



Role of regional educational network in enhancing African nuclear HRD

Mohamed H. Hassan

*Nuclear and Radiation Engineering Department,
Alexandria University, Egypt*

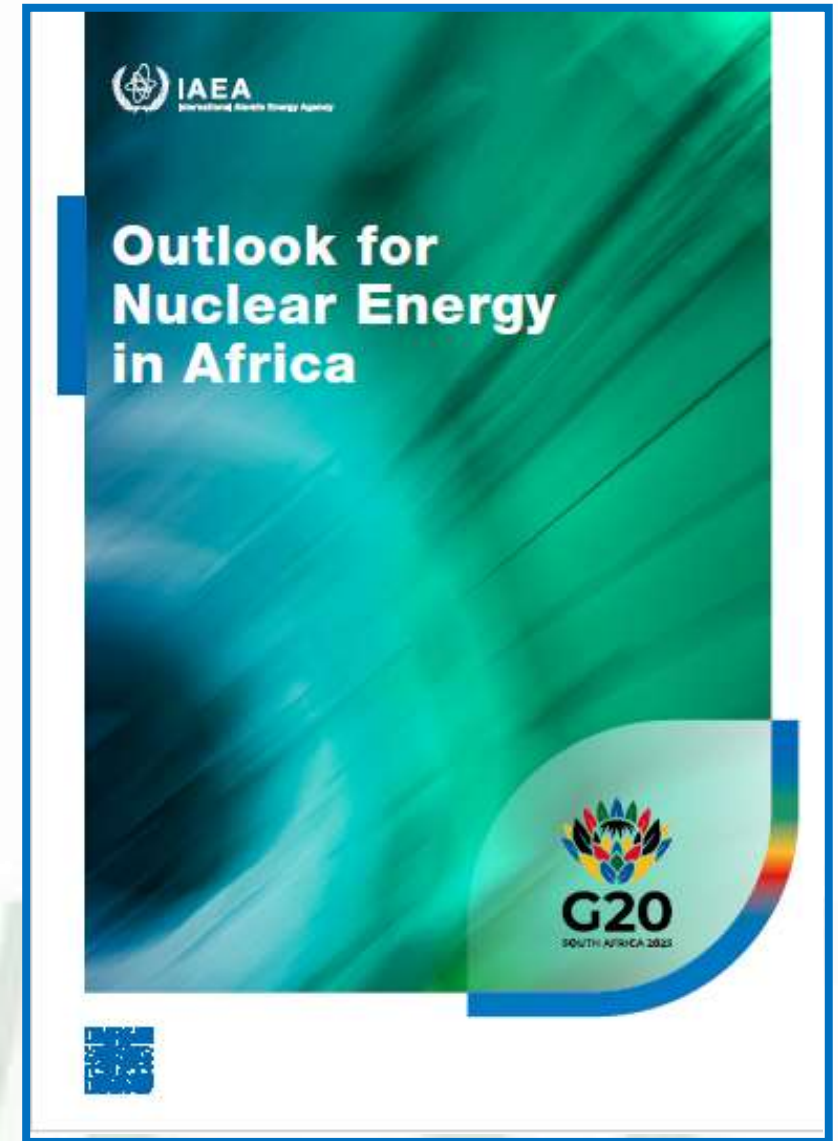
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Objectives & Outline

- Recommend an approach towards fulfilling the INPRO user requirements:
 - Regional arrangements should provide options to reduce needed human resources in Africa
- Stress the need for nuclear engineering education in Africa
- Why regional cooperation?
- INPRO user requirement on regional arrangements to minimize needed infrastructure
- Role of educational network
- AFRA-NEST status and challenges
- Status and needs for nuclear engineering education in Africa
- The way forward

Why regional cooperation?

