ in 2024[102]. These are mainly infrastructural to promote Ethiopia as one of the most important logistic and trade hubs of the world[103]. The underlying idea is to give Ethiopia access to the sea. In this sense a series of actions confirmed it. Firstly, the financing of the Berbera corridor, connecting Ethiopia with Berbera port. Secondly, the tripartite agreement, taken 2018, between DP World, Somaliland, and Ethiopia, recognizing to the latter the 19% of the Berbera port. Finally, the MoU, signed in 2024, between Ethiopia and Somaliland (and not explicitly by the UAE[104]) granting to the former a 20 km strip of land and to the latter the Ethiopian sovereignty recognition. These maneuvers highlight the cited Emirates idea to reinforce Ethiopia as a reliable regional partner against regional and international threats and enemies.

To conclude this subparagraph and in general the section about the Emirati's port strategy, it is worth noting as the UAE have set a real and effective "string of pearls" controlling most African ports and virtually encircling the sub-continent. This has ensured them a leading role in the region together with huge revenues. However as underlined (even tough covering only some side of the vast sub-Saharan region) and as will be analyzed in the last chapter, such efforts have been not sufficient to address the main African troubles. Nevertheless, their presence and consequently

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[102] Addis Standard, "News: Ethiopia Welcomes DP World's Desire to Jointly Enhance Berbera Port, Will Negotiate Terms of Cooperation," *Addis Standard*, January 25, 2024, https://addisstandard.com/news-ethiopia-welcomes-dp-worlds-desire-to-jointly-enhance-berbera-port-will-negotiate-terms-of-cooperation/.

[103] DP World, "Ministry of Transport of Ethiopia and DP World Sign MoU for the Development of the Ethiopian Side of the Berbera Corridor," DP World, May 6, 2021, https://www.dpworld.com.

[104] Aleksi Ylonen, "On the Edge: The Ethiopia-Somaliland MoU," ISPI, January 30, 2024, https://www.ispionline.it/en/publication/on-the-edge-the-ethiopia-somaliland-mou-162032.

their growing economic interests should push them to pursue a more active role mediating and stabilizing the current and future crisis.

2.2. Mining for Critical Materials

Moving to the second section of this chapter dedicated to the Gulf's technological investments in sub-Saharan Africa region, the focus will be on the mining activities that those countries are carrying out in the region. As said, this aspect is central in that fil rouge that start from ports and reach the digital revolution as a common pathway that Gulf States are following to diversify their economies and to get a new, pivotal, international role. Sidelining the traditional materials (gold, silver, and diamonds) that have largely characterized the scramble for Africa since the 19th century, a special focus will be devoted to critical materials. Such materials whose list is composed by fifty minerals, according to latest definition drawn up by IEA in 2023[105], play a fundamental role in various aspects of modern society, ranging from technology and industry to healthcare and defense. Their definition as critical stems from their scarcity, essentiality in key applications, and the potential risks associated with their supply chain disruptions. Overall, their importance spans several and distinct sectors. One of these is surely related to technological progress. Critical materials are indispensable for the development and advancement of technology. Elements such as rare earth metals, platinum group metals, and certain minerals are essential components in electronics, renewable energy technologies, and advanced manufacturing processes. Linked to this aspect is their environmental side. Critical materials are crucial for the transition to a sustainable and low-carbon economy. Elements like lithium, cobalt, and rare earth metals are integral components of rechargeable batteries and renewable energy technologies such as solar panels and wind turbines. National Security is also related. Lots of critical materials, indeed, are vital for national security and defense applications. These materials are integral to the manufacturing of aerospace components, advanced weaponry, and communication systems. Dependence on

[105] IEA, "Final List of Critical Minerals 2022 – Policies," IEA, February 3, 2023, https://www.iea.org/policies/15271-final-list-of-critical-minerals-2022.

foreign sources for critical materials poses risks to national security, highlighting the importance of diversifying supply chains and ensuring domestic production capabilities. This shows their strategic value and their consequent centrality in the geopolitical order. Such elements influence also economic stability and growth. Industries heavily reliant on these materials, such as automotive, electronics, and healthcare, can face significant disruptions in the event of supply shortages or price fluctuations. Diversification of supply sources and investments in recycling and alternative technologies are essential for mitigating economic risks associated with critical material dependencies. As a latter, connected, feature to consider, critical materials often serve as catalysts or key components in research and innovation across various fields. They enable scientists and engineers to explore new technologies, develop novel materials, and address emerging challenges. Investments in research and development aimed at sustainable sourcing, efficient use, and substitution of critical materials are essential for fostering innovation and overcoming dependency risks. Overall, such critical materials, whose critical nature varies across three stages (critical, near critical, not critical) are fundamental elements for current times, particularly in the energy field [106]. As said, the upcoming energy transition and the consequent decarbonization should imply the disposal of fossil products (particularly oil and its byproducts). Also considering the dependencies on critical materials of the new technologies, this is progressively pushing global powers to obtain those critical materials that, due to their scarcity, have started a real and risky struggle. In this uncertain scenario Africa, particularly its sub-Saharan section, has a huge potential not already exploited. The continent hosts the 30% of the world critical minerals reserves being the home of some of the most important ones. According to the United Nation Conference on Trade and Development (UNCTAD), Africa in 2023 hosted the global 79% of Cobalt, the 47.6% of Manganese, the 21.6% of Graphite, the 5.9% of cooper, the 5.6% of

[106] US Department of Energy, “What Are Critical Materials and Critical Minerals?” Energy.gov, 2023, https://www.energy.gov/

Nickel, the 1% of lithium and the 0.6% of Iron Ore[107]. More in details, the Democratic Republic of Congo (DRC) is the world leader in Cobalt production accounting for more than 60% of the total one, meanwhile Mozambique is a world leader in Graphite production and South Africa and Zimbabwe own the largest reserves of Platinum (South Africa more than the 70%). South Africa is also one of the major suppliers of ruthenium, iridium, and rhodium. Gabon concerning the production of manganese. Mozambique and Tanzania have significant reserves of graphite, and DRC and Zambia are important sources of copper[108]. Such prosperity revels an important potential that if properly harnessed may lead the region to become a global leader in production of minerals and related new technologies. However, such abundance has also attracted global powers in their research of alternative source of minerals from the traditional one (mainly those located in China) resembling partly the old scramble for Africa. Among these countries, also those of the Gulf (mainly Saudi Arabia, Emirates and Qatar) have started their own explorations in the area. Considering the effects which the announced decarbonization should produce over these countries and the concurrent heavily investments in new technologies, the acquisition of such critical raw materials seem essential. For these reasons among the large quantity of investments carried out in sub-Saharan Africa by the Gulf countries, mining has a fundamental role. Moreover, such activities may be beneficial for Africa since they could offer a third way solution beyond the harsh strategies of Western countries and China. Rejecting colonialism of the former and dept traps of the latter, this group of country may be a welcome alternative for African development. Such Gulf countries, in fact, has centralized mining as one of the most important drivers for their diversification strategies.

[107] UNCTAD, "Africa's Rise as a Global Supply Chain Force: UNCTAD Report | UNCTAD," unctad.org, August 16, 2023, https://unctad.org/news/africas-rise-global-supply-chain-force-unctad-report.

[108] The African Climate Foundation, "Geopolitics of Critical Materials in Renewable Energy Supply Chain," 2021, https://africanclimatefoundation.org

2.2.1. UAE's Mining Strategy

Starting from UAE, its approach on mining is enclosed in the strategic plan of the UAE Ministry of Energy & Infrastructure. Its mission, as stated in official website, is "Organizing and planning the future of energy, water, mining, oil and gas, land and sea transport, housing and developing a smart infrastructure that keeps pace with future developments and ensuring sustainable investment in cooperation with strategic partners to enhance competitiveness capabilities and improve society wellbeing"[109]. Following such words, the Emirates have acquired the control of some of the largest and most profitable mines of the region. This has been carried out through the actions of national funds and companies. In the mining field these are the Emirates Global Aluminum (EGA), owned by Mubadala sovereign investment fund, and the International Resource Holding (IRH), owned by the International Holding Company (IHC), the Abu Dhabi holding company. These two national companies are pushing UAE towards the diversification objective redirecting petrodollars to secure copper, nickel and other minerals used in power transmission lines, electric cars, and renewable power. As will be explained, such activities have also been aided by the control of strategic infrastructures to facilitate traffic and by investments in other fields to facilitate concessions from local governments and to pave the way for mining activities. It is notable, for example, as every mineral country in which the Emirates started mineral activities have been covered by Amea power and Masdar, the UAE's renewable energy companies with profitable investments not only in the energy field.

Concerning the former company, EGA, it is among the world's largest premium aluminum producers and the biggest industrial company in the United Arab Emirates outside oil and gas[110]. In Africa, the company is investing in Bauxite deposits located in Guinea. Controlling the Guinea Alumina Corporation, its subsidiary in the Republic of Guinea, the Emiratis have invested $ 5 billion (from

[109] UAE Ministry of Energy & Infrastructure, "Our Strategy," Ministry of Energy and Infrastructure in UAE, 2023, https://www.moei.gov.ae/en/about-ministry/our-strategy.

[110] World Economic Forum, "Emirates Global Aluminum," World Economic Forum, 2024, https://www.weforum.org/organizations/emirates-global-aluminium/.

2013) for the extraction of bauxite and aluminum, two core critical materials[111]. This has ensured the exports to UAE of 14.1 million tones in 2023, huge numbers considering also the projected 400 million tons of bauxite resources to be developed by 2040 and the other $ 1.4 billion of investments to be developed[112]. Such operations, whose strategic value for the Emirates is clear, is reinforced, and completed, by the control of the infrastructures to move the minerals obtained. The Emirates control, in fact, through AD Ports, as showed, the port of Kamsar necessary for transferring products. Moreover, they have financed the upgrading of the existing railway connecting the mines to the port, the so called "Bokè Bauxite Mining Project". Such investments have also created economic and social benefits for the local population. According to the mining company, its annual contribution should amount to $ 700 million with a 5.5% boost to Guinea's GDP. Among such expenditures more than $ 1.3 million have been invested on a program for the development of high potential Guineans for permanent roles in the organization. In addition, 14 million $ have been spent in social and environmental projects covering schools, health facilities and other important projects for the development of the local population[113]. Looking at data reported by the World Bank in 2023 Guinea's growth accelerated in 2022 to 4.7% reducing inflation and foremost public dept from 41.7% in 2021 to 35.6% in 2022[114]. Such strategic relation has been reinforced by UAE in 2024. The Emirates have set other $ 4 billion to be provided to Guinea for development projects[115]. Overall, such data reveal the strong interest of the Emirates on Guinea's resources proposing complementary investment packages on

[111] Emirates Global Aluminum, "EGA's Operations - al Taweela Alumina Refinery & Aluminum Production," EGA, 2024, https://www.ega.ae/en/about-us/operations/guinea-alumina-corporation.

[112] Ibidem.

[113] Emirates Global Aluminum, "Guinea Alumina Corporation Factsheet," EGA, 2022, http://www.ega.ae.

[114] The World Bank, "The World Bank in Guinea," World Bank, September 29, 2023, https://www.worldbank.org/en/country/guinea/overview#1.

[115] Alexander Cornwell and Reuters News, "Guinea Set to Raise $4bln from UAE for Development Projects," www.zawya.com, February 16, 2024, https://www.zawya.com/en/economy/africa/guinea-set-to-raise-4bln-from-uae-for-development-projects-q0dhql7a.

other sectors. This is a model inaugurated by China through its Belt and Road Initiative. However, in that case Chinese have often left African countries deeply indebted with some projects that have stalled[116]. For these reasons the Emirates have proposed such alternative way. In the Guinea's case this could be considered successful, differently from other places where transparency is not always grant.

This could happen with the activities carried out by IRH. It is a young natural resources extractive company with a portfolio of diverse metals and minerals. Its operations cover a rich side of African minerals conducting operations or prospects in Angola, Burundi, Democratic Republic of Congo, South Africa, Tanzania, Zambia, and Zimbabwe[117]. Remarkable is its $ 1.1 billion investment in Zambia's Mopani Copper Mines in return for 51% ownership of the business taken in 2023[118]. In addition, the Emirates' company has announced plans to bid for a stake in the Lubambe copper mine, another profitable cooper mine in Zambia. As for the case of Guinea the strategic move of UAE can be observed firstly in the investments taken by Masdar and Amea Power to lay the foundations for the mine's concession[119]. Secondly, in the control of logistic facilities since DP World, as explained, manage the crucial ports of Dar es Salaam (Tanzania) and Maputo (Mozambique). Such infrastructures provide the connection and the control of minerals traffic from such landlocked countries like Zambia. The associated risk in this case is related to the lack of transparency as explained above. IRH, in fact, is a young national opaque company whose aims and projects are not clearly revealed. They are limited to the statement that it believed "sustainable mining can propel economic growth, deliver meaningful impact in communities, and position the UAE

[116] Harry Dempsey and Chloe Cornish, "How Gulf States Are Putting Their Money into Mining," *Www.ft.com*, Financial Times, April 1, 2024, https://www.ft.com/content/59298650-540a-43cd-86f8-a6c6db0aa906.

