

Science and Security Summit (Symposium)
Federation of American Scientists
Washington D. C.
Stephen Dahunsi



THE UNIVERSITY OF
TENNESSEE
KNOXVILLE

April 21, 2017

Outline

- Nigeria
- Past research
 - Human Reliability Program in Nigeria
- Present research
- Conclusion

Nigeria

- ~181 Million Citizens
- Rich History
- Over 250 Ethnic Groups
- Over 520 Languages/Dialects
- English is Official Language



Nigeria

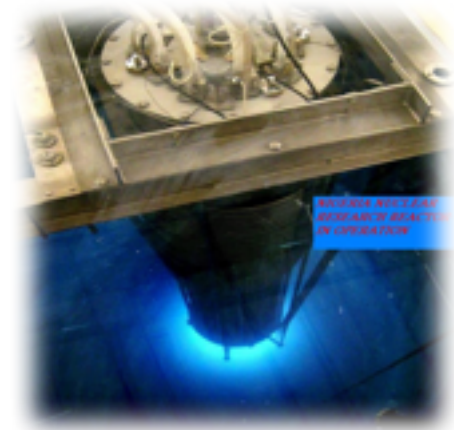


- **Gamma Irradiation Facility**
 - **Used for Food Irradiation**
 - Co-60 source
 - 340 kCi (2005)
 - 150 kCi (2014)
- **Associated Labs**
 - **Dosimetry**
 - **Sterile Insect Technique**
 - **Others**



- **1.7 MV TANDEM Accelerator**
- **Gamma Spec.**
- **Thermal Hydraulics Lab.**
(on-going)

Ongoing efforts to generate electricity from a nuclear plant.



- **Nigerian Research Reactor (NIRR-1)**
 - Commissioned 2004
 - 31 kW
 - HEU ~ 90% (1 kg)
 - Soil Fertility Mapping
- **IAEA Safeguards**
- **Conversion Studies to LEU in 2006 (IAEA-CRP)**
- **Gamma spec.**

Past research

- ❑ **ATBU Bauchi**

B.Eng (Electrical/Electronic Engineering)

- ❑ **University of Ghana**

Pg. Diploma (Radiation protection)