- “Regional cooperation could help countries to *share costs* by developing joint NPPs while maximizing infrastructure benefits across multiple countries”.
- “Additionally, stronger *bargaining power as a result of regional cooperation* can enable African countries to negotiate better financing terms with international partners, ensuring more favorable conditions for development”



UR6: Regional and international arrangements¹:

Regional and international arrangements should provide options that enable a country with an NES to minimize the infrastructure for a nuclear power programme

User requirements

INPRO infrastructure requirements

CR6.1: Options to reduce institutional infrastructure

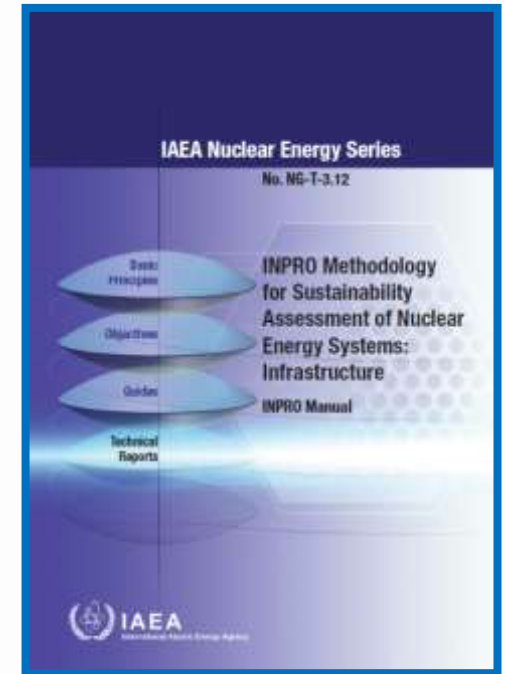
Criteria

IN6.2: Have regional and/or international arrangements to reduce the industrial infrastructure been considered?