[117] International Resources Holding, "About Us," International Resources Holding, 2023, https://irh.ae/about-us/.

[118] Reuters, "Abu Dhabi's IRH to Invest $1.1 Bln in Zambia's Mopani Copper Mines," *Reuters*, December 23, 2023, https://www.reuters.com.

[119] Reuters, "Zambia, UAE to Develop $2 Billion Solar Projects," *Reuters*, January 17, 2023, sec. Energy, https://www.reuters.com/business/energy/zambia-uae-develop-2-billion-solar-projects-2023-01-17/.

as a global leader in resource management"[120]. In addition, the company is suspected to have subsumed the Emirati gold company "Primera Group" accused to not respect due diligence obligations in its extraction activities, particularly those in DRC[121]. These aspects, coupled with the lack of transparency in its projected activities highlights the risk that UAE investments could pose in the territory resembling what done by other powers like the Chinese. This is a risk for all the areas covered. Linked to these risks, it is of interest noting the cited Emirati position in the Sudanese's civil war. Unlike Western and Gulf countries supporting the legitimate governments, UAE has been accused to support the RSF. This is significant for their mining strategy since the RSF currently controls that side of the country marked by precious mines. Even though it is only a presumption, this issue highlights the alleged risk that the Emirati strategy could pose for sub-Saharan Africa countries.

Overall, to conclude this subsection about the Emiratis investments in mining activities it is important to note their huge endeavors to secure critical materials. These are following a different path from the traditional ones, starting from development investments and infrastructural projects to take the first steps and extend their control over the regions. Their greatest strength comes from their neutral position beyond China and US rivalry. However, the risk for the sub-Saharan region, is the lack of transparency and consequently of associated investments resembling what already done by the others.

2.2.2. Saudi's Mining Strategy

Moving to Saudi Arabia, mining is considered a crucial pillar of the cited Saudi Vision 2030. It is, in fact, part of the National Industrial Development and Logistic Program, one of the Vision Realization Programs (VRPs) which are defined as "the

[120] Harry Dempsey and Chloe Cornish, "How Gulf States Are Putting Their Money into Mining," *Www.ft.com*, Financial Times, April 1, 2024, https://www.ft.com/content/59298650-540a-43cd-86f8-a6c6db0aa906.

[121] Ibidem.

driving force behind Vision 2030, working to bring the Vision to life"[122]. Among its multiple strategic targets there is that aimed at "grow and capture the maximum value from the mining sector"[123]. Such objectives represent, as said, the desire to diversify its oil-based economy also providing those (critical) materials essential for the projected technological investments. Several elements confirmed the central role occupied by mining. Surely the existence of a dedicated ministry on mining is one of these. The Ministry of Industry and Mineral Resources was created in 2019 separating from the previous Ministry of Energy and thus highlighting the Saudi primary interest on mining. As a second element there is the predicted GDP $ 75 billion contribution of the mining sector by 2035, up to $ 17 billion[124]. Finally, the establishment of the Future Minerals Forum to spark discussions about international cooperation in the field, confirmed the Saudi direction intended to affirm Saudi Arabia as global mining hub.

Concerning the activities carried out by the Kingdom, it is pursuing, as showed, a nation building approach in which the state is the main driver of the mining programs. The main effort is represented by the need to exploit the domestic minerals reserves whose value amounts to 2.5 tones of mineral assets[125]. Even tough large programs have been set out through the action of the world's largest oil exporter, Saudi Aramco, alongside state mining group Ma'aden, the Saudi territory does not hold all the minerals needed. For such reason the Kingdom is interested in new, promising areas like those described in the sub-Saharan region. For the same reason in 2023 there was the creation of a proper mining investment company, Manara Minerals, a joint venture stemming from Ma'aden and the Public Investment Fund. The approach adopted by Saudis is mainly based on the actions taken by these two mining companies in addition to SABIC, the national chemical

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[122] Saudi Vision 2030, "Saudi Vision 2030," www.vision2030.gov.sa, 2023, https://www.vision2030.gov.sa/en/.

[123] Ibidem.

[124] Invest Saudi, "Invest Saudi," Invest Saudi, 2024, https://www.investsaudi.sa/.

[125] Harry Dempsey and Chloe Cornish, "How Gulf States Are Putting Their Money into Mining," *Www.ft.com*, Financial Times, April 1, 2024, https://www.ft.com/content/59298650-540a-43cd-86f8-a6c6db0aa906.

manufacturing company. Overall, as will be showed the Saudi's strategy is mainly based in share acquisition of western mining companies in search of quick and large funding. In addition, such investments are often coupled by development projects carried out by the Saudi Fund for Development (SFD). Concerning the former company, Ma'aden is active in a wide range of countries (including the sub-Saharan African ones) carrying out explorative and mining activities of base metals, phosphate, aluminum, and industrial minerals. Even though from open data its assets are not always recognizable, some investments are detectable. One of these is that taken in Mauritania where the Saudi Minerals Company was created. Such Mauritanian company with Saudi financing operates in the field of mining especially of gold and foremost iron[126]. As said, such economic ties are often simplified by development projects. Mauritania, indeed, has been supported by SFD in 53 development projects amounting to $ 800 million with others programmed for the upcoming years[127]. Another important move is the agreement finalized in 2023 with the US mining company Ivanhoe Electric Inc. Through the agreement the Saudi company has purchased 9.9% shares in the company obtaining important assets in sub-Saharan Africa[128]. The US company's portfolio, in fact, include three cooper and nickel mines in DRC and South Africa in addition to other minerals exploration in the region. Moreover, Ma'aden has incorporated Meridian Consolidated Investments Limited, a leading company in fertilizer and phosphate extraction operating in Malawi, Mozambique, Zambia, and Zimbabwe. Confirming what said, these countries have good relationship with Saudi Arabia since the large investments taken in their territories. Concerning Manara Minerals, its approach is quite like that taken by its begetter despite some differences. Such joint venture has been set to acquire minority investments into established operations run by blue-chip companies to receive metals supply. This pathway has been followed in several

[126] Saudia Maaden, "Saudi Maaden | Gold & Iron Mining & Exploration in Mauritania," Saudi Maaden | Gold & Iron Mining & Exploration in Mauritania, 2022, https://www.saudimaaden.com/.

[127] Saudi Fund for Development, "SFD Kicks off Development Projects in Mauritania | SFD Portal," www.sfd.gov.sa, June 28, 2022, https://www.sfd.gov.sa/en/n326.

[128] Ma'aden, "Maaden - Details," www.maaden.com.sa, 2023, https://www.maaden.com.sa/en/news/details/576.

circumstances like in those $ 15 billion announced investments in DRC, Guinea, and Namibia[129]. Overall, as said what emerges is the Saudi intention to provide huge investments in the mining sector in a different way from that adopted by the Emiratis which have a longer standing tradition in the region than Saudi Arabia. However, such minority investments in western companies are welcomed by industry giants. Gulf cash and the related political cover should allow them to make riskier investments like those in DRC highly regarded by the US[130]. Moreover, Saudi Arabia is also seeking to be an integral part of the global economy by becoming part and the hub of the global supply chain and trade of minerals. Such investments should be also pivotal for all the projected digital investments ensuring a solid grounding. The risk for African countries, however, as seen from the shortage of data, is the lack of transparency. As for the Emiratis, and as will be explained for Qatar, these countries' investments are opaque. This is one of the reasons why those taken by Saudis are often welcomed by Western companies even though harmful for the continent. The lack of transparency, as said, posed the high risk that the Saudi activities there could resemble what already done by western countries and China.

2.2.3. Qatar's Mining Strategy

Concluding this section about mining with Qatar, this country shares some issues with the other Gulf countries analyzed, even if some differences highlight its autonomous approach. As a first element to consider there is the cited Vision 2030. As for the other countries of the Gulf, also Qatar has planned its diversification strategy from oil through an ambitious Vision to be realized by 2030. However, as already mentioned, its diversification approach is different from that projected by its neighboring countries. Qatar is rich in Natural gas being one of the three largest producers and, consequently, exporters in its liquified form (LNG). This ensures

[129] Reuters Editorial, "US, Saudi Arabia in Talks to Secure Metals in Africa, Wall Street Journal Reports," Reuters, September 10, 2023, https://www.reuters.com/.

[130] Ibidem.

Qatar a fundamental revenues' source with a longer lifespan compared to that coming from oil. Due to LNG's role as the transition's fuel of next decades, Qatar does not need to abandon such valuable livelihood. Conversely, Doha is using such important energy source as one of its main foreign policy's drivers. Moreover, similarly to what performed by the other Gulf countries lots of its resources are invested in development projects carried out mainly by the national Qatar Fund for Development. The national Fund has invested heavily in lots of development projects covering almost entirely the region. Remarkable is also the role played by Qatar Airways, the Qatar national airline in its attempt to cover and connect all the continent. Controlling twenty-nine destinations, its objective is to the extend the Qatari footprint all over the region increasing its economic and political ties with local governments. The launch in 2023 of the Kigali Africa Hub by Qatar Airways Cargo is an example of the strategy outlined leveraging its projected role as logistic hub of the continent. Such Agreement should pave the way for other strategic partnerships including mining for critical materials whereof Rwanda is abundant[131]. Moreover, Doha, leveraging its diplomatic broker role, is considered a central player of the region forging and strengthening economic and political ties (including those related to the mining activities) with the local actors. Such framework highlights the Qatar mining premises in sub-Saharan Africa. Moving more in details, Qatar mining strategy is carried out mainly through the national Qatar Mining Company (QM). This, state-owned mining company is exploring opportunities for investment in mining projects across various commodities, including gold, copper, and iron ore, in Africa to secure long-term mineral resources for Qatar's industrial and economic development. From its establishment in 2010, QM has focused on exploration in Sudan obtaining concessions in several areas. Operating through its subsidiary in Sudan, QMSD, the company is conducting mining activities, mainly of cooper and gold, in the advanced exploration project of

[131] Qatar News Agency, "Qatar Economic Forum/ Rwandan President Stresses Importance of Strategic Partnership between His Country and Qatar," www.qna.org.qa, May 23, 2023, https://www.qna.org.qa/en/News-Area/News/2023-05/23/0050-qatar-economic-forum-rwandan-president-stresses-importance-of-strategic-partnership-between-his-country-and-qatar.

Jebel Ohier and other exploration projects in nine different locations of Sudan[132]. Such mining involvement in Qatar has been and is currently supported by several related investment in the country. Remarkable are those announced in 2022 regarding the Darfur region and covering a wide range of sectors like agriculture, livestock and mining itself[133]. In addition, such interest has been demonstrated by several development and aid projects carried out by the Qatar Development Fund also supporting the legitimate government during the current civil war. In this scenario Qatar has adopted a similar approach to that of Saudi Arabia, diverging, as showed, from that of UAE. Overall, these two diverging stances highlight the different interests, Qatar for its mines on the Red Sea mountains (controlled by the legitimate government), UAE for those mines in the central area of Sudan (controlled by the RSF). In the assessment of the Qatar mining approach, it is also noteworthy the acquisition by the national holding companies of minority stakes of foreign mining companies. A pivotal role in this strategy is played by the Qatar Investment Authority (QIA), the Qatar sovereignty's wealth fund. Holding originally 12% of the mining company Xstrata, after its fusion with the Swiss mining company Glencore, it maintains its bid[134]. Through this company also Qatar is involved in those minerals revenues coming from Mozambique, South Africa, RDC, Botswana, Zambia, and Guinea. QIA has owned also, in 2011, 10% stake in Goldfields company, active in gold mining in Ghana and South Africa[135].

Following what already said for UAE and Saudi Arabia, also Qatar activities are often opaque. This feature does not grant a complete and exhaustive overview of the projects and investments taken by the country. Several announcements, in fact, have been made about projected cooperation with mineral resources rich countries

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[132] QMSD, "QMSD Mining Co Ltd – Qatar Mining Company (QM) Official Website," Qatar Mining, 2023, https://www.qatarmining.com/our-projects/qmsd-mining-co-ltd/.

[133] Gulf Times, "Darfur Seeks Qatari Investments in Sudan's Agriculture, Mining, and Infrastructure Sectors," Gulf Times, September 24, 2022, https://www.gulf-times.com/story/724807/darfur-seeks-qatari-investments-in-sudans-agriculture-mining-and-infrastructure-sectors.

