

249

CRUDE

Magazine



University of Khartoum
SPE Student Chapter

Meet our Team



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Commentary

By December 2024, war in Sudan marks 1 year and 8 months since its brock out. many of us shifted their attention to understand the country's history, and we are no exception.

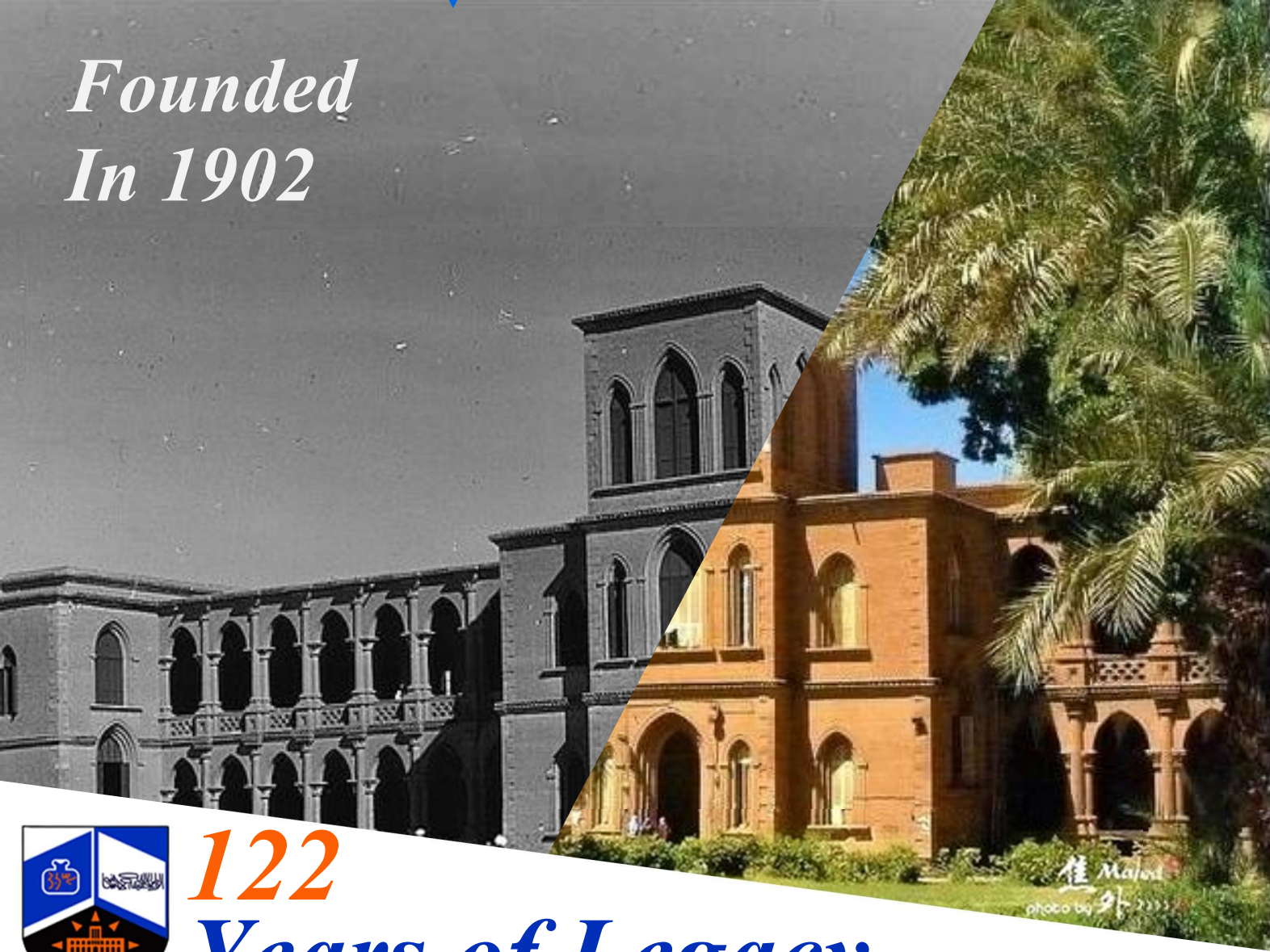
By this edition, we lunch 249Crude Magazine. In our 1st edition we focus mainly on Sudan, we cover briefly oil industry in Sudan and main millstones. We also talked how politics and oil industry have mutually affected each other throughout the history of Sudan. Additionally, we discussed the oil impacts on the national economy with some recent statistics.

We interviewed two iconic characters; our first guest is the founder of Petroleum Engineering and Natural Gas Department, University of Khartoum, he tells us about obstacles, challenges, and efforts made for establishment and beyond. Our second Guest is our SPE chapter supervisor, who talks about challenges he faced during university and after graduation, and the decisions he made to become the man he is today.

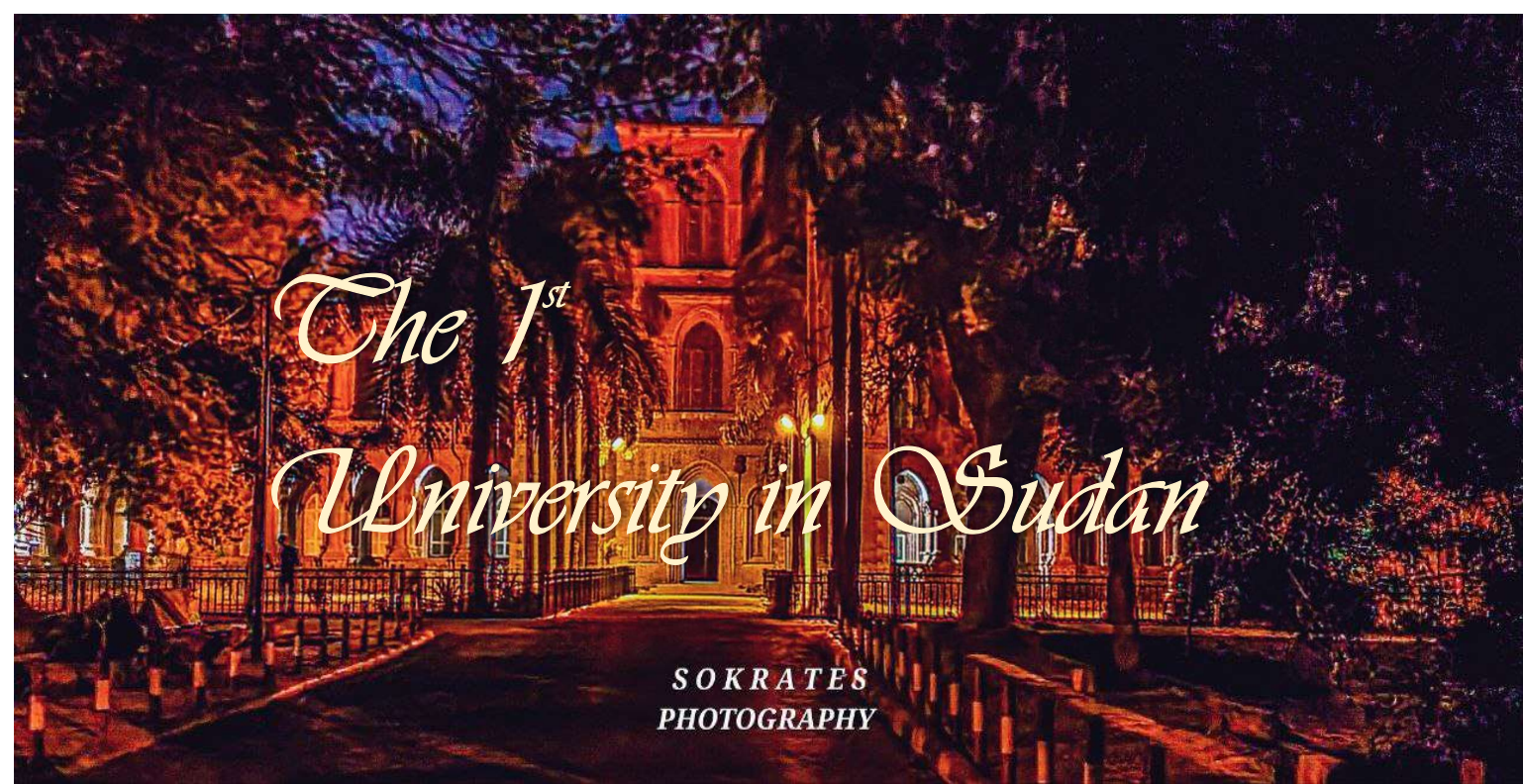
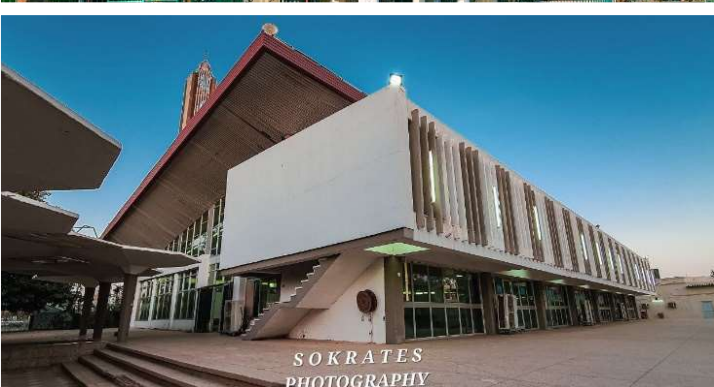
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*Founded
In 1902*