- ❑ **University of Tennessee**

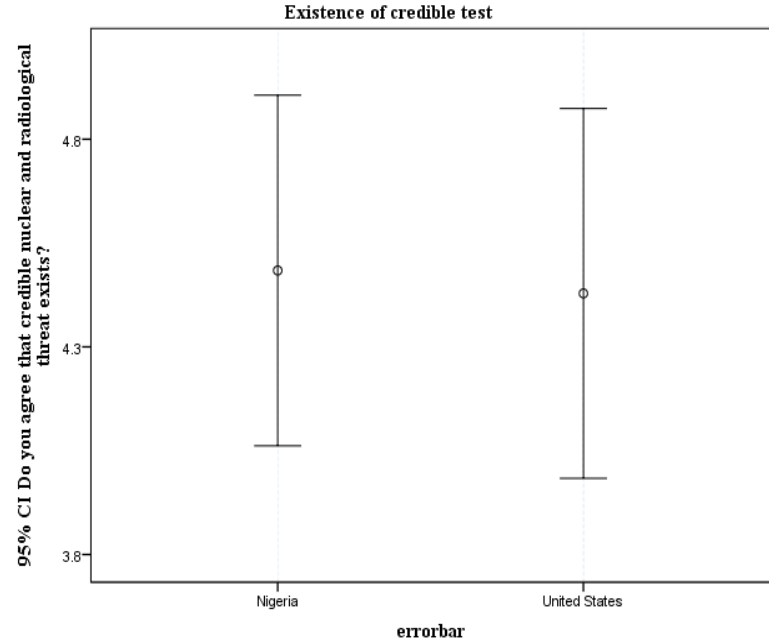
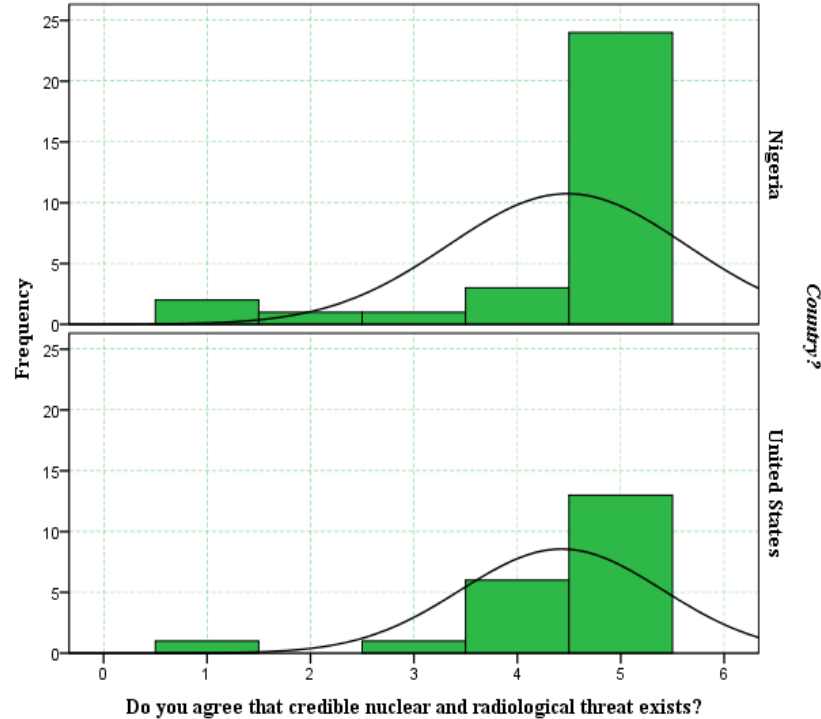
Ms (Nuclear & Radiological Engineering)

Nuclear Security (Integration of nuclear technology with viable public policy for the promotion of peaceful nuclear technologies in newcomer countries)

Human Reliability Program in Nigeria

Do you agree that credible nuclear and radiological threat exists?