[134] Arab News, "Qatar Keeps Glencore Guessing on Xstrata Bid," Arab News, September 12, 2012, https://www.arabnews.com/qatar-keeps-glencore-guessing-xstrata-bid.

[135] Reuters Editorial, "Qatar Holdings to Invest $1 Billion in European Goldfields Reuters Https://Www.reuters.com › Article," Reuters, October 1, 2021, https://www.reuters.com.

like South Africa[136] and DRC[137]. This surely confirmed the core position that Qatar is pursuing, becoming an international logistic hub, including minerals. However, specific data about effective projects often lacks due to the involvement of several different players. This aspect explains, as already said, the risk that these countries can pose to Africa, but also the advantages that such investments have for western investors covered by Gulf countries.

Thus, concluding the section about mining, this is surely a pivotal technological sector for the upcoming worldwide dimension. Critical materials would be essential for the diversification strategies carried out by Gulf countries, both in terms of alternative sources from fossils, but also in terms of those materials required for the new technologies. In this sense, as said, sub-Saharan Africa is an attractive area and for such reasons Gulf countries are pushing their strategies heavily there. These could bring potential benefits for the sub-Saharan countries by moving out from the colonialist western model and from the loan sharking Chinese one. The risk, as said, can be summarized in the effectiveness of the Gulf's strategy, on whether they can bring an alternative, third, model of development.

[136] Qatar News Agency, "Qatar and South Africa. Growing Partnership and Promising Investment Opportunities," www.qna.org.qa, November 14, 2023, https://www.qna.org.qa/en/News-Area/Special-News/2023-11/14/0076-qatar-and-south-africa--growing-partnership-and-promising-investment-opportunities.

[137] Qatar Chamber, "Congolese President Invites Qatari Businessmen to Invest in His Country," Qatar Chamber, May 30, 2021, https://www.qatarchamber.com.

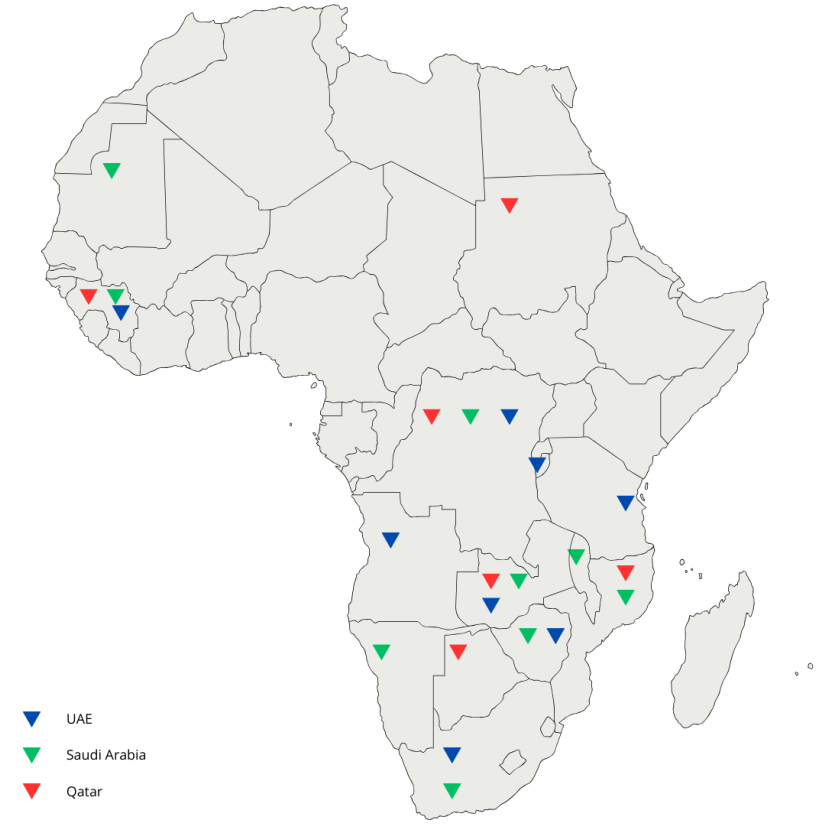

Figure 1: *Gulf's mining activities in sub-Saharan Africa*

Source: *Emirates Global Aluminum, "Guinea Alumina Corporation Factsheet," EGA, 2022, http://www.ega.ae.*
Harry Dempsey and Chloe Cornish, "How Gulf States Are Putting Their Money into Mining," Www.ft.com, Financial Times, April 1, 2024, https://www.ft.com/content/59298650-540a-43cd-86f8-a6c6db0aa906.

2.3. Digital Investments

Starting with the third section of this chapter about Gulf's technological investments in sub-Saharan Africa, it is time to focus on the third final block: digital investments. Looking at the cited common thread which starts from the control of the logistic infrastructures, passing through the control of those critical materials needed for the fourth digital revolution, this last section can be considered its completion. The magnitude (particularly in sub-Saharan Africa) that the digital revolution should bring in the upcoming years has already been described in the first chapter of this dissertation. Overall, it should be massive, impacting on several

activities and sectors, from the economic to the political one. Analyzing the economic field whose ramifications spread to all the other fields, the 4IR should influence productivity, employment, and growth. Particularly, the digital revolution if properly harnessed should provide positive outcomes for both Gulf and sub-Saharan countries. As it is well known, countries with high levels of digital connectivity (measured by internet penetration) tend to have high levels of economic growth. Digital transformation, consequently, increasing the use of digital technologies, should trigger countries to become more competitive achieving further growth in their GDP per capita. In fact, there is a clear link between those countries ranking highly in terms of digital competitiveness and those in the highest positions in respect to their GDP per capita, which exceeds $ 20.000 in every top twenty nation[138]. There are differences between the two regions analyzed, of course.

Looking at Gulf countries (KSA, UAE and Qatar), they consider, as already said, digital investments core elements of their diversification strategy. Each one has included in their own Vision the digital aspect. The Emirates have created their "Digital Government Strategy 2025" aligned with other national development strategies like the "UAE Strategy for Artificial Intelligence", and the "Fourth Industrial Revolution Strategy", also realizing a proper Minister of State for Artificial Intelligence, Digital Economy, and Remote Work Application Office". Similarly Saudi Arabia has set as a main target of its Vision 2030 the objective to develop digital economy, gaining 19.2% of GDP from the digital economy by 2025[139]. Qatar also has designed its digital path, the "Digital Agenda 2030" with six ambitious digital targets. Overall, these countries, on the bases of such efforts, have climbed international digital rankings. According to the IMD World Competitiveness Center Index that "measures the capacity and readiness of 64 economies to adopt and explore digital technologies as a key driver for economic

[138] Ali Al-Khouri, "Building the Arab Digital Economy - a Strategy Blueprint," Dubaipolicyreview.ae, February 28, 2020, https://dubaipolicyreview.ae/building-the-arab-digital-economy-a-strategy-blueprint/.

[139] Kingdom of Saudi Arabia, "Saudi Vision 2030," www.vision2030.gov.sa, 2023, https://www.vision2030.gov.sa/en/.

transformation in business, government and wider society", they have risen in digital technology efforts[140]. In 2023, UAE ranked 10th, Qatar 29th and Saudi Arabia 30th[141]. Far ahead some western countries (Italy ranked 43rd and UK only 20th. Relying on their wide digital penetration these countries have shifted away from simply acting as global technology investors toward being seen as emerging hubs for digital innovation and development. This is projected to raise their per capita GDP by approximately 46% over a 30-year period. The estimated gains are $ 1.6 trillion. Furthermore, the growth in transformative industries' workforce is anticipated to contribute 5% to the GDP. It could create around 1.5 million job opportunities reducing unemployment rates by approximately 7% or 10% within the next six years[142]. Such investments should address some of the most important issues of the Gulf. Diversification from oil is the main one including then the related issues of the labor market and those at international level. However, to not go off topic, the focus of this section will be devoted not so much to the internal aspects of the Gulf digital strategy. Conversely, the emphasis will be on their sub-Saharan African strategy in terms of digital investments adopted or planned there. Resembling in part what done for the other sectors analyzed, the objective refers to the idea to become a global digital hub. The creation and the control of the digital corridor between the Gulf and sub-Saharan Africa should provide Gulf countries a pivotal position for harnessing the African digital potential.

Moving, indeed, to the sub-Saharan Africa's side, as said, digitization, in terms of spread and use of digital technologies should have probably a great impact. Despite the region's low rate of connectivity (the lowest in the world), it has a large, unexploited potential. This is granted by the cited young and interconnected population which ensure a promising digital potential. In confirmation of this, there

[140] IMD, "World Digital Competitiveness Ranking – IMD Business School for Management and Leadership Courses," www.imd.org, 2023, https://www.imd.org/centers/wcc/world-competitiveness-center/rankings/world-digital-competitiveness-ranking/.

[141] Ibidem.

[142] The World Bank, "The Upside of Digital for the Middle East and North Africa: How Digital Technology Adoption Can Accelerate Growth and Create Jobs," World Bank, March 16, 2022, https://www.worldbank.org/en/region/mena/publication/the-upside-of-digital-for-the-middle-east-and-north-africa.

has been a nearly fifty-fold increase in internet usage since the turn of the millennium. By 2030, the continent could achieve rough parity with the rest of the world when three quarters of Africans are projected to become internet users. The consequent economic impact should be enormous. Mobile technologies alone have, in fact, already generated 1.7 million jobs and contribute to $ 144 billion to the continent's economy, roughly 8.5% of GDP[143]. Following this trend and the already cited, demographic one, the 4IR should be a massive growth opportunity. This should close that digital but also economic gap with the rest of the world. Foremost it should put the continent on a trajectory that could enable it to adapt to a rapidly evolving geopolitical landscape that has ramifications for technology and digital economy. However, as already said in the first chapter, investing in digital connectivity opening to the 4IR, requires the development of a digital-friendly policy framework based, generally, on four pillars. The first one refers to the infrastructural aspect since digital connectivity requires the full electrification of the continent, and foremost the internet connection. This is provided through fiber-optic subsea cables whose deployment is broadening. As a second element local governments should ensure an appropriate business and regulatory environments guiding private investments. The promotion of digital education is the third pillar, requiring investments in digital skills. As a final pillar, investing in resilience against digital risk should be fundamental to ensure fair and efficient digital systems. On the bases of such four pillar, which should be pursued to support digital connectivity harnessing its perks, sub-Saharan Africa is backward. Indeed, approximately 53% of the region's population, live without access to electricity, hundreds of millions more have only limited or unreliable electricity[144]. Despite the growing interest on connectivity also subsea cables stands in a similar situation. In

[143] Njuguna Ndung'u and Landry Signe, "The Fourth Industrial Revolution and Digitization Will Transform Africa into a Global Powerhouse," Brookings, January 8, 2020, https://www.brookings.edu/articles/the-fourth-industrial-revolution-and-digitization-will-transform-africa-into-a-global-powerhouse/.

[144] United Nations Conference on Trade and Development, "Commodities at a Glance: Special Issue on Access to Energy in Sub-Saharan Africa," UNCTAD, 2023, https://unctad.org/publication/commodities-glance-special-issue-access-energy-sub-saharan-africa.

such a promising but also difficult framework, Gulf countries might have a role. As will be explained in detail after, they are investing in digital infrastructures (electricity and cables) promoting access to the digital world. Moreover, the same path is followed regarding digital education to improve the digital economies of the area. The main question, however, as for the other fields (ports and mining) analyzed, pertains the beneficial impact for sub-Saharan region.

Starting with the analysis of the first key component for a digital friendly framework, electricity is a crucial item to connect the continent. As said, a great majority of the sub-continent lacks access to electricity. Clearly regional differences exist considering the disparity between Southern Africa (whose values are quite high) and western, eastern, and central Africa, where values are lower. It is also important to note countries' discrepancies to have a detailed and accurate outlook of the situation. According to IEA, DRC, Niger, Malawi, Mali, Uganda, and Burkina Faso, did not have access to electricity in 2022, with some of them worsening their situation in recent years (DRC, Uganda, and Mali)[145]. Others showed a greater condition continuing to reduce or stabilize the number of people without access to electricity (Côte d'Ivoire, Ghana, Kenya, Rwanda, and Senegal)[146]. Such situation must be examined in terms of the future demographic and consequently economic trends that should shape the region. Considering the projected doubling of the population by 2050, also the related energy demand should follow the same trend, according to IEA[147]. On such bases electricity access should increase by 6/8% points each year to keep pace with the highlighted trends. In such a scenario the major hurdles are related to the access to the grid. This aspect suffers several issues like the distance to the grid, expected demand and the size of each community to model the least cost solutions for each settlement. It then considers other factors such as the potential speed at which grid and off-grid systems can provide access, the potential for simultaneously electrifying other sectors and the attractiveness of investments to different investors and vendors.