*122
Years of Legacy*





Sudan is Present in ADIPEC 2024

University of Khartoum Team Victory

Abu Dhabi International Petroleum Exhibition and Conference (ADIPEC) is the largest meeting place for engineers and professionals worldwide. Organized by Abu Dhabi National Oil Company (ADNOC), the UAE Ministry of Energy and the Society of Petroleum Engineers in Abu Dhabi each year. It includes of sessions and exhibitions presented by top class experts and leading companies. It also includes Sub-programs & competitions for undergraduate, which our team participated in.

This year theme was *“Connecting Minds, Transforming Energy”* Focusing on various important topics Such as Artificial Intelligence, Decarbonization and sustainability.

Our team delivered a brilliant presentation under the title:

“Utilizing Algae Farms to Capture Green House Gases (CO₂ and CH₄) From Oil and Gas Industry”

And compete with it against 11 other teams from all over MENA Region.



Inside Glimpse to ADIPEC

“The true treasure of ADIPEC specially the Universities Program was the gained experience, network connections, and new friendships we get along the way”

-Moeid Nadir

Day 1: Speakers/ sessions /discussions

The first day set a strong foundation with influential speakers and dynamic activities, stimulating discussions around pressing energy topics, and allowing us to network with talented students from other universities



“This experience motivated me to push myself further, The unique feeling of being truly seen and appreciated gave me a renewed energy to work harder and fueled my passion to be better researcher.”

-Fatima Nasreldin

“ADIPEC Provided me with both practical insights and stronger professional network. I think true growth happen when we step out to engage in challenges ourselves, and sometimes the journey is the real achievement”

-Maram Alsiddg

Day 2: ADNOC headquarter

Day two began with unforgettable trip to ADNOC headquarter, it was an exceptional experience. We also visited AL-Thmama Floor which is a hub for consulting on ADNOC Oil & Gas Operation, then we went to Panorama Floor where every drop of oil in UAE is monitored. Next, we headed to the exhibitions, where we gained a valuable information about the future of Oil & Gas Industry. Afterward, we went back to the hotel and took some rest and prepared ourselves for another long night of preparations before the presentation day.



Day 3: Competition in Khalifa University

where we presented our project in front of our colleges and industry experts, winning 2nd place in the competition was both humbling and exhilarating.

“It’s an honor to represent University of Khartoum, and it’s a pleasure to be part of the SPE society chapter, and I look forward for future experiences”

- Eman Ahmed

Historical Overview to Sudan's Oil Industry

Written By: Mohammed M. Nour

In modern life, energy is a main need everyone is racing to possess. It used to be woods for fire, later coal for steam engines, and now it is oil, our end uses differ but our need of energy is the always present. In this race for energy, nations spend billions of dollars on oil and natural gas reservoirs exploration, as these reserves -if utilized- will boost economy, especially for developing countries like Sudan.

Sudan Rise Up (1956 – 2010):

Discovery & Exploration Dreams:

Before the discovery of oil in Sudan, about 80% of the country's energy needs came from imported oil and oil products. Sudan's journey with oil & gas industry started in the late 50s when the Italian oil company AGIB started exploration and drilled six offshore wells in the Red Sea, AGIB exploration efforts resulted in discovering natural gas reservoirs, but as Sudanese government and AGIB were looking for oil not natural gas, they did not invest in further operations.

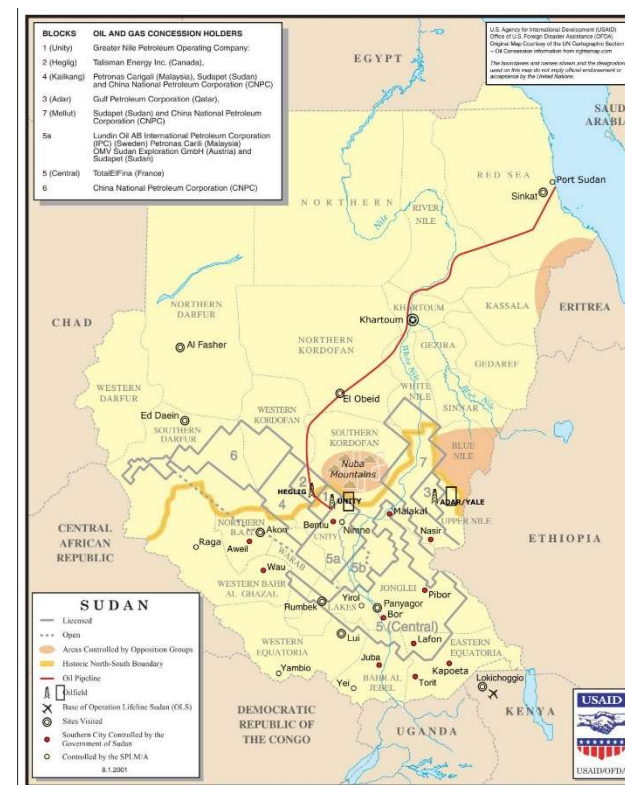
In the following years, explorations decreased because there has not been any discovery for oil reservoirs yet. Finally, in 1974 CHEVRON company successfully discovered the first oil reservoir at Abu-Jabra. Due to this huge progress many companies rushed to enter the Sudanese promising oil market to gain exclusive E&P contract with the government. The exploration processes continued until the early 80s by many companies such as TEXAS EASTERN, UNION TEXAS, SUNOIL and TOTAL.

Production hype:

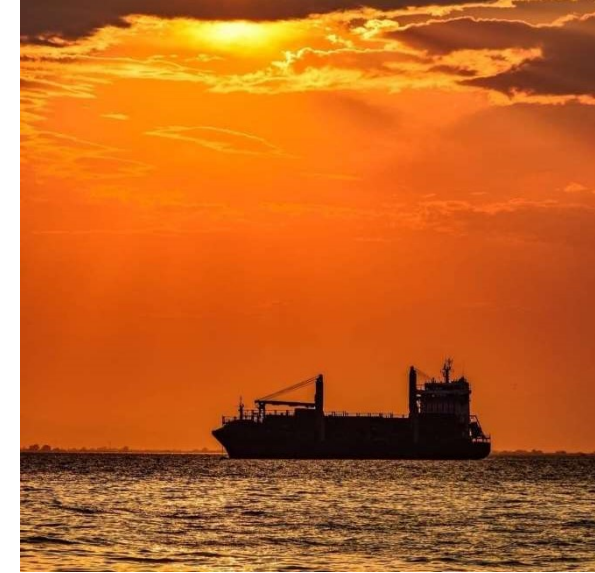
Sudan has 2 types of crude oil:

1. **The Nile Blend crude** which come from *Heglig* (Blocks 2 and 4) and the *Thar Jath* and *Mala* oil fields.
2. **Dar Blend Crude** found in the *Melut Basin* oil field East of the White Nile.

Nile Blend is sold at much higher prices than Dar Blend due to their different qualities.