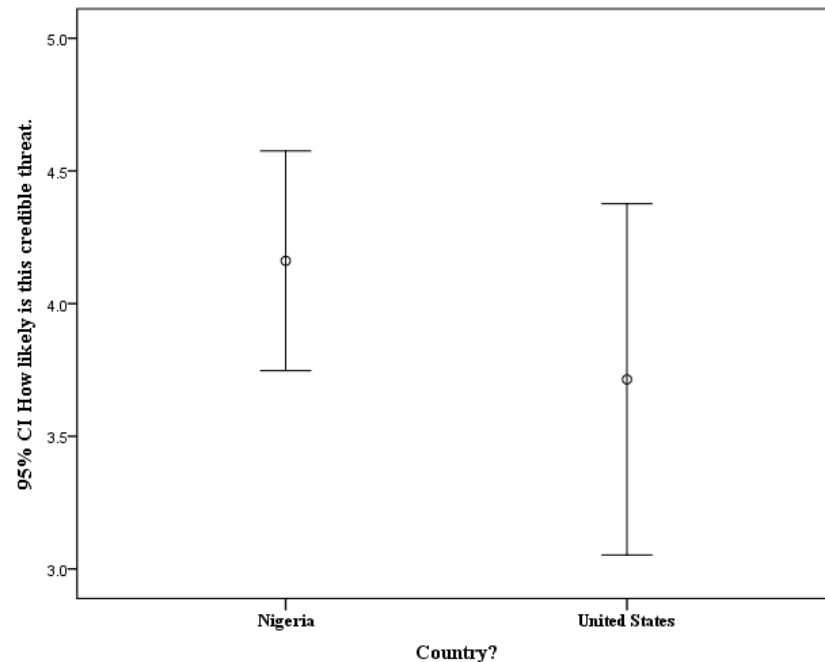
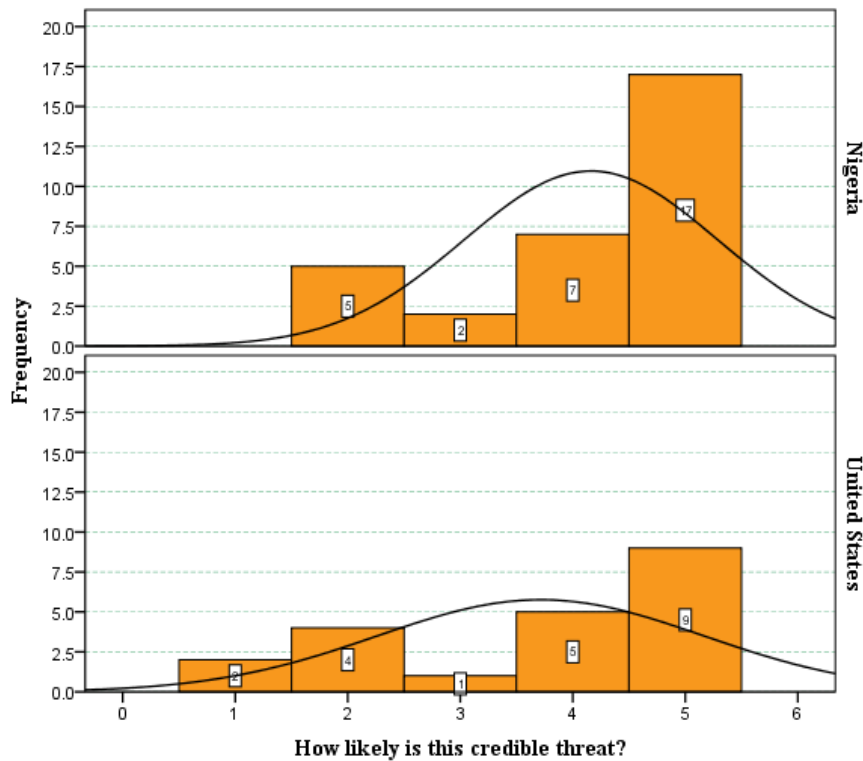
- 1 - Strongly Disagree
- 2 - Somewhat Disagree
- 3 - Neither disagree or agree
- 4 - Somewhat agree
- 5 - Strongly Agree
- 6 - N/A



Human Reliability Program in Nigeria

How likely is this credible threat?

- 1- Strongly Unlikely
- 2- Somewhat Unlikely
- 3 – Neither likely or unlikely
- 4 – Somewhat likely
- 5 – Strongly likely
- 6 – N/A



Present research

University of Tennessee

Institute for Nuclear Security/Oak Ridge National Laboratory

Prof. Howard Hall and Jeff A. Chapman

PhD Energy Science and Engineering

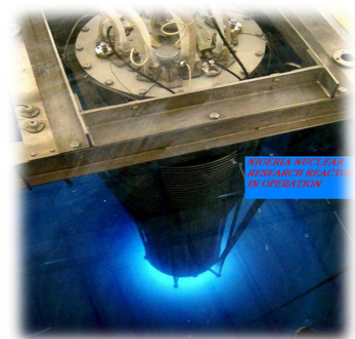
Determination of the Source Terms For NIRR-1 HEU and proposed LEU cores: Evaluation of Safeguards implications for Storage and Transportation

Challenges for International students

- Funding
- Cultural difference
- Project priorities

Challenges for International community

- Global electricity demand
- Credible nuclear security threat
- Need to recreate safety, security and safeguards analyses using modern methods



Conclusions

- ❑ Priorities should be well spelt out in proposal call that gives specificity on research proposals
- ❑ Funding that improves stronger partnership between the US and developing countries should priorities
- ❑ Cross cutting project developments should
- ❑ Collaboration that encourages Human Capital Developments involving young professionals with presence in the US should be encouraged to foster longer partnership.



Thank you 😊



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