AL6.2: Yes

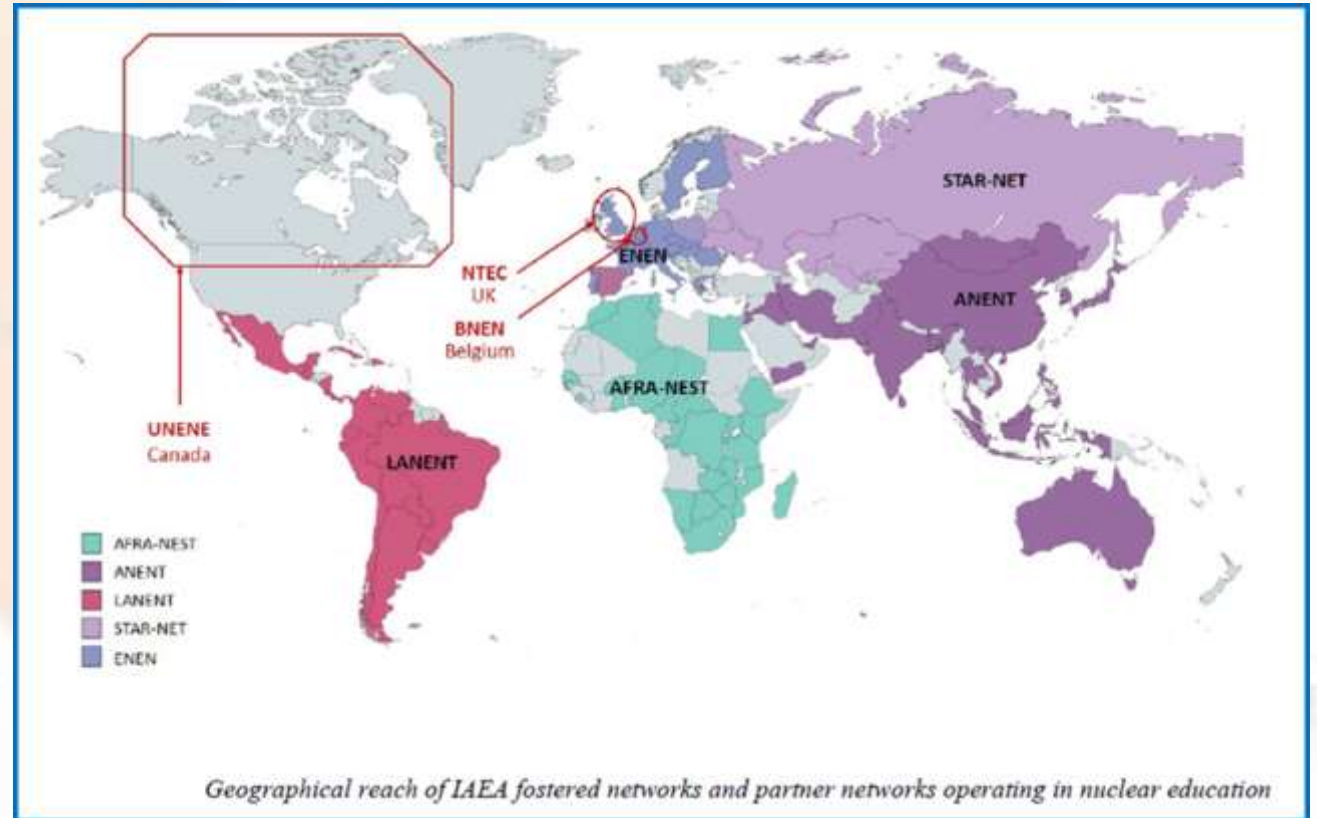
Indicator

Acceptance Level



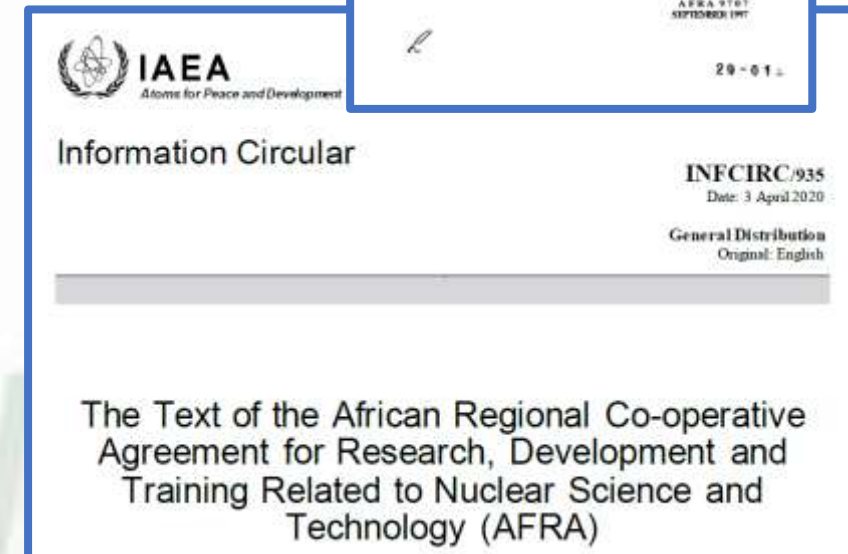
Educational regional networks

- Regional networks bring together *educational institutions, employers and other organizations*.
- Connecting regional and *national networks* would unlock the potential benefits of knowledge transfer and inter-cultural learning, with wider opportunities for *mobility and cross-boundary exchange of students and lecturers*.



AFRA-NEST

- AFRA: Founded by Tunisia, Egypt, and Algeria
 - Entered into force on 4 April **1990**, revised **2020**
- AFRA Network for Education in Nuclear Science and Technology (AFRA-NEST)
 - Established at the AFRA Ministerial Conference held in Aswan, **2007**.
- Objectives:
 - Facilitate the operation and networking of higher education, training and related research in Nuclear Science and Technology (NS&T) in the African Region
 - Foster sustainable human resource development and nuclear knowledge management, to satisfy the needs of African countries with/without higher education and training, in the priority areas of non-power and power applications of nuclear energy.
- Agreed Action Plan:
 - Formation of a General Assembly of all AFRA-NEST Members.
AFRA-NEST would facilitate national benchmarking of national nuclear educational resources, facilities and programs.