The first exportation of Sudanese Crude oil production was in 1997, from *Adar Yale* site. That first 5,000 bbl. was transported from site by truck to Mulet, and then by boat to Khartoum and finally it was exported via Port Sudan marine export terminal. Production from *Adar Yale* site increased to 10,000 bbl./day by May 1998. In 1999 *Heglig- Port Sudan* Pipeline was constructed to transport the crude oil to port



Sudan marine export terminal for exportations. In the same year, the first transports via this pipeline was 1,500 bbl. produced from Heglig oil field. After that, production has increased rapidly to reach maximum production rates in 2006 and 2007, which were about 500,000 bbl. per day, and steadied at 460,000 bbl. per day until the end of 2010.

Even though USA Sanctions affected oil industry, Sudanese government was able to reach a steady economic status and worked with their Asian partners to develop the oil sector, expand the exploration operations, and increase the oil production as much as possible. In addition, Khartoum Refinery Company (KRC) and other refineries were established maximize the possible income of oil products exportation and to minimize the products importing cost.

Everything seemed to go just fine until the moment of the referendum on self-determination for southern region which was agreed on in the Comprehensive Peace Agreement at January 2005 (CPA), to choose whether to unit with rest of Sudan as one country or to declare independence.





Sudan Keeps Falling (2010 - Present):

In 2011, South Sudan declared its independence, and as a result, Sudan lost about 75% of its oil reserves. In the succeeding years, Sudanese government policy for oil sector seemed to focus on maintaining the production operations, instead of developing it.

In 2013, Sudan had a production rate of 130,000 bbl./day, this rate dropped to 72,000 bbl./day in 2019. Due to the low production rates and high demand on oil products, the government had to meet the demand by purchasing crude oil from global market or even purchasing refined oil products which definitely weighted down the country's economy.

In December's revolution that began in 2018, led to taking down the president Omer El-Bashir and his regime from the power. This gave people a chance for change, the winds of hope seemed to blow on Sudanese but unfortunately, not for long. Due to transitional state Sudan was going through between 2019 and 2023, the government attention was directed to politics. During this period, oil sector kept almost steady operation, while the energy sector -mostly renewable sources- got more attention.

Sudanese hopes and dreams hit the rock bottom in April 2023, when armed conflict between the Sudanese Armed Forces (SAF) and the Rapid Support Forces (RSF) broke out.

The conflict started in the capital Khartoum city and spread over the country covering until the moment almost 11 out of 18 states, with the internal displaced people (IDPs) reaching 10.8 Million. Many reports stated that key infrastructures like Khartoum Refinery Company (KRC), Bahri Thermal Station and others had been airstrike, attacked or vandalized.



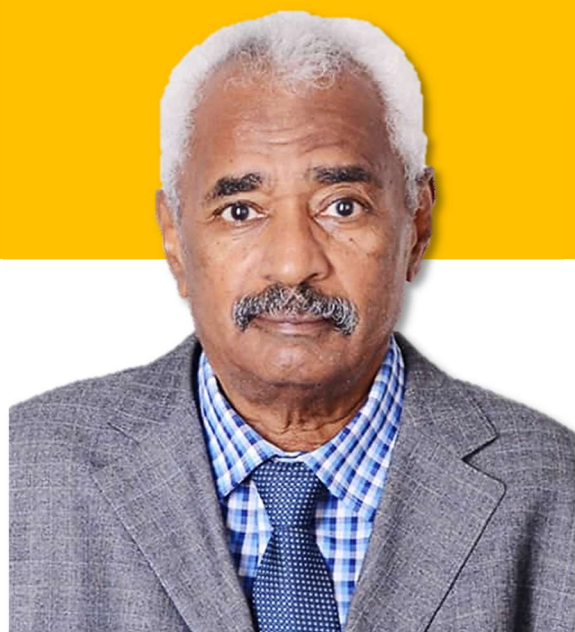
As most oil companies' headquarters are in Khartoum, they had been vandalized, robbed, and destroyed. Even some blocks such as block 6 and block 17 which producing together 22,000 bbl./day are shut down, and all offices on those

sites got robbed. Nonetheless, Petro-Energy and BAPCO Pipelines got out of service. Those catastrophic damages to oil sector's infrastructure did not only affect Sudan, but also its neighbor, South Sudan.

This comes as a result of signed agreements on oil sector between two countries before 2011 secession, such as share of fields, facilities, production, and transportation arrangements to support both countries' economies. So, the current conflict situation is costing South Sudan billions of dollars, as it uses pipelines to transport their crude oil to Port Sudan, since Port Sudan marine terminal is still the only terminal it uses for exportation.

At the moment, the future of the oil sector for both Sudan and South Sudan is still unclear, with the ongoing war and a concerning humanitarian situation, which affect not only the country, but the whole region.





Meet Our Department Founder

I'm Prof. Hassan Bashir Nimir, and I'll talk about my academic life and the most iconic moments in my professional career.

I celebrated last month my 74th birthday, as I was born in November 1950. My pre-university studies were in the schools of Khartoum-Bahri; the primary level at Halfaya Primary School, the intermediate level at Al-Amiria 1 Intermediate School, and the secondary level at Khartoum-Bahri Governmental Secondary Schools.

Afterward, I went to Iraq and studied at the University of Bagdad and graduated from the department of chemical engineering. I headed back to Sudan where I got my first job at the Sudanese Fabric Factory, I was responsible of water treatment for boilers. Later, I moved to Saudi Arabia and worked at ARAMCO company, I was privileged due to the experience I gained from University of Bagdad; as they focus on topics related to oil production. My work was at the fields of Saffania at the northern area, and Al-Khrsania at the central area. Saffania is an off-shore area, and most of the work is in the storing of production and production laboratories which we call Central Production Facilities (CPF) in the on-shore places.

I headed back to Sudan once again in mid 70s when Chevron discovered oil in it. I became the head of the department of petroleum studies at the Ministry of Energy and Mining, and I made several studies to utilize the discovered oil from the fields of Abu Jabra and Sharif, as well to many other studies. I have been sent by the Ministry to study MSc in petroleum engineering at New Mexico Institute of Mining Technology (NMIT). It was founded in 1819, therefore, it is considered an ancient institute in petroleum studies. I got my master degree and went back once again to Sudan in 1986.

After heading back to Sudan, I mostly worked within various committees. We used to work with an American company called Energy Development International (EDI) -as they had offices within the Ministry- to find solution to energy issues in Sudan. In Nimari's era, these committees work ended by putting the first and last energy national plan in Sudan. This plan was made by many efforts including ourselves, as it aimed to utilize the local energy sources to provide energy through sustainable energy fields. Unfortunately, due to the political changes followed with international companies halting their work in Sudan and the war in the south, the plan did not get approval from the parliament in Nimari's time.

When the National Congress Party (NCP) came to power -led by Omer Al-Bashir-, the situation became unpleasant in Sudan. Therefore, I took an unpaid vacation from the Ministry, and I decided to head back to United States to pursue my academic career by enrolling in PhD program in NMIT. My PhD dissertation was about using foams for minimizing the produced water with the oil. It was a significant research for oil companies such as ExxonMobil and Shell, as the usual research funding or grant process is to get results and outcomes that can be implemented on industrial scale, and get funds from companies and the Department of Energy (DOE).

In mid 90s, I moved back to Sudan and worked as a consultant for some private companies in oil field, specifically in exploration. In that time, the Faculty of Engineering at University of Khartoum was intending to establish the department of petroleum & natural gas engineering. Therefore, I applied to work in it, and I got accepted as a lecturer at the Faculty. There, I met Mr. Hafiz Wahbi who was responsible of the department establishment process. Shortly after he travelled to work in Yemen, and became the department head and the responsible of the establishment procedures.

As for my contributions in studies and reports, I participated in 3 global reports in energy field and its relation with climate change. I have done two reports with the International Governmental Organization under the United Nation (UN). The first report was one of my early reports, and the second, was about CO₂ Capture and Storage. I have participated in other two reports in the energy field, one of them is IPCC report that won Noble Prize in Peace in 2007. I also contributed in Sudan- First State of Environment and Outlook Report about the environmental status in Sudan with the international environment institution under the United Nation (UN) and the British Embassy in Sudan with many other colleagues, one of them was Mr. Motaz S. Saeed, who pursues PhD in USA at the moment. Together, we were responsible of addressing emergent environmental issues in Sudan, such as plastic trash and CO₂ emissions from vehicles and Diesel Generators.