[145] IEA, "Africa Energy Outlook 2022 – Analysis," IEA, 2023, https://www.iea.org/reports/africa-energy-outlook-2022.

[146] Ibidem.

[147] Ibidem.

Moreover, considering the energy sources mainly based on fossil fuels, sub–Saharan Africa's oil production is mainly exported, being influenced by global demand trajectories, competitive dynamics in export markets and prices. As a result, future oil revenues will probably remain more sensitive to the pace of the global energy transition than to domestic demand trends. Such global efforts to reduce emissions highlight the longer-term risks. In view of the above, renewable energy systems could offer a promising way to ensure electricity access to the region. Such alternative energy sources could solve some of the highlighted issues due to their abundance (mainly solar sources) and to the possibility to provide electricity access through mini grids and stand-alone systems[148]. In this scenario Gulf countries might play an important role due to the large opportunities offered. The UAE has launched several programs to finance renewables in the region. Remarkable is the "Etihad 7" project. Launched in 2022, the program was set to secure financing for renewable energy projects in Africa, aiming to provide clean electricity to 100 million people by 2035[149]. Under its umbrella, Emirates' energy companies like Masdar have signed several agreements like those with Angola, Uganda, and Zambia. Another valuable operation is Emirati's involvement in the World Bank's project "Scaling Solar" to develop solar projects in sub–Saharan Africa (Zambia, Senegal, Madagascar, Ethiopia, Togo). Overall, the operations taken by Masdar and Amea Power (the two main state-owned companies for renewables energy) gives a general framework of the Emirati's idea in renewables sources for Africa. They, in fact covered the entire area[150]. Concerning Saudi Arabia, its ambitions are like the Emirates' one: becoming a central player for the region driving its energy growth. This is something reinforced by the Saudi investments in energy projects through its national company Acwa Power, and by the agreements taken in the recent and cited "Saudi Arabia-Africa Summit of 2023. The forum as already said, represented

[148] Ibidem.

[149] United Arab Emirates Ministry of Foreign Affairs, "UAE Launches Etihad 7 Program to Fund Renewable Energy Projects in Africa at Abu Dhabi Sustainability Week 2022," www.mofa.gov.ae, January 17, 2022, https://www.mofa.gov.ae/en/mediahub/news/2022/1/17/17-01-2022-uae-projects.

[150] They are present in thirty sub-Saharan countries with projects or prospected projects.

a real projection of the Kingdom's strategy for sub-Saharan Africa. Qatar also is taking a position in the electricity access of the region. It has taken part in the cited "Scaling Solar" project. In addition, it has developed several green energy projects in Zambia and South Africa to provide their electrification[151].

Moving to the second necessary pillar for African digitalization, subsea fiber optic cables are the most critical infrastructure of the current digital age. Their networks, covering all the continents for 750000 miles, carry up 99% of all transoceanic digital communications[152]. For this reason, their deployment can be considered as the first core step to global communication access. Thus, the backbone and core element of the digital revolution. Sub-Saharan African countries are clearly related since their connectivity and consequent digitalization has run and would run hereafter through them. While the region remained relatively digitally isolated from the rest of the world until the end of the 2000s, subsea cable infrastructure has quickly developed. In 2019, Sub-Saharan Africa was connected to the world telecommunications network through eighteen active multilateral cables, with eight being spread over the west coast, five over the east coast, and five passing through the Gulf of Aden[153]. Currently in 2024, almost all coastal African countries host sub-marine cables. As reported by several studies the deployment of such cables has positive impacts on the region's countries. It helped expand internet access for twenty coastal and landlocked countries lowering their broadband costs by 90% also increasing their average internet speed[154]. Additionally, it impacted positively on the GDPs of several countries improving employment and business

[151] Reuters Editorial, "Enel Teams up with Qatar's QIA on Green Energy Projects in Sub-Saharan Africa," Reuters, January 7, 2021, https://www.reuters.com.

[152] Christian Bueger and Tobias Liebetrau, "Protecting Hidden Infrastructure: The Security Politics of the Global Submarine Data Cable Network," Contemporary Security Policy 42, no. 3, March 29, 2021: 391–413, https://doi.org/10.1080/13523260.2021.1907129.

[153] Joël Cariolle, "International Connectivity and the Digital Divide in Sub-Saharan Africa," Information Economics and Policy, December 2020, 100901, https://doi.org/10.1016/j.infoecopol.2020.100901.

[154] Felix Simione and Yiruo Li, "The Macroeconomic Impacts of Digitalization in Sub-Saharan Africa: Evidence from Submarine Cables," SSRN Electronic Journal, 2021, https://doi.org/10.2139/ssrn.4026284.

opportunities. Such effects can be observed in some countries like DRC, Kenya, Mozambique, Nigeria, South Africa, and Tanzania which, between 2007 and 2014 raises their GDP and employment levels[155]. Such brief background exposes the profitable framework which Gulf countries have exploited and are exploiting. The Emirates have realized the opportunity offered until now. Especially through its national telecom provider Etisalat, they have been able to finance, acquire and operate some of the most important subsea cables. It operates EASSy cable (East Africa Cable system) running over Africa' east coast (from Sudan to South Africa). It also owned TEAMs (The East Africa Marine system) connecting Kenya to UAE, showing the large interest that the Emirates have for the digital growth of Kenya. This East African country hosts also DARE1 cable system, in which the UAE have a relevant share. Noteworthy is also the Emirati's involvement in Africa 1 and 2Africa cables, some of the largest and ambitious cables in Africa[156]. These two projects, the former completed in 2023, the latter planned for 2024, confirm the Emiratis' strategy. Such cables connect the Gulf (naturally UAE) to the whole African Continent reaching, at the end, Europe (in one direction), and India (in the opposite one). 2Africa project, particularly, constitutes the single largest step change in international bandwidth in the continent's history. It should increase connectivity access for the African continent affecting positively the region's GDP per capita (between 0.42% and 0.58%)[157]. Consequently, it should have a broad impact in the region (whose outcomes will be analyzed after) incentivizing and mobilizing complementary investments (the involvement of all the other Gulf countries proves it). Emirates are also involved in other remarkable projects owing some of the regional telecom providers. An example is that of Telkom Kenya,

[155] Benjamin Anderson and Alan C. O'Connor, "Economic Impact of 2Africa Sponsored By," November 2020, https://www.rti.org/publication/economic-impact-2africa/fulltext.pdf.

[156] ZAWYA, "UAE's E& to Land World's Largest Subsea Cable in a Push for Greater Connectivity," www.zawya.com, February 5, 2024, https://www.zawya.com/en/business/technology-and-telecom/uaes-e-and-to-land-worlds-largest-subsea-cable-in-a-push-for-greater-connectivity-en8t2u6k.

[157] Benjamin Anderson and Alan C. O'Connor, "Economic Impact of 2Africa Sponsored By," November 2020, https://www.rti.org/publication/economic-impact-2africa/fulltext.pdf.

whose 60% has been acquired in 2023, and controlling the strategic Lion2 cable. Another is that of Maroc Telecom, acquired in 2014 and controlling subsea and terrestrial cables like the West Africa Cable. By the same procedure, Etisalat controls also other terrestrial cables like those of Mauritel (active in Mauritania), and those of Sotelma (operating in Mali). This vast strategy, whose outcomes and opportunities will be analyzed in the next chapter, reveals the profound interest that UAE has for sub-Saharan digital connectivity as pivotal element to grasp its digital dividend. Concerning Saudi Arabia, remarkable is its Saudi Vision Cable. Following the spirit of the Saudi Vision 2030, this project aims to connect Saudi Arabia with Africa, Asia, and Europe, confirming its international hub ambitions. Such plan is carried out by the STC group (Saudi Telecom Company) owned by the sovereign wealth Fund PIF. The company is involved in the cited 2Africa and EASSy projects, but also in other important ones for its ambitions. They are for example IAX-IEX (India Asia-Europe Express) running through the Red Sea, or the SAS 1 and 2 (Saudi Sudan) which reveal that already outlined Saudi interest for this key African region. Qatar is following a similar strategy. Controlling Vodafone Qatar through its national fund Qatar Foundation, it has obtained a share of the cited 2Africa project confirming similarities with the other Gulf Strategies. Its strategy, however, is oriented toward the connection with Asia (particularly India) and Europe.

As a last element to consider, digital education is the conclusive element for a proper digital framework. Reaping the benefits from digital-supporting infrastructure and policies requires investing in education. That includes improvements in core education as a basis for continued learning as well as focused investments in digital skills. This is vital firstly to ensure that people and businesses can successfully leverage technology, while providing some assurance of a viable market for investors. Secondly, it is pivotal to adequately equip the workforce of the future. Overall, investing in sub-Saharan digital human capital is fundamental to grasp the upcoming digital dividend. Moreover, in many cases, the region lacks proper digital education programs and opportunities. For these reasons Gulf countries have adopted and financed several educational programs for the continent. However, since the educational field is a very wide area, it would be meaningless

detailed and analyzed each program set out there. Thus, a general background will be proposed to describe and in the next chapter assess the Gulf educational programs in sub-Saharan Africa. Overall, all three countries are active in the area promoting and financing lots of educational projects especially through their development funds like the cited Abu Dhabi Fund for Development, Saudi Fund for Development and Qatar Fund for Development. Significant is the approach taken by the Emiratis, real core player in the area. In 2020 there was the commitment of the UAE's Consortium for Africa. Such program with an investment of $ 500 million was set out to help fulfil the vision of a 'turbocharged' and connected new Africa, driven by its youth. Based on digitization and youth it aimed to build the region's human capital investing consequently in their digital economy[158]. The Emirati's approach, however, can be summarized in The Digital School Initiative. This project, launched in 2020, aims to provide a certified and digital education to all those students who don't have access to formal education. Acting with the support of several international organization including the World Food Program, it has extended its presence in sub-Saharan Africa from 2023[159]. Such initiative, as said, expressed the Emirati's interest in the digital education of the region. Also, Qatar is active in educational projects. Qatar Foundation promotes education through its platform Wise being in active in several sub-Saharan countries.

Concluding this last section about Gulf's technological investments in sub-Saharan Africa with their digital aspects, it is important to stress the huge potential of the region's digital dividend. However, as showed, several services (from electricity to connectivity and education) lacks inhibiting sub-Saharan digital development. On these bases Gulf countries have started investments there resembling what already done in the other sectors analyzed. Focusing on electricity, connectivity, and digital education, they have obtained the control of an important

[158] United Arab Emirates Ministry of Foreign Affairs, "UAE Unveils New Investment and Development Initiative to Help Build a Connected and 'Turbocharged' New Africa Driven by Youth," www.mofa.gov.ae, February 9, 2020, https://www.mofa.gov.ae.

[159] The Digital School, "UAE Signs MoU to Expand Digital School Initiative in Sub-Saharan Africa," Digital School, September 22, 2023, https://thedigitalschool.org/press-release/uae-signs-mou-to-expand-digital-school-initiative-in-sub-saharan-africa/.

section of sub-Saharan digital economy. Such efforts have been provided and will be provided to grasp such digital dividend that should emerges. An important example of this approach is that adopted by the UAE towards Kenya. As revealed by data provided, UAE are in a leading position investing more than the others (KSA and Qatar). This has ensured them to establish solid relation with the most promising countries of the region, specifically Kenya. The Emiratis, in fact, exploiting the digital opportunities offered by this East African country have started investments in the field of digitalization and technology. They considered Kenya the natural expression of the cited digital corridor strategy. As showed, they have, in fact, financed several electrification projects, being also involved in the control of most of the subsea cables of the country (five out of seven). Remarkable is the MoU signed in 2024. This confirmed the strategy outlined, paving the way for investments in digital infrastructure and artificial intelligence services in Kenya. Moreover, the cooperation may include the development of data center projects with a total capacity of up to 1,000 megawatts[160]. Overall, Kenya represents an important opportunity for the Emiratis. Conversely, the African country could benefit from such investments. It has set a Digital Economy Blueprint defining a path towards comprehensive digital transformation as a cornerstone of economic development. Ambitious targets have been set including the growth of the ICT contribution to increase the size of the digital and traditional economy to 10% of GDP by 2030 providing a pathway or the country to tap into the emerging 4IR[161]. Within this bright framework, the doubt, as usual, concerns the real impact that this relation could have for both sides. The last chapter will assess it.

Such example, even though restricted to the Emiratis and exclusively to Kenya, typifies what discussed in this chapter. Following the cited thread, which starts from logistic infrastructures, moving then to mining for critical materials and concluding

[160] ZAWYA Press Release, "UAE and Kenya Sign Investment Memorandum to Advance Digital Infrastructure and AI Initiatives," www.zawya.com, March 29, 2024, https://www.zawya.com/en/press-release/companies-news/uae-and-kenya-sign-investment-memorandum-to-advance-digital-infrastructure-and-ai-initiatives-pitug8ea.