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African Nuclear Educational Network (AFRA-NEST): Assessment, challenges, and the way forward

Mohamed H. Hassan

Nuclear and Radiation Engineering Department, Alexandria University, Egypt

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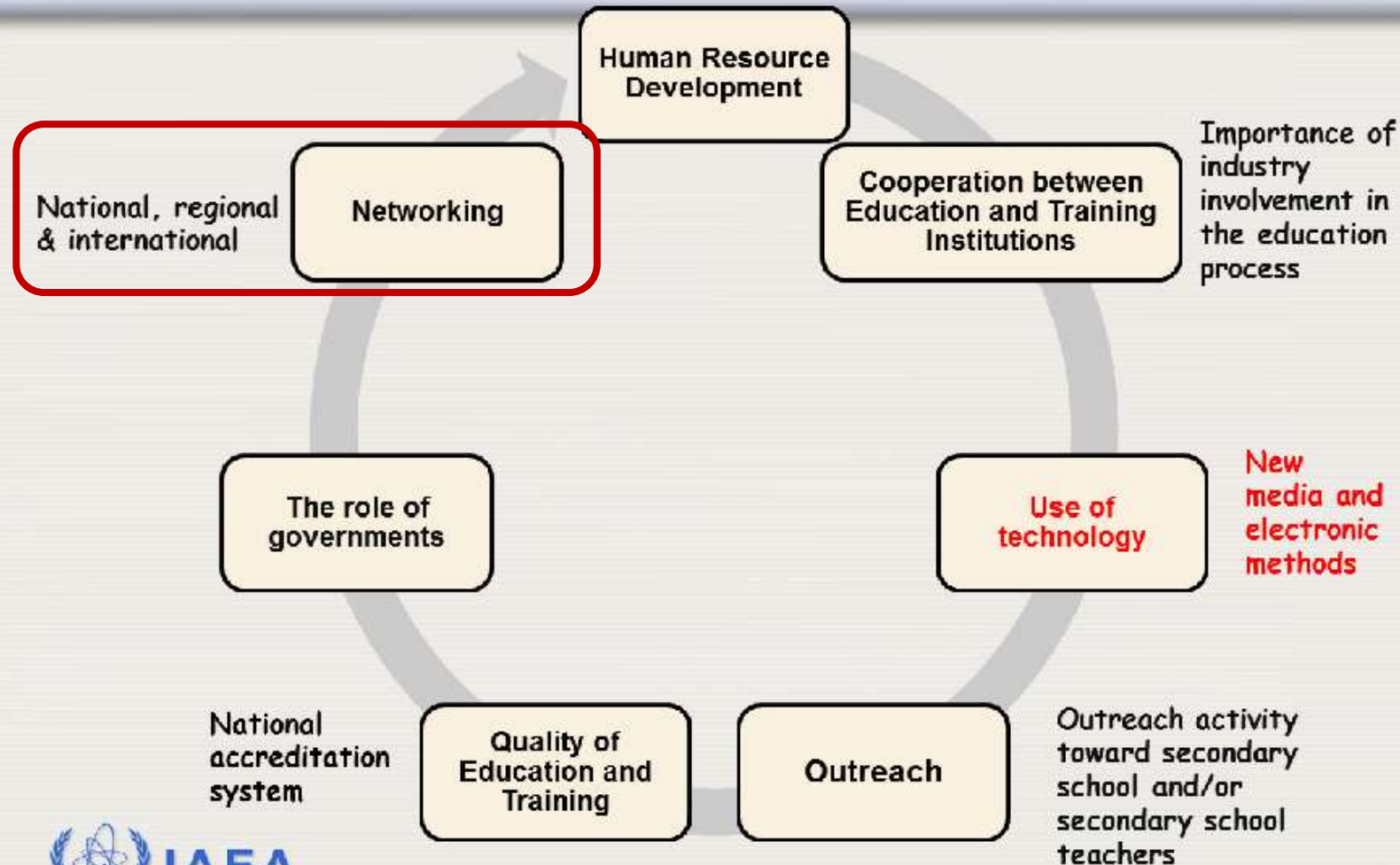
Keywords:

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AFRA-NEST
Capacity building
Regional cooperation
Informed customer

ABSTRACT

As eleven African countries are planning or moving ahead with the implementation of national nuclear programs, the role of nuclear education networks in preparing the needed national workforce cannot be underestimated. A 2022 IAEA publication on Nuclear Educational Networks benchmarked the different nuclear networks. It suffices to mention that; as of 2022; the African Nuclear Educational Network, AFRA-NEST, does not have a network platform and the position of the regional coordinator is vacant. Also, the network did not witness any major activities since nearly 2013. This opinion paper is an attempt to better understand the history and status of AFRA-NEST, address the challenges and provide some recommendations on re-activating it to cope with the ongoing nuclear activities in Africa.