Moreover, I participated in remarkable projects, such as evaluating oil fields equipment for Sharif Company before 2023 war, which was the first Sudanese study done by Sudanese group, as they used to hire foreigner experts. We were able to evaluate the equipment, and many engineers worked in this project under my supervision. Also, I have participated in an evaluation to Khartoum Refinery as was the first evaluation for a refinery in Sudan. As well, I worked as a consultant for companies which work in exporting the Nafta which comes from Al-Obid Refinery and the Petroleum Coal from Khartoum Refinery.

I have other contributions in global researches and supervising post graduates' projects. One of them was a research about using Guar Gum in the oil industry, which gave good results. Additionally, one of the most important global researches was the re-launching of the Sudanese oil pipeline in case of failure of lunching (Startability of crude oil pipeline) with Prof. Mohammed Hashim Siddig. Another research was about (drag reduction regents) which reduce pressure in pipelines for GNPOC company. Also, under Dr. Quosay supervision we did a study about (Determining the crude leaking from the evaporation bonds). The study was made with many engineers from university of Khartoum - civil engineering department, and also International University of Africa, and it had good results .



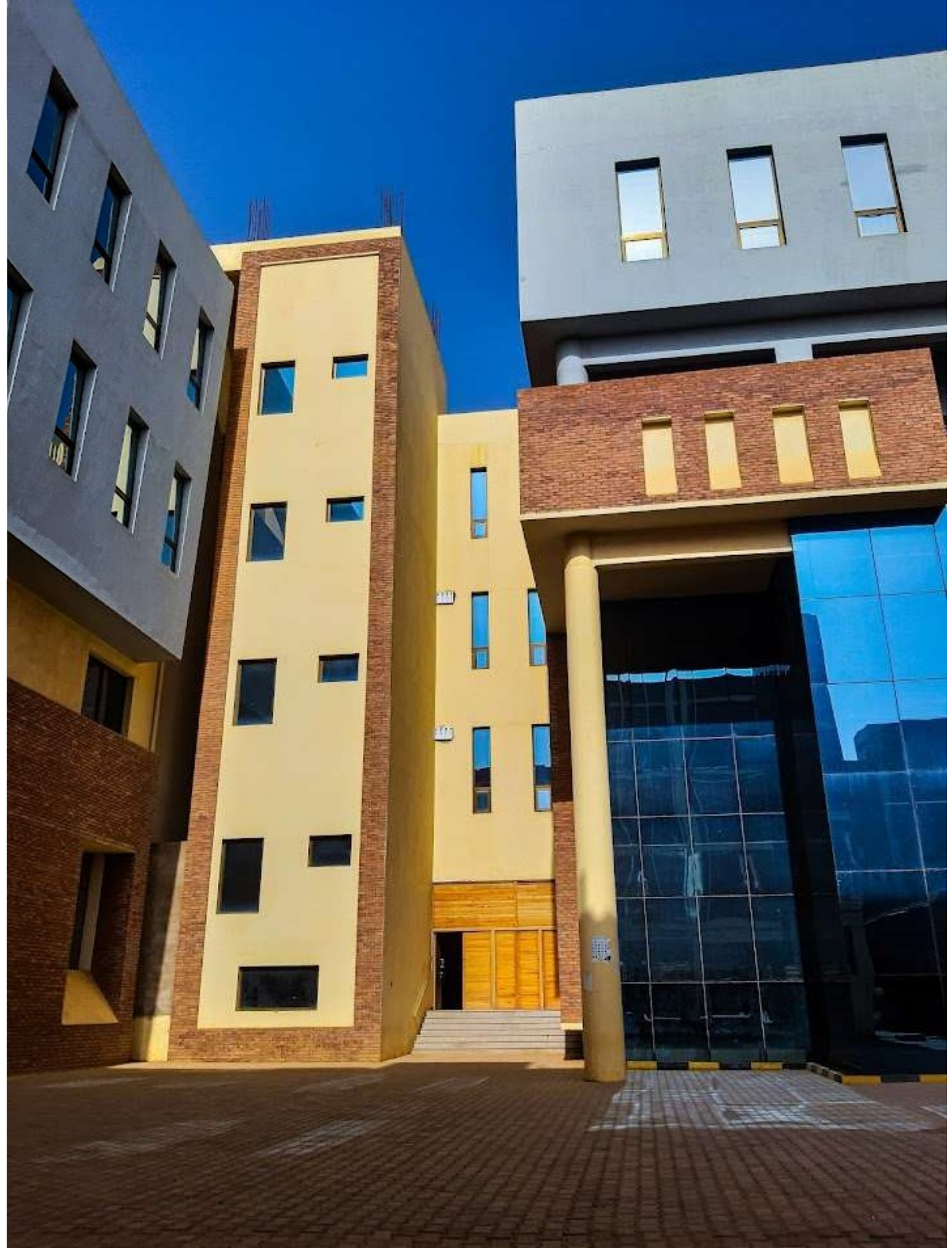
Department Foundation Story

For The First Time, With Prof. Hassan B. Nimir

- **Foundation Process and Faced Difficulties**

As the Faculty of Engineering at University of Khartoum intend to establish Department of Petroleum and Natural Gas Engineering, I applied to work in it, I got accepted as lecturer. There I met another lecture, Mr. Hafiz Wahbi, who was responsible for the establishment process, he started by creating curriculum with committee included Dr. Tag Aldeen and Ministry of Energy. But as Mr. Hazifa moved to Yemen for work, I became the head of the department 1996, and in charge for the establishment procedures. Prof. Al-Ni'ma which was the Dean of Faculty of Engineering, is one of the people who helped me a lot at the beginning.

The establishment of a new department in absence of many resources were not easy as The University Higher board did not put the department establishment in their priorities. There were few textbooks and references in the library of the Geological Science Department and The Main library. But the specialized textbooks and references were not available. As for the offices, the faculty gave us the 5th floor in the Tower Building, which is now belong to the department of the Mechanical Engineering. Mr. Al-Hadi Ibrahim Hassan the General Manager of Nile Distributing CO., and Mrs. Widad Yaqoub the CEO of Alnhla Company had a significant role at the beginnings of the department, helped us and provide their assistances.



- **Department Labs, Offices, Staff, Library, and People Who Helped Us In Early Stages**

It was important to establish department's laboratories. But even more important to provide teachers and library full with references. In this aspect -in the period of Prof. Al-Ni'ma- we had signed contracts with teachers from Iraq. I remember from them Prof. Ziad Al-Aswad, Prof. Al-Sunboli, Dr. Maha Abd-Alamer and Mr. Mohammed Qassab. We had also contracted with Sudanese specialist from Petrodar Company. in addition to independent contractors such as Dr. Nasraddin Hassan Shamsaldin and Mr. Alhassan Omer Abdullah both of them played a very crucial roles in the department. Mr. Al-Hassan Omer Abdullah lived in Canada, he used to come and teach voluntarily Formation Evaluation and Water Flooding courses and then return each semester.