[161] A.C. O'Connor et al., "Economic Impacts of Submarine Fiber Optic Cables and Broadband Connectivity in Kenya" RTI International, 2020, https://www.rti.org.

with digital investments, UAE, Saudi Arabia, and Qatar are pursuing a thorough geopolitical strategy. They are betting on technology in a territory, sub-Saharan Africa, thriving in human and economic terms. Differently from Western countries and China, they have adopted a distinct approach based more on business solutions than on a mere exploitation without glaring political bias. Taking advantage of their geographical location between these two extremes they could offer a neutral solution to harness the sub-Saharan African potential. However, as repeated at the end of each section, the related consequences are not obvious requiring an in-depth study. This will be roll out in the following and final chapter.

CHAPTER III

Evaluation and foreseeable scenarios

Coming to the third and final chapter of this dissertation, it is the time to evaluate what discussed so far trying to address the original research question. On the bases of what highlighted, in fact, it is necessary to assess whether the Gulf's technological efforts (especially ports, mining and digital technologies) could be tailored to the necessities of the actors involved. Such solutions should portray UAE, Saudi Arabia and Qatar into a new, central political and economic dimension addressing their ambitious objectives. Moreover, as said, these solutions should also disentangle some of the challenges that the sub-Saharan region should face in the near future, one above all: the foreseeable demographic explosion and the related consequences. For these reasons, the chapter will be dedicated to the attempt to foresee what might occur in the short and in the long term. The idea, in fact, is to compare what highlighted in the first chapter (Gulf and sub-Saharan region needs) with the Gulf solutions proposed (ports, mining, digital technologies). From this bases it should be possible to give a proper evaluation highlighting also the foreseeable scenarios. In this sense the chapter will proceed as follow. The first paragraph will be focused on the Gulf perspective trying to evaluate the solutions proposed by these countries. Particularly, the section will assess whether their plans could address their upcoming challenges stemming, principally, from the expected decarbonization. The second paragraph will be focused on the other side of the former section. The attention will delve into sub-Saharan Africa region discussing whether the Gulf plans might be beneficial for the stability of the area. At the end, the last paragraph will adopt a global perspective. The effects of the Gulf programs on the international arena will be checked. Along this line, the geopolitical and geoeconomic gains of these countries will be evaluated.

3.1 A way to address the Gulf countries post oil future?

Starting from the first paragraph, it is necessary to evaluate whether all the solutions proposed by UAE, Saudi Arabia and Qatar and directed to sub-Saharan Africa might be sufficient to address their upcoming challenges stemming principally from the planned decarbonization. As said in the first chapter, these three countries, even though with their respective differences, should face similar challenges. Their high reliance on oil and gas revenues has granted them internal and external stability and, more broadly, their rentier state system categorization. Such situation, in fact, as explained, has ensured a solid international position, since the largest quantity of hydrocarbons comes from the region. Moreover, from an internal perspective, such revenues have ensured a stable economic and political system driven by fossil fuels revenues. This situation, however, has prevented the development of an autonomous private sector, has created an unnecessary bureaucracy and has not set up the premises for an alternative internal order and international role. Considering also the demographic situation of these countries experiencing the already defined demographic window of opportunity, the effects of the upcoming decarbonization should be massive. Considering the above, summarizing what discussed in the previous chapters, several aspects and data of each country will be investigated. These refers to the GDP, particularly in terms of the distinction between GDP stemming from oil activities (encompassing crude oil production, natural gas extraction, and refining activities) and non-oil GDP stemming clearly from non-oil activities (comprising all economic activities excluding oil related activities and government activities). Other relevant data are the private sector growth and the employment rate. Such indicators, in fact, should furnish a clear overview of the situation not only detailing but also comparing the current conditions of the three countries. As a last element to consider even though not in statistical terms is the international role acquired through their sub-Saharan strategy. In this sense, political and economic agreements will be assessed. On the bases of the result obtained the core idea is to evaluate whether their strategies involving ports, mining, and digital technologies in Africa are sufficient to address the Gulf challenges.

Beginning with the analysis of the GDP, this is an essential indicator to observe the path towards their diversification strategies outlined in their ambitious plans (Vision 2030, We the UAE 2031, Qatar National Vision 2030). Concerning the Kingdom of Saudi Arabia, as it is possible to observe from data below, its GDP has contracted on average by 0.8% in 2023, growing up again in Q1 2024 by 1.3%. It is important to note that the 2023 contraction was the consequence of oil GDP decline caused by the oil production cuts decided by the OPEC+[162]. The outlined tiny recovery in Q1 of 2024, was the result of the growth of oil activities by 2.4%. In such oil-dependent scenario, non-oil GDP should be analyzed. Referring, in fact, to the same time frame, non-oil GDP grew by 2.8% in 2023, albeit in Q1 of 2024 its growth amounted only to 0.5%. Such data explains the minimum impact that non-oil activities have on Saudi economy, highlighting, conversely the centrality kept by oil and its related activities. Even though, such data cannot be considered exhaustive (particularly in relation to 2024, whose data cover clearly only the Q1), they could underlie the three years deficit that the kingdom is experiencing and should experience in 2024[163]. However, the economy should start running again in 2025 by 6.0%. Moreover, such contractions should be at the base of some of the cutbacks in the government ambitious project planned in the Vision 2030.

Regarding the United Arab Emirates, its GDP has grown during the years from 2017. This a trend that has contracted in 2023 passing from 7.8% increase of the previous year to 3.4% of 2023[164]. More in depth, the non-oil GDP has grown to 6.7% in the Q4 of 2023 (the latest available data) getting better than in the Q4 of 2022 when the registered growth amounted to 5.0%[165]. Moreover, the projections indicate a steady growth in the upcoming years over the 4% growth[166]. Reversely from the Saudi situation, the Emirates do not show a proportional relation between

[162] Andrew Hammond, "Saudi Arabia GDP Contracts but Non-Oil Growth Rises," AGBI, June 10, 2024, https://www.agbi.com/economy/2024/06/saudi-arabia-gdp-contracts-but-non-oil-growth-rises/.

[163] Ibidem.

[164] IMF, "World Economic Outlook," IMF, April 2024, https://www.imf.org.

[165] UAE Stat, "GDP Quarterly - Constant Prices," Fcsc.gov.ae, 2023, https://uaestat.fcsc.gov.ae.

[166] IMF, "World Economic Outlook," IMF, April 2024, https://www.imf.org.

oil activities and GDP. The country, in fact, stands better than Saudi in the diversification of the economy since more the 70% of the GDP is currently composed by non-oil activities. This detail explains the grounds for which the country has not experienced that drop caused by the diversification as happened in Saudi Arabia.

Moving to Qatar, the country's GDP has raised impressively in 2022, when Qatar hosted the FIFA World Cup, increasing consequently the services revenues. However, despite in the subsequent years such numbers have not been reached, a consistent growth can be observed. The total GDP in 2023 accounted to 1.6%, reaching in Q1 of 2024 2.0%, moreover according to the IMF projections it is expected to reach 5.9% by 2026[167]. Concerning the diversification strategy, it is important to note as the oil activities, representing not only oil but also natural gas, should continue to maintain a pivotal role for the country's economy. Natural gas, as already said, is considered the fuel of the transition and would not be abandoned. In fact, it should go along the transition. For such reasons hydrocarbons, under the technical definition of oil activities, should remain a large factor behind the Qatar economy, which is among the biggest in terms of gas produced and exported in LNG form. This is confirmed by data which, as can be observed below, show a sort of parallelism between oil GDP and total GDP, but also by all those new investments made on gas. Nevertheless, non-oil activities should not be left aside, acquiring growing importance in the next decades.

Overall, the situation, as supported by the tables below, demonstrates the significant dominance of the oil sector compared to the non-oil sector. Within this context, the United Arab Emirates are notably ahead in making progress towards the goal of economic diversification.

[167] Ibidem.

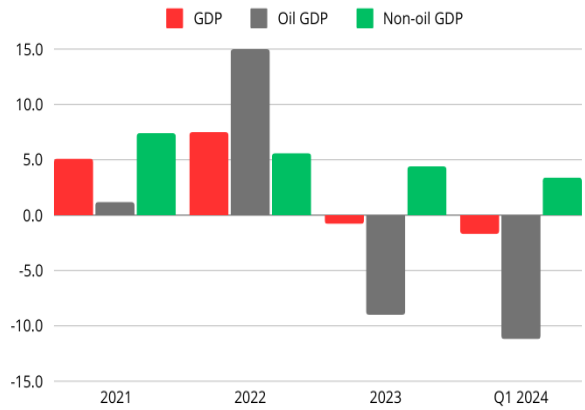

Table 2*: Saudi Arabia's GDP from 2021 to Q1of 2024*

Source*: IMF, "World Economic Outlook," IMF, April 2024, https://www.imf.org*

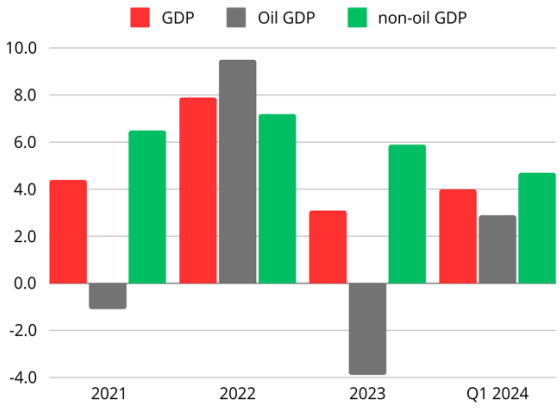

Table 3*: UAE's GDP from 2021 to Q1 of 2024*

Source*: IMF, "World Economic Outlook," IMF, April 2024, https://www.imf.org*

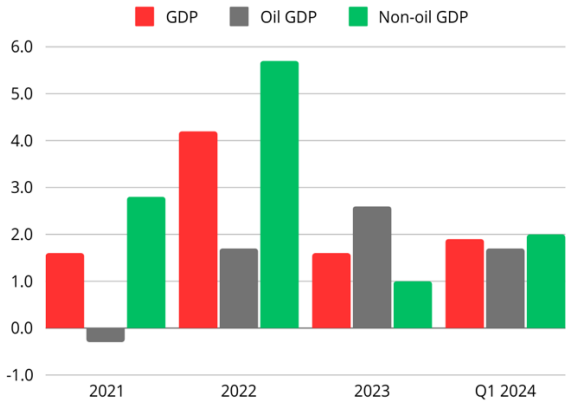

Table 4: *Qatar's GDP from 2021 to Q1 of 2024*

Source: *IMF, "World Economic Outlook," IMF, April 2024, https://www.imf.org*

Even tough, such data provide an important picture of the situation, as said before, they are not sufficient to address the original research questions. Therefore, it is crucial to focus on the level of privatization achieved. Historically, as said, substantial revenues from the public oil sector have ensured stable internal orders but also fostered a stagnant bureaucratic system. This has also hindered the growth of an autonomous private sector capable of driving the countries' economy. However, the demographic growth, coupled with the economic diversification strategies should hindered the model outlined. For such reasons the development of the private sector along with the ability to create jobs is essential to ensure a thriving future to these countries.

Considering the private sector growth, results are strictly related to those outlined above. In Saudi Arabia the private sector contribution to the national GDP has, in fact, risen in recent years switching between 40% in 2017 to 44.79% in 2023[168]. In the UAE things are even better following what said before. The private sector, in fact, contributes to the national GDP by 57.4% as reported by data of

[168] Najlaa Habriri, "Alibrahim to Asharq Al-Awsat: Private Sector Driving Transformation in Saudi Arabia," english.aawsat.com, January 19, 2024, https://english.aawsat.com

2024[169]. Concluding with Qatar, data are similar, since its private sector contribution to GDP oscillated around 54% according to latest data[170]. These figures indicate a favorable scenario; however, it's crucial to acknowledge that many of the private companies mentioned earlier are, to varying degrees, connected to the ruling families. This strategy is employed by these nations to enhance their image and attract more investments. Regarding the job market, for the purposes of the analysis, as said in the first chapter, it is necessary to look at the unemployment rate of national citizens, ignoring the so-called expatriates which are irrelevant. In fact, labor market diversification is equated to a reduced reliance by private companies on foreign workers and a lower reliance by nationals on employment in the public sector. Looking at data, and starting from Saudi Arabia, unemployment rate of Saudi citizen (male and female) has decreased passing from 12.8% in 2017 to 7.7% in 2023[171]. However, the Saudi labor force participation rate, representing the share of the working-age population that is employed or actively looking for work, continues its drop begun in 2022. Such indicator shows that a growing number of working-age Saudis are becoming discouraged from engaging in the labor market, suggesting that the declining unemployment could be pull by this rate. On such bases the situation seems not changed so much from previous years, raising those risks which the predicted reduction of the public sector should brought in the future. Continuing with UAE, in 2019 the citizens employed amounted to half of the population despite the high number of expatriates[172]. Things have not changed during the years. According to the latest data available, of 2023, the unemployment rate has stabilized at 2.7% not diverging from 2019. Concerning the distinction between nationals and not, things are more difficult since from 2019, data have not been disaggregated by nationality. Concluding with Qatar, things are different. The

[169] Shweta Jain, "UAE's Non-Oil Business Activity Hits Highest Level in More than Four Years," The National, January 4, 2024, https://www.thenationalnews.com.