Best Practices in Nuclear Education

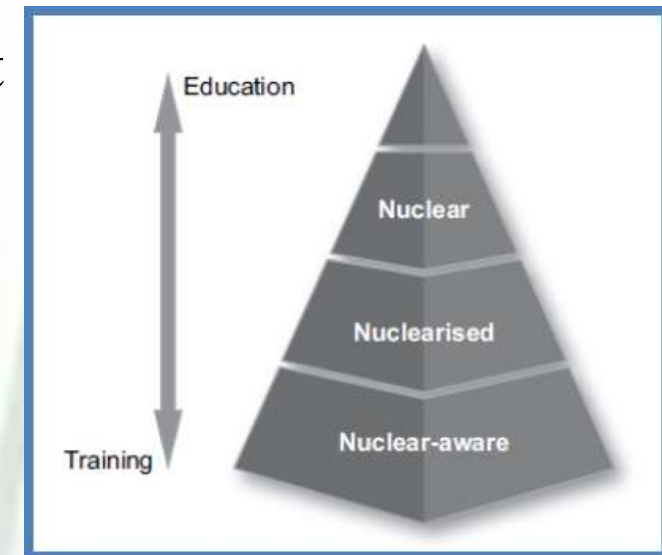
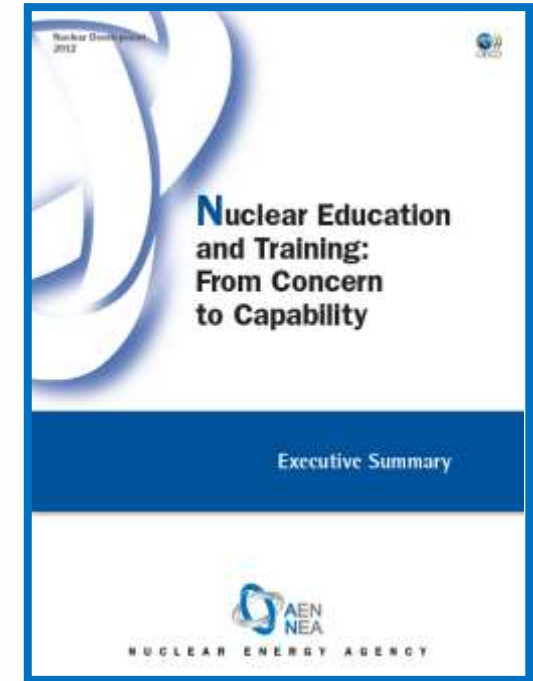


Educational networks are not a goal in themselves, but they are part of the education process.

Their role needs to be integrated with developing nuclear science and education programs.

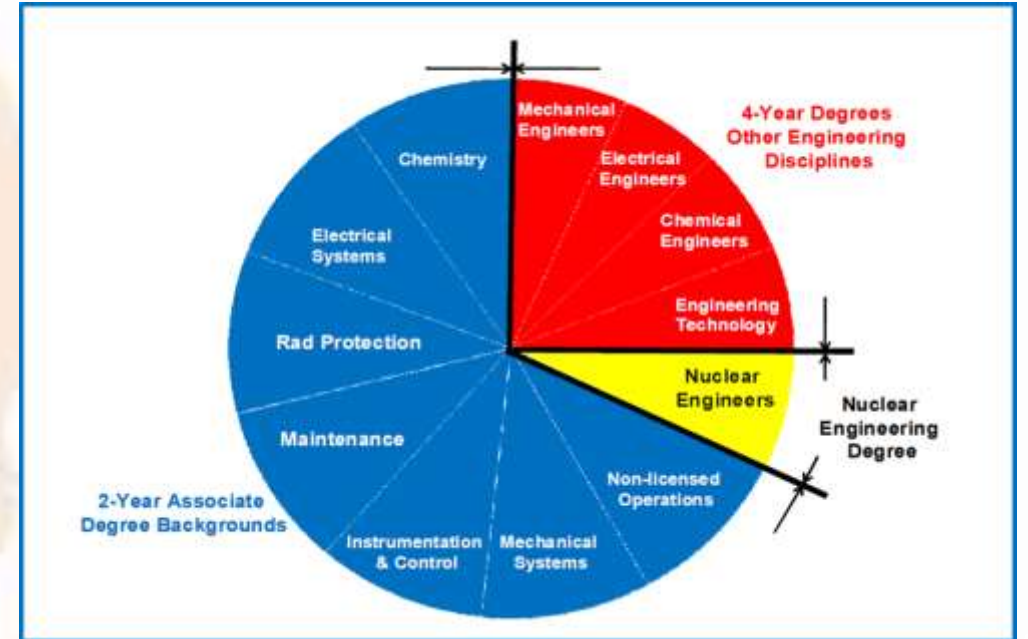
Misconceptions on needed nuclear competencies