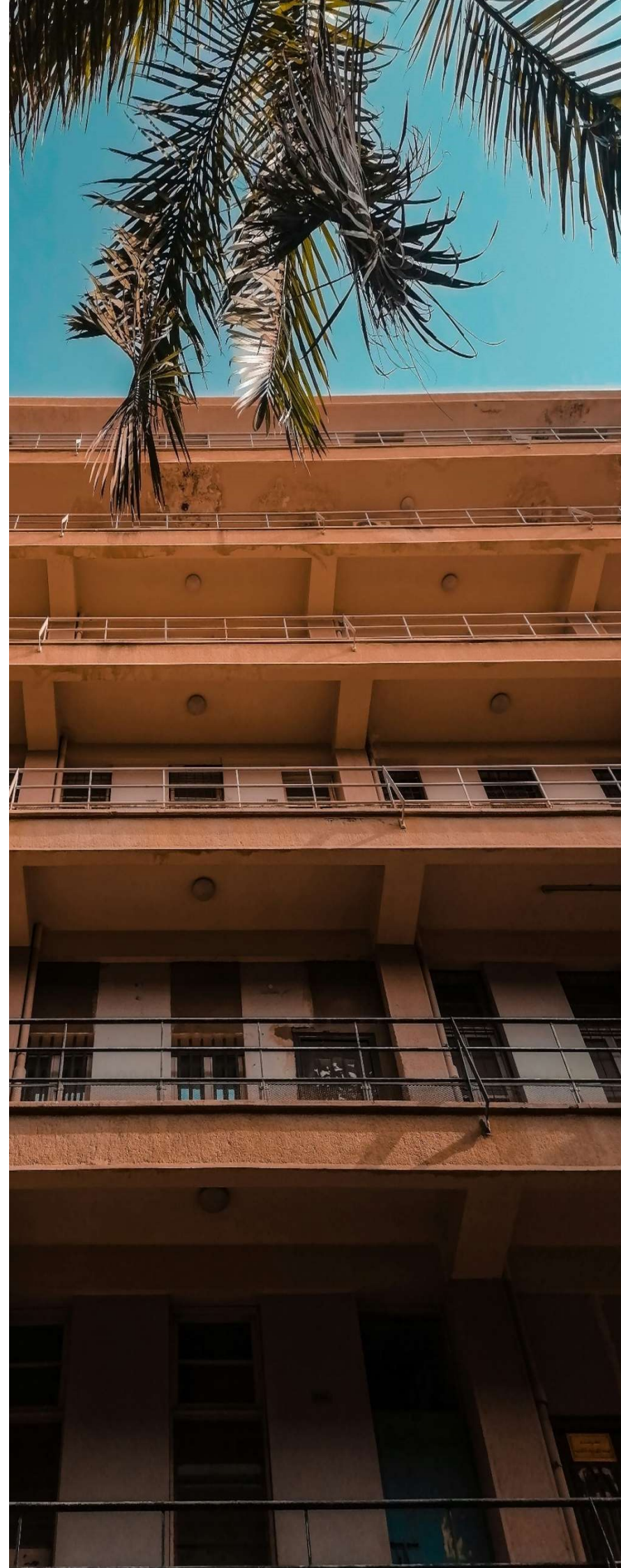
We had overcome the absence of laboratories at the beginning -for first batches- by contracting with University of Bagdad, and we appreciate their help in providing laboratories experience to our students.

Our University Higher Board response to our demands for department offices and laboratories was weak. They have shifted the responsibility to the faculty, and the faculty was incapable financially to meet those demands. Even the Ministry of Energy did not support us although we reached out to the minister himself few times directly.

Luckily, through our independent efforts with Prof. Al-Ni'ma and Dr. Abdullah Khogali, we were able to establish two laboratories, in addition, through help of Prof. Bora'iy from the faculty of veterinary, Sudapet Company donated the Laboratory of Oil Characteristics. As for the offices, the faculty gave us the 5th floor in the Tower Building, which now belongs to the department of the mechanical engineering.

Dr. Abdullah Khogali was actually the most helpful person we worked with in the process of applying for funds and financing the department through his wide network. Thanks to Dr. Abdullah Khogali, our department and mining engineering department were able to establish our own libraries, as he supported us with big budget to get references and textbooks. Thus, myself and the head of mining engineering department went to The Book Fair in Egypt to bring references and textbooks.

After while we tried to come up with new financing ideas, to help the department. We thought that as long as the oil companies need people to train their employees, we can apply for their yearly bids to use in supporting the establishment of the department. All teachers in the faculty participated in it. Those funds provided a very good amount of money for faculty. In addition, Faculty of Engineering at University of Khartoum and specifically the Department of Petroleum and Natural Gas made the exams of Energy Ministry jobs application. Ministry Secretary at that time Mr. Hassan Mohammed Ali played a major role in this.



- **What Experience The First Students Had, and How They Got Admitted To The Department?**

As known in the faculty of engineering at university of Khartoum, the students in the first-year study the same curriculum, regardless what department they have been admitted to. After the first-year, they have a chance to apply to be transferred to another department.

We accepted our first batch in 1996, through internal transfer, as we announced in the faculty and some students applied to be transferred to our department. The first batch was created from 4 students. Dr. Quosay Awad and Mr. Salah Tawfiq Hashim are two of these students who worked in the department after graduation.

The Second batch of 1997 was also accepted by the same transfer procedure. Mr. Nazar Abd-Albari is one of the students' of 1997 batch who worked with us after graduation and has been sent to get his MSc. Back in days, we used to send graduates to China to get MSc degree and became teaching assistants in the department.

The first batches did not exceed 10 students. Fortunately, our efforts got rewarded as the department became the 2nd most desirable department among students after electrical and electronic engineering. The minimum accepted secondary school grade for admission was about 90%. Later, we opened direct admission of students to the department (secondary school to BSc).

Providing practical and laboratory experience to our student is very important. Despite the efforts that were made at the early stages of department foundation to provide well equipped laboratories, I still believe until the moment, there is a lack of the laboratories and equipment.

But in the past, we were able to find other ways to overcome the labs issue by many means such as field trips which used to be easy to organized at that time due to the small number of students, and using some laboratories in some fields.

I worked as supervised the establishment process and have been the head of the department than 10 years. Dr. Quosay Awad became the head of the department in 2007, Mr. Anas Alsiddig in 2020, Mr. Khaleel Yahya in 2023, and now Mr. Ahmed Abdulhameed in 2024.

Also, I worked on updating the curriculums with Dr. Quosay, and I did provide my help when ever needed. In Dr. Quosay period the department kept accepting larger numbers of students.

The department expanded its network and collaborations, we worked with people from the industry, such as Dr. Rao from the Indian company. Many of our graduates worked with us, such as Mr. Ammar Yasin Omer, Dr. Altazi, and Mr. Rajaiy Abdulmottalab who still working with us until now.

There are also, number of lecturers from other departments of the engineering faculty who worked with us in critical time where we did not have enough staff to teach our courses on Undergraduate and Post Graduates level. Some of lecturers are Prof. Mohammed Hashim Siddig, and Dr. Ali Seory, and Prof. Abdulmottalab

You can make an interview with Dr. Quosay who was the responsible of Post Graduates department and he give more details about it.

- **Finally, Advice For Young Petroleum Engineering**

You are doing a great work with SPE, and you have won many competitions.

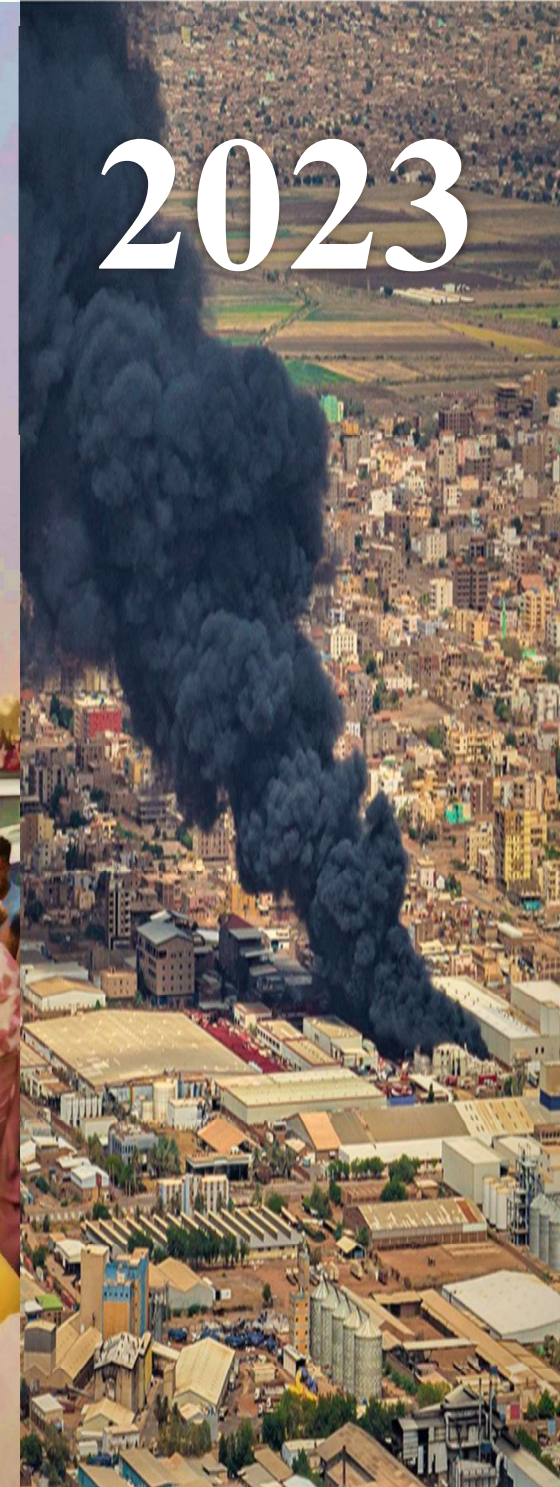
The innovations and developments in petroleum engineering are continues and fast paced, thus it is important to stay updated with the trends and technologies that emerge.