[170] Trading Economics, "Qatar Non-Oil Private Sector PMI - December 2022 Data - 2017-2021 Historical," tradingeconomics.com, 2024, https://tradingeconomics.com.

[171] General Authority for Statistics, "Labor Force," General Authority for Statistics, April 6, 2017, https://www.stats.gov.sa.

[172] UAE Stat., "Labor Force Participation Rate (15 Years and Over) by Nationality, Gender and Educational Status," Fcsc.gov.ae, 2019, https://uaestat.fcsc.gov.ae

country has one of the lowest unemployment rates of the world reaching in 2023 the 0.1%. It is important to note that the Qatar's low unemployment rates are the results of the country's capacity to absorb young nationals into public sector jobs[173]. The productive public sector driven by LNG' exports principally, differently from Saudi Arabia and the United Arab Emirates ensures and will ensure such scenario also in the upcoming years as already explained.

Overall, this framework illustrates how these countries have started to make progress toward their ambitious goals, though they are still anchored to the hydrocarbon industry, facing, consequently and with different degrees, an uncertain future.

Given this perspective, which is essential for comprehending the current stage of the three Gulf countries in pursuing their ambitious objectives, yet not comprehensive regarding the dissertation's research question, it is crucial to align this context with the dissertation's aims. Subsequently, an analysis of the effects of the cited investments, from the Gulf perspective, in sub-Saharan Africa is necessary. In this sense, looking at trade flows data, which include exports and imports of non-oil products, is crucial to highlight the cashflow which animates Gulf-sub-Saharan Africa relation. Generally, trade flows between the three Gulf countries and sub-Saharan Africa are around $100 billion[174].

Observing Saudi Arabia's trade flows with sub-Saharan Africa countries, they amounted approximatively to $ 5.542 million in 2000. In 2010, the value traded reached $ 12.000 million, scaling back slightly to $ 9.000 million in 2023[175]. Switching to the Emirates, Abu Dhabi has adopted a greater investments policy going beyond hydrocarbons investments in sub-Saharan Africa's countries. According to data, in the 2000 non-oil trade volume amounted to $ 732.1 million, reaching in 2010, $ 8933.00 million. Trade flows surged in 2022, when they reached

[173] Arab News, "Qatar Boasts Lowest Unemployment Rate in the World: Report," Arab News, April 30, 2023, https://www.arabnews.com.

[174] Africa Confidential, "Facing Neither West nor East – but Forwards," www.africa-confidential.com, April 2024, https://www.africa-confidential.com.

[175] IMF, "IMF Data," data.imf.org, 2023, https://data.imf.org.

$ 62989.00 million rising again the successive year to $ 68519.00[176]. Finally, referring to Qatar, things are similar even though not comparable to the Emirati's situation. In the 2000 the trade flows, by adding up imports and exports, amounted approximately to $ 92.00 million such value raised then $500.00 million, reaching in 2023 $ 1,000.00 million[177]. Although the data might be approximate and not overly precise, the information from the Emirate's Ministry of Economy and the IMF datasets provides a clear picture of the situation. The UAE leads the group in strengthening economic ties, which has consequently bolstered its political relations with these countries. Similarly, Saudi Arabia has reinforced its relationships in the region, followed by Qatar.

Overall, coming to the conclusions, even though a precise and certain answer might be given to the initial research question, several considerations may be provided. Firstly, as showed, each state is increasing its focus over sub-Saharan countries. The Emirates seems standing in a better position followed by Saudi Arabia, which has started its strategy quite recently, and Qatar, which on the other hand, is pushing still a lot on hydrocarbons, particularly natural gas due to the well-known reasons. However, on the bases of the objective of the chapter in understanding the affordability of such strategies, things are more difficult. Undoubtedly, these countries have made progress towards their diversification aims, however as showed, particularly for Saudi Arabia, and in a different way for Qatar, they already rely on hydrocarbons. The large outcomes provided by the oil & gas sector have not yet been compensated still requiring time for their complete substitution. Data however, as showed, present a promising scenario due to the growth of alternative activities and revenues not dependent on hydrocarbons. Concerning their African strategy, surely Gulf countries have grown up a lot, placing themselves in a good position of influence in the continent. Specifically, the mining and the digital sectors represent a growing and emergent market with profitable possibilities. They are moving progressively up in the mining sector ranks. In this sense the Emirates and Saudi Arabia control completely or in part

[176] United Arab Emirates Ministry of Economy, "International Trade Map," Ministry of Economy UAE, July 4, 2024, https://www.moec.gov.ae/en.

[177] IMF, "IMF Data," data.imf.org, 2023, https://data.imf.org.

some of the most important critical mineral's deposits in sub-Saharan Africa. Knowing that the global demand for these minerals should raise with the ongoing energy and digital transitions, the Gulf countries through their mining strategy could position themselves as leading in the new international economic asset which should emerge in the upcoming future. As showed the UAE are better positioned than the other two countries lying on par with the other global actors in this field, mainly US and China. This aspect is surely reinforced by their infrastructural policy, which, as said, has enabled them to control the chokepoints of the regional and international commerce including that related to critical materials. Saudi Arabia is located just behind the Emirates. The announced investments, $15 billion worth, to develop critical raw materials in Africa, some of which have already been realized, should push the country ahead of the traditional actors of the international community threating also the UAE. Finally, Qatar too is strengthening its presence on the continent. However, as said, the strategy of Doha suffers its high reliance on natural gas, constituting the fuel of the green transitions with more durable expectations than traditional oil. For this reason, Qatar is still interested on gas deposits putting partially aside other sources of revenues. Concerning the digital scenario the three countries are made lots of progress. Considering also their internal objectives, generally to reinforce their digital status, their investments in sub–Saharan Africa on each section of the digital chain, are strengthening their status. Revenues from digital investments in Africa clearly cannot be calculated directly, even though such investments have contributed to position the region in a very good point of the Digital Transformation Index of 2022. Particularly Saudi Arabia and the UAE are two best countries in the related Arab index sharing the 86% and 79% respectively of readiness for digital transformation[178]. Such standing shows the great role acquired by the Gulf in this industry which should be at the core of the upcoming economic order. Controlling and investing in each field of the digital industry is thus rewarding these countries with an increasingly relevant role in the international asset.

[178] International Communication Union, "Global Digital Regulatory Outlook 2023," ITU, 2023, https://www.itu.int/en.wà111

Overall, on the bases of the scenario outlined, the three Gulf countries, Saudi Arabia, UAE, and Qatar, through their investments campaign in sub-Saharan Africa and despite the profound differences, have reached and are reaching an important role in the region. Exploiting their resources both natural and human, they are trying to reinforce their global status in light also of the predicted decarbonization effects. Even tough, as said a real and precise evaluation cannot be made, several promising outcomes have been resulted. However, the oil detachment has not been already achieved contributing to the unpredictability of the future. However, it is also important to note as the decarbonization itself is something not completely precise. Thus, for this reason a precise forecast cannot be realized.

3.2 A way to grant the stability of sub-Saharan countries?

Once assessed that the Gulf strategy could be beneficial to balance the decarbonization effects, it is the right time to look at the other side of the strategy: sub-Saharan Africa. Clearly the region cannot be analyzed in all its countries. The topic of the dissertation, in fact, remains the Gulf. Thus, looking at each African country would be redundant and confusing. For such reason the analysis will be general looking at the entire sub-continent with the awareness of the several differences existing between countries. Overall, the main question regards the positive outcomes that the Gulf strategy based on ports, mining, and digital technologies has brought and may bring in the upcoming future of sub-Saharan Africa addressing consequently its main challenges. These stems, as already outlined, from a mix of economic, political and demographic aspects. Particularly, despite the high natural resources available in the territory, those countries have not been able to take a great advantage of them. Political inefficiencies have paralyzed the region development swaying them towards international actors, mainly China, Us and Russia. Furthermore, demographic growth has produced a large audience of young people. They seek recognition from their governments for their educational achievements and political roles. Their awareness is increasingly shaped by shared ideas spread through the internet. Given these circumstances, the situation appears precarious, and investments from the Gulf could provide a potential solution.

However, there is uncertainty about whether these proposed solutions will be genuinely beneficial or if they will merely replicate the actions of previous players.

Based on the above, several aspects of the region will be scrutinized. These regard the economic growth of the region looking also at crucial data like those related to employment and education results. The focus will shift then to the three sectors observed to understands the benefits provided.

Starting with a general economic outlook, the total GDP of the sub-continent presents high opportunity of growth. In fact, according to the IMF projections the GDP growth in 2024 should reach 3.8% from 3.4% of 2023, until getting to 4.0% in 2025[179]. Such high profitability is also reinforced by the high investments that those countries have received during years amounting currently, in 2024, to the 22.35% of their GDP. In such scenario Gulf countries, as showed in different ways, contributed with $53 billion in 2022[180]. The countries whose investments received contributed most to their GDP are Mozambique, Senegal and Tanzania. Not by chance, these are some of those countries in which the Gulf has invested most. The sub-Saharan countries which have received most foreign direct investments were South Africa, Kenya, Nigeria, Ghana, Cote d'Ivoire, Tanzania, Zimbabwe, and Senegal[181]. In such field the three Gulf countries are among the largest investors in the continent. Particularly the Emirates have extended their presence overlapping all the other traditional players in the region. Namely, they have financed in 2022, 60 projects investing overall $49.9 billion, the largest amount in that year. Moreover, such investments have also created the largest amount of jobs accounting to 18.6000, confirming not only the increasingly significant role of the country and in general of the region, but also the positive outcomes of such presence[182]. However, it is also important to look at the other side of the scene. Despite the

[179] IMF, "Regional Economic Outlook for Sub-Saharan Africa, April 2024 | a Tepid and Pricey Recovery," IMF, April 2024, https://www.imf.org/en.

[180] World Economic Forum, "Africa and the Gulf States: A New Economic Partnership," World Economic Forum, April 28, 2024, https://www.weforum.org.

[181] Ernst & Young Global Limited, "A Pivot to Growth," www.ey.com, November 2023, https://www.ey.com.

[182] Ibidem.

promising situation, the region has serious shortcomings. These stem from the huge gross government debts, amounting to 61.5% of the region GDP in 2024 driven specifically by Sudan, Zimbabwe, Mozambique, Ghana and Congo[183]. Other elements that reinforce this negative outlook are the high inflation, even though slightly dropping in 2024 to 15.7%, remaining however one of the highest in the world, as also the negative current account balance amounting to $55 billion and expressing the lack of possibilities for these countries. Given this general background, it is, thus, necessary to go more in depth. In fact, it should be useful to look at the cited technological investments to understand the effective revenues deployed.

Concerning ports, it may be useful to look at the container port throughput indicating the estimated total number of containers handled, per country, expressed in twenty-foot equivalent units (TEUs). A TEU, as said, represents the volume of a standard 20 feet long intermodal container used for loading, unloading, repositioning and transshipment. In consideration of this, the sub-Saharan region is experiencing a slow but steady growth passing from 11045643 TEU of 2010 to 16953239 TEU of 2022[184]. Such data are not so huge if compared with the rest of the world, however it is worth to note the growth of a region which has started its development not so far. Specifically, Kenya, Mozambique on the east and Senegal and Ghana on the west, are some of those countries which has growth more in the last years. Not by chance, in these countries it is possible to find an abiding presence of the UAE as showed in the second chapter. Albeit, a direct parallelism cannot be established, the Emirati's presence should have influenced such expansion. On the other hand, it is worth to note as in some cases, the Emirates has arrived later, once the potentiality had already been expressed, nevertheless improving the situation. This is the case of Tanzania: the eastern African country is leveraging its strategic position in the international trade. Abu Dhabi, in this case, has entered recently the

[183] IMF, "Regional Economic Outlook for Sub-Saharan Africa, April 2024 | a Tepid and Pricey Recovery," IMF, April 2024, https://www.imf.org/en.

[184] UNCTAD, "UNCTADstat," unctadstat.unctad.org, December 11, 2023, https://unctadstat.unctad.org.

country acquiring the concessions of the Dar es Salam port only in 2023 when the port had already provided its benefits. However, it is worth noting as the UAE entrance has enhanced generally the port, and consequently, the country conditions.

