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**Extractive Industries and Sustainable Job Creation**

**Contribution of higher Education to Capacity building  
and Job Creation In the Extractive Industries**

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The views expressed are those of the author and do not necessarily reflect  
the views of UNCTAD.



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# PRESENTATION OUTLINES

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- Introduction.
- Sudanese Faculties/Departments of Geosciences.
- Annual Number of Graduates.
- Role of Higher Education in Capacity-building.
- Challenges Facing Higher Education.
- Proposals for Solutions.
- An Appeal.
- References.



# INTRODUCTION

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- **The challenges facing the existence of man on planet Earth focus on the exploitation of the geological natural resources such as the hydrocarbons and mineral wealth, in addition to water.**
- **Maximum benefits from such potentialities require necessary knowledge that enables the university graduates and post-graduates to perform their duties in a professional manner.**
- **This is because Sudan is presently undertaking extensive prospecting and exploration programmes for these natural resources.**
- **Execution of the capacity building of the appropriate workforce is mainly the responsibility of the Universities.**



# Sudanese Faculties and Departments of Geosciences & Related Engineering



- Presently, the Sudanese Universities host:
- **Seven** Faculties of Earth Sciences or of Petroleum and Minerals,
- **Four** operating Departments of Geology (two more Departments are now under establishment), and
- **Three** Departments of Mining Engineering affiliated to faculties of engineering.



# Annual Number of Graduates



<b>Geology Department (Khartoum University).</b>	<b>70</b>
Faculties/Departments of Geology (other universities).	400
Petroleum & Mining Engineering Departments.	140



# Role of Higher Education in Capacity building



- Sudanese Universities play an important role in the capacity-building of their graduates through education and research. They
- Provide the graduates and post-graduates with in-depth and advanced theoretical background in geosciences.
- Need to have them acquire the necessary skills for applied geology requirements, as regards field training and laboratory work.
- Enable the graduate to independently design, execute and evaluate prospecting and exploration programmes as needed by the employer.



# Role of Higher Education (contd.)

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- Maximize their career prospects, with strong emphasis on employability.
- Maintain raised awareness, among the candidates, of the environmental impacts related to resource exploitation or natural hazards.





# Higher Education Duty Fulfillment



- Periodically revise and update the curricula so as to accommodate the new developments in geosciences, and diffuse existing knowledge through training and education.
- Execute post-graduate programmes, such as Higher Diplomas and M.Sc.s. by courses and complementary research in the various specialities of Geosciences and related Engineering.
- Continually register graduate employees working in the Petroleum and Mineral Resources Sector for M.Sc.s. and Ph. Ds., by research of applied nature, since they seek higher qualification for promotion or for competition for other jobs.

## Fulfillment (contd.)

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- Cater for fresh graduates in need for post-graduate programmes for maximization of their career prospects and employability requisites.

[Those who have enrolled and completed these capacity-building programmes are now performing their duties in a professional manner; some of them presently work in international companies, ARAMCO & Minerals Company are two examples].



# Challenges Facing Sudanese Higher Education Institutions:

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- Shortage in some of the necessary equipment for training such as gravimeters, magnetometers and Geiger counters.
- Universities usually borrow such equipment from the Geological Research Authorities of Sudan (GRAS), or from the Petroleum Sector.



# Challenges (contd.)

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- Attending or contributing to international conferences by research and teaching staff is very important, but full sponsoring is a problem.
- Higher degrees candidates are expected to publish some of their research in refereed journals before they go before the Viva. If the results were not obtained using sophisticated equipment (NAA, ICP ... etc. analyses), publication becomes impossible.

# Challenges (contd.) Job Opportunities

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- Employment opportunities are limited despite the sectors listed below:
- Private petroleum companies,
- Ministry of Petroleum and Gas,
- Ministry of Minerals,
- Geological Researches Authority of Sudan
- Private Mining Companies,
- Municipal and Rural Water Corporations,
- NGOs working in rehabilitation programmes.
- Ministry of Electricity and Dams.



# PROPOSALS FOR SOLUTIONS

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- A situation analysis needs to be carried out in order to list some equipment shortages, which have a negative impact on the building of research capacities, innovation and sustainable development.
- The establishment of a central laboratory equipped with the necessary instruments is a dream that is hoped to come true, but it is not farfetched by the United Nations.
- A shared central library regularly receiving scientific periodicals, together with some field logistics are strongly needed.
- Prioritization of funding for tertiary education and research of applied nature to solve the problems posed by the extractive industries.



# SOLUTIONS (contd.)



- Intimate links between the Higher Education Institutions and the Mineral and Petroleum Sectors should be firmly encouraged for their mutual benefit.
- The role of **qualified** Technicians in the Higher Education and in the Mineral and Petroleum sectors is indispensable.
- We need to recruit graduates (not secondary school leavers) with Chemistry/physics, and get them trained abroad through sponsoring by the United Nations. They should then be capable of operating, maintaining and repairing the Lab equipments, exactly like the Technicians we have seen in Europe or elsewhere





# AN APPEAL

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- **We strongly call upon the United Nations for help with overcoming, at least, some of these shortcomings.**





# REFERENCES

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- Higher Education Admissions Directory, 2015. Sudan Ministry of Higher Education and Scientific Research. Sudan Currency Printing House, Khartoum.
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**Thank You!**