So, I advise you to:

1. be updated and trained as much as possible, the good thing that knowledge is easily accessible today and affordable, unlike what used to be in the past.
2. Know about petroleum software's models and simulators in the different specializations across the industry

work in groups, have discussion with you peers, create projects proposals as you can learn from each other, and from your working together.





Independence

Ismail Al-Azhari rise the flag of Sudan declaring the official independence from the Anglo-Egyptian Colonization

Oil Discovery

First reserve discovered by the Italian AGIB Company.

Civil Wars

Influenced by the oil discoveries
1958-1972 South 1st war
1983-2005 South 2nd war
2004-2020 Darfur war

Secession

South Sudan gained its independence according to 2005 Addis Ababa Comprehensive peace agreement (CPA)

Revolution

Wide protests across the country led to overthrown Omer El-Bashir. The president of the longest ruling regime -30 Years- in the continent.

Current War

On April 15th, fights broke out between Sudanese Armed Forces (SAF) and Rapid Support Forces (RSF) across the country, and still ongoing.

Sudan's Policies laying Shadows on Oil Industry

African countries depend mostly on the contribution of the energy sector in driving industrialization, economic, and social development. Generally, energy resources aid the development of the economic situation, yet, a critical case can be seen in Sudan, as the oil sector has undergone significant changes over the years, influenced by various political factors. Understanding these factors is crucial to comprehending the current state of the oil industry in the region.

- ***The First (1955–1972) and Second (1983–2005) Sudanese Civil Wars***

First Sudanese Civil War—between north and south over demands for more regional autonomy by southern Sudan region—and Second Sudanese Civil War—between the Central



Written By: Omama Basbar

Sudanese government and the Sudan People's Liberation Army—severely disrupted oil exploration and development. Even after oil was discovered in the late 1970s, the continued conflicts made progress difficult. The Comprehensive Peace Agreement (CPA) in 2005 managed a turning point, briefly maintaining the sector and boosting oil production.

- ***War in Darfur (2003–2020)***

Shortly after the end of one of Africa's longest and most brutal civil wars, the Darfur conflict broke out in 2003. This crisis not only urging international sanctions in response to



allegations of genocide and crimes against humanity but also disrupted the development of Sudan's oil industry. The resulting insecurity and instability in the country significantly increased operational risks, discouraging new investors, and obstructing the oil industry's growth.

- ***South Sudan Secede (2011)***

In 2011, South Sudan seceded along with 75% of Sudan's oil reserves, shrinking Sudan's

economy by 10%. In January 2012, South Sudan shut down oil production for 15 months due to a disagreement with the north over the pipeline transit fees. More oilfields were closed when South Sudan's civil war broke out in December 2013. The fighting physically damaged some oil infrastructure, while hundreds of foreign, mostly Chinese, oil workers were evacuated due to safety concerns.

- ***April 2023 War***

An armed conflict broke out in Khartoum, in 2023, between the Sudanese Armed Forces (SAF), and the Rapid Support Forces (RSF). As the fighting continues between the two parties and has spread to other parts of the country, increasing the risk of shut-ins or damage to oil infrastructure, and reducing Sudan's crude oil production. Sudan has three oil refineries and three topping plants (smaller, less complex refineries). However, most of these facilities have either been shut in or decommissioned; only Al-Jaili refinery, which is the country's largest refinery, and El-Obeid topping plant are currently operating. Yet, the operational status of Al-Jaili refinery remains unclear.

Sudan, once one of Africa's top oil producers—with an output of nearly 500,000 barrels per day in 2008—as of last year, its average daily production had fallen to around 70,000 barrels. S&P Global Commodity Insights notes that Sudan, now the smallest producer in the OPEC+ group, produces about 60,000 barrels per day.



- **Policies**

International oil policies reflect geopolitical interests, balancing energy needs, economic goals, and ethical concerns like sustainability and human rights. They influence global markets through investment, trade, and technology access. Sudan's oil industry has been shaped by opposing international policies from Western and Asian countries. While Western sanctions created obstacles, Asian partnerships have driven its growth.

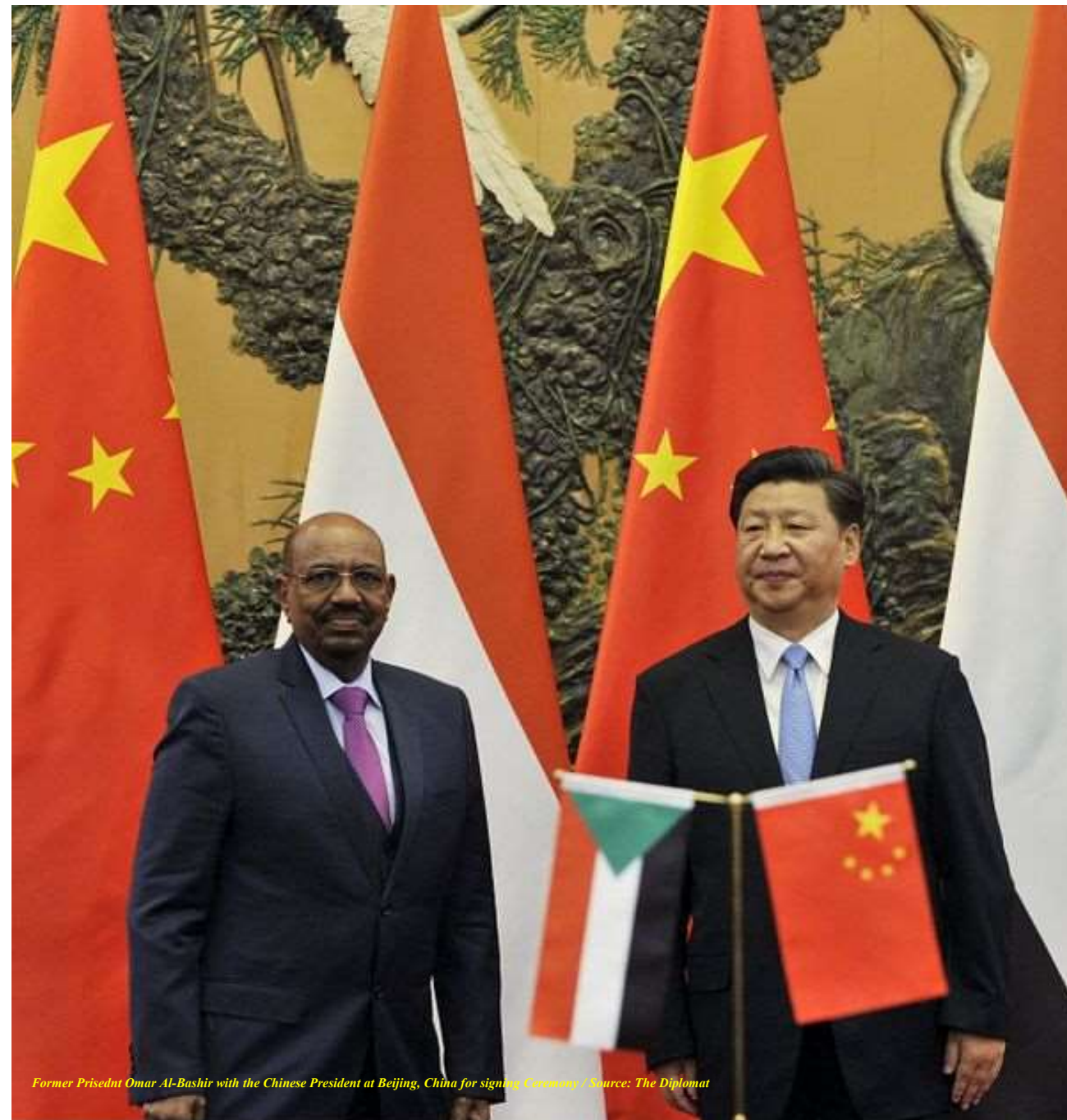
Western sanctions

Since the 1990s, Western nations that led by the United States, imposed sanctions on Sudan in response to human rights violations, particularly in Darfur. These sanctions blocked Sudan's access to Western technology, financing, and investment. U.S. sanctions prohibited American companies from operating in Sudan's oil sector, except for limited exceptions that are allowed by the US administration—import of Gum Arabic for Coca Cola.