Eastern Africa				
Country	**TEUs (2010)**	**TEUs (2022)**	**GDP (2010)**	**GDP (2022)**
Djibouti	406407	635 000	1.13 bn	3.67 bn
Kenya	695 600	1450000	45.41 bn	113.42 bn
Mauritius	332662	407825	10bn	12.93 bn
Mozambique	220000	420500	11.41 bn	20.62 bn
Tanzania	359010	700000	32.01 bn	75.77 bn
Sudan	441469	320274	58.96 bn	61.67 bn

Western Africa				
Country	**TEUs (2010)**	**TEUs (2022)**	**GDP (2010)**	**GDP (2022)**
Angola	533150	654590	83.8 bn	104.4 bn
Cameroon	290000	366667	27.51 bn	43.64bn
Congo	355000	999999	13.15 bn	15.82 bn
DRC	59133	42211	21.57 bn	65.8 bn
Equatorial Guinea	9500	13851	16.31 bn	11.36bn
Gabon	153657	180000	14.37 bn	15.31 bn
Cabo Verde	54873	82871	1.82bn	2.3 bn
Cote d'Ivoire	717700	1042418	34.94bn	70.17bn
Ghana	643188	1244245	32.2 bn	74.26 bn
Guinea	115567	250000	6.85 bn	21 bn
Nigeria	1162000	1566109 (2022)	366.99 bn	472.62 bn
Senegal	349231	738000 (2022)	16.12 bn	27.62 bn

Togo	339900	1952879 (2022)	4.75 bn	8.17 bn

Southern Africa				
Country	**TEUs (2010)**	**TEUs (2022)**	**GDP (2010)**	**GDP (2022)**
Namibia	247743	160368	11.43 bn	12.57 bn
South Africa	3985535	4053350	417.36 bn	405.27 bn

Table 5: *TEUs growth compared to GDPs growth*

Source: *UNCTAD, "UNCTADstat," unctadstat.unctad.org, December 11, 2023, https://unctadstat.unctad.org.*
IMF, "World Economic Outlook," IMF, April 2024, https://www.imf.org

Data above confirmed what said: as can be observed most sub-Saharan African countries which have experienced an important growth in their maritime traffic are linked to the Emiratis' port management. Moreover, in many cases, their total GDP is grown. At the same time, it is important to clarify as such trading hubs are pivotal for the Gulf's placement in the region and for their economic and political strategies there. Overall, such connection, albeit with due consideration, can be useful to understand as the UAE's port strategy has been and is still beneficial for the region's economy.

Turning to mining for critical materials, things, as said, are more confused and opaquer than port investments. As already outlined, data are not precise and often such activities are driven by private companies not publicly related to national authorities. This aspect reinforces those doubts about the strategy pursued by Gulf countries bolstering the hypothesis related to a mere exploitation of the sub-Saharan resources. In fact, as said, critical materials can be considered the backbone of the digital and energy transition being crucial for each country interested in controlling the international economy. Therefore, their procurement is essential for those countries, like the Gulf ones, whose economies are getting away from oil and in general from hydrocarbons potentially missing their advantages. In this sense the Gulf rush to critical materials could be dangerous for the region not bringing any benefit. As already said, for resource-rich nations in sub-Saharan Africa, the

entrance of these middle powers into the critical minerals' battleground is a welcome alternative to decades of exploitative arrangements underpinned by either western colonialism or Chinese debt[185]. Gulf countries could be seen as a "third neutral player" whose investments could favor local economies. Conversely, such neutral standing offers an effective political and economic coverage to industry giants allowing them to make riskier investments in such complex and fragile countries. In addition, Gulf states are promising resource-rich nations investment packages centered around mining. In all these countries local authorities expect the Gulf to invest in agriculture, tourism and energy to counterbalance their acquisition and management of the several mines of the region. Such 360° investments strategy has been partially planned and set up, as showed in the chapter two of this dissertation, however they stand most of the time in an embryonic stage, where investments have been only heralded. There are worries, in fact, that the three Gulf states could replicate the hazy resources for infrastructure deals advanced by China through its Belt and Road Initiative that had mixed outcomes in the global south. Many countries have been left deeply indebted and some projects have stalled[186]. In this sense, albeit the Gulf approach proposes a sort of third way, alternative, specifically to the Chinese approach, there might be parallelism between the two models. The lack of transparency, as already said, is probably the most important issue affecting the Gulf presence in the region. Sharing the same characteristics of gulf companies engaged in other sectors, those involved in mining are often opaque about their structure, functioning and in general about their business ties. An example is given by Zambia, where the Emirates, through their company International Resource Holding have finalized a deal to acquire a stake in the Mopani copper mine. In fact, when the Mopani deal was finalized, the company revealed as its chief executive officer was the same who runs Auric Hub, a gold refinery in the UAE. The global head of strategy, also, was previously head of Primera Group, the cited Abu Dhabi-based gold trader, that supplied Auric with gold shipments from the DRC, according to corporate records and the UN. There

[185] Harry Dempsey and Chloe Cornish, "How Gulf States Are Putting Their Money into Mining," www.ft.com, April 1, 2024, https://www.ft.com.

[186] Ibidem.

this company was accused of not respecting due diligence obligations exercising a real and effective monopoly. In fact, despite the deal with the DRC government ensured a 25-year monopoly, promising huge revenues for the local government, Primera only pays 0.25% tax versus 6% for other exporters. Moreover, IRC's name before incorporation in 2022 was "Auric Hub Holdings", increasing doubts about its transparency. Such example is pivotal to reiterate the characteristics of the three Gulf countries in approaching sub-Saharan mining. Indeed, whether Gulf investments will be beneficial for sub-Saharan countries will depend on whether the technical expertise, community benefits and wider infrastructure investment can be delivered. Moreover, it will hinge on whether adequate industries from these investments will be provided or if it becomes just another speculation which doesn't support their aspirations for industrialization and the diversification of their own economy[187].

Concluding with digital investments, this field, as showed, is very broad including several facets. These range from the basic electrification, essential for the connectivity to more complex issues related to the upcoming digital revolution. Having already analyzed such data, this paragraph will assess the effective benefits provided to sub-Saharan Africa. Specifically, the focus will be on the degree of digitalization driven by the Gulf in the region, as well as the new opportunities created by this fledging sector. As regards the internet penetration, the region has experienced an exponential growth in recent years. The percentage of the population using internet has, in fact, switched from 6% in 2010 to 36% in 2021, with forecasts indicating the possibility to reach 50% of penetration by 2030[188]. Such promising outlook has been the result also of the investments provided by Gulf countries, which, as said, are involved with stakes in many of the local digital providers. Indeed, as an example, Kenya, Mauritania, and Mali, three of those countries in which, as showed before, the Gulf digital presence is strong, have some of the highest internet penetration rate in the area. More specifically, Kenya's population using internet has moved from 7% in 2010 to 29% in 2021, a larger path

[187] Ibidem.

[188] GSMA Intelligence, "The Mobile Economy Sub-Saharan Africa 2023," Gsmaintelligence.com, 2023, https://www.gsmaintelligence.com.

has been followed by Mauritania, moving from 4% in 2010 to 59% in 2021. Finally, Mali too has moved from 2% in 2010 to 34% in 2021 illustrating, albeit not in exhaustive terms, the Gulf positive impact. However, internet penetration alone is not sufficient to highlight the digitalization benefits provided by the Gulf. In fact, as said a growing young population could be more dangerous for the stability of a country if endowed with internet connection. It would be better, in fact, that such digitalization provides effective outcomes like employment and consequently revenues. In this sense, measuring total number of persons, in full-time equivalent (FTE) units employed by telecommunication operators in the country for the provision of telecommunication services, including fixed-telephone, mobile-cellular, Internet and data services seems indispensable. As can be observed from data below, the sub-Saharan telecommunications sector has not fully developed already, even though some exceptions exist[189]. In such framework it might be useful to look at the Gulf presence. United Arab Emirates, Saudi Arabia, and Qatar operates in most of the region's countries[190]. This presence has obtained distinct outcomes: in some cases, in fact, there have been huge results, like in the case of Angola, Ethiopia and Kenya, in other there has been the opposite effect. However, it is important to reiterate the bias of these figures. They regard, indeed, the total investments not only from the Gulf. Thus while, on the one hand, they could be considered responsible for those countries in bad conditions, on the other, such a link cannot be applied to those states under better conditions. Overall, the digital solutions provided by the Gulf even if, as showed in the previous chapter, are in some cases innovative and promising, have not yet deployed their positive outcomes. In fact, they are currently not sufficient to assess completely the sub-Saharan needs.

[189] Ethiopia, Kenya, Nigeria, South Africa.

[190] Angola, Benin, Burkina Faso, Central African Republic, Cote d'Ivoire, DRC, Eritrea, Ethiopia, Gabon, Gambia, Kenya, Lesotho, Mali, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Seychelles, Tanzania, Togo, Uganda, Zimbabwe.

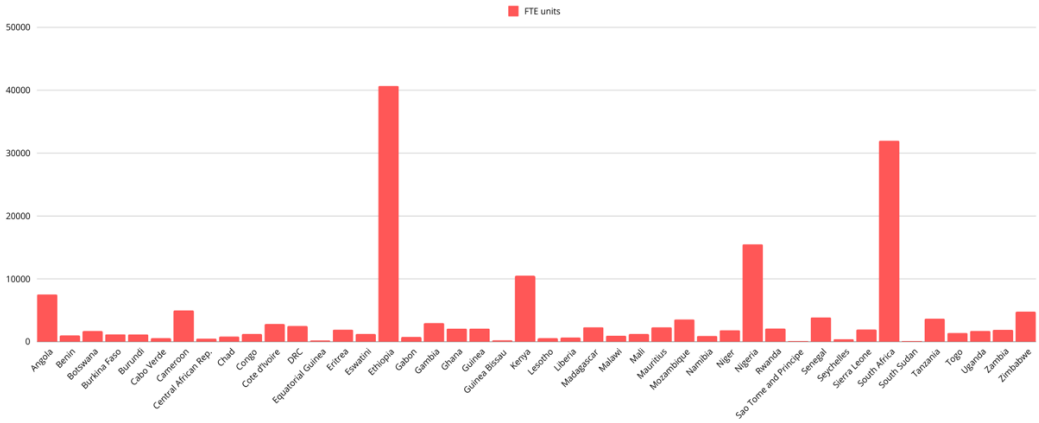

Table 6: *total number of persons, in full-time equivalent (FTE) units employed in the digital sector*[191].

Source: *The UN agency for digital technologies - ITU, "World Telecommunication/ICT Indicators Database Online," ITU, 2024, https://www.itu.int.*

To conclude this paragraph about the effective benefits that the Gulf investments have provided to sub-Saharan Africa, it might be useful to draw the final remarks. The three countries are massively investing in the sub-continent providing positive results to the countries there. In fact, they increasingly looked as third, neutral partners exclusively interested in doing business without any ideological or political bias going beyond the traditional geopolitical scenario. At the same time there are multiple risks. These stem firstly from the lack of transparency of such movements. As showed, the companies involved in investments in sub-Saharan Africa are intertwined with each other and consequently with the ruling families. Such internal complexity, in the most cases not openly declared, exempt them from any liability making things obscured and suspicious. Traditional companies and governments from the west and from the east take advantage of this. Sometimes, in fact, the involvement of the Gulf in western and eastern projects and investments, through the acquisition of some stakes, allow such companies to obtain revenues and

[191] The UN agency for digital technologies - ITU, "World Telecommunication/ICT Indicators Database Online," ITU, 2024, https://www.itu.int.

advantages indirectly not suffering the burden imposed by political and international struggles. Such risky projects are, in fact, carried out by the Gulf preventing the supporting companies to be involved directly and consequently protecting them. Secondly, and strictly related to what said above, the outlined lack of transparency raises the possibility of exploitation for the local governments and in general for the populations. Both the political coverage granted by the Gulf and the general opacity of their actions, increased the risk for these communities resembling, but also advancing the predatory attitude in the region. As a third concluding issue, there is the interference in local affairs deployed in some cases. Dropping the flaunted neutrality, and going beyond their economic interests, they consider sub-Saharan Africa as a relatively uncontested arena where it would be possible to experiment with foreign interventions as part of their strategy to prove their rising status on the world stage. The establishment, in fact, of military ties with regional countries could heighten regional security tensions, with the potential to escalate conflicts or create new security challenges. The example is given by Sudan: as already explained the three Gulf countries supports, even though not publicly, the opposite formations aggravating the situation of instability. Overall, such elements clarify as the Gulf interventions, albeit deploying effective economic benefits, bring also several dangers destabilizing and not improving the sub-Saharan conditions.