- “**Nuclear**” people with a specialized formal education in nuclear subjects (e.g. nuclear engineering, radiochemistry, radiological protection, etc.);
- “**Nuclearised**” people with formal education and training in a relevant (non-nuclear) area (e.g. **mechanical, electrical, civil engineering, systems**) but who need to acquire knowledge of the nuclear environment in which they have to apply their competencies;
- “**Nuclear-aware**” people requiring nuclear awareness to work in the industry (e.g. **electricians, mechanics, and other crafts and support personnel**).



Nuclear science & engineering education in Africa

1. Nuclear and radiation engineering department, *Alexandria University*, Egypt (*Undergraduate and graduate levels*)
2. Nuclear Engineering Department, *Tripoli University*, Libya (*Undergraduate level*)
3. Nuclear engineering program, *Northwest University*, South Africa (*Graduate level*),
4. School of nuclear and allied sciences, *University of Ghana*, Ghana (*Graduate level*)
5. M.Sc. in Nuclear Science & Technology, *University of Nairobi*, Kenya (*Graduate level*)
6. Nuclear Engineering dept., Sudan Univ. of Science and Technology, Sudan (*Undergraduate level*)



Nuclear Workforce

Nuclear science & engineering education in Africa (Cont.)

Regional Designated Centers (RDCs)

- Master of nuclear science and Technology

HIGHER AND PROFESSIONAL EDUCATION

Department of Nuclear and Radiation Engineering
Faculty of Engineering
University of Alexandria
Alexandria, Egypt

Graduate School of Nuclear and Allied Sciences (SNAS), University of Ghana
Ghana Atomic Energy Commission (GAEC)
Accra, Ghana

The way forward ...

- *Re-creating a sense of purpose, identity, and direction at the higher level of AFRA-NEST.*
- A new driving force can be spearheaded by the countries with advanced nuclear power programs/capabilities, such as *South Africa, Egypt, Kenya and Ghana.*
- *Networking the existing African nuclear sciences & engineering programs.*
- Capitalizing upon the *curriculum of the two RDCs to* serve as basics of educational materials to be uploaded to the AFRA-NEST platform.
- Efforts supported by the IAEA need to be undertaken to re-establish the AFRA-NEST, its *digital platforms* and its key role in *integrating available E&T capabilities in the region.*
 - & Capitalizing upon IAEA assist missions like: *KMAV's INEAS*



Q&A

mohamed.hassan@alexu.edu.eg

	ANENT	AFRA-NEST	LANENT	STAR-NET
Main results and activities focus	- LMS and network web-portal development; - E-learning (including training through fellowships and material development).	National networking through IAEA methodologies.	- LMS and network web-portal - E-learning (including training through e-learning on e-learning courses); - KM awareness raising (Conferences, NKM Schools and increasing interest on KMAVs).	The scope of STAR-NET activities includes but is not limited to education (levels of bachelor, master and specialist and postgraduate and PhD), professional training (continuous training, professional development training, etc.) as well as educational, research and development projects in all subjects in the area of nuclear science, technology and management.
Budget	IAEA TC	IAEA TC AFRA-NEST membership fee to be paid through the AFRA membership fee financial arrangement	IAEA TC	Membership fees and services
Network platforms	Website: https://www.anentweb.org/	Not operational	Website: https://www.lanentweb.org/en LMS: https://www.lanentweb.org/es/portal-educativo-0	Website: https://www.star-net.online STAR-NET LMS: http://lms.star-net.online