The European Union (EU) suspended formal cooperation with Sudan in 1990 but continued humanitarian aid. In 2001, the EU adopted a policy of “constructive engagement,” aiming to explore economic opportunities in Sudan despite U.S. sanctions. However, public disagreement in Europe and competition from Asian investors limited European involvement. By 2007, major European companies like Rolls Royce withdrew from Sudan.



Source: Reuters



Former President Omar Al-Bashir with the Chinese President at Beijing, China for signing Ceremony / Source: The Diplomat

Asian Investment: Key to Sudan's Oil Growth

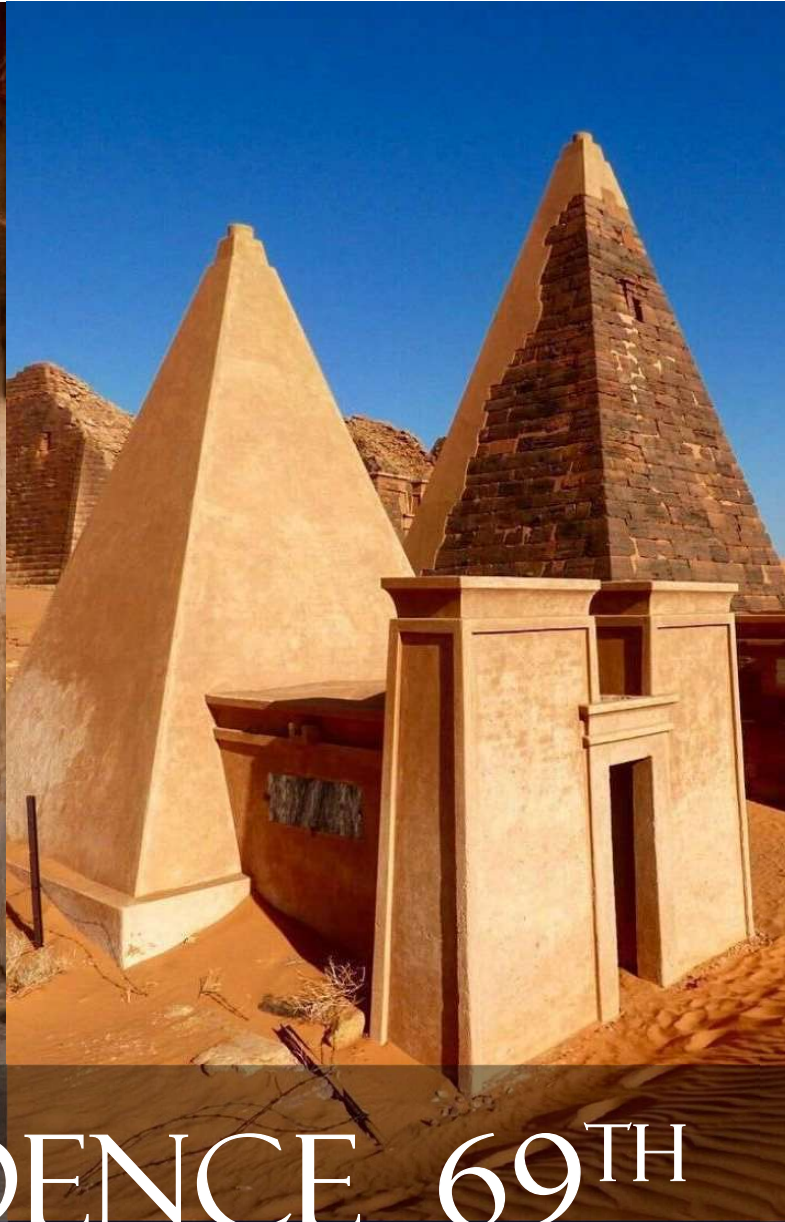
In contrast, Asian nations, especially China, Malaysia, and India, actively supported Sudan's oil sector. They invested heavily in the infrastructure, enabling Sudan to maintain production and exports, without challenging its internal policies. China, in particular, opposed international sanctions against Sudan and secured energy resources through this partnership. Malaysia also backed Sudan by resisting calls for sanctions.

Internal policies

To offset revenue losses following South Sudan's secession, the Sudanese government increased taxes and tightened control over oil operations. While intended to address budget gaps, these policies often restrained industry growth and created an unstable environment.

The Sudanese Petroleum Corporation (SPC) and Sudapet, the national oil company, hold significant power over oil exploration, production, and distribution. However, their budgets lack transparency, as they are not reviewed or approved by parliament or the Ministry of Finance. This absence of oversight has contributed to inefficiencies and further complicating the development of Sudan's oil sector.

In conclusion, Sudan's ongoing conflict and political instability threaten not only its oil sector but also the broader economy, which has long relied on oil revenues as a critical foundation. These revenues once supported a substantial portion of Sudan's GDP and funded essential government services and development projects.



INDEPENDENCE 69TH

ANNIVERSARY





The Impact of Oil Sector on National Economy

Written By: Aya Abduljabar

Diverse natural resources of any country can be a reason for its rise or its fall, and Sudan as many African countries is not an exception. Since Sudan independence in 1956, the economy was dependent on agricultural sector. In 1983, agriculture accounted for more than 90% of exports, while the GDP sectors share was agriculture 38%, industry 13%, and Services 49%.

Oil sector has had the greatest impact on the economy since Sudan started exporting crude oil in August 1999. The share of oil exports increased from 36% in 1999 to 95% in 2008, which made the economic growth to 6% during this period. Thus, the financial revenues doubled from 7.6% of GDP to 15.2% between 1999 and 2011, with oil revenues contributing 60% of total revenues.

With the majority of South Sudan's oil reserves after the separation in 2011, Sudan's economy was shocked, as there were issues of economic mismanagement, corruption, and increased spending on the military.



Sudan is used to importing 50% of diesel and 15% of liquefied petroleum gas consumed in the local market and exporting a small amount of gasoline, but after 2011, as the local production could not meet the fuel demands, the fuel imports increased. After 2016, as the gap between the local production and demand increased, the share of domestic production in total consumption decreased.

As the economic crisis kept getting worse in addition to the decline of oil exports, the December 2018 took

place resulting in the fall of al-Bashir regime on 6th April 2019. However, the crisis continued with 50% of gasoline, more than 60% of diesel, and 50% of liquefied petroleum gas to be imported in 2019. The economic crises, based on fuel scarcity, continued until the outbreak of war on 15th April 2023, which its losses at the first moths were 5 billion dollars, and the losses are increasing daily.

Before South Sudan separation in 2011, most of operating field were located to the south and west south of Sudan, while most of operating facilities and transportation pipe, and exporting terminals are located in the middle and northern, and eastern parts of Sudan.



As results, after separation both Sudan and South Sudan signed agreement in 2012 for transporting the South Sudan oil the pipeline to be exported via Port Sudan marine terminal, exchange Sudan received a fee. This oil transportation agreement was expired in March 2022, but a month ago the two countries agreed to resume the transfer process.

Sudan's economy has been affected by many factors; one of the factors that affected Sudan's economy so badly is the American sanctions against Sudan since 1992, which have been updated, revised, and altered several times. These sanctions aimed to pressure the country and the governing regime, which was accused of sponsoring terrorism. In 2017, the White House announced that the sanctions were partially lifted. The US sanctions had significant impact on the availability of goods, services, and financing to the Sudanese economy. Under the freezing of Sudanese financial assets, the export of American technology to Sudan was prevented. In addition to the denial of the financial services by US banks that had established a partial international blockade on the Sudanese banking system, and the European Union has implemented these sanctions too.