3.3 Global effects in the international scenarios

Having outlined the impact that the Emirati, Saudi, and Qatari strategies produce both in the Gulf and in the sub-Saharan region, the time has come to assess the effects on the international arena, with specific reference to European Union. Given sub-Saharan Africa's strategic significance for Europe's interests and ambitions the Gulf expansion in the region poses some clear risks to European objectives, spanning economic interests, geostrategic considerations, and values. At the same time, it is worth to note as such strategies if correctly leveraged could be beneficial for Brussels.

Starting from the former aspect, the risks are multiples. The primary is related to the economic power of the three Gulf countries. Being completely different from the European approach based on liberal principles, the Gulf adopt a state-backed method, thus threating the European private sector. Such model centered on more flexibility and more financial backing enables these countries to adopt a more daring approach compared to their more risk-averse European counterpart[192]. This, endanger European companies often perceived as less advantageous and cumbersome partners compared to Gulf investors. Moreover, as said, these countries demonstrate a greater risk disposition, enabling them to back projects that European companies and financial institutions might shy away from favoring the Gulf hazardous approach. Strictly connected to this, there is the cited lack of transparency. Albeit dangerous, it is an advantage for some governments interested more on make profits than respecting strict standards regarding financial transparency, regulatory boundaries, environmental governance, and human rights considerations. Such tolerance, not comparable to the European one, provides African governments more flexibility in navigating their developmental priorities while still accessing crucial financial support. The general plans carried out by these countries, particularly UAE and Saudi Arabia, confirmed what said. They are positioning themselves as global financial and trading hubs attracting companies and investments from all over the world due to their wide financial boundaries and regulations. Particularly the number of foreign companies, including African ones, registered in the three countries has ballooned recently with Dubai reaching 26420 by 2022, Riyadh 23297 by 2022, and Doha 14824 by 2018[193].

From a geopolitical point of view, the Gulf's expansion into strategic sectors across Africa also gives it leverage over important trade routes. The control of such infrastructures is allowing them to exercise a strict control over the sub-continent, managing the flow of goods inside and outside the region. At the same time, their

[192] Maddalena Procopio Corrado Čok, "Beyond Competition: How Europe Can Harness the UAE's Energy Ambitions in Africa," ECFR, June 20, 2024, https://ecfr.eu/publication/beyond-competition-how-europe-can-harness-the-uaes-energy-ambitions-in-africa/.

[193] The World Bank, "World Bank Open Data," World Bank Open Data, 2022, https://data.worldbank.org/indicator/IC.BUS.NREG?locations=SA-AE-QA.

relations with other international players on the continent, like China and Russia, could lead to alliances that could pose risks to European interests. Whereas it is true that their main interest is doing business, without any political bias, they are approaching such partners. Particularly, the Emirates have joined the BRICS+ group in 2023 reinforcing their connection with the so-called Global South, specifically China which is one of its main trade partners[194]. Similarly, Saudi Arabia could follow the same path. It is very close to such countries, being admitted in the group even if it has not already joined it according to recent updates[195]. In addition, as UAE, Beijing is one of the main trading partners of Riyadh. A more cautious approach has been adopted by Qatar, which confirmed its neutrality maintaining good and prosperous relations with the west and the east. Overall, such proximity is enhanced by the position adopted by the three countries aligning as gateways for such states thus extending collaborations to a wide range of fields. These factors could tangle for Europeans the promotion of stability, good governance, and human rights. Both Beijing and Moscow are strategically well-positioned to deepen cooperation with sub-Saharan Africa. Their arrangement carries implications for security, economics, energy, and climate. Europe's disengagement from these dynamics risks adverse effects, such as a curtailing of European companies' access to resources, markets, and trade routes in and around Africa[196].

As a third issue, the Gulf, leveraging its dominance in the energy sector, could be a fascinating partner for sub-Saharan African countries. Differently from Europe, which is phasing out completely the traditional energy sector, being hesitant to commit to long term investments, the Gulf, as showed, is still tied up to fossil fuels. Such aspect attracts African partners and their needs and growth ambitions considering fossils still useful. Such convergence should pose challenges to

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[194] United Arab Emirates Minister of Foreign Affairs, "United Arab Emirates Joins BRICS Group," www.mofa.gov.ae, August 24, 2023, https://www.mofa.gov.ae/en/mediahub/news/2023/8/25/25-8-2023-uae-brics.

[195] Reuters Editorial, "China Supports Kazakhstan Joining BRICS, Eyes Energy Reserves," Reuters, July 3, 2024, https://www.reuters.com.

[196] Maddalena Procopio Corrado Čok, "Beyond Competition: How Europe Can Harness the UAE's Energy Ambitions in Africa," ECFR, June 20, 2024, https://ecfr.eu/publication/beyond-competition-how-europe-can-harness-the-uaes-energy-ambitions-in-africa/.

Europe's approach to the energy transition and decarbonization efforts. Overall, as showed, the UAE, Saudi Arabia and Qatar, have become increasingly influential in Africa, driven by their vigorous financial resources and their extensive logistics network across Africa. These developments pose risks to Europe's market access and trade routes, and in general influence, threatening the European annihilation toward sub-Saharan Africa.

Nevertheless, Gulf countries could provide also some benefits to Europe. Together, Europe and the three countries have the potential to pursue complementary rather than purely competitive approaches, leveraging their respective strengths and shared interests to improve sub-Saharan Africa condition in line with African governments' own aspirations for development and stability. Trilateral cooperation between European, Gulf, and African stakeholders would also help mitigate the outlined risks for Europe coming from the Gulf and from Africa itself. Middle powers like the Gulf countries could be beneficial for Europe connecting sub-Saharan Africa huge resources, both materials and human, with the European needs. Such cooperation should bring several advantages ranging from an economic and political point of view. Controlling the vast majority of African ports, and consequently managing most trade passing through Africa, the Gulf, particularly UAE, should favor the cooperation between Europe, on the one hand, and Africa, on the other. Still, in fact, fresh in the memory the European colonialist approach which had been adopted in the previous decades, European countries, usually failed to engage directly with African partners. In this sense the Gulf neutral attitude should simplify the relation connecting the Gulf financial resources, the African raw materials and the European market. Clearly, such cooperation regards trade as well as digital connections since sub-marine cables coming from the financial hubs of the east pass-through Africa. In addition, the development inside the continent of digital infrastructures and skills should favor the creation or the strengthening of financial hubs, determinant for Europe, in Africa. The European Union could also cooperate on energy projects of common interest investing in critical infrastructure and participating in financial mechanisms. Cooperation in these areas can cater to each party's respective strengths: the EU and member states can provide expertise in technologies, governance, institution-building, and

regulatory frameworks that guarantee innovation as well as stability for investors[197]. These can be complemented by the UAE's financial prowess, connectivity capacity, and growing technological capacity, as well as Africa's availability of natural resources and efforts to increase energy access. By working collaboratively in this way, they could expedite the implementation infrastructural and financial initiatives, simultaneously bolstering commercial and strategic aspirations. Such Trilateral cooperation should also encourage the inevitable interdependencies between the UAE, Africa, and Europe from a political standpoint contributing to a more cooperative and stable international environment. As already said regarding the economic side, also from a political perspective, European countries solutions are often rejected. By way of illustration, the situations of Niger, Burkina Faso and South Sudan where Western forces have been mostly driven away, confirmed what said. This situation affects the stability of the area having regard also of the hypothetical worsening of the situation in the upcoming future, with harmful outcomes for Europe. Conversely the Gulf presence should mitigate such complexity. Interacting with their African partners, they should encourage a conciliatory process between all the actors involved based on business without any predatory purpose. This could be beneficial for each side: thus, for Europe enhancing its relationship with the continent, for sub-Saharan countries which should emerge in the international arena, and finally for the Gulf which should be able to be confirmed as an intermediary between the east and the west, getting out from their limiting fossil fuels relevance.

To conclude, balancing competition with cooperation in this way would acknowledge the need to gain a competitive advantage while recognizing the potential benefits of cooperation on mutually beneficial initiatives, such as accelerating innovation and sharing risks and costs challenging also the traditional mutually exclusive relation between competition and cooperation. United Arab Emirates, Saudi Arabia, and Qatar as middle powers have shown the flexibility to do so by engaging in variable partnerships. European players should adopt a similar

[197] Ibidem.

approach taking advantage of what done by the Gulf demonstrating their capacity to act in a progressively multifaceted and interconnected world.

Conclusions

Arriving at the conclusions of this dissertation, it is possible to confirm as the international arena is changing fast. In such scenario the Gulf region, specifically Saudi Arabia, United Arab Emirates, and Qatar, the main countries there, are moving massively to address the upcoming challenges. Those provoked by the global decarbonization and the consequent reduction of fossil fuels, are the main ones impacting severely on their internal but also external, international, position.

For this reason, they are changing their attitude adopting a new, active and open guise. In such realignment they are approaching also sub-Saharan Africa countries, a region rich of opportunities but also of challenges stemming from the demographic growth and the poor economic situation. This paper has focused on the technological investments made by these Arab countries in the region, concentrating particularly on ports, mining and digital solutions. In such three fields, the Gulf, as showed, is leading the way in sub-Saharan Africa being one of the largest investors there. They control, indeed, a major part of such strategic elements suggesting the existence of a “fil rouge” which should link them. Ports, but also the connected corridors are, in fact, the traditional and main cornerstone of the economic and political penetration in the region. They are in fact, strategic for the acquisition of critical raw materials, the probable substitutes of fossils in the future, of which sub-Saharan Africa is rich. Moreover, they are pivotal for the digitalization of the sub-continent grasping those opportunities that the young population should bring. In such scenario, as showed, the UAE are the leading players controlling the major solutions highlighted. They are followed by Saudi Arabia and Qatar, which despite their profound differences, are advancing in the region: the former with a massive economic penetration, the latter, with a more concealed one.

The three chapters of this investigation, as showed, have been dedicated to demonstrating the general effectiveness of the Gulf programs, and of the national, regional and international outcomes for both regions. Considering the whole efficacy of these strategies it is possible to confirm the positive outcome of such movements. Overall, it can be sustained that the Gulf, through such solutions, is

affirming itself as an active and leading player in the region, fostering firstly its diversification objectives. The three states have, in fact, been able to reinforce their global status becoming important players in such vibrant region. Lots of investments have been made and other declared contributing to the control of some of the strategic locations of the region. Managing both physical and digital commercial routes moving towards and passing through Africa is surely the main proof of such power.

Nevertheless, the outlook is still unclear. This makes the two other research questions outlined in the analyses unforeseeable. Concerning the former, related to whether such plans could bring Saudi Arabia, UAE and Qatar into a new national, regional, and international dimension, things are quite clear. As said, the three countries, mainly the UAE, even if in distinct ways are among the main investors in sub-Saharan Africa. However as showed, the oil detachment has not been already achieved. The three countries have not diversified their economies not abandoning their traditional asset. Thus, such plans cannot be considered as fully accomplished. Specifically, this aspect contributes to the unpredictability of the future.

On the other side of the analysis, and in relation to the final question, whether the Gulf movements could be sufficient to grant the stability and the development of the sub-Saharan Africa region, things are very ambiguous. The Gulf countries are surely supporting, through their substantial investments, the economic growth of sub-Saharan countries. Looking, in fact, as third, neutral partners exclusively interested in doing business without any ideological or political bias is surely positive for such countries historically plagued by predatory strategies. However, there are multiple risks stemming from the lack of transparency of the Gulf movements and from the frequent involvement in their affairs. Such attitude, as said could not grant real benefits for the region, with the risk of re-proposing what already done by the other powers. Moreover, from a European and consequently Italian perspective, as said this situation poses some threats, but also opportunities if properly leveraged.

To sum up, these strategies are highly promising, even though not already realized at all. For these reasons, the upcoming years should be essential to obtain a better overview of the situation. Firstly, it should be assessed, the effectiveness of

the Gulf plans specifically their Visions ‘objectives. As showed, such ambitious goals, have been already modified several times and other realignments have been declared. Following this tendency there could be other shifts impacting on the effectiveness of the Gulf’s actions. Secondly, the real effects on the forthcoming sub-Saharan Africa bubbling up scenario should be the other area of study. Despite the social and economic projections made, the sub-continent future is unpredictable. The countries’ framework might change totally directing them in different and opposite ways. The third and final steps which should be accomplished hereafter regards the effectiveness of the global decarbonization plans. Generally, the world’s countries are lagging behind their decarbonization goals. In such scenario, it should be verified whether such intentions would not be revised impacting consequently on the Gulf countries plans. On such bases whether such objectives would be respected in the Gulf is questionable. As said, the three countries’ economies are still heavily reliant on fossils not requiring a real shift in their internal and external assets. Thus, things remain uncertain requiring a subsequent assessment to be verified.

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