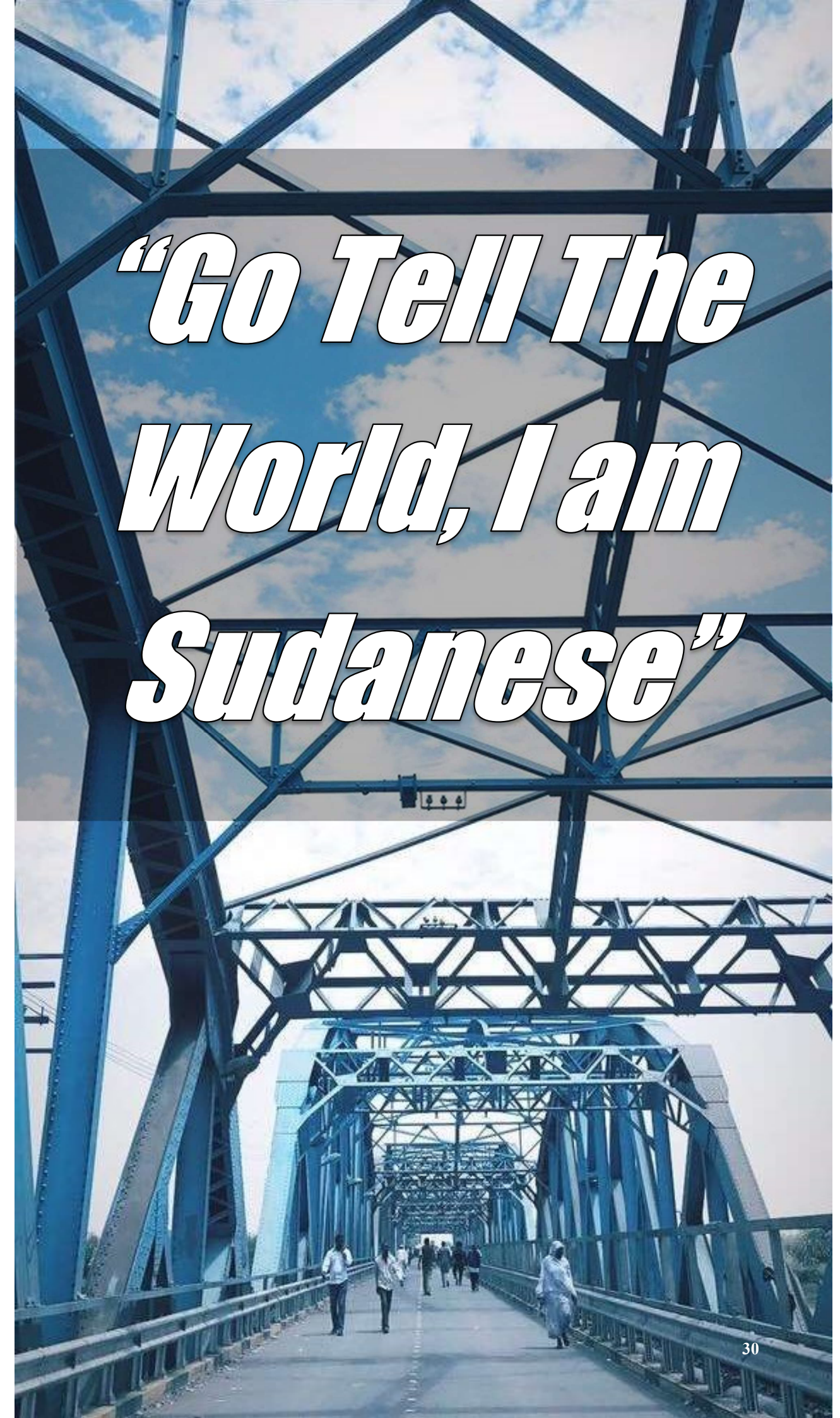




The current conflict that our broke on April 2023 between the Sudanese Armed Forces (SAF) and Rapid Support Forces (RSF) quickly spread across the country. Wars whenever they happen are expected to bring killing, devastation, displacement, starvation, and infrastructure destruction. The current war is causing enormous disruptions in Sudan's economy and the oil sector infrastructure, in addition to complex humanitarian crisis as Sudan witness the largest displacement crisis in the world as 11 million people are displaced, 20000 deaths at least, 33000 injuries, and job losses, poverty increased in most of the country.

Industry sector, and specifically oil sector is suffering from direct damages due to attacks and looting, but environmental sector is affected indirectly by war. Given the challenging accessibility to plants, wells, fields, and pump stations there is possibilities of leaks from these facilities causing soil and water pollution, Furthermore, unplanned shutdowns, especially those not conducted according to environmental safety standards, may lead to the release of hazardous substances and greenhouse gases. As the war continues, environmental damage will also increase.

At the end of the day, Sudan needs many things; the war to stop, a plan for recovery and development, qualified leaders, its people to stand up for it, and the world to look at what happened. Is this war going to stop soon? We do not know, but what is certain is that we need to revive eventually, and learn and grow out of it as individuals and nation.



Meet Our Supervisor

Dr. Anas Alsiddig Yosif MohammedAhmed, Faculty Advisor SPE University of Khartoum Student Chapter since 2021. Dr. Anas academic journey is very diverse as it has been between Sudan, Saudi Arabia, and China. He obtained BSc in Petroleum and Natural Gas Engineering from University of Khartoum (Sudan) in 2011, MSc in Petroleum Engineering from King Fahd University for Petroleum & Minerals in 2017, and currently he is pursuing PhD in Petroleum Engineering at China University of Petroleum (China).

Dr. Anas is a lecturer at University of Khartoum Department of Petroleum & Natural Gas Engineering since 2018 and was the head of the department until 2022.

How would you describe the oil industry in Sudan during your undergraduate studies in mid 2000s?

When I was doing in undergraduate studies between 2006 and 2011, the oil industry in Sudan was at its peaks as Sudan was exporting around half million barrel per day, and that reflected positively on the economy and the life quality of individuals.

The sector was developing consistently and employment rates were high. At the time, petroleum engineering was only taught in two university in Sudan, University of Khartoum, and Sudan's University for Sciences & Technologies, thus the graduates of those universities were recruited by big oil companies like Greater Nile Petroleum Operating Company (GNPOC) and Petro Energy, and also in the Ministry of Energy & Mining at that time.

The relations between educational institutions oil sector were strong, in our department Prof. Hassan Nimir invested in creating partnerships and relations with companies and ministry that



found great employment opportunities for university graduates.

Schlumberger for example provided annual scholarships and job positions for exceptional students and graduates, and also awarded prizes for top class students in each batch which encouraged them eventually to work in the company, everything changed after the secession of South Sudan in 2011.

On personal level, did South Sudan secession in 2011 affect your career and professional decisions?

Yes, it significantly did. Sudan's production dropped from about 500,000 barrel per day to around 150,000 barrel per day, almost two thirds of the production had been lost to South Sudan. Thus, it had direct effects on oil industry and economy as it was dependent on oil exports.

I graduated 2011, the same year of secession, the companies' employment opportunities decreased rapidly. My colleagues and I did get employed in any oil companies at the time as fresh graduates, later in 2013 GONPOC opened few employment



Taken By: Ahmed Najim

opportunities in and didn't open again until after 2018, eventually most of us turned to academia.



You are the Faculty Advisor for the SPE University of Khartoum Student Chapter, do you have any previous experiences with SPE? and how did SPE influenced in you professional or academic career?

Actually, after graduation my collages and I tried many times to establish SPE Chapter at University of Khartoum, we collected members data and talked to Sudan Section at that time, but we were not able to meet all regulations because the US Sanctions that has affected Sudan significantly. That why the establishment of SPE University of Khartoum Chapter was delayed until 2018 -after lifting of US sanctions in 2017-. During my MSc at KFUPM, I got the chance to know more about SPE goals, opportunities, and conferences, I participated myself in few conferences with scientific papers. Those participations allowed me to see how oil industry looks like outside Sudan. My involvement in SPE

help sharpen my academic and professional skills. Reaching out to several oil companies and research institutions as part of SPE relations building helped me develop my communication and networking skills, and those networks were -and still- very valuable for my academic journey as I got insights about new trends various specializations in the oil industry such as reservoir, drilling, production, EOR ... etc, in addition to getting familiarized with Machine Learning (ML) and Artificial Intelligence (AI) and their application in industry, and how these technologies influence development of industry sector in general, and oil sector specifically.

So, I can say that networking is very important as it can get you many doors open, and gives chance to be more engaged with experts and peer in your field all these things contribute to developing your skills.

That's why I advise students to build professional networks -even before graduation- with leaders and experts of the oil industry through known platforms such as LinkedIn which considered a social media professional platform that allow you to contact directly with the professionals in any field, in addition to the SPE community.

At the end, I want to thank SPE University of Khartoum Student Chapter for hosting me, and I hope that Sudan will rise again soon, providing many opportunities to its people, and all of us can work together to rise the name of our university and our country to where it should be, because if we did not work to help our country, who would?

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